SEA Environmental Report

LTP4 Strategic Environmental Assessment

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Contents

Figures

Tables

1 Introduction

1.1 Background

Amey has undertaken a Strategic Environmental Assessment (SEA) of Kent County Council's (KCC) fourth Local Transport Plan (LTP4). KCC's third Local Transport Plan (LTP3) ran from 2011 to 2016. The requirement to review Local Transport Plans every five years was removed by the Local Transport Act 2008; therefore LTP4 is a high-level strategy document covering an extended timeframe of 2016 to 2031. The new transport plan will be known as 'KCC Local Transport Plan 4: Delivering Growth without Gridlock 2016-2031'.

KCC is responsible for the management and maintenance of all of Kent's local roads and public rights of way. Additionally, KCC implements local transport schemes that support the long-term objectives of improving the economic, social and environmental wellbeing of the county; and lobbies for major transport infrastructure, such as a new Lower Thames Crossing, an alternative to Operation Stack, a solution for inappropriate overnight lorry parking, and improvements to bus and rail services.

Local Transport Plans are a statutory requirement for Local Transport Authorities, and are used to determine how local transport investment is made, with particular reference to the Local Road Network. As such, it includes all of the aspects detailed above. While KCC does not directly provide or invest in the infrastructure for rail, sea or air transportation modes, their policies and priorities for Rail and Aviation are detailed in LTP4. The current (third) KCC Local Transport Plan (LTP3) was adopted on 6 April 2011 and is for the five-year period 2011-2016. LTP3 contains a 50-page Strategy and 100-page Implementation Plan which look in detail at Kent's requirements, challenges and a range of potential solutions over the plan period. By contrast, the main body of LTP4 is 63 pages long, with an Annexe of 7 pages in length detailing the newly-proposed ITP Prioritisation Methodology.

The final pre-consultation draft LTP4 along with a draft SEA Environmental Report (Rev0) was presented to the Environment and Transport Cabinet Committee on 8 July 2016. Public Consultation on both LTP4 and the SEA Environmental Report Rev0 commenced on 8 August 2016 for 12 weeks, and the responses incorporated as necessary into both documents. This document is the updated Environmental Report (Rev1) that takes into account the changes to LTP4 post-consultation, and the SEA-specific consultation comments. LTP4 has been approved

by Cabinet Committee and Cabinet and will be adopted at full County Council in July 2017, after which the final LTP4 will be published alongside the SEA Statement.

1.2 Outline of LTP4

1.2.1 Policy Context

The local policy context identified by LTP4 is reproduced in Figure 1, below.

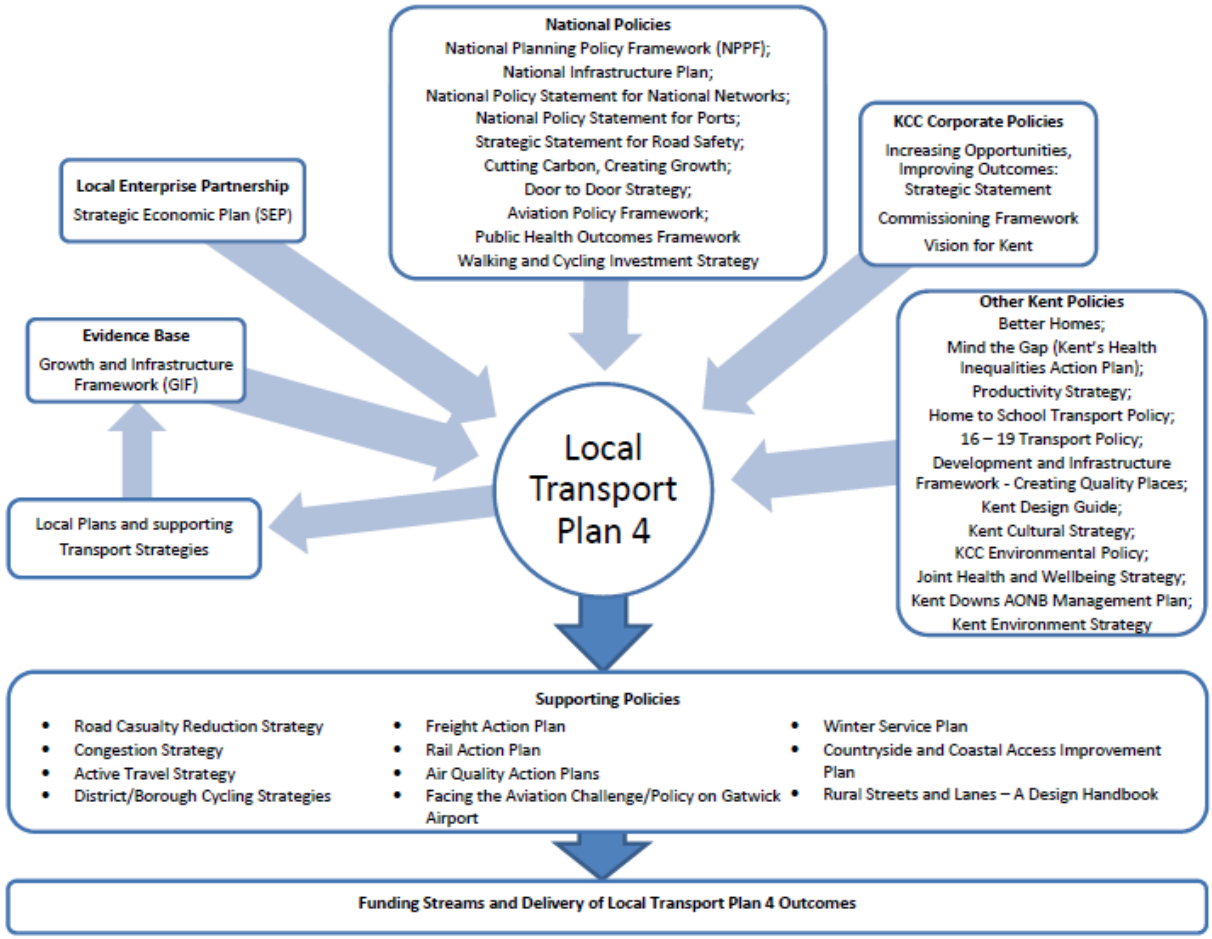


Figure 1: LTP4 Policy Context

While this provides a useful overview of the wide-ranging influences that have been taken into account in the production of LTP4, the following additional plans are identified in the Kent Environment Strategy (KES; adopted by KCC in March 2016) but are not mentioned within LTP4:

- Kent Housing Strategy
- Minerals and Waste Development Plan
- Growth strategies at Local Enterprise Partnership (LEP) and local level
- Joint Strategic Needs Assessment (JSNA)

- Living Well
- Child Poverty Strategy
- Fuel Poverty Strategy
- Kent Nature Partnership Action Plan
- SE LEP Rural Strategy
- Local Flood Risk Strategy

The environmental policy context is presented in Section 2, along with the environmental baseline data.

1.2.2 Objectives of LTP4

The Ambition and Outcomes for the LTP4 Review developed during the initial stages of plan-making are presented below:

"To deliver safe and effective transport, ensuring that all Kent's communities and businesses benefit, the environment is enhanced and economic growth is supported"

Outcome 1: Economic growth and minimised congestion

Policy: Deliver resilient transport infrastructure and schemes that reduce congestion and improve journey time reliability to enable economic growth and appropriate development, meeting demand from a growing population.

Outcome 2: Affordable and accessible door-to-door journeys

Policy: Promote affordable, accessible and connected transport to enable access for all to jobs, education, health and other services.

Outcome 3: Safer travel

Policy: Provide a safer road, footway and cycleway network to reduce the likelihood of casualties, and encourage other transport providers to improve safety on their networks.

Outcome 4: Enhanced environment

Policy: Deliver schemes to reduce the environmental footprint of transport, and enhance the historic and natural environment.

Outcome 5: Better health and wellbeing

Policy: Provide & promote active travel choices for all members of the community to encourage good health and wellbeing, and implement measures to improve local air quality.

1.3 Kent's Strategic Transport Priorities

Kent's Strategic Transport Priorities within LTP4 are of both National and Countywide significance. These are outlined spatially in Figure 2, and summarised below.

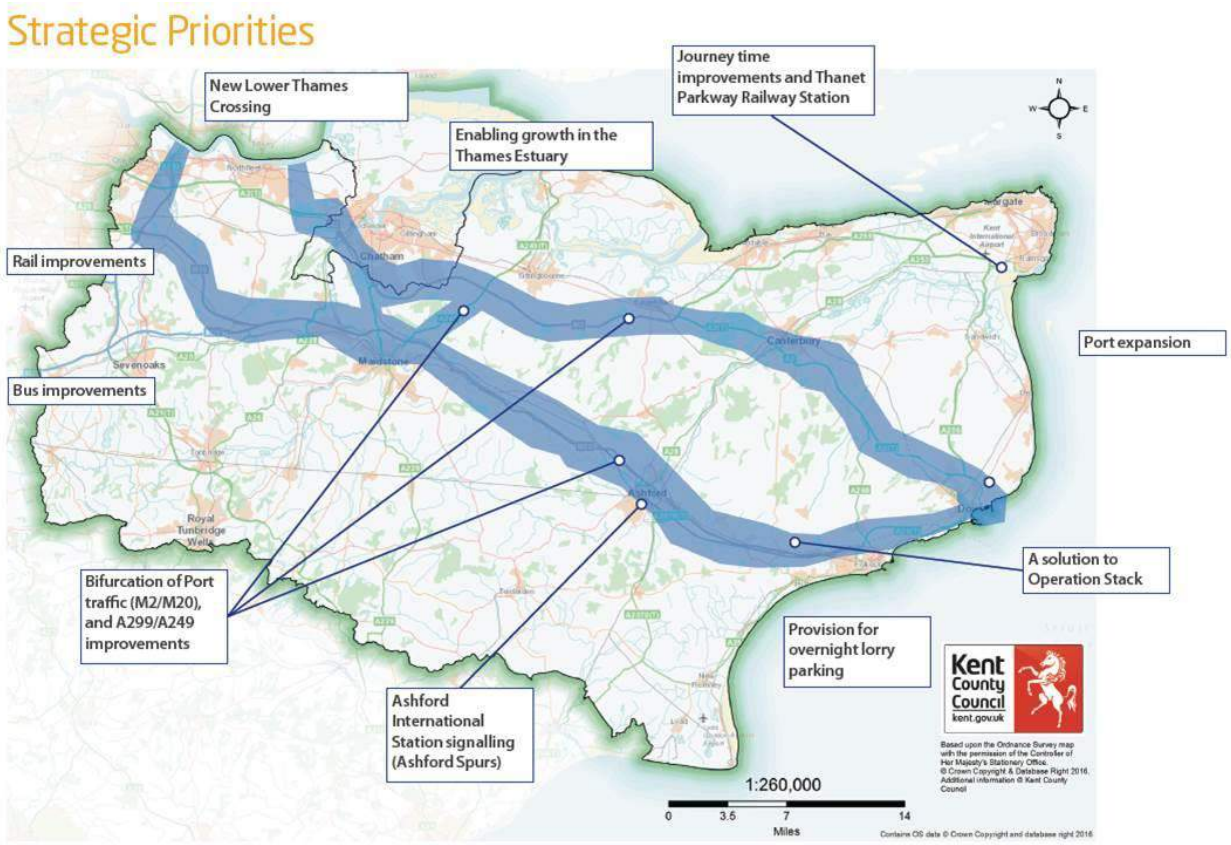


Figure 2: Kent's Transport Priorities

1.3.1 National

LTP4 details several strategic priorities of national importance, as detailed below. Not all national priorities will be included in the scope of the SEA for LTP4 due their inclusion in LTP3 and therefore have already undergone assessment under SEA.

i. Enabling Growth in the Thames Estuary	
Issue	The Thames Estuary is the South East's most important location for housing and commercial growth yet unlocking its potential depends on bringing forward significant new infrastructure given existing levels of congestion and lack of resilience
Action	Prioritise the transport investments that are required to deliver the major commercial and residential developments planned over the next 10 – 15 years.
Transport Improvements Needed	• A2 Bean junction upgrade. • A2 Ebbsfleet junction upgrade. • M2 junction 5 upgrade • Increased high speed rail services to Ebbsfleet. • Enhanced Fastrack bus network • Crossrail extension from Abbey Wood to Dartford, Ebbsfleet and Gravesend.
Outcome	87,000 new homes and up to 20,000 new jobs at Ebbsfleet Garden City and up to 27,000 new jobs at the leisure resort proposed on the Swanscombe Peninsula. LTP4 Outcomes: 1 Economic growth and minimised congestion, 2 Affordable and accessible door-to-door journeys, 4 Enhanced environment
Funding & Decision-making	A2 Bean and Ebbsfleet junctions c. £125 million. Crossrail towards Gravesend c £2 billion.
Status	Previously prioritised in LTP3 and Growth without Gridlock – LTP4 represents continuation of 'business as usual'.
Inclusion in SEA Assessment required?	**No**: No change from LTP3; KCC is not the LPA nor the Highways Authority for the majority of the affected area. KCC transport schemes to be promoted in this area should be subject to prioritisation and early assessment using the revised Value for Money (VFM) matrix to ensure early consideration of potential environmental impacts and opportunities.

ii. New Lower Thames Crossing	
Issue	The Dartford Crossing carries over 50 million vehicles a year and congestion costs the UK economy by constraining growth, impacting on north Kent, south Essex and southeast London. It has one of the highest incident rates on the major road network and there is no real alternative route.
Action	Provision of a new Lower Thames Crossing to the east of Gravesend.
Transport Improvements Needed	In the 2016 consultation, KCC's response was adamant that the Western Southern Link should be chosen and that with careful route alignment and tunnelling, the environmental and heritage impacts could be substantially minimised. As part of the project to deliver the new Lower Thames Crossing the A229 between M2 Junction 3 and M20 Junction 6 should be upgraded (what has previously been called Option C 'variant') along with improvements to the A249 as another link between the two motorways and the upgrades identified for 'bifurcation of port traffic'.
Outcome	Over 50,000 new homes and 26,000 jobs across North Kent. Significant cost savings to UK businesses by improving journey time reliability and network resilience. LTP4 Outcomes: 1 Economic growth and minimised congestion, 2 Affordable and accessible door-to-door journeys, 3 Safer travel, 5 Better health and wellbeing
Funding & Decision-making	Highways England 2016 consultation estimates the cost to be in the range £4.1bn to £5.7bn (if Route 3 with Western Southern Link is chosen).
Status	Previously prioritised in LTP3 and Growth without Gridlock – LTP4 represents continuation of 'business as usual'.

ii. New Lower Thames Crossing	
Inclusion in SEA Assessment required?	**No**: No change from LTP3; no clarity is yet available on the Option to be progressed; scheme is promoted by Central Government with KCC as a consultee.

iii. Bifurcation of Port Traffic	
Issue	Inefficient motorway network along the Channel Corridor as all traffic is routed along the M20/A20.
Action	Bifurcate (split traffic) between the M20/A20 and M2/A2 routes.
Transport Improvements Needed	• M2 Junction 7 (Brenley Corner) improvements to increase capacity and provide free-flow between the M2 and A2. • Dualling sections of single carriageway on the A2 north of Dover along Jubilee Way to Whitfield and near Lydden. • M20 Junction 7 improvements to provide ease of access between the A249 and M20. • M2 Junction 5 Stockbury improvements to provide free-flow between the M2 and A249.
Outcome	A resilient transport network and major regeneration of Dover. LTP4 Outcomes: 1 Economic growth and minimised congestion, 3 Safer travel, 5 Better health and wellbeing
Funding & Decision-making	LGF funding contribution via KMEP and SELEP. Investment by Highways England through their Road Investment Strategies.
Status	Previously prioritised in LTP3 and Growth without Gridlock – LTP4 represents continuation of 'business as usual'.
Inclusion in SEA Assessment required?	**No**: No change from LTP3. KCC transport schemes contributing to bifurcation should be subject to prioritisation and early assessment using the revised VFM matrix to ensure early consideration of potential environmental impacts and opportunities.

iv. Port Expansion	
Issue	Annual forecast for growth at the Port of Dover is between 2% and 4% so capacity is needed to support increasing freight movements and the resilience of the Port.
Action	Work with Dover Harbour Board and other port operators to support development.
Transport Improvements Needed	The Western Docks would provide a dedicated ferry terminal and additional holding capacity for freight vehicles. The redevelopment would also kick-start the regeneration of Dover town, attracting investment, creating jobs and improving the appearance of the Waterfront. The scheme will remodel the Prince of Wales and York Street roundabouts on the A20.
Outcome	Job creation, regeneration and the redistribution of freight traffic. LTP4 Outcomes: 1 Economic growth and minimised congestion
Funding & Decision-making	Dover Western Docks Revival c £250M
Status	Not previously prioritised in LTP3 or Growth without Gridlock – new to LTP4.
Inclusion in SEA Assessment required?	**Yes**: See Section 5.

v. A Solution to Operation Stack	
Issue	Significant and prolonged disruption to the county when Operation Stack closes sections of the M20.
Action	Highways England to deliver an Operation Stack Lorry Area for 3,600 HGVs.
Transport Improvements Needed	KCC are working with Highways England who is leading on the delivery of a Lorry Area that will reduce the need to use the M20 to queue freight vehicles during times of disruption to cross-Channel services. In addition to this work, KCC will lobby for more freight to be transported by rail although they acknowledge that limited train paths for rail freight and the economics of transporting goods by road limits the scope for significant modal shift.
Outcome	Fewer instances of disruption, ultimately improving the image of Kent as a place to do business. LTP4 Outcomes: 1 Economic growth and minimised congestion
Funding & Decision-making	£250m allocated in 2015 Autumn Statement.
Status	Previously prioritised in LTP3 and Growth without Gridlock – LTP4 represents continuation of 'business as usual'.
Inclusion in SEA Assessment required?	**No**: No change from LTP3; scheme is promoted by Central Government.

vi. Provision for Overnight Lorry Parking	
Issue	There is a significant amount of unofficial and often inappropriate overnight lorry parking that causes distress for the communities affected and potential safety issues on Kent's roads.
Action	Identify a network of smaller overnight lorry parks and work with Kent Police to enforce against offenders.
Transport Improvements Needed	KCC are developing a strategy for a network of small lorry parks at suitable locations across Kent and a partnership approach with the Districts and the Police to address enforcement. The proposed Operation Stack Lorry Area adjacent to the M20 at Stanford should be integrated with this overall strategy.
Outcome	Relocation of overnight lorry parking away from communities and reduced antisocial behaviour. LTP4 Outcomes: 3 Safer travel, 4 Enhanced environment
Funding & Decision-making	Lorry parks to be commercially operated, typical construction cost £2.6M to £6M per lorry park.
Status	Previously prioritised in LTP3 and Growth without Gridlock – LTP4 represents continuation of 'business as usual'.
Inclusion in SEA Assessment required?	**No**: No change from LTP3. Identification of potential new lorry parks should be subject to prioritisation and early assessment using the revised VFM matrix to ensure early consideration of potential environmental impacts and opportunities.

1.3.2 Regional

LTP4 also details strategic priorities of regional (countywide) importance. Not all regional priorities will be included in the scope of the SEA for LTP4 due their inclusion in LTP3 and therefore have already undergone assessment under SEA.

vii. International Station Signalling (Ashford Spurs)	
Issue	The signalling on the Ashford Spurs needs upgrading to retain international services to Ashford International Station.
Action	KCC is working in partnership with Ashford Borough Council, Network Rail, Eurostar and High Speed 1 to secure the delivery of the signalling upgrade at Ashford International, for which funding is being sought through the Local Enterprise Partnership.
Transport Improvements Needed	KCC, working in partnership with Ashford Borough Council, have led a working group with all concerned stakeholders to fund, procure and deliver an upgrade to the signalling system.
Outcome	Ashford will continue to operate as an international station and be served by the new trains as well as any future international rail operators. LTP4 Outcomes: 1 Economic growth and minimised congestion, 2 Affordable and accessible door-to-door journeys
Funding & Decision-making	SELEP - £10.5M
Status	Not previously prioritised in LTP3 or Growth without Gridlock – new to LTP4.
Inclusion in SEA Assessment required?	**Yes**: See Section 5.

viii. Journey Time Improvements and Thanet Parkway Railway Station	
Issue	East Kent has real opportunity for growth but currently is beyond the 'magic hour' time from London, which discourages employers from locating in the area. Regeneration in East Kent is dependent on improving accessibility.
Action	Delivery of Thanet Parkway railway station.
Transport Improvements Needed	Not specified
Outcome	Improved rail connectivity between East Kent, London and the wider Kent area, and increased attractiveness of East Kent to employers. LTP4 Outcomes: 1 Economic growth and minimised congestion, 2 Affordable and accessible door-to-door journeys
Funding & Decision-making	Thanet Parkway cost of £21 million (at 2020 prices)
Status	Previously prioritised in LTP3 and Growth without Gridlock – LTP4 represents continuation of 'business as usual'.
Inclusion in SEA Assessment required?	**No**: No change from LTP3.

ix. Rail Improvements	
Issue	Growth in housing and jobs will increase demand for rail travel especially to and from London. Cost of commuting by rail to access employment is a major barrier for many people. The new SE franchise will need to offer increased capacity on both High Speed and Mainline services in Kent.
Action	Create a co-ordinated public transport network and promote initiatives to encourage greater use of rail in Kent. Liaise with partners to identify options for reducing the 'rail price penalty'.
Transport Improvements Needed	KCC will work with Government and the rail franchisee to identify options to reduce this. KCC has made good progress on promoting improvements to rail passenger services through the Rail Action Plan for Kent, and this has led to KCC being recognised as a voice of authority on rail matters for the South East. KCC will now work to influence the new South Eastern rail franchise (2018) as well as continuing to run annual Rail Summits to stand up for Kent's passengers. KCC supports the proposal for an extension of Crossrail 1 from Abbey Wood to Dartford, Ebbsfleet and Gravesend ensuring the delivery of additional rail capacity for the planned Ebbsfleet Garden City, London Paramount and Thames Estuary area.
Outcome	Increased access to jobs, education and health by public transport, providing opportunities to Kent's residents without the need for a private car and therefore reducing road congestion. LTP4 Outcomes: 1 Economic growth and minimised congestion, 2 Affordable and accessible door-to-door journeys, 3 Safer travel, 4 Enhanced environment
Funding & Decision-making	Total infra on the rail network in Kent 2019-2024 c£500M
Status	Not previously prioritised in LTP3 or Growth without Gridlock – new to LTP4.
Inclusion in SEA Assessment required?	**Yes**: See Section 5.

x. Bus Improvements	
Issue	Growth in housing and jobs will increase traffic on Kent's roads. Bus operators will need to ensure that services are reliable despite this challenge and that they cater for the additional demand.
Action	Work closely with bus operators and other partners to ensure that public transport has a high level of modal share.
Transport Improvements Needed	Currently around 97% of bus journeys in Kent operate on a commercial basis, with no contract in place with KCC. KCC have to take a pragmatic approach to funding commercially unviable bus services and will seek to support other means of provision that can achieve the same aims, such as community buses. KCC will review the potential benefits that the new Buses Bill (2017) could bring to Kent and the opportunities for enhanced partnership working.
Outcome	Increased access to jobs, education and health by public transport, providing opportunities to Kent's residents without the need for a private car and therefore reducing road congestion. LTP4 Outcomes: 1 Economic growth and minimised congestion, 2 Affordable and accessible door-to-door journeys, 3 Safer travel, 4 Enhanced environment
Funding & Decision-making	For 2016/17, £5.6m on supported bus services, £16.9m on older and disabled person's bus pass, £8.7m on young person's travel pass, £300k on public transport infrastructure, and c. £600k on Kent Karrier support.
Status	Not previously prioritised in LTP3 or Growth without Gridlock – new to LTP4.

x. Bus Improvements	
Inclusion in SEA Assessment required?	**Yes**: See Section 5.

1.4 Non-Strategic Priorities

1.4.1 Countywide

LTP4 details a number of countywide priorities which equate not to individual schemes or areas, but to policies:

- Road Safety
- Highways Maintenance & Asset Management
- Home to School Transport
- Active Travel
- Public Rights of Way
- Sustainable Transport
- Aviation

With the exception of Aviation and Sustainable Transport (both discussed below) the above have been included within the scope of the SEA and results of the assessment are presented and discussed in Section 5.

Aviation

Aviation has been scoped out of SEA for LTP4: LTP3 recognised that airports "have a significant impact on the County's residents, both positive; such as the employment opportunities they generate, and negative; including the traffic congestion, noise and environmental pollution associated with their activities". LTP3 clearly stated KCC's policy of working with, "airport operators and Central Government to ensure that these negative externalities are minimised whilst supporting managed expansion where it aligns with the County Council's economic growth and regeneration objectives". LTP4 perpetuates this approach, stating, "we are clear that processes are needed to properly measure, minimise and mitigate the noise impacts of existing airport operations and airport expansion". The aviation policy is therefore a continuation of that stated in LTP3, and has thus already undergone SEA.

The one aviation scheme mentioned in LTP4 is that at Lydd (London Ashford) Airport: Planning permission was granted in 2013 at Lydd to increase the size of the terminal and increase

passenger and flight numbers. This has been subject to rigorous Environmental Impact Assessment. The scheme is not promoted by KCC and further assessment under this SEA of LTP4 is not considered appropriate.

Sustainable Transport

A number of local schemes, targeted at sustainable transport and including initiatives to encourage modal shift, will deliver benefits across district boundaries. Details of these have been expanded on in LTP4 post-consultation, identified as 'Cross-District Priorities'. Many of these schemes have already secured funding. As a result of this – and due to their focus on achieving sustainability objectives – these have not been included within the scope of the SEA. These schemes include but are not limited to:

- **Kent Thameside Local Sustainable Transport Fund** (£4.5m LGF funding) – a capital programme of works for Dartford and Gravesham delivering schemes to promote the use of alternative modes of transport to the private car, e.g. cycle parking, cycle and walking routes and bus infrastructure.
- **West Kent Local Sustainable Transport Fund** (£4.9m LGF funding) – a capital programme of works delivering schemes to promote the use of alternative modes of transport to the private car, including Snodland Station forecourt, Tonbridge Station access improvements, Maidstone East Station improvements and Swanley Station improvements.
- **Sustainable access to education and employment** (£1m LGF funding) – schemes to upgrade or create new Public Rights of Way as identified by local communities to encourage walking and cycling to places of education and employment. This will deliver new Public Footpath and Cycling routes in Tonbridge & Malling, Ashford, Maidstone and Tunbridge Wells and assists in delivery of our Countryside and Coastal Access Improvement Plan.
- **Kent Sustainable Interventions supporting growth programme** (£3m LGF funding) – the delivery of smaller schemes designed to encourage users to switch to walking, cycling and public transport through the provision of facilities such as crossings, footway improvements, bus priority and cycle lanes, as well as Smarter Choices initiatives such as publicity and travel plans.
- **Kent Connected journey planning and smart ticketing for public transport** – an innovative journey planner and information hub which allows users to make an informed decision on how to travel. This includes the development of the Connected Kent and Medway Smartcard which offers users a convenient cashless way to pay for bus travel.

1.4.2 Local

The local priorities section of LTP4 brings together the priorities from individual Local Plans and supporting Transport Strategies that set out the transport infrastructure requirements to support growth in each district. They are not listed exhaustively within LTP4, and will be subject to prioritisation as suitable funding sources become available. Environmental assessment will be undertaken on a scheme by scheme basis. Due to the lack of clarity on the funding to be made available and the broad range of potential schemes – not all of which have been detailed within LTP4 - it has not been possible to undertake Strategic Environmental Assessment of these proposals. These schemes include, but are not limited to:

- **Kent Strategic Congestion Management programme** (£4.8m LGF funding) – a countywide programme that identifies areas of poor journey time reliability and develops schemes that seek to improve reliability so as to encourage economic growth.

1.5 LTP4 Funding Sources

LTP4 presents a strategic vision for Kent's transportation requirements, and is primarily concerned with two key funding sources:

National funding sources and the Local Growth Fund (LGF) – Applicable to large-scale schemes, these sources focus on unlocking barriers to economic growth, and as such are related solely to Outcome 1. Administered through the South East Local Enterprise Partnership (SELEP), applications are made by KCC via the Kent and Medway Economic Partnership (KMEP) and must demonstrate accordance with the Key Criteria laid down by SELEP's Strategic Economic Plan (SEP) as detailed in the Common Assessment Matrix (Table 1, below).

Integrated Transport Programme (ITP) – The funding allocation and method of prioritisation for these smaller scale schemes has been subject to an Options Report prepared by KCC and amended during the SEA process. This will be discussed in detail in Section 4. In brief, as previously mentioned LTP4 Annex 1 presents a proposed ITP Prioritisation Methodology based on a wide-ranging series of Value for Money Indicators; additionally LTP4 proposes a scheme for budget allocation to the five Outcomes after the ITP funding has been top sliced by 50% to CRM schemes (40% to economic growth and minimised congestion, 15% to affordable and accessible door-to-door journeys, 15% to safer travel, 15% to enhanced environment, and 15% to better health and wellbeing).

Table 1: Key Criteria within SELEP's Common Assessment Matrix

Fit with SELEP strategic objectives • secure the growth of the Thames Estuary • promote investment in our coastal communities • strengthen our rural economy • strengthen the competitive advantage of strategic growth locations
Impact on housing delivery
Direct jobs supported (existing or new)
Indirect jobs supported (existing or new)
Value for money in terms of cost per job, or cost per home
Risk management and mitigations
Proportion of costs met elsewhere
Adaptability and scalability of project
Deliverability

The funding of Strategic, Kent-wide and District Priorities identified within LTP4 is outlined in Table 2, below.

Table 2: Funding of LTP4 Strategic, Kent-wide and District Priorities

Level	Sub-level	Primary Funding Source(s)
Strategic	National	Central Government (Dept for Transport)– KCC is not the key proponent of the scheme
	Countywide	Central Government (LGF) – KCC is often the key proponent of or major stakeholder in the scheme
Countywide		Central Government (LGF and allocated funding blocks) – KCC is often the key proponent of or major stakeholder in the scheme ITP – KCC is often the key proponent of the scheme Community Infrastructure Levy (CIL) – applied to specific infrastructure projects Other sources external to KCC's influence
Local		

1.6 The SEA Process

1.6.1 Purpose of the SEA

Strategic Environmental Assessment is a legal requirement for Local Transport Plans, falling under the European Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment, as transposed in England by the Environmental Assessment of Plans and Programmes Regulations 2004 ("the SEA Regulations"). The objective of the Directive is:

"To provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans… with a view to promoting sustainable development, by ensuring that, in accordance with this Directive, an environmental assessment is carried out of certain plans and programmes on the environment which are likely to have significant effects on the environment."

SEA is a systematic way to scrutinise a plan or programme of actions and examine the likely impacts it may have on human health and the environment. It provides a high standard to ensure that a plan is environmentally sound and promotes sustainable development. Two key procedural requirements of the SEA Directive are that:

- When deciding on 'the scope and level of detail of the information' which must be included in the Environmental Report there is a consultation with nationally designated authorities concerned with environmental issues. The Scoping exercise is discussed in Section 1.3.3, below.
- A report (the 'Environmental Report') is published alongside the Plan that presents an assessment of the Plan (i.e. discusses 'likely significant effects' that result from plan implementation) and reasonable alternatives. This Environmental Report has been produced in fulfilment of this requirement; this version (Rev1) has been updated post-consultation to reflect consequential amendments to LTP4, and comments made on the SEA (Rev0).

1.6.2 The Environmental Report

The SEA Regulations require that a report is published that 'identifies, describes and evaluates' the likely significant effects of implementing 'the plan, and reasonable alternatives'. The report must then be taken into account, alongside consultation responses, when finalising the plan. In line with the SEA Regulations this report – which is known as the 'Environmental Report' – answers the following four questions:

- What is the scope of the SEA? [See Section 1.6.3]

- What has Plan-making / SEA involved up to this point? [See Section 1.6.4]
- What are the assessment findings at this current stage i.e. in relation to the draft plan? [See Section 5]
- What happens next? [See Section 6]

In order to start addressing these questions, in December 2015 Amey produced a draft Scoping Report (Amey/KCC, 2016), which was amended by Kent County Council and issued as a Consultation Draft in January 2016. This was finalised post-consultation in April 2016.

1.6.3 The Scope of the SEA

The SEA Regulations require that 'When deciding on the scope and level of detail of the information that must be included in the Environmental Report, the responsible authority shall consult the consultation bodies'. In England, the consultation bodies are Natural England, the Environment Agency and English Heritage. These authorities and additionally Kent's District and Borough Councils, were consulted on the Consultation Draft of the SEA Scoping Report in January 2016. Reflecting the requirements of the SEA Regulations, the following information was presented in the final SEA Scoping Report for the nine environmental themes:

- **Context review**: This explored the environmental and sustainability 'context' for the SEA / LTP4 Review through reviewing high level messages (e.g. internationally, from central government and at the regional and county level) with a view to establishing the focus for the SEA.
- **Baseline data**: This established the baseline situation in the area in the absence of the LTP4 Review (including the future baseline) in order to help identify the plan's likely significant effects.
- **Key issues**: This identified particular problems or opportunities ('issues') that should be a focus of the SEA.

On the basis of the evidence detailed in the SEA Scoping Report (Amey/KCC, 2016), the following topic is scoped out of the SEA due to LTP4 being predicted to have negligible effects:

- Soil

The Strategic Environmental Assessment of KCC's fourth Local Transport Plan will therefore be based on the environmental *Topics* presented in Table 3, below.

Table 3: SEA topics of importance identified during scoping

Biodiversity, flora and fauna	Water
Air Quality	Cultural Heritage
Human Health	Landscape
Climatic factors	Noise and Tranquillity
Population	Material Assets

1.6.4 Plan-making and the SEA

Amey received the first outline draft of LTP4 in November 2015, containing the draft Local Transport Schemes Prioritisation methodology and a list of LGF1 and LGF2 schemes. The prioritisation methodology at this stage stated that schemes must, "demonstrably achieve one or more of the outcomes from LTP4", of which Enhanced Environment was one. This lightness of touch was discussed with KCC's Transport Strategy Team who worked with the Traffic Scheme Team to devise a new method that overcame the disadvantages of the previous LTP3 prioritisation method. Subsequently the first draft Options Report (v1) received from KCC on 14/1/16 contained an expanded decision matrix for use irrespective of the desired Outcome(s) which assigned value to a variety of indicators including "Environment – what impact will the scheme have on the natural environment?" and "Air quality – what impact will the scheme have on air quality?".

Progression of LTP4 continued through early 2016, and Amey received a new version in March 2016 which took the SEA Scoping Report (Amey/KCC, 2016) and consultation responses into account, plus feedback from Members. The body of the Plan was expanded to introduce the relationship of Priorities to Outcomes – therefore schemes considered by KCC to have potential for Environmental Enhancement are now identified. The ITP prioritisation methodology was omitted from this draft of LTP4 which utilised a previous ITP budget allocation system. It is believed that this prioritisation methodology was less environmentally favourable to that of the Preferred Option, shown in the Options Report, as illustrated in Table 4 [It should be noted that the lower allocation to Safety shown under v1 and v2 reflects that the ITP budget is already 50% top sliced for Crash Remedial Measures schemes].

As LTP4 was developed, reference to the prioritisation methodology was caveated with the phrase, "TBC - this is being options appraised".

Table 4: Differences in Funding Allocation between Options Report v2 and LTP4 v4.5

Outcome	Preferred Option 3 (Options Report v1 & v2)	Allocation shown in LTP4 v4.2 & v4.5
Economic growth and minimised congestion	45%	45%
Affordable and accessible door-to-door journeys	15%	15%
Safer travel	10%	15%
Enhanced environment	15%	10%
Better health and wellbeing	15%	15%

Amey formally reviewed the revised Options Report (v2) and noted the discrepancies with the draft LTP4 v4.7 plus additional concerns around the ITP prioritisation methodology. A progress meeting resulted in KCC asking Amey to revise the Options Report and appended prioritisation methodology in order to make these more environmentally robust. KCC also amended the budget split within the LTP4 Approved Version for Cabinet Committee, as shown in Table 5 [the allocation to Safety has increased, as this is a priority for Members who wanted it to have an equal allocation to the other 3 priorities]. This allocation has been retained in the Final draft of LTP4.

Table 5: Preferred Funding Allocation in Options Report v3 and LTP4 Cabinet version

Outcome	Preferred Option 3 (Options Report v3 & LTP4 Approved Version for Cabinet Committee)
Economic growth and minimised congestion	40%
Affordable and accessible door-to-door journeys	15%
Safer travel	15%
Enhanced environment	15%
Better health and wellbeing	15%

The proposed SEA Objectives and Assessment Framework were also presented to KCC during this meeting, and the approach agreed.

Amey provided the revised Options Report (v3) to KCC (Appendix B), containing an augmented prioritisation matrix and comments on additional points of concern which are included in this Environmental Report. These have been addressed by KCC in the final iteration of LTP4's Annexe, which is reproduced in Appendix C.

2 Environmental Baseline and Policy Context

A summary of the plans, programmes and policies of relevance to LTP4 is presented in Appendix D, while details of how these relate to each environmental topic are shown below along with baseline information and Scoping conclusions.

2.1 Biodiversity, flora and fauna

2.1.1 Baseline

Natural England has defined Natural Areas within Kent, which each have distinctive wildlife and natural features, and individual nature conservation aims. Kent contributes significantly to the value of the regional biodiversity resource, with numerous sites of European and International Importance including 14 Special Areas of Conservation (SACs), 5 Special Protection Areas (SPAs), and 5 Ramsar Wetland Sites. This is significant as the presence of these sites triggers the requirement for Habitats Regulations Assessment (HRA) Screening to be undertaken for LTP4. There are also 11 National Nature Reserves.

There are 101 Sites of Special Scientific Interest (SSSIs) within Kent, which cover a total area of 33,163 hectares covering 8.5% of the county. As of June 2010, 97% of the area of SSSIs in the county was meeting the Public Service Agreement (PSA) target of being in either favourable (77.17%) or unfavourable recovering (19.90%) condition. Data available for the South East (including Kent) states that 91% of SSSIs are meeting the PSA target (47% favourable; and 44% unfavourable recovering).

There are 456 Local Wildlife Sites (LWSs) across Kent (with some being transboundary with Medway) which contain large tracts of priority habitat. LWSs cover approximately 7% of the county. Over 60% of agricultural land in Kent is under Environmental Stewardship.

Kent Biodiversity Action Plan (BAP) identifies priority habitats/species and includes targeted actions for 85 UK BAP species and 24 UK BAP Priority Habitats within the county. The Kent BAP includes a number of objectives to halt the loss or decline of these species and habitats. The Kent UK BAP priority habitats are now the focus of Habitat Action Plans (HAPs) produced by the Kent Biodiversity Partnership. Each HAP sets out the steps needed to secure a healthy future for the habitat and for the wildlife that depends on the habitat for their survival. These generally relate to raising awareness and securing appropriate habitat management. Some of the BAP priority species are also legally protected such as Noctule bats, great crested newt, otter, dormouse and

water vole.

In relation to biodiversity, the Regional State of the Environment Report identifies that the South East which includes Kent county territory has:

- 30% of England's broadleaved, mixed and yew woodland, making it the most highly wooded region;
- 40% of England's lowland heath resource, more than any other region;
- 16% of the lowland calcareous grassland resource;
- 60% of England's vegetated shingle resource, over 10% of the intertidal mudflats, 16% of coastal lagoons and over 15% of coastal and floodplain grazing marsh, more than other region.

Biodiversity in the UK is already being affected by climate change. BAP habitats at a particular location may not be viable in the same location in the future due to a changing climate. Areas of intertidal habitat have already been lost to sea level rise, in the South East there have been significant losses of saltmarsh across 12 Special Protection Areas. An increasing human population in Kent is likely to cause a decline in biodiversity due to an increased requirement for infrastructure, housing development and water consumption. To withstand these pressures it is important to retain connectivity of existing habitats within the LTP area and reduce fragmentation of habitats where possible.

2.1.2 Policy Context

The UK is a Party to the Convention on Biological Diversity (CBD), a principal objective of which is the conservation of biodiversity. Following implementation of the CBD, member states of the European Union committed to halting biodiversity loss by 2010 and putting biodiversity 'on the course to recovery'. This ambitious target was not achieved and the CBD are looking into a new target for 2020. Commitment to the CBD also led to the preparation of the 1994 UK Biodiversity Action Plan (UKBAP), which identifies our most threatened habitats and species and includes action plans with ambitious targets for their recovery.

A Biodiversity Strategy for England was published in 2012. The Strategy sets out the UK Government's vision for biodiversity in terms of ensuring that biodiversity considerations become embedded in all the main sectors of economic activity, public and private. The Natural Environment and Rural Communities Act 2006 seeks to entrench this new way of thinking about the environment and biodiversity within policy and decision-making process, and places a duty on public authorities to have serious regards to the conservation of biodiversity in exercising their

power.

The Department for the Environment Food and Rural Affairs (DEFRA) developed the Ecosystem Approach, which seeks to provide a framework for looking at ecosystems holistically in the decision making process with an emphasis on putting a sterling value onto ecosystem services. As part of the approach the Government has given consideration to how best to reconcile conserving a list of priority species (as required by the UK BAP) with the wider agenda of maintaining ecosystem services which within the UK focuses on maintaining, creating and restoring functional combinations of habitats.

The full legislative and policy context relevant to biodiversity will be detailed within the aforementioned HRA Screening. Key legislation of importance is presented below:

- Habitats Directive 1992 (92/43/EEC) - protects over 1,000 species and 200 habitats and gives special protection to Special Areas of Conservation (SACs) which form part of the Natura 2000 network. This directive was transposed into UK law under the Conservation of Habitat and Species Regulations 2010.
- Marine and Coastal Access Act 2009 - makes provisions for better systems in improving marine and coastal nature conservation and biological diversity by requiring the creation of sustainable development of marine and coastal environment.
- Natural Environment and Rural Communities (NERC) Act 2006 - Section 40(1) imposes a duty on public bodies to conserve biodiversity.
- Countryside and Rights of Way (CROW) Act 2000 – gives the importance of biodiversity conservation a statutory basis; gives local authorities a statutory duty to further the conservation and enhancement of SSSI both in carrying out their operations, and in exercising their decision making functions; strengthens the legal protection for threatened species and brings up to date the Wildlife and Countryside Act 1981.
- Wildlife and Countryside Act 1981 (as amended) provides detail on a range of protection and offences relating to wild birds, other animals, and plants.

Kent Environment Strategy (KCC, 2016) confirms the county-level importance of biodiversity, flora and fauna, stating as an objective the need to, "Conserve and enhance the quality and supply of the county of Kent's natural and historical resources and assets".

2.1.3 Key Issues

There are many road related pollution or infrastructure development issues which can and do cause damage to habitats and have the potential to negatively affect European, National and local sites of nature conservation value. The main ways in which the existing transport network may impact on biodiversity and wildlife are pollution in the form of noise, air and water contaminants. These may be dispersed many meters away from a diffuse source, such as a road, and cause harm or degradation to the quality of a habitat. Further disturbance of the ecosystems can come as a result of noise and light affecting the migratory or hunting patterns of animals, in particular bats.

The movement of both vehicles and ships can cause damage to individuals within the habitats they pass though (e.g. road kill, tree strikes, benthic layer damage from ships' hulls). Injury of vegetation from vehicle movements enhances the dispersal and movement of weeds, opening the way for intrusive species and disrupting the ecological balance of the ecosystems; concurrently bilge water discharges and anchor dragging from cargo operations in ports may result in the suffocation or displacement of marine life on the seabed in the vicinity of trade routes.

A more significant threat to a habitat is the way road schemes have the potential to result in the loss or fragmentation of key strategic nature areas, impacting on protected or BAP species. Habitats such as ancient or species rich hedgerows, road verges, ditches and other linear habitats are especially at risk. Targeted action within these areas, either in terms of buffering or linking habitat patches or increasing the permeability of flora and fauna to their surrounding landscapes, has the potential to result in large scale functioning of ecological networks, which will allow BAP species and habitats to thrive and be resilient to climate change.

2.1.4 Future Trends

A reduction in the number of Natura 2000 and SSSI sites meeting PSA targets, reflecting a continued decline in biodiversity within the county, in contradiction to the recommendations set out by the BAP possibly resulting in a de-listing of important sites for nature and in extreme cases localized extinction of "at-risk" species.

2.1.5 Gaps and Uncertainties

In order to implement targeted conservation measures, strategic nature areas and critical species present within or near to the Kent transport network that are likely to be affected by the LTP must be identified. Without the latest concise mapping of the precise boundaries and nature of the LTP4 as well as the current ecological states of protected lands and biodiversity make predicting effects in specific areas, and therefore suggestions for mitigation, difficult.

2.2 Air

2.2.1 Baseline

Transport is a significant contributor to poor air quality and its associated health problems in Kent, as evidenced by Kent's 39 declared Air Quality Management Areas (AQMAs); the majority of which are located on main roads or motorways. They have additionally been declared in town centres of Canterbury and Tunbridge Wells, the docks at Dover, Tonbridge Town centre, A20/A25 corridor in Tonbridge and Malling, and areas of Maidstone and Thanet (see Figures 3 & 4). The M25, M20, M2 and A299 are major transport corridors with the heaviest traffic flows between Kent's town centres.

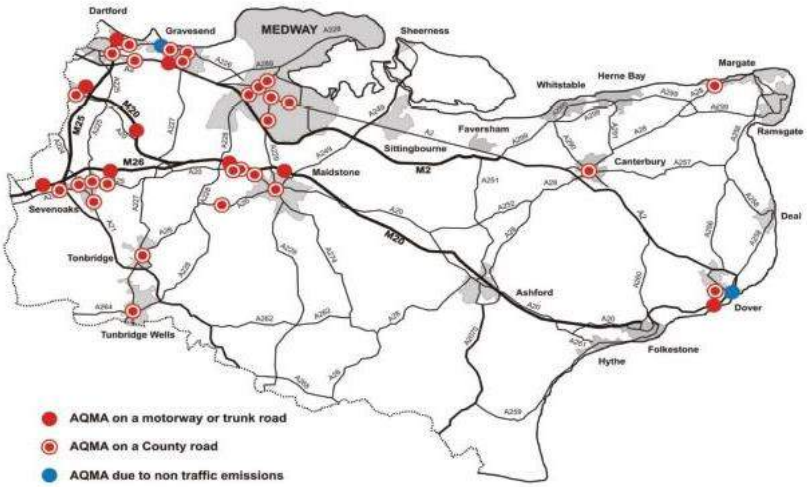


Figure 3: AQMA locations in Kent (Motorways, County Roads and non-road sources)

Causative emissions from industrial sources are comparatively well regulated and minor compared to those from motor vehicles, due to the extensive road network crossing the county. The key pollutants which affect human health and are of most relevance to the SEA of the LTP4 are Nitrogen Dioxide (NO_2) and PM10 (Particulate Matter up to 10 micrometres in size). Poor air quality as a result of these pollutants may result in more than 32,000 premature deaths in the UK per year. These figures demonstrate the importance of good planning to help bring about improved air quality. Kent, despite recent improvements, still contains some of the worst air pollution in the UK. The most recent ratified data for Kent is presented in Table 6, below.

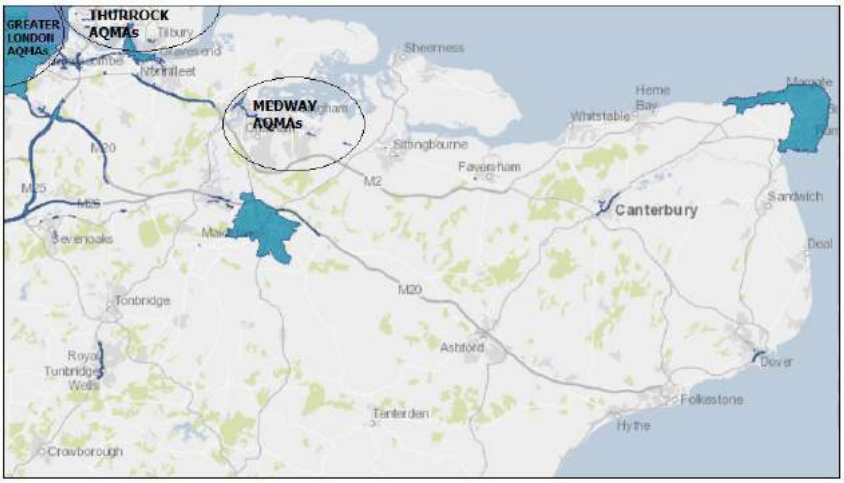


Figure 4: AQMAs in Kent
(shown in blue – some not visible due to scale)

2.2.2 Policy Context

International legislation and conventions have been instrumental to reducing air pollution; most relevant on an EU level was the passing of the Air Quality Framework Directive (96/62/EC) and its amendment Directive (2008/50/EC). These set the limits of seven pollutants: Sulphur Dioxide - SO_2, Nitrogen Dioxide - NO_2, Lead - Pb, Benzene - C6H6, Carbon Monoxide - CO, Butadiene - C_4H_6, Ozone – O_3 and Particulate Matter – $PM_{2.5}$ & PM_{10}. All of which were included into the Air Quality Standards Regulations 2002.

On a local level, the Environmental Protection Act 1990 requires that statutory nuisance is not caused, for example by dust during construction. Additionally, the Environment Act 1995 sets out the statutory duties for the local authorities in assessing air quality in the Local Air Quality Management (LAQM) process. The process allows a review of whether the national air quality objectives (minus ozone) are likely to be met.

An Air Quality Management Area (AQMA) is declared where exceedances of the objectives are likely to or have occurred. To tackle the problem Air Quality Action Plans (AQAP) are written to set out measures to reduce pollution and propose actions to reduce pollution to achieve national air quality objectives. These are District-level documents, with KCC an important stakeholder and implementation partner in working towards meeting transport-related air quality objectives. Local transport plans (LTPs) allow transport policies at the local level to take air quality into consideration and mitigate or improve atmospheric levels.

Kent Environment Strategy (KCC, 2016) has air quality supporting objectives, including the need, "improve our resource efficiency such as energy, water and land" and to "support sustainable access and connectivity for businesses and communities".

Table 6: Comparison of 2014 data with Air Quality Strategy Objectives
(KMAQM, 2014)

	CO	NO_2		O_3	PM_{10}		SO_2		
Period	Running 8-hr mean	1-hr mean	Annual mean	Max daily running 8-hr mean	24-hr mean	Annual mean	24-hr mean	1-hr mean	15-min mean
Objective	10 mgm^{-3}	200 μgm^{-3}	40 μgm^{-3}	100 μgm^{-3}	50 μgm^{-3}	40 μgm^{-3}	125 μgm^{-3}	350 μgm^{-3}	266 μgm^{-3}
Exceedance Object	-	18	-	10	35	-	3	24	35
Roadside									
Canterbury Military Road	-	0	28	-	-	-	-	-	-
Canterbury Roadside	-	0	33	-	-	-	-	-	-
Canterbury St Peter's Place	-	0	42	-	-	-	-	-	-
Chatham Centre Roadside	-	0	25	-	15	21	-	-	-
Dartford Bean Interchange Roadside	-	4[a]	51[a]	-	11[a]	27[a]	-	-	-
Dartford St Clements Roadside	-	51[a]	61[a]	-	11[a]	25[a]	-	-	-
Dartford Town Centre Roadside	-	20[a]	44[a]	-	13[a]	24[a]	-	-	-
Dover Centre Roadside	-	-	-	-	0[b]	24[b]	-	-	-
Gravesham A2 Roadside	-	0	31	-	6	18	-	-	-
Maidstone A229 Kerbside	-	2	47	-	7[b]	18[b]	-	-	-
Swale Canterbury Road	-	2	34	-	-	-	-	-	-
Swale Newington 3	-	1	33	-	-	-	-	-	-
Swale Ospringe Roadside 2	-	0[a]	41[a]	-	4[a] [b]	18[a] [b]	-	-	-
Swale St Pauls	-	2	34	-	-	-	-	-	-
Thanet Birchington Roadside	-	0	31	-	6	21	-	-	-
Thanet Ramsgate Roadside	-	0	26	-	13	25	-	-	-
Tonbridge Roadside 2	-	2	47	-			-	-	-
Tunbridge Wells A26 Roadside	-	0	48	-	3[b]	19[b]	-	-	-
Background and Industrial urban/background									
Canterbury	-	0	12	25	0	18	-	-	-
Chatham Luton Background	0	0	22	-	0[b]	15[b]	0	0	0
Gravesham Industrial Background	-	0	24	-	11	19	-	-	-
Thanet Airport	-	0	16	-	-	-	-	-	-
Gravesham Industrial Background	-	0	24	-	11	19	-	-	-
Rural									
Maidstone Rural	-	0	12.3	2	18	25	0	0	0
Rochester Stoke	-	0	14.4	14	7	18	0	0	0

[a] Annual data capture less than 75 %.
[b] PM_{10} data from TEOM analysers VCM corrected.

2.2.3 Key Issues

Predicted increasing numbers of vehicles and levels of congestion could lead to increasing concentrations of atmospheric pollutants within the already designated AQMAs. This could also lead to an increase in the spatial area of the AQMA. In relation to the specific pollutants as measured by the Kent and Medway Air Quality Monitoring Network (KMAQMN) from over 30 monitoring stations since 1997 the following summarises trends associated with a number of pollutants deemed to be particularly relevant to transport.

Carbon monoxide (CO) - No site in Kent has exceeded the EU levels for CO since pre-2000. The significant reduction in CO concentrations in Kent and in the UK as a whole has been attributed to the use of vehicles with clean burn engines and catalytic converters.

Ozone (O_3) - For fifteen years the Kent rural and urban maximum average ozone level has been dropping, however starting in 2012 the rate has rapidly risen to an all-time high of 75µg/m^3. This can be attributed to the rise in summer temperatures and average number of sunny days in summer which create ozone from precursor pollutants emitted by transportation.

Particulate matter (PM2.5 & PM10) - Concentrations are not just limited to areas that are particularly high in traffic. Saharan dust and European forest fires also contribute so readings can be dependent on continental dust generation levels. As a result PM10 concentrations in Kent come from non-local sources (mainly from London and mainland Europe) thus it is difficult to reduce the annual average reading for Kent to below 40µg/m^3. Dover due to its proximity to the continent and dense road and port infrastructure has the highest readings in the county.

Nitrogen dioxide (NO_2) - For sixteen years there has been very little variation in NO_2 concentrations, with all but two roadside stations (Gravesham and Dartford) meeting the annual mean objective of less than 40µg/m^3. As a pollutant emitted by road vehicles, it is unlikely to decrease without significant reductions in vehicle numbers. However, if an increase in population leads to more private car journeys and additional vehicle kilometres to service this population then NO^2 levels will increase.

Sulphur dioxide (SO_2) - The sources of SO_2 in Kent are power generation and industry located to the north of the county and shipping to the east. Modern scrubbing technology has reduced industrial emissions of SO_2 resulting in minor fluctuations, all within the air quality targets. The exceptions are believed to be the result of shipping traffic along the coast.

The overall trend of air pollution in Kent is shown in Figure 5, which is a count of the days when pollution from the above-detailed pollutants was rated as moderate or greater. Whilst overall there is a moderate downward trend in air pollution, the spikes seen in 2003 and 2011 to 2013 can be attributed to the sunny weather exacerbating the climatic conditions that trap or generate pollutants.

2.2.4 Future Trends

Despite the passing of EU Directive 2005/33/EC on the sulphur content of fuels limiting the amount in diesel to 1.5% from 4.5% in 2010 and the tightening of other legislated pollutant levels; high levels of housing development planned for Kent to house a growing population and the creation of more road acreage will lead to proportionally more cars so there will be a potential for air quality to worsen on major transport corridors.

2.2.5 Gaps and Uncertainties

The volume of traffic and town centre congestion is not just influenced by transport interventions or changes in the local population. The economy can influence traffic flow while industrial and trans-boundary (i.e. continental) emissions make source apportionment and modelling difficult.

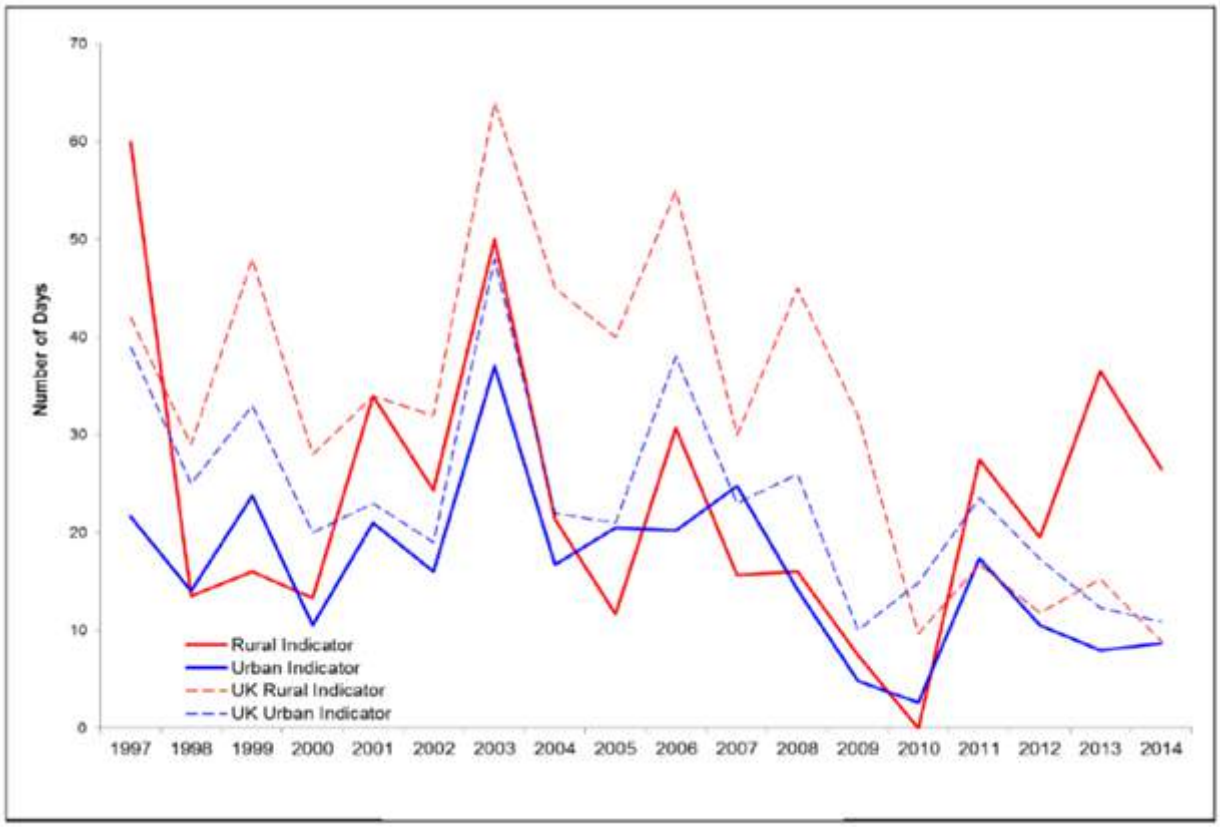


Figure 5: Air quality for Kent & UK

Number of days with "moderate" or higher concentrations

2.3 Human Health

2.3.1 Baseline

Transportation and the access it can provide to vital services, such as hospitals, employment and community amenities, makes it a significant factor in the health and wellbeing of Kent's populous. Conversely, environmental impacts such as noise and air pollution of some modes of transportation negatively affect morbidity and mortality. Therefore it is vital to consider human health when altering transport policies in order to target inequalities and positively impact on human health, rather than inadvertently worsening them.

2.3.2 Policy Context

Human Health is a statutory consideration within SEA. In order to fully address this consideration, Health Impact Assessment (HIA) is to be undertaken separately and will be integrated into the SEA.

The Health Act 1999 places a duty on the health agencies and local authorities to "secure and advance the health and welfare of the people". Government aims to simultaneously improve the health of everyone, whilst also focusing efforts on improving the health of the worst- off in

particular. Additionally the White Paper Choosing Health 2004 in conjunction with the Walking and Cycling Action Plan 2004 further emphasise the importance of shifting from travelling in cars to walking and cycling, providing an alternative forms of transport that can be part of the daily exercise routine as a way of improving health.

Further schemes such as Healthy Weight - Healthy Lives 2008, incorporating the School Transport Bill, calls for an improvement to cycling infrastructure, and improving skills in frontline personnel to deal with children's weight and investing in a Walking into Health campaign At a more local level, Annual Public Health Reports are produced which focus on health issues within individual areas.

The Health and Social Care Act 2012 provides a new focus on Public Health and related inequalities and wider determinants, with transport being explicitly identified as such: Transport policy can have considerable input with regards to tackling obesity, promoting healthy and active lifestyles, supporting independent living and reducing death/injury from road accidents, as well as reducing polluting emissions. Local authorities are given responsibility for improving health and wellbeing in their areas by the Act.

Kent Environment Strategy (KCC, 2017) has human-health supporting objectives, including the need to, "support sustainable access and connectivity for businesses and communities".

2.3.3 Key Issues

The predicted rise in Kent's housing requirement could lead to an increase in congestion, and careful planning will be required to ensure that options for public transport and road improvements are fully explored in order to manage this potential problem. Not only does congestion cause difficulties for travellers such as pedestrians, cyclists and the disabled but it also adversely affects the quality of life for those living close by through noise and air pollution and road safety impacts.

When it comes to the health of the county overall, the total mortality rate has been dropping from 13,000 deaths per 100,000 in 1995 to 950 per 100,000 in 2013; this is in line with the UK national average (Figure 6). Using the latest data, cancer of all kinds is the largest cause of death at 29% of the total mortality rate, followed closely by cardiovascular disease (28%) and respiratory disease (14%). All except respiratory disease have been following a downward trend, which in line with the UK average has stagnated. Poor air quality can be a trigger for more aggressive symptoms in those who are already sick and can in some cases cause illness itself.

The prevalence of obesity is increasing; in the UK 26% of all men and women are obese (BMI 30 kg/m^2 or more) and 68% of men and 58% of women are overweight or obese (BMI over 25 kg/m^2 but less than 30 kg/m^2). The percentage of adults in England who have excess weight (overweight and obese combined) is 63.8%

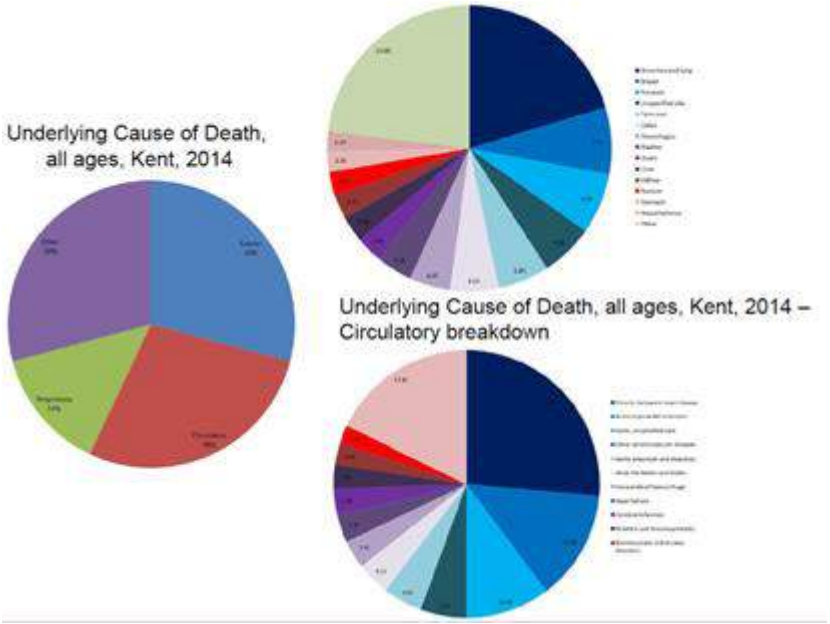


Figure 6: Underlying cause of death for all persons

In Kent, 27% of the population are obese. This figure rises in the Isles of both Sheppey and Thanet to 35%, and is also the site of Kent's most deprived citizens, where high unemployment, smoking, binge drinking and poor diet devalue the quality of life in 80% of households. In Kent the excess weight rate is 64.6%: This translates into 771,476 people across Kent aged 16 and above. Obesity tends to track into adulthood, so obese children are more likely to become obese adults.

Total road deaths in the county have dropped from 6,460 in 2007 to 5,645 in 2014. While better engineering and speed reductions are critical in improving road safety for all users, the most effective way to reduce the potential risk of accidents has been proven to be educational programmes which involve regional and local cooperation.

2.3.4 Future Trends

If the consequences to human health are not considered, alterations to the transportation network could have negative impacts. For example, changes in noise and air pollution due to the proximity to transport infrastructure, water quality, climate change impacts, and access to fresh food would result in a direct effect on human health and wellbeing.

Reduced availability of modes of travel other than private car (such as cycling and walking, which enhance health) affects the local economy by altering access to employment and key services including health facilities, shops and the countryside/local green spaces.

2.3.5 Gaps & Uncertainties

Uncertainty exists as a result of the breadth of determinants of health and wellbeing and the complex interrelationships between influences and risk factors.

2.4 Climatic factors

2.4.1 Baseline

Climate change refers to the slow increase in the global average temperature which, due to anthropogenic factors, has accelerated over the last century resulting in a warming of 0.74ºC over that period and a rise in the UK's sea levels by approximately 1.2mm every year. The anthropogenic actions considered responsible for this are emissions of greenhouse gases (GHGs) including carbon dioxide and methane. In the UK around a quarter of the CO_2 emissions are from transport. Globally higher temperatures increase the available energy in weather systems resulting in more numerous and intense extreme weather conditions such as flooding and droughts. GHGs remain in the atmosphere for centuries, providing inertia even if the GHG emission levels were immediately reduced to historic norms. As a result, human systems must adapt to the new circumstances and where possible assist natural systems to do the same; meanwhile militating against further GHG emissions.

KCC has since 2008 participated in the 'PACT organisational capacity building framework', in addition to the well-established Climate Change Programme created following Kent's inclusion into the Nottingham Declaration framework. However, Kent still faces a challenge when it comes to reducing its GHG outputs and reinforcement of existing infrastructure against the effects of a changing climate.

2.4.2 Policy Context

UK climate change policy can be summarised as reducing greenhouse gas emissions and adapting to climate change. Starting with the Kyoto Protocol in 1997, the UK Government has enforced more stringent and legally binding carbon dioxide reduction targets. The Climate Change Programme 2006 and the Climate Change Act 2008 are examples of the UK's commitment to reducing net carbon release by 80% from 1990 to 2050. The key drivers of this ambitious reduction is investment in greener transportation in the form of electric vehicles and increasing

availability of alternatives to private car road travel in the form of cycle ways, paths and public transport.

Kent Environment Strategy (KCC, 2017) has climate supporting objectives, including the need to, "improve our resource efficiency such as energy, water and land" and to, "improve the county of Kent's environmental, social and economic resilience to environmental change".

2.4.3 Key Issues

According to the Intergovernmental Panel on Climate Change (IPCC), "Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperature, widespread melting of snow and ice and rising global average sea level."

Kent's Local Climate Impacts Profile indicates that the County has seen 52 significant weather events over the last 14 years; 22 of these, caused by heavy rain, have incurred the county £30 million in direct costs.

In 2007 the rate of Kent's GHG emissions was 9 tonnes per person. This figure is above the South East regional average (8.6 tonnes per person in 2007), but in line with the national average. The main sources of Kent's emissions are industrial and commercial (42%), domestic (29.5%) and road transport (26.5%).

2.4.4 Future Trends

In the South East of England we expect climate change to lead to greater volatility of weather - more intense downpours, more severe droughts and floods, more extreme heatwaves. The predictions for Kent up to the year 2050 under the assumption of a continuation of a medium emissions scenario include:

- Winter mean temperature increases by 2.0ºC
- Summer mean temperature increases by 2.6ºC
- Winter mean precipitation increases by 13%
- Summer mean precipitation falls by 14%
- Up to 76cm sea level rise (by 2095)
- Overall increase in temperature and rainfall variability

These predictions are of particular concern to Kent, as due to its geographic location and long coastline, it is expected to be affected from climate change more than other parts of the UK. The high summer temperatures and low rainfall could adversely affect the local water supply as well as the human health impacts of heat-related illness, water borne and air borne disease and

asthma like symptoms linked to air quality incidents, triggered by more frequent and extreme heat-waves.

Additionally the increase in winter precipitation creates an exacerbated risk of flooding both from fluvial sources and rising sea levels; a combined factor of polar ice melt and isostatic rebound. This risk of coastal flooding puts approximately 10% of Kent's population at risk. Consequently £25 million is invested annually for flood defence across Kent and East Sussex, and the Kent coast is covered by three Shoreline Management Plans (Medway Estuary and Swale, Isle of Grain to South Foreland and South Foreland to Beachy Head) and eight coastal strategies.

Parts of the region's transport network and several key interchanges lie within Flood Zone 2 (current 0.1% chance of flooding). More frequent flooding and heatwaves and sea level rise are likely to result in increased damage to road and rail infrastructure within such areas and may affect the reliability of the networks and services. The government has prioritised the need to improve the long-term resilience of new and existing infrastructure networks in the transport sector.

2.4.5 Gaps & Uncertainties

Predicting the effects of climate change to any degree on a local level is complex, dependent on future GHG emissions and their effect worldwide. How to model their change to the climate and influence the weather is also uncertain. Further research and climate modelling may be needed to begin to understand the wider implications of climate change on the local transport network.

2.5 Population

2.5.1 Baseline

By ensuring that Kent has a robust transport network it will allow residents to have access to jobs and services, therefore it is essential changes in population and travel patterns are monitored to be aligned with the proposed transport priorities. As of 2014, the population for the county is estimated to be in the region of 1,510,400. According to the KCC mid-2014 data (July 2015) Maidstone has the largest population of all Kent districts, with a population of 161,800, however Dartford has the smallest with 102,200 individuals. The population of Kent is projected to grow between 2016 and 2033, rising by 13.8% to 1,734,600 in 2033. This growth is partly due to natural increase (more births than deaths) and net migration into the county. Kent also has an aging population.

2.5.2 Policy Context

The DfT promotes equality of opportunity (goal five, as indicated in the DfT paper: 'Towards a Sustainable Transport System') ensuring that transport systems provide effective access for everyone, including disadvantaged groups and disabled people, to jobs, services and social networks. Individual life-chances can vary hugely depending on birth and geography: average household income varies widely between regions, and there are pockets of deprivation in even the most affluent areas. LTP4 will need to consider where transport improvements can help redress inequalities of this kind and prevent poor accessibility from reinforcing wider social exclusion. Tackling disadvantage in local areas is a key government ambition which is best realised through a collaborative approach with local authorities, as they best understand their residents. Transport is a key driver for achieving wider aims, but accessibility does not just relate to transport. Level of access depends on a number of factors: where people live, where services are located and affordability of transport in the area.

The DfT's 'Guidance on Local Transport Plans (July, 2009) stipulates the need for local authorities to consider the transport needs of older people and people with mobility difficulties when developing local transport plans. According to the legislation (The Local Transport Act 2008) regard has to be given to disabled people, in both phases of development and implementation. The government is keen to improve access to and safety on public transport, more notably for allowing provisions that assist disabled people in accessing public transport. An example is to ensure there are sufficient levels of wheelchair accessibility within taxis across England and Wales and that wheelchair users receive the necessary assistance from drivers when they hire a taxi suitable for them. The government is also planning for the carriage of mobility scooters on public transport.

The government recognises the need to encourage the public to travel more sustainability and ensuring cycling, walking, car sharing and public transport are viable options over the private car. The government believes, however, these changes can only be delivered at a local level, for example by citizens working together to help shape the delivery of local transport solutions that meets the needs of local people and therefore create growth. The government also lobbies that these solutions are tailor-made for the places they serve and individual needs, alongside behavioural patterns of individual communities.

Kent Environment Strategy (KCC, 2017) has population-supporting objectives, including the need to, "improve our resource efficiency such as energy, water and land", "support sustainable access and connectivity for businesses and communities" and, "supporting growth in the economy with a focus on low carbon, environmental services and rural sectors".

2.5.3 Key Issues

As described above, the population of Kent is forecast to grow in the coming years and in addition has an ageing population with the total number of males and females who are 65 and over set to increase by 46% between 2016 and 2033. As highlighted in the Kent and Medway Growth and Infrastructure Framework (2015) as the population ages infrastructure requirements will alter, particularly in terms of more emphasis on health care systems as opposed to housing demand. The number of working age residents will decline by 4% in their total stake of the population by 2031, whereas the elderly will increase their share by 5%.

The English Indices of Deprivation (2015) is a measurement tool which highlights the scale of deprivation in small areas (lower-layer super output areas) across England. The following results were displayed for Kent below:

- Kent ranked 104th out of 152 authorities in England as a deprivation rank. (One being the most deprived).
- Out of all districts within Kent, Sevenoaks was the least deprived and Thanet was the most. Nationally this equates to being 26th out of 326 (Thanet) local authorities districts across England. Sevenoaks is ranked 274th out of 326. This clearly shows Thanet is relatively deprived in Kent and nationally.

The ONS 2011 Census Analysis 'Method of Travel to Work in England and Wales' Reports, in the South East 66.8% use road vehicles as a method of travelling to work, however only 12.1% use public transport and 13.9% choose to walk or cycle. Accessibility to public transport is much simpler for residents living in urban areas than rural. The rural population is also restricted in accessing jobs and services by factors such as distance, travel time and lack of transport.

2.5.4 Future Trends

Growth pressures across the south east, and particularly in London, mean that over the coming years the importance of London as a destination for Kent's residents is likely to grow. Analysis undertaken for the GIF (2015) forecasts that 17% of all new commuting trips across Kent will be destined for London, a large proportion of which will be by rail. Therefore, the importance of connectivity to support sustainable growth across Kent cannot be overstated.

The implications of a growing population will put pressure on community services and potentially put more private car users on the road, therefore contributing towards pollution. Another implication of an ageing population is that those older residents who live in rural areas of the county will have limited travel options, particularly as there are less regular public transport services in those areas and they are less likely to drive.

Rural Kent also has an ageing population with more middle-aged residents and fewer individuals from the younger generation. This will have implications for transport planning, community activities, housing needs and social care provision.

The areas in Kent that are suffering from deprivation are restricted by affordable travel and if this continues there will be limited scope for these residents to access public transport or use a private vehicle in order to approach employment and access other key services, such as health.

There are only a small number of active travel users within Kent and more private road vehicles as a method of travelling. The continuation of this will increase pollution, and neither support healthy lifestyles or a reduction in obesity levels.

2.5.5 Gaps & Uncertainties

Trends and travel habits within the Kent population will need to be closely monitored going forward, as needs can change and therefore transport within the county should reflect that.

2.6 Water

2.6.1 Baseline

North Kent falls in the Thames River Basin District (RBD), which contains a total of 545 surface and ground water bodies (Table 7). Within Thames RBD, the ecological status of surface waters has worsened since 2009, although groundwater quality and chemical status of surface waters have shown some improvement (Table 8). South Kent falls in the South East RBD, which contains a total of 315 surface and ground water bodies (Table 9). In the South East RBD, trends in water quality mirror those in the Thames RBD (Table 10).

Table 7: Water bodies in Thames RBD

Water body categories	Natural	Artificial	Heavily modified	Total
Rivers, canals and surface water transfers	287	21	106	414
Lake	7	47	19	73
Coastal	0	0	1	1
Estuarine	1	4	5	10
Groundwater	47	0	0	47
Total	**342**	**72**	**131**	**545**

Table 8: Water quality in Thames RBD

Percentage of water bodies at good or better status	2009	2015 predicted	2015 actual
Surface water ecological status	23	25	14
Surface water chemical status	13	14	18
Groundwater quantitative status	35	35	57
Groundwater chemical status	43	46	63
Overall status	23	25	17

Table 9: Water bodies in South East RBD

Water body categories	Natural	Artificial	Heavily modified	Total
Rivers, canals and surface water transfers	138	13	69	220
Lake	2	16	10	28
Coastal	2	0	9	11
Estuarine	1	5	17	23
Groundwater	33	0	0	33
Total	**176**	**34**	**105**	**315**

Table 10: Water quality in South East RBD

Percentage of water bodies at good or better status	2009	2015 predicted	2015 actual
Surface water ecological status	19	22	14
Surface water chemical status	11	11	13
Groundwater quantitative status	43	43	57
Groundwater chemical status	63	63	50
Overall status	20	23	16

In both RBMPs, "Urban and Transport" is identified in 2015 as negatively influencing numerous physical and chemical water quality determinants: The transportation network and its associated construction create hundreds of hectares of impermeable areas which can adversely affect water quality and flow. From small steams to the main rivers, all levels of a catchment area are at risk from contamination by silt, engine oil, tyre rubber, de-icing salt, and metals. In addition to these

chronic diffuse pollution sources there is the risk of occasional acute point source spillages of pollutants in the event of accidents. During long dry periods pollutants accumulate on impermeable surfaces and lead to highly polluting surface water run off when it rains.

Impermeable surfaces promote rainwater run-off and prevent infiltration into soil and hence reduce recharge to groundwater; these in turn contribute to both flooding of low lying areas, and water shortages due to depleted aquifers. The nature and severity of these is affected by the design of the existing highway drainage systems and the transport infrastructure such as the roads' construction.

2.6.2 Policy Context

The EU Water Framework Directive (WFD) unifies the management of European rivers, and the transposed UK legislation Water Environment (WFD) Regulations 2003 aim to reach a good overall status in inland, groundwater and coastal waters by 2015 in accordance with the directive. Objectives include promoting the sustainable use of water, reducing the pollution of water by priority substances, reducing groundwater pollution and enhancing existing wetland ecosystems. These are delivered at River Basin District level by River Basin Management Plans.

The Flood and Water Management Act 2010 aims to provide better management of risk associated with flooding and coastal erosion for people, environment and infrastructure. Catchment Flood Management Plans (CFMP) are an important element of flood risk management both fluvial, pluvial and coastal. CFMPs are being superseded by Flood Risk Management Plans. In conjunction with Shoreline Management Plans (SMPs) these aim to communicate the factors that contribute to flood risk within a catchment/shoreline both now and in the future so that recommendations can be made for managing flood risk over the next 50 to 100 years.

Finally, many local authorities have completed Strategic Flood Risk Assessments (SFRA), and a regional SFRA for the South East England Region has also been completed. When considering the proportions of the districts with more than 10% of their area within Flood Zone 3 (from the sea by a flood that has a 0.5 per cent (1 in 200) or greater chance of happening each year; or from a river by a flood that has a 1 per cent (1 in 100) or greater chance of happening each year: see Figure 7) it indicates a relatively high level of inherent flood risk across the Kent area. This requires the adoption of a risk-based approach to development proposals in which it is only permitted if it passed the Sequential and Exceptional Tests.

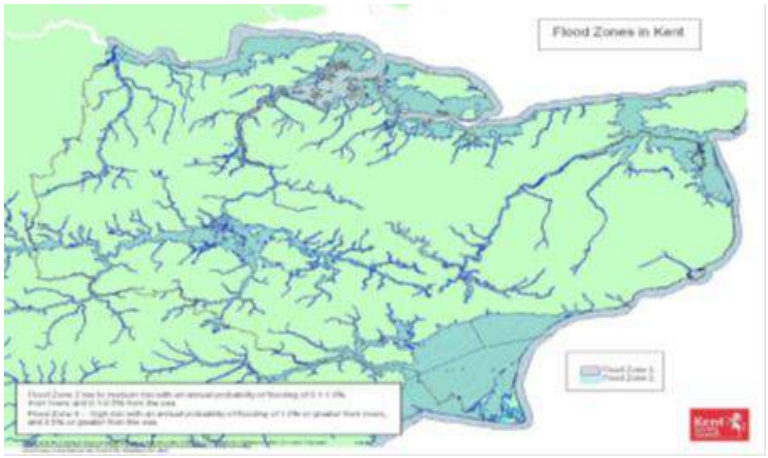


Figure 7: Land at risk from flooding from rivers and the sea in Kent

A number of detailed plans and strategies have been published by the Environment Agency for the southern region of the UK; these include the River Basin Management Plans – for the Southeast River Basin District and the Thames River Basin, the Water Resources Strategy Regional Action Plan (required due to the excessive abstraction in the region), Catchment Abstraction Management Strategy (CAMS). Additionally Natural England is promoting a Catchment Sensitive Farming initiative.

Kent Environment Strategy (KCC, 2017) has water-supporting objectives, including the need to, "improve our resource efficiency such as energy, water and land".

2.6.3 Key Issues

The high rate of intensive farming for many years and encroaching urbanisation has put strain on the water abstraction in Kent, particularly in the Isle of Thanet. There, the treatment of polluted ground water is necessary and abstraction for human use has lowered the water table within the chalk aquifers to a point where the unique habitat of chalk streams are dry during hot weather, damaging the wildlife that live in a habitat with only 210 known examples worldwide.

Over 50,000 properties in Kent are currently at risk of flooding. The impact of this could increase when considering the population that may be unable to escape in the event of flooding as transport infrastructure is overwhelmed.

The Regional SFRA has identified two areas as particularly vulnerable to flooding: Ashford and the Kent Thames Estuary. Ashford has both a high flood risk and high levels of proposed development. Historically, Ashford has been particularly vulnerable to fluvial flooding since runoff from the higher ground converges into the town via the East Stour, the Great Stour, Ruckinge Dyke, Whitewater Dyke and Aylesford Stream. Ashford has suffered several fluvial flood events over the last 50 years, both within the town and, particularly, to the south of the town.

The Kent Thames Estuary is an area with high flood risk, particularly the low lying areas behind the sea defences, which are at risk from tidal flooding that may cause rapid inundation of the land.

2.6.4 Future Trends

Due to the development of infrastructure there will be an increase in the area of impermeable ground surfaces and consequently this could lead to an increase in surface water runoff and potentially higher flood risk. Due to climate change it is likely that winter flooding is to increase (see Climate Change) and widespread flooding has the potential to impact on communities due to disruption to services and transport.

Water quality is now a priority due to the introduction of the WFD, and demands that new infrastructure proposed for the LTP4 be built to standards that mitigate diffuse pollution. However, the potential increase in use of existing infrastructure due to the expansion of road capacity could impact on water quality also. This may not be designed to the current best practice for water quality preservation and could therefore lead to a deterioration of water quality. Further, current drainage systems may not be designed to best practice and therefore will be unable to adapt to the potential impacts of climate change and increased impermeable area. Conversely, sustainable drainage systems can reduce flood risk by storing rainfall and allowing it to percolate through the soil.

2.6.5 Gaps & Uncertainties

Prediction of flood risk in Kent carries uncertainty due to the different climate impact scenarios.

2.7 Cultural Heritage

2.7.1 Baseline

Kent as the historical gateway to continental Europe from Britain has a rich history of archaeology which includes the oldest evidence of human occupation, starting over half a million years ago. Kent has a large selection of protected cultural heritage features (Table 11) ranging from listed buildings to the World Heritage site at Canterbury where the cathedral, St Augustine's Abbey and St Martin's Church provide the visual record of the introduction of Christianity to Britain. Kent's wider historic landscape gives local distinctiveness that is essential to the character of its towns, villages and countryside.

Table 11: The number of Kent's protected cultural heritage assets

Listed Buildings	Scheduled Ancient Monuments	Historic Parks & Gardens	Conservation Areas	World Heritage Sites
1,406	400	61	>150	1

In addition to this Kent has an extensive record of archaeological finds from known hotspots and discoveries reported by the public. The risk of loss or damage to Kent's historic environment comes from many threats, large and small. From the accumulation of land-take or neglect of buildings eroding their value, to the loss of the cultural heritage features in redevelopment projects, of which transport infrastructure is capable of. It is essential to minimise harmful impacts via good practice. Equally transport schemes can uncover remains, which is properly managed can add to our understanding of the historic environment.

2.7.2 Policy Context

The Council of Europe produced The Valletta Treaty, which protects European archaeological heritage. This includes remains, objects and any other historic traces of mankind. There are many reasons why cultural heritage is considered valuable and therefore should be protected.

When it comes to legislation within the UK, general protection is afforded by the guidelines set out in Planning for the Historic Environment which defined a heritage asset as "a building, monument, site, place, area or landscape positively identified as having a degree of significance meriting consideration in planning decisions and described sustainable practices around historical resources." This and its recommendations have been superseded by the National Planning Policy Framework NPPF, which condenses and simplifies the recommendations of parliament into a step guide for local authorities.

A selection from the text states "local planning authorities should take into account the desirability of sustaining and enhancing the significance of heritage assets and putting them to viable uses consistent with their conservation," which is followed by statements on the importance of creating a sense of place in the landscape due to the wider social cultural economic and environmental benefits that conservation of the historic environment can bring.

It also describes how new development must make a "positive contribution to local character and distinctiveness" and consider clashes between conservation and development. However, "here a development proposal will lead to substantial harm to or total loss of the significance of a designated heritage asset, it should be refused, however this harm should be weighed against the

public benefits of the proposal if the site prevents all reasonable use as is or prevents all reasonable use."

The Ancient Monuments and Archaeological Areas Act 1979 gives powers to schedule monuments and require consent for activities within the scheduled area, and hence grants strong protection with the risk of a criminal conviction to historic ruinous assets and areas.

Heritage protection extends underwater with the Protection of Wrecks Act 1973, as recreational diving and undersea infrastructure and shipping threaten significant wreck sites off the coast of the UK. This is supplemented by the later Protection of Military Remains Act 1986 which provides automatic protection of downed military aircraft and the ability to register sunken vessels as war graves preventing damage or salvage.

Kent Environment Strategy (KCC, 2016) has cultural heritage-supporting objectives, including the need to, "conserve and enhance the quality and supply of the county of Kent's natural and historical resources and assets", and to "support sustainable access and connectivity for businesses and communities".

2.7.3 Future Trends

The LTP4 and other development have the potential to compromise local distinctiveness and historical assets which are essential to the character of Kent's towns, villages and countryside to meet the increasing demands on the transport system by the growing pressures of population growth and economic renewal.

Development that homogenises a landscape or obscures its history is removing an irreplaceable resource that can affect other service industries like tourism. However an increase in tourism and therefore the number of visitors to the area would also be potentially damaging due to an increase in vehicle emissions, which on a local level can damage buildings and contributes to global CO_2 emissions.

Dredging out new shipping channels or increasing the rate of passing ships can damage the underwater heritage of Kent as dumped waste; lost netting and dragged anchors disturb the benthic layers and cover or move valuable or protected wreck sites.

Construction and maintenance of existing infrastructure without appropriate archaeological mitigation could lead to accidental damage and loss of the resource.

2.7.4 Gaps & Uncertainties

The nature of the historic environment means that it is a very much case-by-case basis approach to conservation and protection due to the different qualities of the sites.

2.8 Landscape

2.8.1 Baseline

The quality of Kent's countryside has been recognised as a valuable national asset with two parts of the county having been designated as Areas of Outstanding Natural Beauty (AONB): the Kent Downs and the High Weald. The Kent Downs AONB consists of the eastern half of the North Downs covering nearly a quarter of Kent, stretching from the White Cliffs at Dover up to the Surrey and London borders. In addition, the highest areas of the Greensand ridge in Kent, together with a spit of ragstone escarpment above the Romney Marsh, are also within the Kent Downs. It is a landscape of dramatic chalk escarpments, secluded dry valleys, ancient woodlands and traditional orchards. The area has networks of tiny lanes, historic hedgerows, locally distinctive villages and many sites of historic and cultural interest.

The High Weald AONB is an historical countryside of rolling hills draped by small, irregular fields, abundant woods and hedges, scattered farmsteads and sunken lanes. Other features include flower-rich meadow, patches of heathland, hop gardens, orchards, sandstone outcrops, steep wooded ravines bottomed by streams, and 'hammer' ponds (remnants of the Wealden iron industry). The High Weald was once an untamed, wooded area, with patches of wild grassland and heath land. It remains as a densely wooded area of England and now hosts the highest proportion of ancient woodland in the country.

However, rather than being limited to just the best and most beautiful areas, it is increasingly understood that a consideration of landscape must seek to value and appreciate the diversity of all landscapes. Thus, before the value of landscapes can be evaluated they first have to be characterised. In the 1990s the country was divided into 159 National Character Areas (NCAs). 'Character' was defined as a particular combination of physical influences (geology, topography, soils) with cultural and historical influences. Seven NCAs have been identified in Kent, the descriptions of which highlight that the landscape is sensitive to new roads, road improvement schemes or increased traffic on local roads, particularly where roads tend to be narrow rural lanes (e.g. High Weald) and where tranquillity is currently high (e.g. the North Downs):

NCA 81 – Greater Thames Estuary

NCA 113 – North Kent Plains

NCA 119 – North Downs

NCA 120 – Wealden Greensand

NCA 121 – Low Weald

NCA 122 – High Weald

NCA 123 – Romney Marshes

Hedgerows, trees and woodland are important natural features in Kent's landscape. Although Kent has proportionately less woodland cover than the South East as a whole, a high proportion of its woodland is ancient. Kent has approximately 10% of the national resource of ancient woodland. Ancient woodland inventories are available, some of which have recently been revised (e.g. Ashford Borough and Tunbridge Wells Borough).

2.8.2 Policy Context

The European Landscape Convention ('the Florence Convention' (2000); Council of Europe Treaty Series no. 176) came into force 1/3/2004 promotes the protection, management and planning of European landscapes and organises European co-operation on landscape issues.

National policies such as the UK Sustainable Development Strategy and the DEFRA Rural Strategy aim to find a balance between the economic development of an area and the social development of that area as well as the protection of the natural and built environment.

Section 85 of the Countryside and Rights of Way Act 2000 requires all statutory undertakers in carrying out their duties to have regard to the purpose of conserving and enhancing Areas of Outstanding Natural Beauty. This is applicable to Kent County Council as Highway Authority.

In order to support the conserving and enhancement of areas of outstanding natural beauty within the county, supporting policy has been created through the Kent Downs AONB Management Plan 2014 to 2019 and the Kent Downs AONB Rural Streets and Lanes.

Kent Environment Strategy (KCC, 2016) has landscape-supporting objectives, including the need to, "conserve and enhance the quality and supply of the county of Kent's natural and historical resources and assets", and to "support sustainable access and connectivity for businesses and communities".

2.8.3 Key Issues

Any type of new transport infrastructure or expansion of existing infrastructure has the ability to significantly affect the landscape through many different ways such as land take, visual intrusion, light pollution and loss of tranquillity. There are several aspects of transport infrastructure which require careful management to ensure harmful impacts on the landscape are minimised. These aspects include inappropriate signage, lighting and road surfaces. AONB are particularly sensitive to impacts caused by transport infrastructure, as vehicle use within them increases and roads become busier and consequently noisier, they are widened to accommodate the increased traffic.

Thus concrete curbing is installed to prevent further erosion of verges. Signs proliferate to direct and inform the driver and are more prominent to gain attention as vehicle speeds have increased.

Light pollution is of concern as considerations of the landscape at all times of day must be taken in to account, as both a hindrance to stargazers and scientific measurements as well as the negative effects it can have on the migratory patterns of local fauna (Figure 8).

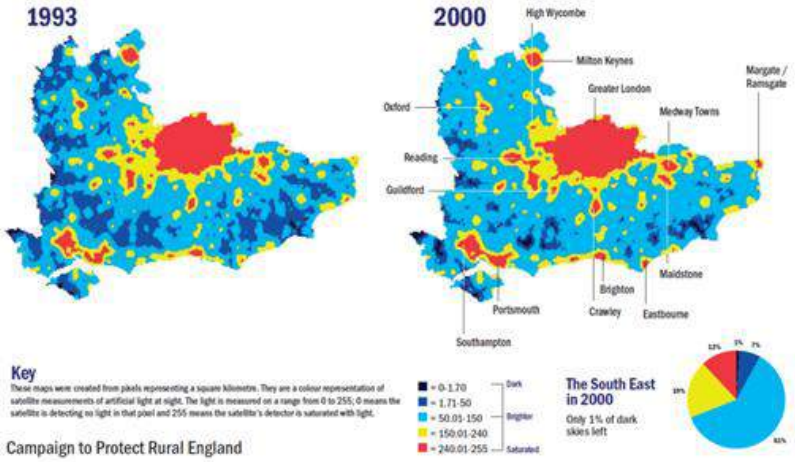


Figure 8: Light pollution in the South East

2.8.4 Future Trends

Due to population growth, development on brown and green field sites surrounding Kent's larger settlements is very likely as there will be a demand to expand these larger settlements outwards into these boundaries, reducing the amount of native landscape. This expansion includes the infrastructure to support development.

However, not all affects are adverse. If managed correctly transport can play an important role in improving the public's access to landscapes of high value which could consequently lead to improvements in health via increased exercise such as walking and cycling. Improvements to general health can also occur through relief of stress from tranquil areas and landscapes.

2.8.5 Gaps & Uncertainties

Data on light pollution is sporadic.

2.9 Noise & Tranquillity

2.9.1 Baseline

Disturbance resulting from noise can be a nuisance and a negative influence on both human health and wellbeing, and biodiversity. Due to the effects noise pollution can have on a surrounding population it is covered by a wide range of legislation, policy and guidance. It is included in this Scoping Report despite not being a topic in its own right within the SEA regulations, as the construction and operation of transport infrastructure has considerable potential to cause negative impacts as a result of noise.

Kent is a relatively tranquil county (Figure 9) due to the dispersed nature of its settlements and wide tracks of agricultural or rural use land, and its prominent position on the coast provides a buffer to ambient noise generated by coastal infrastructure like shipping or road and rail. There are nonetheless transport-related noise hotspots throughout the county, touched on in Figure 10 and shown in more detail for road and rail in Figures 11 and 12 respectively. Noise levels are provided in 'Lden' (day-evening-night) – the equivalent continuous noise level over a whole 24-hour period, but with noise in the evening (19:00 to 23:00) increased by 5 dB(A) and noise at night (23:00 to 07:00) increased by 10 dB(A) to reflect the greater noise-sensitivity of people at those times).

2.9.2 Policy Context

The over-arching aim of the European Union Directive 2002/49/EC on the Assessment and Management of Environmental Noise (Environmental Noise Directive; END) is: "to define a common approach intended to avoid, prevent or reduce on a prioritised basis the harmful effects, including annoyance, due to exposure to environmental noise". The Directive requires EU Member States to create strategic noise maps and adopt action plans for developments, major roads, railways and major airports, which are defined by the Directive. Under the END and the transposing Environmental Noise (England) Regulations 2006, DEFRA have a responsibility to produce noise maps where certain conditions are met, including agglomerations where the population exceeds 250,000 or for major roads and railways. For these, Noise Action Plans must be developed by the Highway and Rail Authorities where Noise Important Areas are identified (Figure 13).

Noise is regulated through the Control of Pollution Act 1974 and the Environmental Protection Act 1990, amongst others; although transportation noise is exempt from statutory nuisance provisions. The potential noise impact of the LTP4 schemes will be assessed under DMRB, CTRN, the Noise Insulation Regulations 1975 (as amended) and the NPSE.

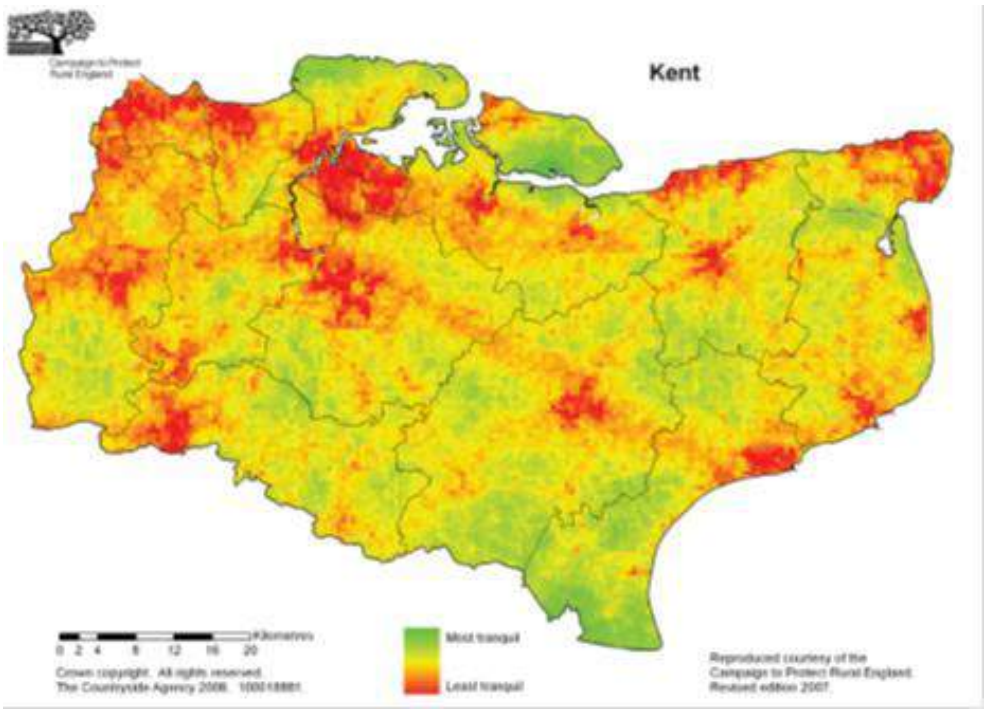


Figure 9: Tranquillity in Kent, as a measure of noise levels

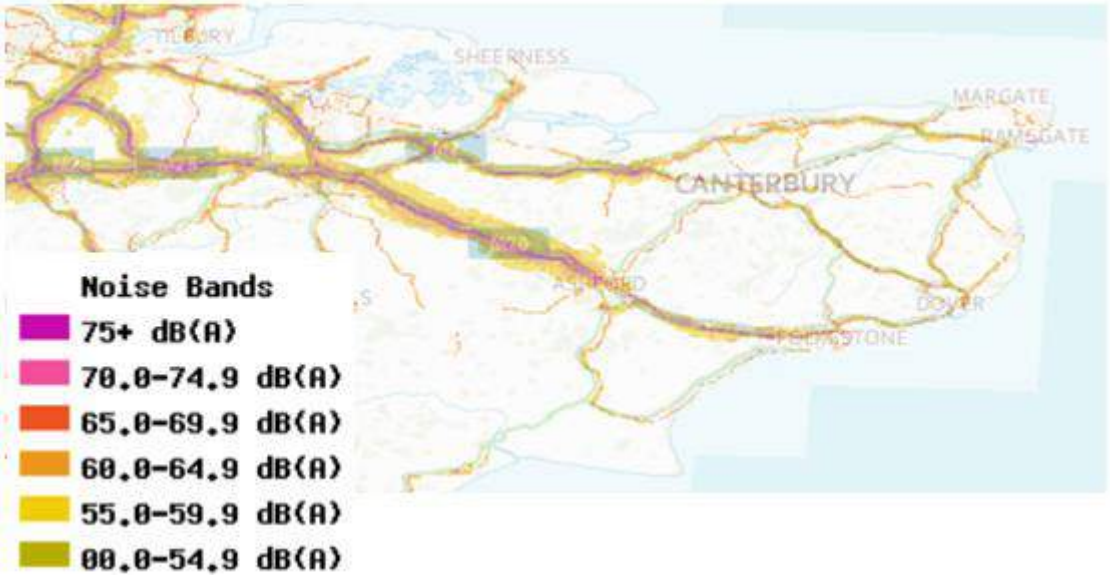


Figure 10: Road Noise (Lden) in Kent

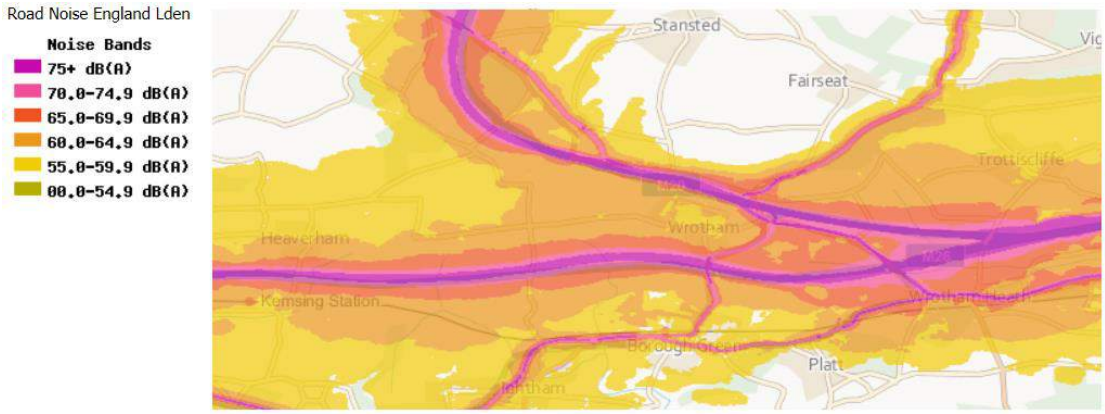


Figure 11: Close-up of M20/M26 junction in Kent showing Lden noise contours

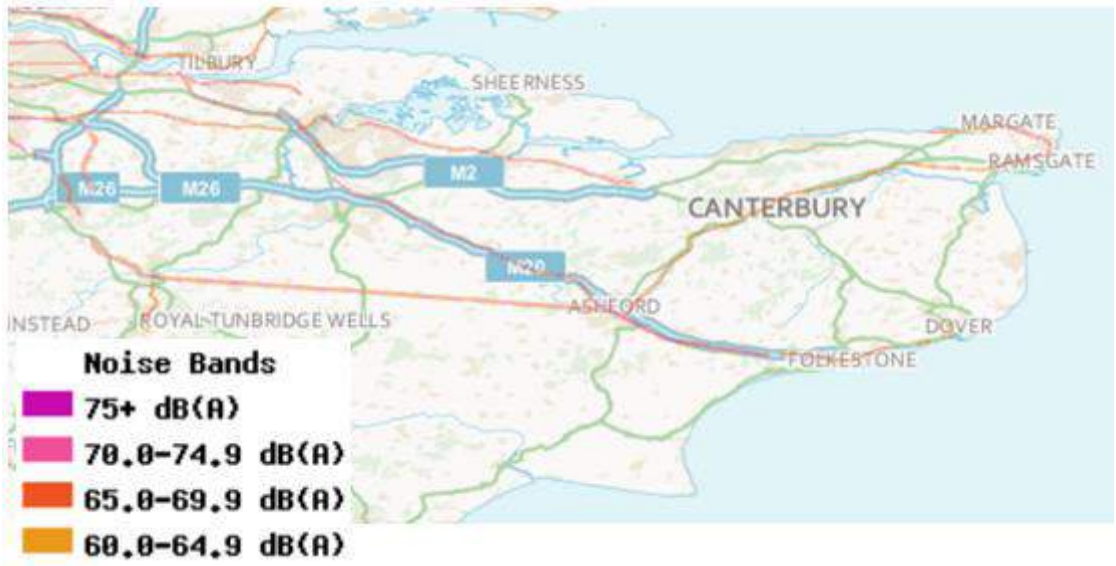


Figure 12: Rail noise (Lden) in Kent

Figure 13: Noise Important Areas in Kent

2.9.3 Key Issues

Increased traffic speed, volume and congestion may all be accompanied by increased noise impacts. With Important Areas already identified throughout Kent where noise levels at human receptors exceed the threshold laid down by the END, LTP4's schemes have potential to worsen the noise climate in existing Important Areas and to increase noise levels in other areas such that they exceed the END threshold. Conversely, LTP4's schemes have potential to improve the noise climate at key transportation locations around the county.

With regard to biodiversity, noise and lighting will only be an issue if they affect European sites designated for their animal interest. The factors that influence a species response to a disturbance are numerous, but the three key factors are species sensitivity, proximity of disturbance sources and timing/duration of the potentially disturbing activity. Disturbance from noise or visual intrusion is likely to be most relevant if the road is immediately adjacent to an SPA or certain SACs (e.g. those designated for bat species), although impacts have been reported up to 1km away due to more intense sources such as busy highways.

2.9.4 Future Trends

As the number of vehicle users is predicted to increase due to a growing population it is likely that congestion will increase in some areas and therefore noise pollution will also increase. However, with LTP4 schemes congestion can be reduced on existing transport infrastructure and where new infrastructure is built there may not necessarily be significant increases in noise pollution for the surrounding areas.

2.9.5 Gaps & Uncertainties

None identified.

2.10 Material Assets

2.10.1 Baseline

"Material assets" is defined as the consumption of resources and the generation of waste. Within the scope of the LTP4 SEA are:

- The transport asset and its condition;
- Material usage, re-usage and waste; and
- Energy and fuel usage.

KCC's transport network includes in excess of 5000 miles of roads, 4000 miles of footway, 4200 miles of public rights of way, 400 miles of cycle routes, as well as 2700 bridges, 130,000 traffic signs, and 700 traffic signal sites. Additions are made to the network each year as well as improvements and general maintenance. Materials are integral to the construction and maintenance of transport infrastructure.

2.10.2 Policy Context

KCC is the statutory waste disposal authority (WDA) for the county. There has been a duty on the WDA to provide household waste recycling centres originally going back as far as the Civic Amenity Act 1967. The duty is now embodied within section 51 of the Environmental Protection act 1990. In summary, the act states that household waste recycling centres must be provided free of charge and open over part of a weekend. The twelve district and borough councils in the county are waste collection authorities (WCA).

The revised European Waste Framework Directive (Directive 2008/98/EC on waste) introduces the "polluter pays principle" and the "extended producer responsibility," and includes two new recycling and recovery targets to be achieved by 2020:

- 50% preparing for re-use and recycling of certain waste materials from households and other origins similar to households; and
- 70% preparing for re-use, recycling and other recovery of construction and demolition waste.

The EU legislation is translated into the Waste Management Plan for England (2013), which has targets as per the Waste Framework Directive. The DEFRA Waste Management Plan for England sets out the waste hierarchy (waste prevention, re-use, recycling, recovery and disposal as the last option). The Plan states that this is to move towards "a 'zero waste economy' in which material resources are reused, recycled or recovered wherever possible and only disposed of as the option of last resort."

European Directive 1999/31/EC on the Landfill of Waste (the Landfill Directive) aims to reduce reliance on landfill, decrease the environmental impacts, and reduce the risk to human health. To help achieve the targets in the directive the UK introduced the Landfill Tax; in the current financial year (2015/16) this is £82.60 per tonne of waste sent to landfill.

A more recent regulation is the Materials Recovery Facility (MRF) Code of Practice Regulations. The requirements of these regulations began in October 2014 and are incorporated in to the Environmental Permitting (England and Wales) (Amendment) Regulations 2013. They require that every MRF that accepts in excess of 1,000 tonnes of mixed recyclables a year reports on the quality of the input, output and residual waste every three months. The regulations intend to

provide confidence to the reprocessing market of materials coming out of MRFs.

All District and Borough authorities along with KCC have developed and signed up to a Joint Municipal Waste Management Strategy (the Kent Waste Strategy) which focuses on how the Partnership will manage municipal solid waste arisings over the next 20 years. The strategy was developed following a baseline study in 2005 which in part, identified current and historic trends in municipal waste.

The Kent Minerals and Waste Local Plan (KMWLP) is at the time of writing being updated following consultation. The KMWLP sets the overarching strategy and planning policies for mineral extraction, importation and recycling, and the waste management of all waste streams that are generated or managed in Kent. The KMWLP affirms the Council's commitment to promote and encourage the use of secondary and recycled aggregates. This is more sustainable than extracting primary land-won aggregates, for example recycled aggregates can be used instead of sharp sand in concrete production.

Kent Environment Strategy (KCC, 2016) has material asset-supporting objectives, including the need to, "improve our resource efficiency such as energy, water and land".

2.10.3 Key Issues

The Landfill Tax is increased each financial year, providing an incentive to minimise waste sent to landfill. In 2005 75% of Kent's household waste was sent to landfill, reducing to just 18% in 2013/14 (Figure 14). However, there is a strong correlation between economic growth and volume of waste and so the amount of waste sent to landfill is likely to increase in absolute terms. There will also be an increase in construction waste as new infrastructure is built. An increase in the amount of waste also has implications for KCC's disposal capacity.

The disposal of waste to landfill is the largest source of methane (CH_4) in the UK. The Kent Resource Partnership has a target to reduce the proportion of waste sent to landfill to 5% by 2020/21 and this will reduce the impact on climate change accordingly. One way to meet this target is to increase recycling and re-use of waste, which have been steadily increasing in Kent (as shown in Figure 14).

The most significant in terms of quantity of all minerals extracted in Kent are construction aggregates, namely sand, gravel, crushed rock, silica sand, brickearth clay, chalk and building stone. The demand for these materials is likely to increase as construction projects increase in number, whether for housing or transport infrastructure. By using recycled aggregates the impact on the environment can be substantially reduced, especially if locally sourced. Globally, recycling reduces the reliance on virgin raw materials and maximises the lifetime of resources. In the

context of LTP4, this includes the use of secondary aggregates for highway maintenance. Where mineral assets may be rendered sterile by a transport scheme then they should be extracted and used as part of that scheme where possible. Similarly, brownfield development should incorporate re-use of onsite materials.

Aside for economic growth, climate change will also increase demand for minerals as the frequency of maintenance is increased. This in itself could further exacerbate climate change by requiring that minerals are transported from further afield, and therefore sustainable modes of transport (water or rail) should be used where minerals cannot be sourced locally. The salt used during winter service has varied significantly over the last few years depending on the severity of the winters (Table 12).

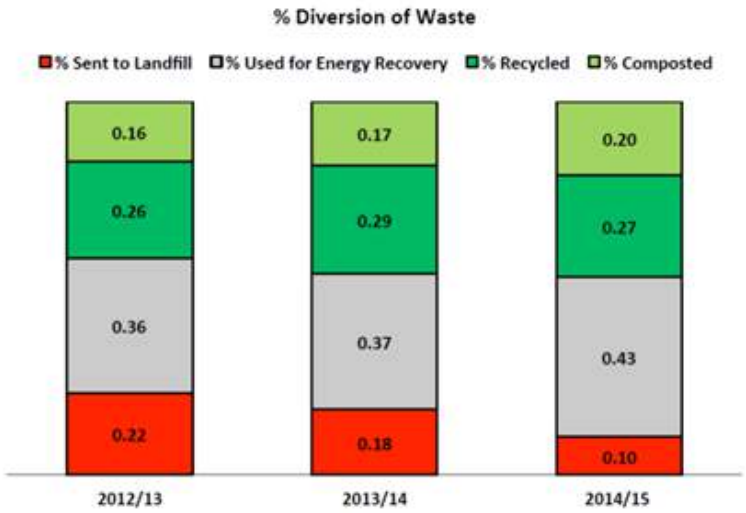


Figure 14: Percentage diversion of waste
(source: Kent State of the Environment Report 2015)

Table 12: Road salting quantities used by KCC since 2009/10

Year	Salt used (tonnes)
2009/10	24,289
2010/11	27,787
2011/12	25,200
2012/13	1,746
2013/14	9,772
2014/15	17,343

KCC does not currently have an asset management approach in place to provide a strategic approach to the allocation of resources in the maintenance and operation of the network. Fossil fuels are used in highway construction materials, but also in providing energy for electrical transport infrastructure. Table 13 shows the energy consumed by Kent's traffic signals. The traffic signal asset has been converted to LED technology and subsequently the energy consumed as approximately halved. It is planned to convert Kent's street lights to LED from 2016, with expectations of a 60% reduction in energy (and therefore carbon) consumed. Continued investment in such technology should see a reduction in the environmental footprint.

Table 13: Energy consumption of highway electrical assets

Traffic signals	**1.8GWh**

2.10.4 Future Trends

The consumption of natural resources in order to maintain Kent's transport network has a negative environmental effect. However, if maintenance was not undertaken the integrity and quality of the asset would deteriorate to the detriment of accessibility and economic growth.

Improvements to the economic climate and government incentives promote housebuilding and large-scale infrastructure projects. These inherently use material assets and produce waste. It is anticipated that this trend will continue over the coming years.

2.10.5 Gaps & Uncertainties

The effects of climate change on the material assets covered by LTP4 over its lifetime are uncertain. Further, no data on the condition of the county's transport assets is currently held so the scale of investment required is unknown. However, owing to nationwide funding constraints it can be assumed that funding will be targeted at those assets in the worst condition.

The data on highway waste that is currently re-used, recycled or sent to landfill is not accessible as this is done on a scheme-by-scheme basis.

The specific detail of, in particular, major transport infrastructure will be developed over time and through prescribed processes. Therefore, it will be impossible for LTP4 to provide any more detail other than a commitment that due consideration will be given to each scheme.

2.11 Opportunities for LTP4 Outcomes and Priorities

A number of *Opportunities* were identified during Scoping, which have been taken through the adoption and implementation of LTP4 (Table 14).

Table 14: Opportunities for LTP4

SEA Topic	SEA Opportunities Identified through Scoping
Biodiversity, flora & fauna	• Maintain and where possible to restore and enhance Kent's biodiversity; protect or enhance habitats of international, national, regional or local importance; and protect international, national, regional or locally important species. • Maintain wildlife corridors and minimise fragmentation of ecological areas and green spaces. • Manage access to sites in a sustainable way that protects or enhances their nature conservation value. • Create new appropriate habitats for at risk populations of flora and fauna.
Air Quality	• Improve air quality in urban areas and achieve the NAQS and the objectives in AQMAs • Minimise transport related pollution using the LTP4 in conjunction with other parallel and daughter plans.
Human Health	• Improve the health of the people of Kent • Reduce disparities in health geographically and demographically • Encourage healthy living for all. Reducing road traffic volume, congestion and pollution by including proposals that will: • Reduce the need to travel, • Promote sustainable transport, • Increase use of public transport, • Increase physically active modes of travel and encourage healthy lifestyles, • Promote integrated transport networks, • Support the modal shift from freight to rail and water, • Minimise safety risk associated with car travellers, cyclists and pedestrians.
Climatic Factors	Reduce Kent's vulnerability to the impacts of climate change as well as its continuing GHG contributions, by trying to: • Reduce the county's contribution to climate change by reducing greenhouse gas emissions from transport; • Increase the proportion of renewable and alternate means of transportation; • Design/construct transportation infrastructure that is resilient to increased incidences of extreme weather events such as storms, flooding, drought and heat waves; • Design public transport systems to be more resistant to heat, such as tinted windows and air conditioning in buses and trains • Review engineering standards to prevent asphalt deformation and increased thermal expansion/contraction of the road and rail network; • Decarbonise transport through the adoption of energy efficient technologies, and the shift to more sustainable modes of transport for

SEA Topic	SEA Opportunities Identified through Scoping
	both people and freight.
Population	• To support transport solutions that cater for individual community needs, for example developing solutions to provide transport links within deprived areas in order to allow for full opportunity to jobs and services. • Additionally promoting positive health outcomes through promoting active and sustainable travel choices, but equally focusing on reducing congestion in order to allow for smoother journeys for the people of Kent. • Road safety and consequently reductions in road casualties for all road users including cyclists is also a key objective and can be achieved through pro-active partnership working within the County and between the County, Local Planning Authorities and other agencies and organisations. • Delivering effective transport infrastructure to aid better-connected journeys throughout Kent.
Water	• Aim to minimise transport-related pollution and reduce the risk of flooding by following best practice and installing sustainable drainage for new schemes. • Consider the capacity of drainage on expansions or maintenance to existing roads and reduce flood risk or provide mitigation/resilience to change in flood risk due to climate change, in particular infrastructure and transport systems on key corridors.
Cultural Heritage	• Aim to preserve and enhance cultural heritage, including sites, areas and features of historic, architectural or archaeological importance. • Promote access to the historic environment in a sustainable manner and look for ways in which the carbon footprint and other disruptive impacts associated with these visits could be reduced.
Landscape	• To value, enhance and protect natural environmental assets including AONBs, historic landscapes, open spaces, parks and gardens and their settings. • To promote the use of rural areas and open space by all, encourage easy non-car based access and accommodate the needs of disabled users.
Noise & tranquillity	• Aim to maintain or reduce the existing ambient noise level. • Use of noise reduction at source and mitigation at pathway and receiver to address Noise Important Areas within Kent.
Material assets	• Strategically coordinate transport for the whole county, including packaging schemes together to minimise their impact on material assets. • Consider the sustainability of the supply chain in highway maintenance, such as locally sourcing materials and re-using and recycling aggregates where possible. • Ensure future technological and materials sciences advances are utilised to prolong the life of transport assets. • New technologies that reduce energy consumption of electrical assets should be supported. • Focus should be on minimising the use of non-renewable energy. • Commit a whole lifecycle approach can be taken to the long-term

SEA Topic	SEA Opportunities Identified through Scoping
	sustainability of infrastructure, thereby minimising waste. • Footways and cycleways for local travel should be maintained and promoted as modal shift will reduce wear and tear and thus the maintenance burden on roads.

These Opportunities have been summarised as follows into themes, to permit their inclusion within the SEA Objectives detailed in Section 3:

- Protect & Enhance…
- Promote sustainable access to …
- Encourage modal shift
- Reduce the need to travel
- Safety
- Technology/Innovation

3 SEA Assessment Methodology and Objectives

The SEA process provides a way in which the environmental effects of the LTP4 and alternative options can be defined and assessed in a structured and consistent way.

The Environmental Report includes:

- The likely significant effects associated with the plan approach; and
- The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects of implementing the plan approach.

This section of the Environmental Report presents the assessment methodology and the key elements to be assessed; Section 4 provides an assessment of alternative options for the LTP4; and, Section 5 presents the assessment findings in relation to LTP4. The objectives and assessment questions are presented for each environmental topic are presented in Table 15.

3.1 Assessment methodology

The assessment identifies and evaluates 'likely significant effects' of the LTP4 on the baseline, utilising the SEA methodology developed through scoping. The SEA Objectives have been developed by combining the Topics and Opportunities developed during Scoping, which identified the environmental issues of relevance for the plan. Findings are presented through these eleven SEA Objectives, which are outlined in Table 15, below.

Assessment matrices have been developed for the Options (Table 16), VFM prioritisation for ITP schemes (Table 17), LTP4 Policies (Table 18 & 19) and LTP4 Strategic Priorities (Table 20) and were used as a framework to undertake the assessment. The completed matrices are presented in Appendices D to G and the findings discussed in Section 5. For each set of results, the worst score is reflected in the overall score in order to be robust and precautionary in the assessment.

Table 15: SEA Objectives and Questions

SEA Topic	SEA Objectives	Overarching Objective	Assessment Questions – will LTP4 help to…
Biodiversity, Flora & Fauna	Protect and enhance the county's habitats, biodiversity levels, and species of international, national, regional and local importance.	Apply innovative and technological approaches to achieving sustainable outcomes.	• Protect the integrity of designated sites in Kent? • Manage infrastructure impacts on designated sites? • Preserve the status of designated sites?
Air Quality	Improve air quality in urban areas and achieve the NAQS and AQMA objectives across the county.		• Reduce quantities of air pollution from transport across the county? • Target areas with problematic air quality issues?
Human Health	Support transport solutions that promote positive health outcomes through active and sustainable travel choices and improved road safety.		• Identify community and economic transport needs? • Create integrated and sustainable transport networks?
Climatic Factors	Reduce vulnerability to climate change-related extreme weather events by creating a resilient transport infrastructure and identifying appropriate adaptation and mitigation measures.		• Implement adaptation and mitigation measures to the infrastructure?
Population	Promote accessible, integrated and sustainable transport networks that support the needs of the economy and local communities.		• Reduce congestion? • Provide viable non-car based transport options?
Water	Coordinate across the county in parallel with other planning policy, in order to address water catchment quality and resource issues.		• Use catchment information positively as part of the infrastructure's development?
Cultural Heritage	Protect and enhance cultural heritage, and access to areas and features of historic, architectural or archaeological importance.		• Allow cultural heritage to exist in parallel with the transport infrastructure?

SEA Topic	SEA Objectives	Overarching Objective	Assessment Questions – will LTP4 help to…
Landscape	Protect and enhance the character and diversity of all landscape assets through planning and policy decisions and ensure development does not decrease visual and recreational amenity.		• Preserve landscape features?
Noise & Tranquillity	Seek to reduce noise at source, particularly in existing Noise Important Areas, and to prevent the creation of new Noise Important Areas; protect tranquil areas from impact, including cumulative impact.		• Alleviate ambient noise levels derived from transport?
Material Assets	Maximise resource efficiency in materials, energy, waste and water use by utilising sustainable construction and procurement methods, and ensuring appropriate ongoing maintenance of assets.		• Use construction and engineering standards to generate efficiency?

The following aspects of the plan were assessed using each of the SEA objectives set out in Table 15:

- LTP4's strategic objectives and supporting policies;
- the plan Options;
- the Value for Money (VFM) prioritisation matrix for ITP schemes;
- strategic and countywide transport priorities which are newly developed since LTP3 and therefore have not previously been subject to SEA.

The following aspects of the plan were assessed using each of the SEA objectives set out in Table 15:

- strategic and countywide transport priorities which featured in LTP3 and therefore have previously been subject to SEA;
- KCC's policy position on Aviation, which is a continuation of LTP3's position, and which does not contain details of any proposed schemes to be promoted by KCC;
- local transport priorities, due to the lack of clarity on the funding to be made available and the broad range of potential schemes – not all of which have been detailed within LTP4.

3.2 Data limitations, uncertainty and assumptions

It is important to acknowledge the limitations of the assessment approach. These relate to both the scope and coverage of the plan and the nature of the SEA process. The following considerations should therefore be recognised:

- Some proposals to be taken forward through the LTP4 Review are not spatially specific and thus are deployed across the county. This situation can reduce the confidence in forecasting potential environmental outcomes.
- Where the proposal has a specific geographic location, the available scheme definition and the subsequent scheme design can lead to uncertainties of the resultant impact. Potential impacts identified in the SEA may be capable of being avoided or mitigated during subsequent scheme design and environmental assessment processes.

Where appropriate, the SEA will acknowledge these limitations throughout the process. Every effort is made to predict effects accurately; however, this is inherently challenging given the high level nature of the policy approaches under consideration, and limited understanding of the baseline. Due to the uncertainties involved there is inevitably a need to make assumptions. Assumptions are made cautiously, and explained within the text included in the matrices. The

aim is to strike a balance between comprehensiveness and conciseness/accessibility to the public. In many instances, given reasonable assumptions, it is not possible to predict significant effects, but it is possible to comment on merits (or otherwise) in more general terms. Effects are predicted taking account of the criteria presented within Schedule 1 of the SEA Regulations 2004. Account is taken of the probability, duration, frequency and reversibility of effects as far as possible. Cumulative effects are also considered.

Table 16: Options Matrix

Plan Options	Biodiversity Protect and enhance the county's habitats, biodiversity levels, and species of international, national, regional and local importance.	Air Quality Improve air quality in urban areas and achieve the NAQS and AQMA objectives across the county.	Health Support transport solutions that promote positive health outcomes through active and sustainable travel choices and improved road safety.	Climate Reduce vulnerability to climate change-related extreme weather events by creating a resilient transport infrastructure and identifying appropriate adaptation and mitigation measures.	Population Promote accessible, integrated and sustainable transport networks that support the needs of the economy and local communities	Water Coordinate across the county in parallel with other planning policy, in order to address water catchment quality and resource issues.	Heritage Protect and enhance cultural heritage, and access to areas and features of historic, architectural or archaeological importance.	Landscape Enhance and protect the character and diversity of all landscape assets through planning and policy decisions and ensure development does not decrease visual and recreational amenity	Noise Seek to reduce noise at source, particularly in existing Noise Important Areas, and to prevent the creation of new Noise Important Areas; protect tranquil areas from impact, including cumulative impact.	Materials Maximize resource efficiency in materials, energy, waste and water use by utilising sustainable construction and procurement methods, and ensuring appropriate ongoing maintenance of assets.	Technology & Innovation Apply innovative and technological approaches to achieving sustainable outcomes.	Overall	Comments Comments
What will be the situation without LTP4 - Option 1: Business as usual – i.e. retain existing prioritisation methodology from LTP3 and keep the funding prioritised on growth points and growth areas as well as being unequally allocated among themes (in the context of LTP4: outcomes). GWG 45%; 15 others; 10 life in Kent													
What will be the situation with LTP4 - Option 2: Use the revised prioritisation methodology and make all outcomes equally weighted and of equal priority – i.e. equal allocation of funding. 20% each													
What will be the situation with LTP4 - Option 3 [preferred by KCC & captured in the LTP4 Draft for Cabinet Cttee] : Use the revised prioritisation methodology and give a priority order to the outcomes and weight them differently – i.e. more available funding for some outcomes (an alternative funding allocation). 40% ec; 15 others.													
What will be the situation with LTP4 - Option 4: Use the revised prioritisation methodology and give a priority order to the outcomes and weight them differently – i.e. more available funding for some outcomes (an alternative funding allocation). 55% ec; 15 others; 0 safety (as CRM already top sliced)													

Table 17: VFM Prioritisation for ITP Schemes Matrix (Biodiversity example)

Biodiversity, flora & fauna: Protect and enhance the county's habitats, biodiversity levels, and species of international, national, regional and local importance.						
Plan Outcomes	**Plan Policies**	**Proposed VFM Indicators**	**Effect**	**Assessment vs SEA Objectives - Biodiversity**		**Assessment key**
1. Economic growth & minimised congestion	Deliver resilient transport infrastructure and schemes that reduce congestion and improve journey time reliability to enable economic growth and appropriate development, meeting demand from a growing population.	Is the scheme directly connected with delivering development?				++ Major positive
		Does the scheme have impacts in one of the most deprived Lower Super Output Areas using the Index of Multiple Deprivation?				+ Minor positive
		Congestion – what impact will the scheme have on congestion and journey time?				0 None /unknown
		Climate resilience - how will the scheme contribute to improved climate resilience in Kent?				- Minor negative
2. Affordable and accessible door-to-door journeys	Promote affordable, accessible and connected transport to enable access for all to jobs, education, health and other services.	Accessibility – what impacts will the scheme have on access to key services (jobs, education, healthcare, etc.)?				- - Major negative
		Connectivity – what impact will the scheme have on creating connected door-to-door journeys?				
		Local Masterplanning - has accessibility and reduced journey time been designed into the overall plan for the scheme area?				
3. Safer travel	Provide a safer road, footway and cycleway network to reduce the likelihood of casualties, and encourage other transport providers to improve safety on their networks.	Safety – are there any secondary benefits to safety (road, cycleway, footway)?				
4. Enhanced environment	Deliver schemes to reduce the environmental footprint of transport, and enhance the historic and natural environment.	Sustainable travel – what impact will the scheme have on sustainable travel (e.g. modal shift)?				
		Townscape and heritage – what impacts will the scheme have on the historic and built environment (including severance)?				
		Environment – what impact will the scheme have on...				
		Biodiversity?				
		Carbon Emissions?				
		Water quality and resources?				
		Natural & Cultural Heritage Landscape & Visual Impact?				
		Noise & Tranquility?				
		Material assets (i.e. materials, energy, waste & water resource use in construction & maintenance)?				
		Technology & innovation (i.e. approaches to achieving sustainable outcomes)?				
5. Better health and wellbeing	Promote active travel choices for all members of the community to encourage good health and wellbeing, and implement measures to improve local air quality.	Air quality – what impact will the scheme have on air quality?				
		Active travel – what impact will the scheme have on promoting active travel?				

Table 18: LTP4 Policies Assessment Matrix (Biodiversity example)

LTP4			SEA Objectives		
Plan Outcomes	**Plan Policy**	**Effects**	**Biodiversity, flora & fauna: Protect and enhance the county's habitats, biodiversity levels, and species of international, national, regional and local importance.**		**Assessment key**
1. Economic growth & minimised congestion	Deliver resilient transport infrastructure and schemes that reduce congestion and improve journey time reliability to enable economic growth and appropriate development, meeting demand from a growing population.				++ Major positive
2. Affordable and accessible door-to-door journeys	Promote affordable, accessible and connected transport to enable access for all to jobs, education, health and other services.				+ Minor positive
3. Safer travel	Provide a safer road, footway and cycleway network to reduce the likelihood of casualties, and encourage other transport providers to improve safety on their networks.				0 None identified
4. Enhanced environment	Deliver schemes to reduce the environmental footprint of transport, and enhance the historic and natural environment.				- Minor negative
5. Better health and wellbeing	Promote active travel choices for all members of the community to encourage good health and wellbeing, and implement measures to improve local air quality.				- - Major negative

Table 19: LTP4 Policies Summary Matrix

	SEA Objectives										
	Biodiversity	**Air Quality**	**Health**	**Climate**	**Population**	**Water**	**Heritage**	**Landscape**	**Noise**	**Materials**	**Technology & Innovation**
LTP4 Outcomes	**Protect and enhance the county's habitats, biodiversity levels, and species of international, national, regional and local importance.**	**Improve air quality in urban areas and achieve the NAQS and AQMA objectives across the county.**	**Support transport solutions that promote positive health outcomes through active and sustainable travel choices and improved road safety.**	**Reduce vulnerability to climate change-related extreme weather events by creating a resilient transport infrastructure and identifying appropriate adaptation and mitigation measures.**	**Promote accessible, integrated and sustainable transport networks that support the needs of the economy and local communities**	**Coordinate across the county in parallel with other planning policy, in order to address water catchment quality and resource issues.**	**Protect and enhance cultural heritage, and access to areas and features of historic, architectural or archaeological importance.**	**Enhance and protect the character and diversity of all landscape assets through planning and policy decisions and ensure development does not decrease visual and recreational amenity**	**Seek to reduce noise at source, particularly in existing Noise Important Areas, and to prevent the creation of new Noise Important Areas; protect tranquil areas from impact, including cumulative impact.**	**Maximise resource efficiency in materials, energy, waste and water use by utilising sustainable construction and procurement methods, and ensuring appropriate ongoing maintenance of assets.**	**Apply innovative and technological approaches to achieving sustainable outcomes.**
1. Economic growth & minimised congestion											
2. Affordable and accessible door-to-door journeys											
3. Safer travel											
4. Enhanced environment											
5. Better health and wellbeing											

Assessment key
++ Major positive
+ Minor positive
0 None /unknown
- Minor negative
- - Major negative

Table 20: LTP4 Strategic Priorities Matrix

Type	Scheme	Biodiversity	Air Quality	Human Health	Climatic Factors	Population	Water	Cultural Heritage	Landscape	Noise & Tranqility	Material Assets	Innovation & Technology
Strategic	Port Expansion											
	International Station Signalling (Ashford Spurs)											
	Rail & Bus Improvements											
Non-Strategic Kent-wide	Road Safety											
	Highways Maintenance & Asset Management											
	Home to School Transport											
	Active Travel											
	Aviation											

4 Assessment of reasonable plan alternatives

4.1 Objective

A key element of the SEA process is the assessment of 'reasonable alternatives' to the LTP4. Alternative options have been considered in relation to funding allocations by which the LTP policy outcomes may be taken forward through the Local Transport Plan review process.

4.2 Alternative options considered

Alternative options for the LTP4 have been set out by KCC in an Options Report dated 8/4/2016 (v2, Appendix A), which has subsequently been amended as part of the SEA process (v3, Appendix B; Final draft, Appendix C). The alternative options to be assessed are:

1. Retain existing prioritisation methodology from LTP3 and the funding prioritised spatially as well as being unequally allocated among themes GWG 45%; 15% others; 10% life in Kent (in the context of LTP4 policy outcomes).
2. Use the LTP4 revised prioritisation methodology and equally weight/equally prioritise outcomes – i.e. 20% equal funding allocation.
3. Use the LTP4 revised prioritisation methodology and give a priority order to the outcomes and weight them differently – i.e. 40% Outcome 1; 15% other outcomes.
4. Use the LTP4 revised prioritisation methodology and give a priority order to the outcomes and weight them differently – i.e. 55% Outcome 1; 0% Outcome 3; 15% other outcomes.

4.3 Assessment of the alternative options

An assessment of alternatives has been made in broad terms against the SEA objectives, provided there is sufficient detail to identify the significant environmental effects of each alternative. The focus has been on the effects of the plan, rather than other factors that may influence the achievement of the SEA objectives. Only the main differences between the alternatives options has been considered and documented. In assessing the plan, expert environmental and sustainability judgement has been utilised.

A qualitative assessment has been made based on perceived short or long term improvements or regressions for each SEA objective. The full results of this are presented in Appendix E, and are summarised in Figure 15, below. To support the assessment findings, the options have been ranked in terms of their environmental performance against each theme, and the relative merits of each option depicted in Figure 15. It is anticipated that this will provide a likely

indication of the comparative environmental performance of the four options in relation to the various themes.

	Plan Options	Overall	Comments
1	What will be the situation without LTP4 - Option 1: Business as usual – i.e. retain existing prioritisation methodology from LTP3 and keep the funding prioritised on growth points and growth areas as well as being unequally allocated among themes (in the context of LTP4: outcomes). GWG 45%; 15 others; 10 life in Kent	-2	Option 1's emphasis is housing and employment within the county to support GWG. Having this as a key independant theme by-passes the opportunity to develop sustainable solutions to support GWG (other than by CBA). The funding assessment methodology provides for spatial analysis, although this is based on the theme of LTP3 and therefore is not holistic. The CBA provides very limited ability for consideration of the environment. Funding to key growth points in the county will lead to increased environmental pressures on all areas of the environment will increase. The option does address wider social and commnuity needs in the improved access to non-vehicular travel. The theme for the environment relates primarily to climate change - which is a far-reaching subject in terms of the schemes that could support it. The main issue is the limited spatial distribution of the schemes, leading to an all or nothing outcome for areas. Top slicing of the budget for safety related schemes means that less budget is available for other themes as a wholes. This is despite there being a dedicated theme for safety.
2	What will be the situation with LTP4 - Option 2: Use the revised prioritisation methodology and make all outcomes equally weighted and of equal priority – i.e. equal allocation of funding. 20% each	14	Option 2 is a progression from Option 1, developing the issues found into solutions. Because the assessment scheme uses the themes in LPT4, each area is addressed. Funding is allocated to schemes based on their theme. Funding allocation is equalised - the environment based schemes benefits from a 5% increase (20% total) in allocation.Additionally, Outcome 2 has strong environmental and social benefits and so a 20% funding allocation to outcome 2 benefits outcome 4. Revised assessment scheme allows for consideration of the environment for each scheme. The impact of increased funding for economic growth may or may not have a residual negative impact - this will depend on the scoring for Outcome 4, whch may well be high. Scheme design will play a role in deciding the Outcome scores.
3	What will be the situation with LTP4 - Option 3 [preferred by KCC & captured in the LTP4 Draft for Cabinet Cttee] : Use the revised prioritisation methodology and give a priority order to the outcomes and weight them differently – i.e. more available funding for some outcomes (an alternative funding allocation). 40% ec; 15 others.	6	Option 3 is a progression from Option 2, developing the issues found into solutions. Because the assessment scheme uses the themes in LPT4, each area is addressed. Funding is allocated to schemes based on their theme. Funding allocation is equalised - the environment based schemes benefits from a 15% funding allocation. Revised assessment scheme allows for consideration of the environment for each scheme. The impact of increased funding for economic growth may or may not have a residual negative impact - this will depend on the scoring for Outcome 4, whch may well be high. Scheme design will play a role in deciding the Outcome scores.
4	What will be the situation with LTP4 - Option 4: Use the revised prioritisation methodology and give a priority order to the outcomes and weight them differently – i.e. more available funding for some outcomes (an alternative funding allocation). 55% ec; 15 others; 0 safety (as CRM already top sliced)	-5	Option 4 is a progression from Option 2, developing the issues found into solutions. Because the assessment scheme uses the themes in LPT4, each area is addressed. Funding is allocated to schemes based on their theme. Funding allocation is equalised - the environment based schemes benefits from a 5% increase in allocation. Revised assessment scheme allows for consideration of the environment for each scheme. The impact of increased funding for economic growth may or may not have a residual negative impact - this will depend on the scoring for Outcome 4, whch may well be high. Scheme design will play a role in deciding the Outcome scores. Outcome 3 'Safety' delivers little in environmental benefits and therefore a reduction in the funding allocation for Outcome 3 raises the amount available for Outcome 4 'Environment'. However, the allocation for Outcome 1 'Growth' has benefited directly from the lack of funding for Outcome 3 and this has the strongest negative effect on environmental outcomes.

Figure 15: Assessment of Options

Option 1

Option 1's emphasis is housing and employment within the county to support GWG. Having this as key independent theme by-passes the opportunity to develop sustainable solutions to support GWG (other than by CBA). The funding assessment methodology provides for spatial analysis, although this is based on the theme of LTP3 and therefore is not holistic. The CBA provides very limited ability for consideration of the environment. Funding to key growth points in the county will lead to increased environmental pressures on all areas of the environment will increase. The option does address wider social and community needs in the improved access to non-vehicular travel. The theme for the environment relates primarily to climate change - which is a far-reaching subject in terms of the schemes that could support it. The main issue is the limited spatial distribution of the schemes, leading to an all or nothing outcome for areas. Top slicing of the budget for safety related schemes means that less budget is available for other themes as a whole. This is despite there being a dedicated theme for safety.

Option 2

Option 2 is a progression from Option 1, developing the issues found into solutions. Because the assessment scheme uses the themes in LPT4, each area is addressed. Funding is allocated to schemes based on their theme. Funding allocation is equalised - the environment based schemes benefits from a 5% increase (20% total) in allocation. Additionally, Outcome 2 has strong environmental and social benefits and so a 20% funding allocation to outcome 2 benefits

outcome 4. Revised assessment scheme allows for consideration of the environment for each scheme. The impact of increased funding for economic growth may or may not have a residual negative impact - this will depend on the scoring for Outcome 4, which may well be high. Scheme design will play a role in deciding the Outcome scores.

Option 3

Option 3 is a progression from Option 2, developing the issues found into solutions. Because the assessment scheme uses the themes in LPT4, each area is addressed. Funding is allocated to schemes based on their theme. Funding allocation is equalised - the environment based schemes benefits from a 15% funding allocation. Revised assessment scheme allows for consideration of the environment for each scheme. The impact of increased funding for economic growth may or may not have a residual negative impact - this will depend on the scoring for Outcome 4, which may well be high. Scheme design will play a role in deciding the Outcome scores.

Option 4

Option 4 is a progression from Option 2, developing the issues found into solutions. Because the assessment scheme uses the themes in LPT4, each area is addressed. Funding is allocated to schemes based on their theme. Funding allocation is equalised - the environment based schemes benefits from a 5% increase in allocation. Revised assessment scheme allows for consideration of the environment for each scheme. The impact of increased funding for economic growth may or may not have a residual negative impact - this will depend on the scoring for Outcome 4, which may well be high. Scheme design will play a role in deciding the Outcome scores. Outcome 3 'Safety' delivers little in environmental benefits and therefore a reduction in the funding allocation for Outcome 3 raises the amount available for Outcome 4 'Environment'. However, the allocation for Outcome 1 'Growth' has benefited directly from the lack of funding for Outcome 3 and as this has the strongest negative effect on environmental outcomes.

Option 2 performs more favourably than Options 1, 3 and 4 in terms of providing improvements to the SEA themes and/or to meeting the SEA objectives. With a focus on shared economic, social and environmental features, it is considered that this approach will deliver wider beneficial outcomes for air quality, greenhouse gas emissions and residents' quality of life and health and wellbeing through more effectively addressing issues related to congestion, accessibility and modal shift.

4.4 Development of the preferred plan

It is acknowledged that the main focus of LTP4 is 'Delivering Growth without Gridlock'. It is therefore accepted that KCC's preferred Option 3 – which delivers greater funding for Outcome 1 while not causing significant negative impacts on the SEA Objectives – is an appropriate choice for the funding allocation.

LTP4 extends the plan period up to 2031 to reflect the timeframes of the emerging district-led development plans. Each district describes the different challenges faced over the next 15-20 years and the proposed transport initiatives to be prioritised for that area, as well as for issues for beyond Kent linked to transport in the county. For each of the districts, the LTP4 process selects a series of schemes for potentially taking forward in the plan period. These are to be determined through the Scheme Value for Money (VFM) Prioritisation System (including affordability and acceptability) and their potential role in enabling future development and growth. It is intended that these schemes will be delivered through the Integrated Transport Programme (ITP). The Scheme Prioritisation System (the LTP3 prioritisation method) has been assessed as part of this SEA (see Section 5, below) and the revised prioritisation system (v3) can be found in Appendix B.

It is noted that these Options and the related VFM prioritisation system relate only to ITP schemes. It is recommended that there would be value in applying the VFM Matrix to all scheme decision-making, to enable early consideration of environmental topics irrespective of funding source (see also Section 5.3).

5 LTP4 Assessment Results

The assessment of LTP4's Outcomes, Policies, Priorities and VFM Prioritisation Matrix indicates that no major (i.e. significant) negative effects on the SEA Objectives will arise. As such, it has not been necessary to develop and assess alternatives to the policies. The Tables below summarise the results of the various assessments, and results are also presented graphically in charts. The full assessment matrices for these are presented in Appendices D to G, respectively. The results for each SEA Objective are then explored. In each case, in pursuance of the Precautionary Principle, the worst score is taken as representative.

5.1 LTP4 Outcomes and Policies

The environmental assessment of the Outcomes and Policies proposed by LTP4 indicates that overall these will have a minor negative environmental impact (Table 21). This is principally as a result of Outcome 1 (Economic Growth and Minimised Congestion). Early consideration of environmental aspects and impacts is key to identifying and mitigating these – this has been built into the ITP schemes through the use of the VFM prioritisation matrix, but may be lacking for more major schemes where specific funding streams are focused on economic growth, such as the Local Growth Fund. It is proposed that by way of mitigation the ITP VFM matrix is routinely used at bid and business case stage for all priority transport schemes promoted by KCC and Kent's Districts, irrespective of the funding source, in order to counteract the economic bias inherent in growth-centred proposals.

5.2 LTP4 Priorities

The environmental assessment of the Priorities put forward by LTP4 and which do not represent 'business as usual' (i.e. are not priorities which have been carried over from LTP3 and thus have not previously been subject to assessment) indicates that overall these will have a neutral environmental impact (Table 22). No specific concerns came to light during the assessment, although it is clear that the level of benefit in relation to schemes proposing modal shift will depend on the approach taken in developing the sustainable and active travel networks and the ways in which this are promoted to the population. LTP4 acknowledges that private motorised vehicles will remain the primary mode of transport within Kent and therefore step-change is unlikely – however at individual level the benefits of such change must be appreciated.

Table 21: LTP4 Outcomes and Policies Summary

	SEA Objectives											
	Biodiversity	**Air Quality**	**Health**	**Climate**	**Population**	**Water**	**Heritage**	**Landscape**	**Noise**	**Materials**	**Technology & Innovation**	**Overall**
LTP4 Outcomes	Protect and enhance the county's habitats, biodiversity levels, and species of international, national, regional and local importance.	Improve air quality in urban areas and achieve the NAQS and AQMA objectives across the county.	Support transport solutions that promote positive health outcomes through active and sustainable travel choices and improved road safety.	Reduce vulnerability to climate change-related extreme weather events by creating a resilient transport infrastructure and identifying appropriate adaptation and mitigation measures.	Promote accessible, integrated and sustainable transport networks that support the needs of the economy and local communities	Coordinate across the county in parallel with other planning policy, in order to address water catchment quality and resource issues.	Protect and enhance cultural heritage, and access to areas and features of historic, architectural or archaeological importance.	Enhance and protect the character and diversity of all landscape assets through planning and policy decisions and ensure development does not decrease visual and recreational amenity	Seek to reduce noise at source, particularly in existing Noise Important Areas, and to prevent the creation of new Noise Important Areas; protect tranquil areas from impact, including cumulative impact.	Maximise resource efficiency in materials, energy, waste and water use by utilising sustainable construction and procurement methods, and ensuring appropriate ongoing maintenance of assets.	Apply innovative and technological approaches to achieving sustainable outcomes.	
1. Economic growth & minimised congestion	-	0	0	0	+	-	-	-	-	0/+	+	-
2. Affordable and accessible door-to-door journeys	0	0/+	+	0/+	+	0	+	+	+	0/+	+	0
3. Safer travel	0/-	0	++	0	++	0	0	0	0	0/+	+	0/-
4. Enhanced environment	0/+	0/+	+	0/+	+	0/+	0/+	0/+	0/+	+	+	0/+
5. Better health and wellbeing	0	0/+	++	0/+	+	0/+	0/+	0	0/+	0/+	+	0
Overall	-	0	0	0	+	-	-	-	-	0/+	+	-

Assessment key

++ Major positive

\+ Minor positive

0 None /unknown

\- Minor negative

\- - Major negative

Table 22: LTP4 Priorities Summary

Type	Scheme	Biodiversity	Air Quality	Human Health	Climatic Factors	Population	Water	Cultural Heritage	Landscape	Noise & Tranqility	Material Assets	Innovation & Technology	Overall	Comments
Strategic	Port Expansion	0/+	+	+	+	+	0	0/+	+	+	+	0	0	This scheme has potential to have minor positive impacts providing there is appropriate mitigation/enhancement following proper assessment of environmental aspects at outline design stage.
	International Station Signalling (Ashford Spurs)	0	0	0	0	0	0	0	0	0	0	0	0	Resignalling scheme is to permit the perpetuation of the status quo - i.e. continued international rail services at Ashford - therefore this scheme represents 'business as usual' There is potential for temporary negative impacts during construction - these must be properly managed and mitigated through scoping assessment plus BS5228/IAQM construction assessments if deemed necessary.
	Rail & Bus Improvements	+	+	++	+	++	+	+	+	+	+	0	0	This Priority has potential to have minor positive impacts providing there is appropriate mitigation/enhancement of any related route enhancement schemes, following proper assessment of environmental aspects at outline design stage.
Non-Strategic Kent-wide	Road Safety	0	0	++	0	++	0	0/+	0/+	0	0/+	0	0	Although significantly beneficial in terms of direct impact on human health, and thus having intrinsic value for that reason alone, there are few additional benefits. Care must be taken that schemes do not cause negative impacts to the environment during construction or operation, through proper assessment of environmental aspects at outline design stage.
	Highways Maintenance & Asset Management	0/+	0/+	0	+	0/+	+	0	0	0	+	0/+	0	Minor benefits may be achieved through lifecycle thinking and a holistic approach.
	Home to School Transport	+	+	++	+	+	0/+	0/+	0/+	0/+	0/+	0	0	Minor benefits may arise from the promotion of active travel modes and the provision of additional buses - there is potential for significant positive impact if this Priority focuses on the promotion of School Travel Plans and the encouragement of sustainable modes amongst school-age children and their parents/guardians. Attending school - irrespective of how they get there - is a significant benefit therefore the positive impact to individuals of transport being facilitated - whether sustainable or not - must not be overlooked.
	Public Rights of Way	0	0/+	++	+	0	0	0/+	0	0	0	0		Benefits of the improved access, condition and use of public foootpaths for recreation or non-motorised transport to health and climate
	Active Travel	+	+	++	0/+	+	0/+	0/+	0/+	0/+	0/+	0	0	Minor benefits may arise from the promotion of active travel modes - there is potential for significant positive impact however this is dependent on the level of uptake by the population and consequent knock-on effects.
	Overall	0	0	0	0	0	0	0	0	0	0	0	0	

Assessment key
++ Major positive
+ Minor positive
0 None /unknown
- Minor negative
- - Major negative

5.3 LTP4 VFM Prioritisation Assessment

An environmental assessment was undertaken of the original VFM prioritisation matrix (Figure 16; Appendix F1) and then of the revised matrix produced by Amey (Figure 17; Appendix F2 and summarised in Table 23). Although by taking the worst-case as the overall outcome this comes out as having a negligible negative effect, it is notable that the Sustainable Travel indicator and the Population SEA Objective are predicted to benefit from minor positive effects as a result of using this methodology. Furthermore, it would appear that the likelihood of achieving a significant or minor positive effect has been increased (from 39% to 78% of the total) as a result of the revisions to the matrix. In the final version of the VFM Matrix presented in the LTP4 Annexe (reproduced in Appendix C of this report) it is noted that Climate Resilience/Adaptation has been removed from the Matrix; KCC has however provided assurances that the resilience of schemes will be a key consideration at the design stage. It is worth noting that, although carbon reduction/climate change are not explicitly mentioned, the sections within the Matrix on Sustainable Travel, Environment and Air Quality are all intended to to ensure the proper consideration of schemes' potential climate impacts.

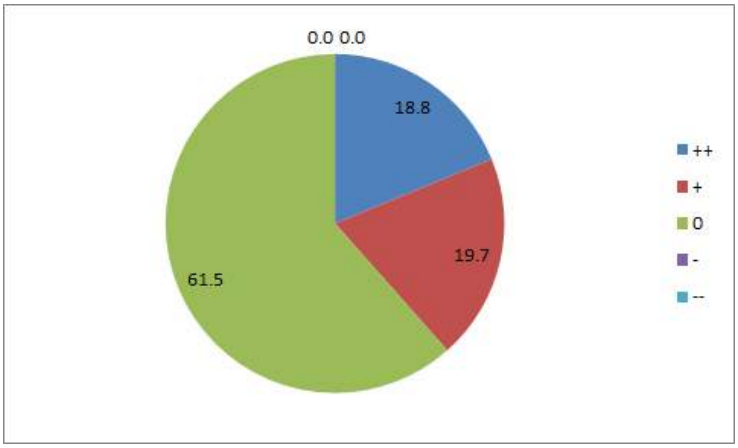


Figure 16: Effect of original (v2) VFM Prioritisation Matrix on SEA Objectives (% of total)

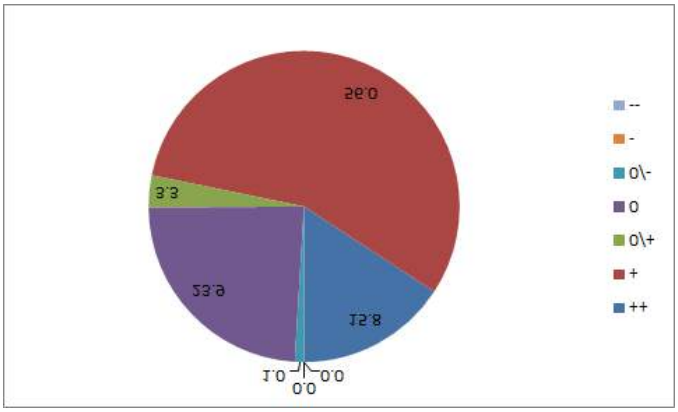


Figure 17: Effect of revised (v3) VFM Prioritisation Matrix on SEA Objectives (% of total)

Table 23: LTP4 VFM Prioritisation Assessment Summary

	Biodiversity	Air Quality	Human Health	Climatic Factors	Population	Water	Cultural Heritage	Landscape	Noise & Tranqility	Material Assets	Innovation & Technology	Overall
Is the scheme directly connected with delivering development?	0	0	0	+	+	0	0	0	0	+	0	**0**
Does the scheme have impacts in one of the most deprived Lower Super Output Areas using the Index of Multiple Deprivation?	0	+	++	+	++	0	0	0	+	+	0	**0**
Congestion – what impact will the scheme have on congestion and journey time?	0/+	+	+	0	++	+	+	+	+	+	0	**0**
Climate resilience - how will the scheme contribute to improved climate resilience in Kent?	+	+	+	++	+	+	+	0	0	+	+	**0**
Accessibility – what impacts will the scheme have on access to key services (jobs, education, healthcare, etc.)?	0	0	+	+	+	0	+	+	0	0	+	**0**
Connectivity – what impact will the scheme have on creating connected door-to-door journeys?	+	+	+	+	++	0	+	+	+	0/+	+	**0**
Local Masterplanning - has accessibility and reduced journey time been designed into the overall plan for the scheme area?	0	0	+	++	+	0	+	+	+	+	+	**0**
Safety – are there any secondary benefits to safety (road, cycleway, footway)?	0/+	0	++	0/+	+	+	0/+	+	0/-	0/+	+	**0/-**
Sustainable travel – what impact will the scheme have on sustainable travel (e.g. modal shift)?	+	++	+	++	++	+	+	+	++	++	+	**+**
Townscape and heritage – what impacts will the scheme have on the historic and built environment (including severance)?	0	+	+	+	+	0	++	+	0	0	0	**0**
Biodiversity?	++	0	+	+	+	+	+	+	0	0	++	**0**
Carbon Emissions?	+	++	+	++	+	+	+	+	0	+	+	**0**
Water quality and resources?	+	0	+	0/+	+	++	0	0	0	+	++	**0**
Natural & Cultural Heritage Landscape & Visual Impact?	+	0	+	0	+	+	+	++	0	+	+	**0**
Noise & Tranquility?	+	0	+	0	+	0	+	+	++	+	++	**0**
Material assets (i.e. materials, energy, waste & water resource use in construction & maintenance)?	0	+	+	++	+	+	+	+	+	++	+	**0**
Technology & innovation (i.e. approaches to achieving sustainable outcomes)?	+	+	+	++	+	+	0	0/+	+	++	+	**0**
Air quality – what impact will the scheme have on air quality?	+	++	++	++	+	0	+	+	0	+	+	**0**
Active travel – what impact will the scheme have on promoting active travel?	+	++	++	+	+	+	+	+	++	++	+	**+**
Overall	**0**	**0**	**0**	**0**	**+**	**0**	**0**	**0**	**0/-**	**0**	**0**	**0/-**

Assessment key
++ Major positive
+ Minor positive
0 None /unknown
- Minor negative
- - Major negative

5.4 Assessment against SEA Objectives

5.4.1 Biodiversity, flora and fauna

Habitats Regulations Assessment (HRA) Screening has been undertaken for LTP4, and the resultant report is presented in Appendix I. This has concluded that Appropriate Assessment is not required for any Natura 2000 site – although it has identified that project-level HRA Screening will be required for all schemes detailed within LTP4.

As summarised in Tables 21 to 23, LTP4's Priorities and the VFM Matrix are assessed as being neutral overall in their impact on biodiversity, albeit with some negligible and minor positive elements resulting from predicted improvements to air quality and the potential for enhancement to be carried out in a way that benefits (for example) at-risk species such as bees through carefully selected planting and maintenance. LTP4's Outcomes/Policies on the other hand have potential to cause minor negative impact overall, with loss of habitat and connectivity being key issues of concern.

It is therefore concluded that, while LTP4 will avoid having a significant detrimental effect on biodiversity, the potential for minor (non-significant) negative effects remain. Mitigation will require the topic to be considered early and holistically, with proper ecological impact assessment and HRA, and with both mitigation and enhancement being prioritised in scheme development.

5.4.2 Air Quality

As summarised in Tables 21 to 23, LTP4 is assessed as being neutral overall in its likely impact on air quality, albeit with some negligible positive elements in respect of the Outcomes and Policies; and minor positive elements associated with the Priorities and the VFM Matrix. The latter also notes some major (significant) positive effects. Reduced congestion and modal shift to sustainable and active travel are key to these predicted improvements; these are not easy to achieve in practice therefore the implementation of LTP4 will be central to determining success. It is likely that vehicle traffic will increase in parallel with the growing population, creating a shifting baseline within which that any positive changes could easily be hidden.

It is concluded that LTP4 will avoid having a detrimental effect on air quality and could contribute positively – providing the topic is considered early and holistically, with proper detailed assessment, and with both prevention and mitigation being prioritised in scheme development.

5.4.3 Human Health

Health Impact Assessment (HIA) has been undertaken for LTP4, and the resultant report is presented in Appendix J. The outcome of the assessment demonstrates that some of the strategic outcomes and Kent-wide priorities within LTP4 will lead to positive health impacts for the Kent population; however, in some instances the health impacts at this stage are unknown.

Human health has also been assessed using matrices. As summarised in Tables 21 to 23, LTP4 is assessed as being neutral overall in its likely impact on human health, albeit with some positive elements in respect of each of Outcomes and Policies, Priorities and the VFM Matrix. The potential for health benefits to arise due to improved safety, reduced noise and air pollution, improved local environments and the adoption of healthier lifestyles is noted; although overcoming the inertia of current travel choices and achieving modal shift to active and sustainable options is a key challenge for LTP4 to face.

No effects of LTP4 were assessed as being negligible, minor or major negative. In accordance with the HIA findings, it is therefore concluded that LTP4 will avoid having a detrimental effect on human health and could contribute positively.

To ensure positive benefits are maximised, the following recommendations for mitigation and/or enhancement are proposed by the HIA:

- Prioritise the allocation of funding to schemes with the least negative impact or a positive impact on health.
- Assess each scheme/proposal for health impacts in order to maximise the positive health impacts of each scheme.
- Plan construction activities to minimise disturbance to pedestrians, residents, tourists and workers within affected areas, for example through the use of temporary acoustic screening, low emission equipment and sound on site practices.
- Continue to encourage people to use sustainable modes of transport, prioritising walking and cycling and educating people in the health benefits of doing so, focusing on the most deprived areas of the county.
- Communicate with schools and health care providers to establish the most appropriate method for encouraging the young and physically inactive to cycle and walk in addition to raising awareness around safety.
- Consider investment in cycle infrastructure and awareness for cyclists and other motorists (including HGVs), due to the vulnerability of cyclists.
- Consider investment in public transport provision in deprived areas.

- Carefully plan schemes in terms of location, scale and design at the project level to ensure air quality reductions are realised.
- Seek to implement measures to counteract traffic growth (e.g. by continuing to improve opportunities for sustainable transport).
- Consider the use of trees in appropriate locations to filter out pollution.
- Ensure that schemes are designed and implemented in line with other KCC policies and guidance concerned with improving public health.

5.4.4 Climatic factors

As summarised in Tables 21 to 23, LTP4 is assessed as being neutral overall in its likely impact on climatic factors, albeit with some negligible positive elements in respect of the Outcomes and Policies; and minor positive elements associated with the Priorities and the VFM Matrix. The latter also notes some major (significant) positive effects. The resilience of schemes and their environs will depend on the use of sustainable design to future-proof both the network and the surrounding area in terms of rainfall, heat and flooding. Decreasing Kent's carbon footprint in the face of increasing traffic resulting from a growing population is a significant challenge, and modal shift plus the use of 'green' technology will need to be central to LTP4's approach.

No effects of LTP4 were assessed as being negligible, minor or major negative. It is therefore concluded that LTP4 will avoid having a detrimental effect on climatic factors and could contribute positively – providing the topic is considered early and holistically, with proper detailed air quality assessment, and with prevention and mitigation in terms of carbon emissions and climate resilience being prioritised in scheme development.

5.4.5 Population

An Equalities Impact Assessment (EqIA) has been undertaken for LTP4, and the resultant report is presented in Appendix K. The EqIA has concluded that LTP4 will have an impact on Kent Residents, as summarised in Table 24, below.

Population effects have also been assessed using matrices. As summarised in Tables 21 to 23, LTP4's Priorities are assessed as being neutral overall in their impact on population, albeit with some positive elements identified in the increased access and connectivity proposed by the Strategic and Non-Strategic schemes. LTP4's Outcomes/Policies and the VFM Matrix on the other hand have potential to cause minor positive impact overall, with both also displaying major (significant) positive elements. Affordability, accessibility, connectivity, safety, enhanced environments and increased ability to choose healthier lifestyles have the potential to work together to enable the population to reach education, employment, healthcare, leisure and

service destinations.

Table 24: Summary of EqIA Findings

Adverse Impact: After completing the initial screening grid, it indicated that LTP4 will not have a significant negative impact on any of the protected characteristics. As stated earlier, individual schemes (example two of the strategic priorities in the Plan are a new Lower Thames Crossing and solution to Operation Stack) will be subject to an individual Equalities Impact Assessment as the schemes are developed and taken forward for delivery to ensure that no protected characteristics are adversely impacted. The consultation was tailored to ensure that a range of people with protected characteristics, and groups representing them, had the consultation specifically promoted to them. This is so we could take their views into account and revise LTP4 and this EqIA accordingly. KCC's Inclusive Communication Policy was followed so that those members of the public that have a disability, for example visual impairments or learning disabilities, were able to access the information in alternative formats. **Positive Impact:** The objectives and aims of LTP4 through the delivery of schemes will promote a better quality life for all residents in Kent by providing a transport network of all modes that enables access to jobs and services within the county. Therefore, it will benefit the overall needs of residents within Kent. The older generation and families with younger children tend to rely on public transport, and therefore will benefit from more affordable and accessible transport solutions (bus and rail) that will enable them to enjoy their journeys throughout Kent, for example through accessing jobs and education services. The provision and promotion of active travel choices will potentially benefit all residents' health and well-being, but equally reducing congestion and pollution will benefit road users. Disabled people, who rely on public transport, will also be a beneficiary.

No effects of LTP4 were assessed as being negligible, minor or major negative. In accordance with the EqIA findings, it is therefore concluded that LTP4 will avoid having a detrimental effect on population, and could contribute positively if the Action Plan provided by the EqIA is followed as shown in Table 25.

Table 25: KCC's EqIA Action Plan

Protected Characteristic	Observations made	Action to be taken	Expected outcomes	Owner	Time Scales	Cost Implications
Age	• Kent has an ageing population. • Older Kent residents are: less mobile; less likely to use independent travel; have greater concerns with safety.	• Ensure the elderly and young can access future consultations. • Ensure there are alternative formats of new transport information. • Include design features for those with limited mobility (e.g. dropped curbs). • Include design features for those with safety concerns (e.g. well-lit pedestrian paths).	The LTP's five outcomes deliver a net benefit for all members of the community: **Outcome 1**: Economic growth and minimised congestion **Outcome 2**: Affordable and accessible door-to-door journeys **Outcome 3**: Safer travel **Outcome 4**: Enhanced Environment **Outcome 5**: Better health and wellbeing All schemes and policies are expected to have regard to achieving these outcomes.	Director of Highways, Transportation and Waste – Roger Wilkin Director of Environment, Planning and Enforcement – Katie Stewart	Ongoing	Will vary dependent on the individual scheme or policy.

Protected Characteristic	Observations made	Action to be taken	Expected outcomes	Owner	Time Scales	Cost Implications
Disability	• Disabled Kent residents are: less mobile; less likely to use independent travel.	• Ensure the disabled can access future consultations and developments • Ensure there are alternative formats of new transport information • Include design features for those with limited mobility (e.g. dropped curbs) • Work with other transport operators to ensure they accommodate disabled users. For example, in January 2017, the Supreme Court ruled that bus drivers must try to persuade other passengers to make room for wheelchair users[1].				

[1] https://www.theguardian.com/society/2017/jan/18/court-backs-wheelchair-user-who-was-stopped-from-boarding-bus-yorkshire-leeds

Protected Characteristic	Observations made	Action to be taken	Expected outcomes	Owner	Time Scales	Cost Implications
Race	• BME Kent residents are more likely to: be dependent on public transport systems; be concerned with safety.	• Ensure BME communities can access future consultations and developments • Ensure there are alternative formats of new transport information (including other languages)				
Gender	• Female residents are: less likely to use independent travel by car; be concerned with safety; make journeys with additional dependents; have multiple stages to their journeys. • Male residents are more likely to suffer injuries or fatalities in a car accident; statistically undertake longer journeys.	• Ensure all genders can access future consultations and developments • Ensure alternative formats of new transport information • Include design for those with safety concerns (e.g. well-lit pedestrian paths)				

Protected Characteristic	**Observations made**	**Action to be taken**	**Expected outcomes**	**Owner**	**Time Scales**	**Cost Implications**
On-going Action Plan						

Protected Characteristic	Observations made	Action to be taken	Expected outcomes	Owner	Time Scales	Cost Implications
Age	• Kent has an ageing population. • Older Kent residents are: less mobile; less likely to use independent travel; have greater concerns with safety.	• Ensure the elderly and young can access future consultations and developments • Ensure there are alternative formats of new transport information • Include accommodations for those with limited mobility (eg: dropped curbs) • Include accommodations for those with safety concerns (eg: well-lit pedestrian paths)	• The LTP's five outcomes deliver a net benefit for all members of the community: Outcome 1) Economic growth and minimised congestion Outcome 2: Affordable and accessible door-to-door journeys Outcome 3: Safer travel Outcome 4: Enhanced Environment Outcome 5: Better health and wellbeing	Relevant Project Manager for the scheme being implemented	On-going or in-line with the writing of an implementation plan.	To be determined.

Protected Characteristic	Observations made	Action to be taken	Expected outcomes	Owner	Time Scales	Cost Implications
Disability	• Disabled Kent residents are: less mobile; less likely to use independent travel.	• Ensure the disabled can access future consultations and developments • Ensure there are alternative formats of new transport information • Include accommodations for those with limited mobility (eg: dropped curbs)				
Race	• BME Kent residents are: more likely to dependent on public transport systems; be concerned with safety.	• Ensure the elderly and young can access future consultations and developments • Ensure there are alternative formats of new transport information • Include accommodations for those with safety concerns (eg: well-lit pedestrian paths)				

Protected Characteristic	Observations made	Action to be taken	Expected outcomes	Owner	Time Scales	Cost Implications
Gender	• Female residents are: less likely to use independent travel by car; be concerned with safety; make journeys with additional dependents; have multiple stages to their journeys. • Male residents are more likely to suffer injuries or fatalities in a car accident; statistically undertake longer journeys.	• Ensure all genders can access future consultations and developments • Ensure alternative formats of new transport information • Include accommodations for those with safety concerns (eg: well-lit pedestrian paths)				

5.4.6 Water

As summarised in Tables 21 to 23, LTP4's Priorities and the VFM Matrix are assessed as being neutral overall in their impact on water, albeit with some negligible and minor positive elements in terms of the potential to improve water quality as a result of improved air quality; and the reduction in likelihood of pollution incidents which could arise from increasing the proportion of sustainable travel modes. LTP4's Outcomes/Policies on the other hand have potential to cause minor negative impact overall, with particular concerns arising from the potential for contaminated run-off reaching water courses, and the potential for decreased recharge to groundwater arising from increases to the impermeable surface area.

It is therefore concluded that, while LTP4 will avoid having a significant detrimental effect on water, the potential for minor (non-significant) negative effects remain. Mitigation will require the topic to be considered early and holistically, with proper drainage and hydrological assessment, and with both prevention and mitigation being prioritised in scheme development.

5.4.7 Cultural Heritage

As summarised in Tables 21 to 23, LTP4's Priorities and the VFM Matrix are assessed as being neutral overall in their impact on cultural heritage, albeit with some negligible and minor positive elements such as improved access to sites, and protection of heritage features resulting from potential improvements to air quality. LTP4's Outcomes/Policies on the other hand have potential to cause minor negative impact overall, with the requirement for land-take for schemes potentially in conflict with heritage assets.

It is therefore concluded that, while LTP4 will avoid having a significant detrimental effect on cultural heritage, the potential for minor (non-significant) negative effects remain. Mitigation will require the topic to be considered early and holistically, with proper assessment, and with both prevention and mitigation being prioritised in scheme development.

5.4.8 Landscape

As summarised in Tables 21 to 23, LTP4's Priorities and the VFM Matrix are assessed as being neutral overall in their impact on landscape, albeit with some negligible and minor positive elements such as improved access to sites, and enhanced visual amenity. LTP4's Outcomes/Policies on the other hand have potential to cause minor negative impact overall, with the location of schemes and the requirement for land-take potentially in conflict with Kent's landscape assets.

It is therefore concluded that, while LTP4 will avoid having a significant detrimental effect on landscape, the potential for minor (non-significant) negative effects remain. Mitigation will require the topic to be considered early and holistically, with proper assessment, and with both mitigation and enhancement being prioritised in scheme development.

5.4.9 Noise and Tranquillity

As summarised in Tables 21 to 23, LTP4's Priorities are assessed as being neutral overall in their impact on noise and tranquillity, albeit with some negligible and minor positive elements in the prioritisation of sustainable and active transport modes which have lower noise emissions, and focus on some areas of deprivation and thus potential to reduce environmental inequality. LTP4's VFM Matrix and the Outcomes/Policies on the other hand have potential to cause negligible to minor negative impact overall, with low noise vehicles potentially conflicting with safety objectives, and schemes designed to increase road and junction capacity being associated with increased noise levels due to changes in traffic volume and flow.

It is therefore concluded that, while LTP4 will avoid having a significant detrimental effect on noise and tranquillity, the potential for minor (non-significant) negative effects remain. Mitigation will require the topic to be considered early and holistically, with proper detailed assessment, and with both prevention and mitigation being prioritised in scheme development.

5.4.10 Material Assets

As summarised in Tables 21 to 23, LTP4's Priorities and the VFM Matrix are assessed as being neutral overall in their impact on material assets, albeit with some positive elements potentially arising from prolonging asset life and reducing maintenance costs by achieving modal shift to sustainable travel. LTP4's Outcomes/Policies on the other hand have potential to cause negligible positive impact overall, resulting from the opportunity to promote the use of sustainable materials and supply chain and more broadly the drive to reduce the environmental footprint of Kent's transport.

No effects of LTP4 were assessed as being negligible, minor or major negative. It is therefore concluded that LTP4 will avoid having a detrimental effect on material assets and could contribute positively – providing the topic is considered early and holistically, with proper lifecycle assessment and sustainable procurement being prioritised in scheme development.

5.4.11 Innovation and Technology

As summarised in Tables 21 to 23, LTP4's Priorities and the VFM Matrix are assessed as being neutral overall in their impact on innovation and technology, albeit with some positive elements

such as the use of asset management systems for highways maintenance, and the promotion of sustainable travel smartphone applications. LTP4's Outcomes/Policies on the other hand have potential to cause minor positive impact overall through the early consideration of opportunities in partnership with environmentalists, engineers and designers.

No effects of LTP4 were assessed as being negligible, minor or major negative. It is therefore concluded that LTP4 could contribute positively to the development and use of environmental innovation and technology – providing the topic is considered early and holistically in scheme development.

6 Consultation and Implementation

6.1 Environmental Report Consultation

Parallel consultation took place for the draft LTP4 and the draft Environmental Report (Rev0), engaging with statutory consultees (Environment Agency, Natural England, Historic England), interested parties and the public.

The 12 week consultation period for the Environmental Report was between 8th August 2016 to 30th October 2016. The consultation questionnaire could be completed online at: kent.gov.uk/localtransportplan. Alternatively, interested parties were invited to write to: Transport Strategy Team, Environment, Planning and Enforcement, Kent County Council, Invicta House, County Hall, Maidstone, Kent ME14 1XX. Hard copies the consultation documents were available via email: alternativeformats@kent.gov.uk or by calling: 03000 421553.

6.2 Final Steps for the LTP and SEA process

Consultation responses relevant to the Environmental Report are presented in Appendix L. The Final draft of LTP4 was developed in the period to January to June 2017, and adoption is anticipated in July 2017. Any changes arising to the LTP4 Review following consultation were assessed as part of the SEA process. This Environmental Report (Rev1) has been published to accompany the final KCC LTP4.

SEA Regulations (2004) 16.3c) (iii) and 16.4 require that a 'statement' be made available to accompany the plan, as soon as possible after the adoption of the plan or programme. The purpose of the SEA Adoption Statement is to outline how the SEA process has influenced and informed the LTP4 Review development process and demonstrate how consultation on the SEA has been taken into account. As the regulations outline, the statement contains the following information:

- The reasons for choosing the preferred strategy for the LTP4 Review as adopted in the light of other reasonable alternatives dealt with;
- How environmental considerations have been integrated into the LTP4 Review;
- How consultation responses have been taken into account; and
- Measures that are to be taken to monitor the significant environmental effects of the LTP4 Review.

To meet these requirements, a SEA Adoption Statement has been published with the adopted version of KCC's Fourth Local Transport Plan 2016-2031.

6.3 Monitoring and Implementation

The SEA Directive states that 'member states shall monitor the significant environmental effects of the implementation of plans and programmes…..in order, inter alia, to identify at an early stage unforeseen adverse effects, and to be able to undertake appropriate remedial action' (Article 10.1).

Monitoring the impacts of LTP4's implementation is therefore not required by the legislation because no significant negative effects have been predicted as a result of this Strategic Environmental Assessment. It can be noted however that the Kent Environment Strategy forms a framework for the monitoring of relevant targets and indicators, and Kent is committed to producing an annual State of the Environment report.

7 Conclusions

The LTP4 Ambition is "to deliver safe and effective transport, ensuring that all Kent's communities and businesses benefit, the environment is enhanced and economic growth is supported". To this end, the Outcomes, Policies and Priorities, preferred Funding Allocation Option, and proposed VFM Prioritisation Matrix have been assessed as being unlikely to have significant adverse effects on the environmental criteria encompassed by the SEA Objectives. Moreover, there is evidence that some effects of LTP4 will have beneficial environmental effects.

It is however important to note the areas in which potential for negligible and minor negative impacts to occur have been identified; namely:

- Outcomes & Policies – minor negative – conflict between Outcome 1 and biodiversity, water, cultural heritage, landscape, and noise & tranquillity.
- VFM Prioritisation – negligible negative – conflict between Safety and Noise & Tranquillity, in the form of the potential hazard to the public associated with low noise vehicles.

Avoidance and mitigation of these impacts will require particular care in the implementation of LTP4 and the prioritisation and assessment of individual schemes.

8 References

Amey/KCC (2016) *SEA Scoping Report, LTP4 Strategic Environmental Assessment, CO04300448 /SCO1 Revision 1* (April 2016)

Ashford Borough Council (2009) *A revision of the Ancient Woodland Inventory for Ashford Borough, Kent*. Web: http://www.ashford.gov.uk/search?term=ancient+woodland+inventory&search=Search&type=all [accessed 10/12/2015]

Campaign for the Preservation of Rural England (CPRE; 2007) *Tranquillity Map Kent*. Web: http://www.cpre.org.uk/resources/countryside/tranquil-places/ [accessed 11/12/2015]

CPRE (2015) *Dark Skies*. Web: http://www.cpre.org.uk/resources/countryside/dark-skies [accessed 10/12/2015]

Climate South East (2015) *Climate information for the South East of England*. Web: http://www.climatesoutheast.org.uk/images/uploads/South_East_LOW_RES.pdf [accessed 4/12/2015]

Committee on Climate Change (CCC; 2015) *Global Action on Climate Change*. Web: https://www.theccc.org.uk/tackling-climate-change/the-legal-landscape/global-action-on-climate-change/ [accessed 4/12/2015]

Council of Europe (2015) *European Landscape Convention*. Web: http://www.coe.int/en/web/landscape [accessed 10/12/2015]

Department for Communities and Local Government (DCLG; 2006) *A Practical Guide to the Strategic Environmental Assessment Directive*. HMSO: London.

DCLG (2012) *National Planning Policy Framework* (NPPF). Web: http://planningguidance.communities.gov.uk/blog/policy/ [accessed 11/12/2015]

DCLG (2014) *Noise Planning Guidance*. Web: http://planningguidance.communities.gov.uk/blog/guidance/noise/ [accessed 11/12/2015]

DCLG (2015) *English Indices of Deprivation*. Web: https://www.gov.uk/government/statistics/english-indices-of-deprivation-2015 [accessed 11/12/2015]

DCLG (2015) *Planning Practice Guidance: Flood Risk and Coastal Change*. Web: http://planningguidance.communities.gov.uk/blog/guidance/flood-risk-and-coastal-change/ [accessed 8/12/2015]

Department for Culture, Media and Sport (DCMS; 2015) *Conservation of Historic Buildings and Monuments*. Web: https://www.gov.uk/government/policies/conservation-of-historic-buildings-and-monuments [accessed 9/12/2015]

Department of the Environment and Rural Affairs (DEFRA; 2007) *The Air Quality Strategy for England, Scotland, Wales and Northern Ireland - Volume 1.* Web: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69336/pb12654-air-quality-strategy-vol1-070712.pdf [accessed 2/12/2015]

DEFRA (2007) *The Air Quality Strategy for England, Scotland, Wales and Northern Ireland - Volume 2*. Web: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69337/pb12670-air-quality-strategy-vol2-070712.pdf [accessed 2/12/2015]

DEFRA (2010) *Noise Policy Statement for England (NPSE).* Web: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69533/pb13750-noise-policy.pdf [accessed 11/12/2015]

DEFRA (2010) *Climate Change Plan*. Web: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69254/pb13358-climate-change-plan-2010-100324.pdf [accessed 4/12/2015]

DEFRA (2013) *Waste Management Plan for England*. Web: https://www.gov.uk/government/publications/waste-management-plan-for-england [accessed 18/12/2015]

DEFRA (2014) *Noise Action Plan for Roads*. Web: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/276237/noise-action-plan-roads-201401.pdf [accessed 11/12/2015]

Department for Transport (DfT; 2007) *Towards a Sustainable Transport System*. Web: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/228953/7226.pdf [accessed 11/12/2015]

DfT (2009) *Guidance on Local Transport Plans*. HMSO: London.

DfT (2009) *Strategic Environmental Assessment for Transport Plans and Programmes*. HMSO: London.

Department of Transport (1988) *Calculation of Road Traffic Noise*. London: HMSO.

Environment Agency (EA; 2004) *The State of Soils in England and Wales*. Web: http://www.adlib.ac.uk/resources/000/030/045/stateofsoils_775492.pdf [accessed 8/12/2015]

EA (2009) *Flooding in England – A National Assessment of Flood Risk*. Web: http://webarchive.nationalarchives.gov.uk/20140328084622/http://cdn.environment-agency.gov.uk/geho0609bqds-e-e.pdf [accessed 4/12/2015]

EA (2015) *Water for Life and Livelihoods: River Basin Management Plan – South East River Basin District (and Annexes) 2009 and 2015 proposed update*. Web: https://www.gov.uk/government/collections/river-basin-management-plans-2015 [accessed 8/12/2015]

EA (2015) *Water for Life and Livelihoods: River Basin Management Plan – Thames River Basin District (and Annexes) 2009 and 2015 proposed update*. Web: https://www.gov.uk/government/collections/river-basin-management-plans-2015 [accessed 8/12/2015]

European Commission (EC; 2012) *Report from the Commission to the European Parliament and the Council on the Implementation of the Water Framework Directive (2000/60/EC) River Basin Management Plans.* Web: http://ec.europa.eu/environment/water/water-framework/pdf/3rd_report/CWD-2012-379_EN-Vol3_UK.pdf

European Parliament and the Council of the European Union (2005) *EC Directive 2005/33/EC on the sulphur content of marine fuels*. Web: http://eur-lex.europa.eu/ [accessed 2/12/2015]

European Parliament and the Council of the European Union (2008) *EC Directive 2005/33/EC on ambient air quality and cleaner air for Europe*. Web: http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1469030150214&uri=CELEX:32008L0050 [accessed 2/12/2015]

European Union (EU; 2008) *Adapting the management of Water and Environmental Resources in response to Global Change*. Web: http://ec.europa.eu/environment/water/adaptation/index_en.htm [accessed 4/12/2015]

Heritage Gateway (2012) *Heritage Gateway Websearch Tool*. Web: http://www.heritagegateway.org.uk/Gateway/ [accessed 9/12/2015]

Highways England (formerly the Highways Agency) *Design Manual for Roads and Bridges (DMRB) Volume 11 (Environmental Assessment) Section 3 (Environmental Assessment Techniques).* Web: http://www.standardsforhighways.co.uk/ha/standards/dmrb/vol11/section3.htm [accessed 27/12/2015]

Intergovernmental Panel on Climate Change (IPCC; 2015) *Fifth Assessment Report of the IPCC*. Web: http://www.ipcc.ch/ [accessed 4/12/2015]

Joint Nature Conservation Committee (JNCC; 2010) *List of SACs in England*. Web: http://jncc.DEFRA.gov.uk/protectedsites/sacselection/SAC_list.asp?Country=E [accessed 1/12/2015]

Joint Nature Conservation Committee (JNCC; 2010) *Distribution of Special Protection Areas in Kent, Essex and Suffolk.* Web: http://jncc.DEFRA.gov.uk/page-2543 [accessed 1/12/2015]

Kent Biodiversity Partnership (2016) *Kent Biodiversity Action Plan (Kent BAP).* Web: http://www.kentbap.org.uk/ [accessed 1/12/2015]

Kent County Council (KCC; 2011) *Census Data*. Web: http://www.kent.gov.uk/about-the-council/information-and-data/Facts-and-figures-about-Kent/population-and-census [accessed 11/12/2015]

KCC (2013) *Kent Joint Municipal Waste Management Strategy*. Web: http://www.kent.gov.uk/about-the-council/strategies-and-policies/environment-waste-and-planning-policies/waste-strategies [accessed 18/12/2015]

KCC (2015) *Kent and Medway Growth and Infrastructure Framework*. Web: www.kent.gov.uk/gif [accessed 11/12/2015]

KCC (2015) *Kent State of the Environment Report.* Web: http://consultations.kent.gov.uk/gf2.ti/f/565026/16253381.1/PDF/-/150723_Kent_State_of_the_Environment_report.pdf [accessed 18/12/2015]

KCC (2015) *Kent Landscape Information System*. Web: https://www.kent.gov.uk/waste-planning-and-land/kent-landscape-information-system/resources [accessed 10/12/2015]

KCC (2016) *Minerals and Waste Local Plan 2013-2030*. Web: http://www.kent.gov.uk/about-the-council/strategies-and-policies/environment-waste-and-planning-policies/planning-policies/minerals-and-waste-local-plan/minerals-and-waste-local-plan [accessed 18/12/2015]

KCC (2016) *Kent Environment Strategy*. Web: https://democracy.kent.gov.uk/documents/s61616/ANNEX%201%20FINAL%20KES%20Low%20Resolution.pdf [accessed 14/06/2016]

Kent Downs AONB Unit (2014) *Kent Downs AONB Management Plan*. Web: http://www.kentdowns.org.uk/guidance-management-and-advice/management-plan [accessed 10/12/2015]

Kent and Medway Air Quality Monitoring Network (KMAQM; 2014) *Annual Report 2014: Report for Medway Council on behalf of the Kent and Medway Air Quality Monitoring Network*. Web: http://www.kentair.org.uk/ [accessed 2/12/2015]

Kent Public Health Observatory (KPHO; 2015) *Joint Strategic Needs Assessment (JSNA).* Web: www.kpho.org.uk/joint-strategic-needs-assessment [accessed 3/12/2015]

Kent Rural Network (2008) *The Kent Rural Evidence Base*. Web: http://www.kentruralnetwork.org.uk/kent-rural-framework/the-kent-rural-evidence-base [accessed 11/12/2015]

Natural England (formerly English Nature; 2008) *State of the Natural Environment*. Web: http://www.naturalengland.org.uk/publications/sone/default.aspx [accessed 1/12/2015]

Natural England (2015) Areas of Outstanding Natural Beauty – Natural England's Role. Web: https://www.gov.uk/government/publications/areas-of-outstanding-natural-beauty-natural-englands-role [accessed 10/12/2015]

Natural England (2015) *Designated Sites View*. Web: http://www.english-nature.org.uk/special/sssi/report.cfm?category=C,CF [accessed 1/12/2015]

Organisation for Economic Co-operation and Development (OECD; 2014) *OECD Health Statistics*. Web: www.oecd.org/health/healthdata [accessed 3/12/2015]

Public Health England (2007) *Health Impact Assessment (HIA) Gateway*. Web: http://www.apho.org.uk/default.aspx?RID=40141 [accessed 3/12/2015]

Southeast England Regional Assembly (2008) *Southeast Regional Flood Risk Appraisal*. Web: http://webarchive.nationalarchives.gov.uk/20100908090945/http://www.southeast-ra.gov.uk/documents/sustainability/rfra_nov08.pdf [accessed 8/12/2015]

United Kingdom Climate Impacts Programme (UKCIP; 2015) *Decision-making for Adaptation*. Web: http://www.ukcip.org.uk/index.php [accessed 8/12/2015]

UK Government (1973) *Protection of Wrecks Act 1973*. Web: http://www.legislation.gov.uk/ukpga/1973/33 [accessed 9/12/2015]

UK Government (1979) *Ancient Monuments and Archaeological Areas Act 1979*. Web: http://www.legislation.gov.uk/ukpga/1979/46 [accessed 9/12/2015]

UK Government (1996) *Treasure Act 1996.* Web: http://www.legislation.gov.uk/ukpga/1996/24 [accessed 9/12/2015]

UK Government (2012) *Gov.uk map-based environmental data search*. Web: https://data.gov.uk/data/map-based-search [accessed 11/12/2015]

UK Government (2014) *Kent's National Nature Reserves*. Web: https://www.gov.uk/government/publications/kents-national-nature-reserves/kents-national-nature-reserves [accessed 1/12/2015]

UK Government (2014) *National Character Areas in South East England and London*. Web: https://www.gov.uk/government/publications/national-character-area-profiles-data-for-local-decision-making/national-character-area-profiles#ncas-in-south-east-england-and-london [accessed 1/12/2015]

UK Government (2015) *Steps in Landscape Impact Assessment*. Web: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/218695/env-impact-landscape.pdf

UK Government (2016) *Noise Insulation Regulations 1975 (amended 1988)* Web: http://www.legislation.gov.uk/uksi/1975/1763/made [accessed 11/12/2015]

UK Meteorological Office (Met Office; 2009) *UKCP09: UK Climate Projections*. Web: http://ukclimateprojections.metoffice.gov.uk/ [accessed 4/12/2015]

Appendices

Appendix A Options Report v2

(provided to Amey by KCC)

Kent County Council

Local Transport Plan 4 – Options Appraisal

Background

Four options have been considered in the preparation of LTP4 in relation to the outcomes the strategy wants to achieve and how this influences funding. The five outcomes set out in LTP4 are:

1. Economic growth
2. Affordable and accessible door-to-door journeys
3. Safer travel
4. Enhanced environment
5. Better health and wellbeing

One of the funding sources used by KCC is the Integrated Transport Block, which is awarded by the Department for Transport (DfT). Once this has been top-sliced for maintenance and then again for the Crash Remedial Measures Programme the remainder is available for the Integrated Transport Programme (ITP). The third Local Transport Plan (LTP3) produced a prioritisation methodology that focused spending in specific geographical areas of the county as well as on the themes identified in the strategy ('themes' being equivalent to 'outcomes' in LTP4). However, since the implementation of LTP3 and the practical application of this methodology some issues have become apparent that indicate it would benefit from amendment. Therefore, a new methodology has been drafted.

The proposed new methodology is a scoring mechanism based on the LTP4 outcomes, deliverability and financial criteria that determines if a scheme should be progressed and then ultimately delivered using ITP funding. Each proposed scheme must target at least one LTP4 outcome and come from a credible source, such as adopted plans and strategies or Member suggestions. The spatial targets have been removed from this methodology because the Growth Points and Growth Areas are no longer recognised designations, and by ensuring schemes are derived from district Transport Strategies then a prerequisite is in place that the infrastructure/improvements are required to support growth or some other identified need. The second part of the options is the distribution of funding amongst the outcomes. Therefore the four options are:

1. Business as usual – i.e. retain existing prioritisation methodology from LTP3 and the funding prioritised spatially as well as being unequally allocated among themes (in the context of LTP4: outcomes).
2. Use the revised prioritisation methodology and equally weight/equally prioritise outcomes – i.e. equal allocation of funding.

3. Use the revised prioritisation methodology and give a priority order to the outcomes and weight them differently – i.e. more available funding for some outcomes (one funding allocation).
4. Use the revised prioritisation methodology and give a priority order to the outcomes and weight them differently – i.e. more available funding for some outcomes (an alternative funding allocation).

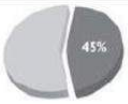
Each option will now be explained in more detail.

Options

Option 1: Business as usual – i.e. retain existing prioritisation methodology from LTP3 and keep the funding prioritised on growth points and growth areas as well as being unequally allocated among themes (in the context of LTP4: outcomes).

This option, as used currently, consists of a two stage approach. Firstly, the annual budget is divided according to the weightings for the five LTP3 themes, and secondly funding is assigned spatially. This is demonstrated in figure 1 below.

Budget allocation/spatial distribution methodology

LTP3 Theme	Budget allocation	Spatial distribution	Scheme type	Value for money assessment
Growth Without Gridlock		 Growth Areas and Growth Points	Schemes that support housing and employment	1* - Access road 2 - Bus rapid transit 3 - Cycle route 4 - Traffic management
A Safer and Healthier County		 Problem sites	Schemes that tackle road casualties, air pollution, poor health etc.	1 - Safety schemes 2 - Safe routes to school 3 - Walking routes 4 - Bus route to hospital
Supporting Independence		 Disadvantaged areas (East Kent coastal towns)	Schemes that provide access to jobs and services for those without access to a private car	1 - Bus improvements 2 - Walking and cycling 3 - Community transport 4 - Public information
Tackling a Changing Climate		 Urban areas	Schemes that promote low emission travel	1 - Low emission vehicles 2 - Travel Plans 3 - Kent Freedom Pass 4 - Walking and cycling
Enjoying Life in Kent		 Countywide	Schemes that improve access to opportunities and reduce impact of transport on Kent and it's communities	1 - Public rights of way improvements 2 - Public realm 3 - Lorry management 4 - Journey planner

* - Indicative scheme types for illustration only

Figure 1: LTP3 budget allocation/spatial distribution methodology

Growth without Gridlock is given the highest weighting owing to the economic challenges facing the county, as well as due to projected housing growth in the Thames Gateway, Ashford, Maidstone and Dover. The lowest weighting was given to Enjoying Life in Kent as all schemes broadly contribute towards a better quality of life in some way. The funding is then

targeted at specific areas to incentivise the delivery of complimentary packages of schemes to improve value for money compared to schemes delivered individually and spread across the county.

A Cost Benefit Analysis (CBA) is carried out for all proposed schemes by calculating a cost score (build, maintenance and external funding contribution) and a benefit score (geographical extent of impacts, distributional impacts and public acceptability) and dividing the latter by the former. This is designed to overcome a limitation in the previous methodology (LTP2) whereby larger, more expensive, schemes that may have a range of positive impacts in a wider area were disadvantaged because the method was biased towards low cost schemes.

Each of the elements assessed for the CBA is given a score of 1, 2 or 3 according to the magnitude of the cost or benefit. This is explained in appendix 1 to this note.

There have been a number of issues identified with this methodology, as follows:

- Two schemes might receive the same score but there is no means of prioritising between them because the scoring system does not differentiate enough. There are only three elements assessed for each of the costs and the benefits with a limited range from 1 – 3 in the scoring.
- The CBA tends to benefit less costly schemes, which are usually the smaller ones. It should assess the magnitude of the impact of the scheme more than the magnitude of the cost, i.e. cost should not be given an equal weighting to benefits.
- The public acceptability criterion in the assessment is flawed as it requires a scheme to be endorsed by an individual or a Parish Council but does not have regard to whether that scheme is in an adopted strategy/plan. If it in a strategy or plan then some extent of public consultation will have been completed and there will be a clear aim that the scheme targets, for example supporting development or addressing some other identified need. Under the existing method a scheme could be progressed so long as it's been proposed by a single member of the public – is this sufficient justification for a scheme where limited funding is available?
- The Crash Remedial Measure (CRM) programme has funding top-sliced from the IT Block budget. Therefore the merit in making available further funding for the Safer Travel outcome as part of the ITP is questionable. The CRM schemes address sites with statistically higher than expected crash rates and if that is the definition of a safety problem then are the 'other' safety schemes actually improving safety? Is there a case for addressing the perception of safety?
- The costs are also assessed by awarding a score based on the relative construction and maintenance costs of individual schemes. Extra points are awarded for external funding, however, even if there is no external funding the scheme gets 1 point. This is another flaw in the methodology.

- The growth areas and growth points designation is no longer relevant and the context for housing development has changed so that this is spread throughout the county rather than in those specified areas since the demise of regional planning.
- Targeting certain schemes in certain areas disadvantages other parts of the county that may suffer from the same issues. For example, although the east Kent coastal towns are areas of deprivation there are also pockets of deprivation in West Kent. Schemes addressing that issue would be prevented from being progressed elsewhere in the county.

Option 2: Use the revised prioritisation methodology and make all outcomes equally weighted and of equal priority – i.e. equal allocation of funding.

A revised prioritisation methodology has been developed to overcome the issues identified above. This is annexed to the draft LTP4 and has been appended to this document (appendix 2). The funding allocations in the appended document are illustrative and vary between options 2, 3 and 4.

The assessment methodology looks at a range of criteria, much wider than the LTP3 version, and has a greater range of possible scores. This also includes the potential for a negative score where the scheme may adversely affect congestion, air quality, connectivity, and so on. The bias towards smaller schemes has been overcome by effectively reserving the extremities of the scoring scale to larger schemes; therefore a small scheme that has been awarded a score of +6 would have to have a highly significant impact to justify that score. Scheme endorsement has also been added as an assessment criterion to replace public acceptability. This reinforces that schemes must come from a legitimate source, with higher scores awarded to those schemes coming from approved transport strategies.

The cost part of the assessment now uses financial data rather than awarding points based on relative proportionate costs of each scheme. This will produce a 'points per pound' final assessment score, and is in effect a value for money figure.

There is no spatial distribution to types of schemes or schemes targeting specific outcomes. Therefore, each proposed scheme must be assessed on its own merits and for the scale of the impact it achieves, regardless of area. The assessment methodology is designed as a means of prioritising but does not determine the ITP or the schemes and therefore it is reliant on local knowledge to accurately assess the magnitude of the benefits. Before carrying out the assessment, officers should consider whether to package schemes together to magnify their benefits.

When the final programme is compiled it may be appropriate to slip schemes to the following financial year where there is a concentration of schemes in one geographical location. For example, it may not be possible to be granted the permits in the school holidays for all schemes.

Outcome	ITP budget allocation (once CRM budget has been top sliced)
Economic growth	20%
Affordable and accessible door-to-door journeys	20%
Safer travel	20%
Enhanced environment	20%
Better health and wellbeing	20%

Table 1: Option 2 funding allocations

Table 1 shows the funding allocations that would be available under option 2. All outcomes are of equal importance and so 20% of the ITP should address each outcome. All proposed schemes should be sorted by the outcome they are targeting and then ranked by their value for money score. Under each outcome, all schemes should be progressed until a total of 20% of the available budget is reached.

Option 3: Use the revised prioritisation methodology and give a priority order to the outcomes and weight them differently – i.e. more available funding for some outcomes (one funding allocation).

This option uses the revised prioritisation methodology as per option 2 but with unequal funding allocations. Economic growth (outcome 1) has been awarded the most owing to the priority with which both central government and KCC strategic policy affords it. Schemes coming from district/borough transport strategies would naturally align with this outcome because they are designed to support housing growth. The lowest amount of funding has been allocated to safer travel (outcome 1) to reflect the fact that at least 50% of the budget has already been top sliced for safety critical schemes delivered through the CRM programme. The additional 10% of funding could be awarded to schemes that address perceived safety issues or sites identified through the use of data other than that which is currently utilised in the calculation of Killed and Seriously Injured (KSI) figures.

Outcome	ITP budget allocation (once CRM budget has been top sliced)
Economic growth	45%
Affordable and accessible door-to-door journeys	15%
Safer travel	10%
Enhanced environment	15%
Better health and wellbeing	15%

Table 2: Option 3 funding allocations

Option 4: Use the revised prioritisation methodology and give a priority order to the outcomes and weight them differently – i.e. more available funding for some outcomes (an alternative funding allocation).

This option is the same as option 3 but with further revised funding allocations. Again, economic growth has been given a greater proportion of the budget. Safer travel has not

been allocated any of the ITP budget to reflect that this outcome has already been addressed by the CRM programme; and no scheme will be implemented if it has a negative effect on safety.

Outcome	ITP budget allocation (once CRM budget has been top sliced)
Economic growth	55%
Affordable and accessible door-to-door journeys	15%
Safer travel	0%
Enhanced environment	15%
Better health and wellbeing	15%

Table 3: Option 4 funding allocations

Preferred Option

In summary, option 1 retains the existing methodology and funding allocation, which includes a spatial element. The other 3 options use the new methodology but with varying allocations to the different outcomes.

Prior to any environmental assessment of the range of options, the KCC preferred option is **option 3**.

Option 1 has been rejected because of the flaws identified above by officers currently using the methodology. Option 2 has been rejected because the outcomes should not be equally weighted when they should align with KCC's strategic and corporate objectives, one of which is to grow the Kent economy. Option 4 has been rejected because it was deemed politically important to continue to fund schemes that target safer travel from the ITP funding in addition to the CRM programme funding.

Option 3, conversely, funds every outcome through the ITP budget but varies the amount of funding for each outcome so that economic growth is prioritised.

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Appendix 1: Integrated Transport Programme CBA methodology for LTP3

(Available on Request)

Appendix 2: Integrated Transport Programme CBA methodology for LTP4

Prioritisation for the Integrated Transport Programme

Background and overview

A robust method of appraising and prioritising local transport schemes is required to ensure that those delivered help to achieve the outcomes specified by this fourth Local Transport Plan (LTP4). The previous prioritisation methodology, developed as a result of the third Local Transport Plan (LTP3), has been updated and modified to enable Kent County Council (KCC) to generate a score for every proposed scheme, with the highest scoring schemes representing the highest possible value for money and contributing towards the LTP4 outcomes.

This methodology applies to schemes seeking Integrated Transport Block funding and used to form the Integrated Transport Programme (ITP). In addition to the ITP, KCC implements a Crash Remedial Measure (CRM) programme, which identifies locations where statistical data shows that an unexpectedly high number of crashes occur. If suitable, schemes are then designed and implemented aiming to prevent future crashes from following the same pattern. More information can be found in the KCC Road Casualty Reduction Strategy. The funding for these schemes is top-sliced from the ITP budget representing the importance with which KCC views safety. CRM funding is allocated on a needs basis but KCC will endeavour to ensure a minimum of 50% of the total budget is allocated to these schemes (achieving Outcome 1: Safer travel).

For the remainder of the funding forming the ITP, each proposed scheme will be assessed for the impact it achieves compared to the cost to implement and maintain it. As illustrated in Figure A4.1, at the beginning of the financial year 1 proposed schemes should be assessed and prioritised. The top schemes selected should form approximately 120% of the anticipated budget and then for the remainder of that year should be worked up to be deliverable in financial year 2, when the budget is formally allocated.

Pre-assessment criteria

Schemes should be put forward from valid sources, such as Transport Strategies that support district/borough Local Plans, approvals at Joint Transportation Boards (JTB) or similar bodies, or from Member and Parish Council suggestions. This requires that some public consultation must have been carried out. They should also be at a stage where minimal additional design work is required so that a reasonable estimation of cost is available. For a scheme to be put forward for the ITP it must demonstrably achieve one or more of the outcomes from LTP4, these are:

Outcome 1: Safer travel

Outcome 2: Economic growth

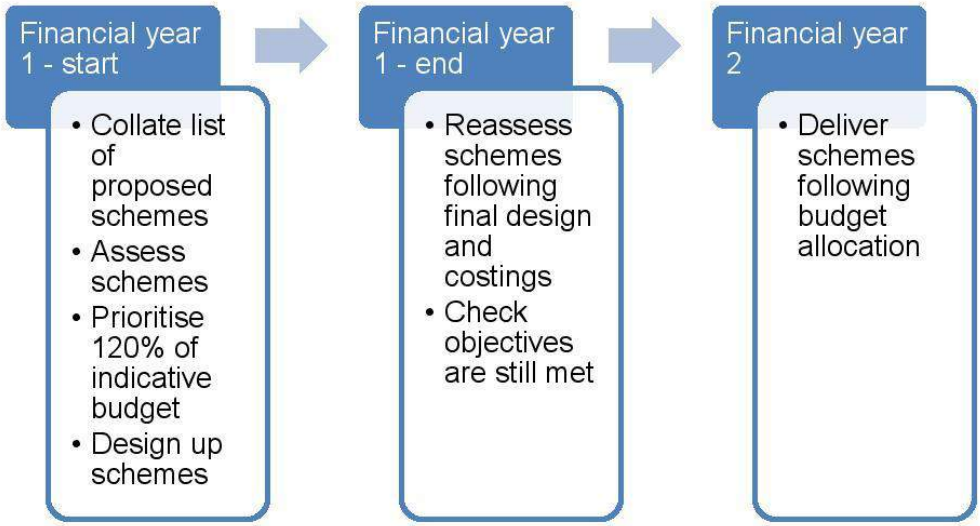
Outcome 3: Enhanced environment

Outcome 4: Better health and wellbeing

Outcome 5: Affordable and accessible door-to-door journeys

However, where a request has been investigated in the last three years and rejected, and the situation has not changed significantly enough to justify reconsidering, it will not be assessed.

Figure A4.1: ITP scheme prioritisation, design and delivery process.



Funding allocation

Consistent with LTP3, available funding will be allocated to the LTP4 outcomes so that the ITP is a rounded programme that targets all of KCC's outcomes. Funding will be allocated as follows:

Outcome	ITP budget allocation (once CRM budget has been top sliced)
Safer travel	20%
Economic growth	20%
Better health and wellbeing	20%
Enhanced environment	20%
Affordable and accessible door-to-	20%

door journeys

Value for money assessment

The value for money assessment considers both the positive and negative effects of a scheme to produce an overall score. However, it has no mechanism to cease the progression of a scheme in the case that the scheme has some strong positive impacts (resulting in a high score) and a wide range of weakly negative impacts (reducing that score slightly). In these cases, the Officers need to ensure that sufficient consultation has been conducted and, where possible, alter the scheme to mitigate negative impacts.

The first part of the process is an impact assessment, producing an impact score for the scheme. These have broadly been grouped into the five LTP4 outcomes, although it is recognised that there is some crossover. When assessing the scale of the impact consideration should be given to the size of the scheme, for example it would be expected that large schemes should have stronger impacts than the smaller schemes and therefore a highly significant positive impact would be required for a small scheme to be awarded 6 points.

	-6	-3	0	3	6
Outcome 1: Safer travel					
Safety – are there any secondary benefits to safety (road, cycleway, footway)?	N/A – scheme should not be progressed if it has a negative impact on safety		Neutral	Positive impact	Strong positive impact
Outcome 2: Economic growth					
Is the scheme directly connected with delivering development?	N/A		No	Yes	Yes – with developer funding contribution
Does the scheme have impacts in one of the most deprived Lower Super Output Areas using the Index of Multiple Deprivation?	N/A		No direct impacts in one or more of Kent's 60% most deprived LSOAs	Direct impacts in one or more of Kent's 20% – 60% most deprived LSOAs	Direct impacts in one or more of Kent's 20% most deprived LSOAs
Congestion – what impact will the scheme have on congestion and journey time?	Strong negative impact	Negative impact	Neutral	Positive impact	Strong positive impact
Outcome 3: Better health and wellbeing					
Air quality – what impact will the scheme have on air	Strong negative impact	Negative impact	Neutral	Positive impact	Strong positive impact

quality?					
Active travel – what impact will the scheme have on promoting active travel?	Strong negative impact	Negative impact	Neutral	Positive impact	Strong positive impact
Outcome 4: Enhanced environment					
Sustainable travel – what impact will the scheme have on sustainable travel (e.g. modal shift)?	Strong negative impact	Negative impact	Neutral	Positive impact	Strong positive impact
Townscape and heritage – what impacts will the scheme have on the historic and built environment (including severance)?	Strong negative impact	Negative impact	Neutral	Positive impact	Strong positive impact
Environment – what impact will the scheme have on the natural environment?	Strong negative impact	Negative impact	Neutral	Positive impact	Strong positive impact
Outcome 5: Affordable and accessible door-to-door journeys					
Accessibility – what impacts will the scheme have on access to key services (jobs, education, healthcare, etc.)?	Strong negative impact	Negative impact	Neutral	Positive impact	Strong positive impact
Connectivity – what impact will the scheme have on creating connected door-to-door journeys?	Strong negative impact	Negative impact	Neutral	Positive impact	Strong positive impact
Scale of impact					
	N/A		Localised impact – few people benefit	Wider impact – a substantial number of people benefit	Very wide impact – many people benefit

The second part of the assessment deals with scheme deliverability, producing a deliverability score.

	-1	1	3	6
Scheme endorsement	N/A – scheme should not be assessed if it does not have a legitimate source	Derived from a recognised body, such as a Quality Bus Partnership, from Members or parish councils	Scheme has been to JTB and is approved	Scheme derived from an adopted strategy (including district/borough transport strategies) or has been approved by Cabinet Committee or at a similar level
Scheme readiness	Substantial further design and feasibility work required	Minimal additional design work required some consultation necessary.	Minimal additional design work required, no further consultation necessary	Scheme is ready to construct
Is the scheme dependent on the completion of any other projects?	Yes	No	N/A	

This then produces a total combined score out of a maximum of 85 points.

Next the cost of the scheme is considered. This has three elements to it: the construction costs, the whole life maintenance costs, and any external funding contribution.

Cost element	Cost
Construction cost	£
Maintenance cost (commuted sum or selection of indicative costs supplied)	£
External funding contribution (funding from budgets other than the ITP, e.g. S106 money or Combined Member Grant fund)	-£
Total scheme cost	£

A cost-benefit analysis (CBA) can now be made by taking the total points scored by the scheme and dividing it by the scheme cost, producing a simplistic "points per pound" score that demonstrates the value for money a scheme achieves. Schemes

targeting each LTP4 outcome can then be sorted by the CBA score and the best performing schemes prioritised for delivery the coming financial year.

Compiling the ITP

The cost-benefit analysis does not determine the ITP; rather it is a tool to guide officers. After the proposed schemes have been subjected to CBA they will be validated and scrutinised to ensure that a consistent approach to scoring has been used and that a balanced and deliverable programme is provided, for example so that schemes are not concentrated in one area. The final list will then be approved at senior management level using delegated powers.

Appendix B Options Report v3

(amended by Amey and showing additional Amey comments to be addressed post-consultation)

Produced for SEA Environmental Report
Draft 3 – 04/07/2016

Kent County Council

Local Transport Plan 4 – Options Appraisal Report

Version 2 drafted 08/04/16 by Katie Pettit, Principal Transport Planner (KCC) in advance of the Post-Scoping stages of LTP4's SEA being commenced.
Version 3 drafted 04/07/16 by Jen Taylor, Principal Environmentalist (Amey) as part of Stage B of LTP4's SEA.

Background

Four options have been considered in the preparation of LTP4 in relation to the outcomes the strategy wants to achieve and how this influences funding. The five Outcomes set out in LTP4 are:

1. Economic growth and minimised congestion
2. Affordable and accessible door-to-door journeys
3. Safer travel
4. Enhanced environment
5. Better health and wellbeing

One of the funding sources used by KCC is the Integrated Transport Block, which is awarded by the Department for Transport (DfT). Once this has been top-sliced for maintenance and then again for the Crash Remedial Measures (CRM) Programme the remainder is available for the Integrated Transport Programme (ITP). The third Local Transport Plan (LTP3) produced a prioritisation methodology that focused spending in specific geographical areas of the county as well as on the themes identified in the strategy ('themes' being equivalent to 'outcomes' in LTP4). However, since the implementation of LTP3 some issues have become apparent with the practical application of this methodology that indicate it would benefit from amendment. Therefore, a new methodology has been drafted and is presented here.

The proposed new methodology is a scoring mechanism based on the LTP4 Outcomes, deliverability and financial criteria that determines if a scheme should be progressed and then ultimately delivered using ITP funding. Each proposed scheme must target at least one LTP4 outcome and come from a credible source, such as adopted plans and strategies or Member suggestions. The spatial targets have been removed from this methodology because the Growth Points and Growth Areas are no longer recognised designations, and by ensuring schemes are derived from district Transport Strategies then a prerequisite is in place that the infrastructure/improvements are required to support growth or some other identified need.

The second part of the options is the distribution of funding amongst the Outcomes. Therefore the four options are:

1. Business as usual – i.e. retain existing prioritisation methodology from LTP3 and the funding prioritised spatially as well as being unequally allocated among themes (in the context of LTP4: outcomes).
2. Use the revised prioritisation methodology and equally weight/equally prioritise outcomes – i.e. equal allocation of funding.
3. Use the revised prioritisation methodology and give a priority order to the outcomes and weight them differently – i.e. more available funding for some outcomes (one funding allocation).
4. Use the revised prioritisation methodology and give a priority order to the outcomes and weight them differently – i.e. more available funding for some outcomes (an alternative funding allocation).

Each option will now be explained in more detail.

Options

Option 1: Business as usual – i.e. retain existing prioritisation methodology from LTP3 and keep the funding prioritised on growth points and growth areas as well as being unequally allocated among themes (in the context of LTP4: outcomes).

This option, as used currently, consists of a two stage approach. Firstly, the annual budget is divided according to the weightings for the five LTP3 themes, and secondly funding is assigned spatially. This is demonstrated in figure 1 below.

Budget allocation/spatial distribution methodology

LTP3 Theme	Budget allocation	Spatial distribution	Scheme type	Value for money assessment
Growth Without Gridlock		 Growth Areas and Growth Points	Schemes that support housing and employment	1* - Access road 2 - Bus rapid transit 3 - Cycle route 4 - Traffic management
A Safer and Healthier County		 Problem sites	Schemes that tackle road casualties, air pollution, poor health etc.	1 - Safety schemes 2 - Safe routes to school 3 - Walking routes 4 - Bus route to hospital
Supporting Independence		 Disadvantaged areas (East Kent coastal towns)	Schemes that provide access to jobs and services for those without access to a private car	1 - Bus improvements 2 - Walking and cycling 3 - Community transport 4 - Public information
Tackling a Changing Climate		 Urban areas	Schemes that promote low emission travel	1 - Low emission vehicles 2 - Travel Plans 3 - Kent Freedom Pass 4 - Walking and cycling
Enjoying Life in Kent		 Countywide	Schemes that improve access to opportunities and reduce impact of transport on Kent and it's communities	1 - Public rights of way improvements 2 - Public realm 3 - Lorry management 4 - Journey planner

* - Indicative scheme types for illustration only

Figure 1: LTP3 budget allocation/spatial distribution methodology

Growth without Gridlock is given the highest weighting owing to the economic challenges facing the county, as well as due to projected housing growth in the Thames Gateway, Ashford, Maidstone and Dover. The lowest weighting was given to Enjoying Life in Kent as all schemes broadly contribute towards a better quality of life in some way. The funding is then targeted at specific areas to incentivise the delivery of complimentary packages of schemes to improve value for money compared to schemes delivered individually and spread across the county.

A Cost Benefit Analysis (CBA) is carried out for all proposed schemes by calculating a cost score (build, maintenance and external funding contribution) and a benefit score (geographical extent of impacts, distributional impacts and public acceptability) and dividing the latter by the former. This is designed to overcome a limitation in the previous methodology (LTP2) whereby larger, more expensive, schemes that may have a range of positive impacts in a wider area were disadvantaged because the method was biased towards low cost schemes.

Each of the elements assessed for the CBA is given a score of 1, 2 or 3 according to the magnitude of the cost or benefit. This is explained in appendix 1 to this note.

There have been a number of issues identified with this methodology, as follows:

- Two schemes might receive the same score but there is no means of prioritising between them because the scoring system does not differentiate enough. There are only three elements assessed for each of the costs and the benefits with a limited range from 1 – 3 in the scoring.
- The CBA tends to benefit less costly schemes, which are usually the smaller ones. It should assess the magnitude of the impact of the scheme more than the magnitude of the cost, i.e. cost should not be given an equal weighting to benefits.
- The public acceptability criterion in the assessment is flawed as it requires a scheme to be endorsed by an individual or a Parish Council but does not have regard to whether that scheme is in an adopted strategy/plan. If it in a strategy or plan then some extent of public consultation will have been completed and there will be a clear aim that the scheme targets, for example supporting development or addressing some other identified need. Under the existing method a scheme could be progressed so long as it's been proposed by a single member of the public – is this sufficient justification for a scheme where limited funding is available?
- The Crash Remedial Measure (CRM) programme has funding top-sliced from the IT Block budget. Therefore the merit in making available further funding for the Safer Travel outcome as part of the ITP is questionable. The CRM schemes address sites with statistically higher than expected crash rates and if that is the definition of a safety problem then are the 'other' safety schemes actually improving safety? Is there a case for addressing the perception of safety?

- The costs are also assessed by awarding a score based on the relative construction and maintenance costs of individual schemes. Extra points are awarded for external funding, however, even if there is no external funding the scheme gets 1 point. This is another flaw in the methodology.
- The growth areas and growth points designation is no longer relevant and the context for housing development has changed so that this is spread throughout the county rather than in those specified areas since the demise of regional planning.
- Targeting certain schemes in certain areas disadvantages other parts of the county that may suffer from the same issues. For example, although the east Kent coastal towns are areas of deprivation there are also pockets of deprivation in West Kent. Schemes addressing that issue would be prevented from being progressed elsewhere in the county.

Option 2: Use the revised prioritisation methodology and make all outcomes equally weighted and of equal priority – i.e. equal allocation of funding.

A revised prioritisation methodology has been developed to overcome the issues identified above. This is annexed to the draft LTP4 and has been appended to this document (appendix 2). The funding allocations in the appended document are illustrative and vary between options 2, 3 and 4.

The assessment methodology looks at a range of criteria, much wider than the LTP3 version, and has a greater range of possible scores. This also includes the potential for a negative score where the scheme may adversely affect congestion, air quality, connectivity, and so on. The bias towards smaller schemes has been overcome by effectively reserving the extremities of the scoring scale to larger schemes; therefore a small scheme that has been awarded a score of +6 would have to have a highly significant impact to justify that score. Scheme endorsement has also been added as an assessment criterion to replace public acceptability. This reinforces that schemes must come from a legitimate source, with higher scores awarded to those schemes coming from approved transport strategies.

The cost part of the assessment now uses financial data rather than awarding points based on relative proportionate costs of each scheme. This will produce a 'points per pound' final assessment score, and is in effect a value for money figure.

There is no spatial distribution to types of schemes or schemes targeting specific outcomes. Therefore, each proposed scheme must be assessed on its own merits and for the scale of the impact it achieves, regardless of area. The assessment methodology is designed as a means of prioritising but does not determine the ITP or the schemes and therefore it is reliant on local knowledge to accurately assess the magnitude of the benefits. Before carrying out the assessment, officers should consider whether to package schemes together to magnify their benefits.

When the final programme is compiled it may be appropriate to slip schemes to the following financial year where there is a concentration of schemes in one geographical location. For example, it may not be possible to be granted the permits in the school holidays for all schemes.

Outcome	ITP budget allocation (once CRM budget has been top sliced)
Economic growth and minimised congestion	20%
Affordable and accessible door-to-door journeys	20%
Safer travel	20%
Enhanced environment	20%
Better health and wellbeing	20%

Table 1: Option 2 funding allocations

Table 1 shows the funding allocations that would be available under option 2. All outcomes are of equal importance and so 20% of the ITP should address each outcome. All proposed schemes should be sorted by the outcome they are targeting and then ranked by their value for money score. Under each outcome, all schemes should be progressed until a total of 20% of the available budget is reached.

Option 3: Use the revised prioritisation methodology and give a priority order to the outcomes and weight them differently – i.e. more available funding for some outcomes (one funding allocation).

This option uses the revised prioritisation methodology as per option 2 but with unequal funding allocations. Economic growth (outcome 1) has been awarded the most owing to the priority with which both central government and KCC strategic policy affords it. Schemes coming from district/borough transport strategies would naturally align with this outcome because they are designed to support housing growth.

Outcome	ITP budget allocation (once CRM budget has been top sliced)
Economic growth and minimised congestion	40%
Affordable and accessible door-to-door journeys	15%
Safer travel	15%
Enhanced environment	15%
Better health and wellbeing	15%

Table 2: Option 3 funding allocations

Option 4: Use the revised prioritisation methodology and give a priority order to the outcomes and weight them differently – i.e. more available funding for some outcomes (an alternative funding allocation).

This option is the same as option 3 but with further revised funding allocations. Again, economic growth has been given a greater proportion of the budget. Safer travel has not

been allocated any of the ITP budget to reflect that this outcome has already been addressed by the CRM programme; and no scheme will be implemented if it has a negative effect on safety.

Outcome	ITP budget allocation (once CRM budget has been top sliced)
Economic growth and minimised congestion	55%
Affordable and accessible door-to-door journeys	15%
Safer travel	0%
Enhanced environment	15%
Better health and wellbeing	15%

Table 3: Option 4 funding allocations

Preferred Option

In summary, option 1 retains the existing methodology and funding allocation, which includes a spatial element. The other 3 options use the new methodology but with varying allocations to the different outcomes.

Prior to any environmental assessment of the range of options, the KCC preferred option is **option 3**.

Option 1 has been rejected because of the flaws identified above by officers currently using the methodology. Option 2 has been rejected because the outcomes should not be equally weighted when they should align with KCC's strategic and corporate objectives, one of which is to grow the Kent economy. Option 4 has been rejected because it was deemed politically important to continue to fund schemes that target safer travel from the ITP funding in addition to the CRM programme funding.

Option 3, conversely, funds every outcome through the ITP budget but varies the amount of funding for each outcome so that economic growth is prioritised.

Produced for SEA Environmental Report
Draft 3 – 04/07/2016

Appendix 1: Integrated Transport Programme CBA methodology for LTP3

(Available on Request)

Prioritisation for the Integrated Transport Programme

Background and overview

A robust method of appraising and prioritising local transport schemes is required to ensure that those delivered help to achieve the outcomes specified by this fourth Local Transport Plan (LTP4). The previous prioritisation methodology, developed as a result of the third Local Transport Plan (LTP3), has been updated and modified to enable Kent County Council (KCC) to generate a score for every proposed scheme, with the highest scoring schemes representing the highest possible value for money and contributing towards the LTP4 outcomes.

This methodology applies to schemes seeking Integrated Transport Block funding and used to form the Integrated Transport Programme (ITP). In addition to the ITP, KCC implements a Crash Remedial Measure (CRM) programme, which identifies locations where statistical data shows that an unexpectedly high number of crashes occur. If suitable, schemes are then designed and implemented aiming to prevent future crashes from following the same pattern. More information can be found in the KCC Road Casualty Reduction Strategy. The funding for these schemes is top-sliced from the ITP budget representing the importance with which KCC views safety. CRM funding is allocated on a needs basis but KCC will endeavour to ensure a minimum of 50% of the total budget is allocated to these schemes (achieving Outcome 3: Safer travel).

For the remainder of the funding forming the ITP, each proposed scheme will be assessed for the impact it achieves compared to the cost to implement and maintain it. As illustrated in Figure A4.1, at the beginning of the financial year 1 proposed schemes should be assessed and prioritised. The top schemes selected should form approximately 120% of the anticipated budget and then for the remainder of that year should be worked up to be deliverable in financial year 2, when the budget is formally allocated.

Pre-assessment criteria

Schemes should be put forward from valid sources, such as Transport Strategies that support district/borough Local Plans, approvals at Joint Transportation Boards (JTB) or similar bodies, or from Member and Parish Council suggestions. This requires that some public consultation must have been carried out. They should also be at a stage where minimal additional design work is required so that a reasonable estimation of cost is available. For a scheme to be put forward for the ITP it must demonstrably achieve one or more of the outcomes from LTP4, these are:

Outcome 1: Economic growth and minimised congestion

Outcome 2: Affordable and accessible door-to-door journeys

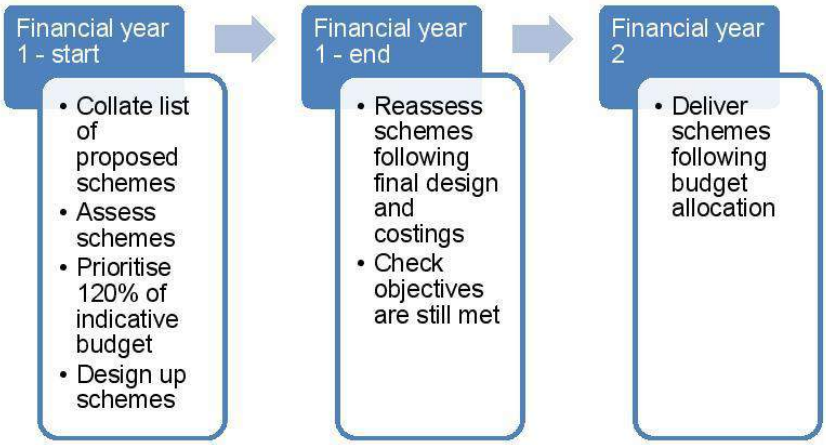
Outcome 3: Safer travel

Outcome 4: Enhanced environment

Outcome 5: Better health and wellbeing

However, where a request has been investigated in the last three years and rejected, and the situation has not changed significantly enough to justify reconsidering, it will not be assessed.

Figure A4.1: ITP scheme prioritisation, design and delivery process.



Funding allocation

Consistent with LTP3, available funding will be allocated to the LTP4 outcomes so that the ITP is a rounded programme that targets all of KCC's outcomes. Funding will be allocated as follows, as per the Options Appraisal:

Outcome	ITP budget allocation (once CRM budget has been top sliced)
Economic growth and minimised congestion	40%
Affordable and accessible door-to-door journeys	15%
Safer travel	15%
Enhanced environment	15%
Better health and wellbeing	15%

Value for money assessment

Comment [JT1]: Meeting with client 140616 – client agreed to the points below and it was agreed that I will make suggestions for a revised and expanded table of assessment for inclusion in consultation draft of LTP4

The value for money assessment considers both the positive and negative effects of a scheme to produce an overall score. However, it has no mechanism to cease the progression of a scheme in the case that the scheme has some strong positive impacts (resulting in a high score) and a wide range of weakly negative impacts (reducing that score slightly). In these cases, the Officers need to ensure that sufficient consultation has been conducted and, where possible, alter the scheme to mitigate negative impacts.

Comment [JT2]: Careful of using this formal language –mustn't allow it to be confused with formal EIA (etc) which comes later in the process. Who carried out the impact assessment? Are they qualified to do so – will they adequately take all variables into account?

The first part of the process is an impact assessment, producing an impact score for the scheme. These have broadly been grouped into the five LTP4 outcomes, although it is recognised that there is some crossover. When assessing the scale of the impact consideration should be given to the size of the scheme, for example it would be expected that large schemes should have stronger impacts than the smaller schemes and therefore a highly significant positive impact would be required for a small scheme to be awarded 6 points.

Indicator	-6	-3	0	3	6
Outcome 1: Economic growth and minimised congestion					
Is the scheme directly connected with delivering development?	N/A		No	Yes	Yes – with developer funding contribution
Does the scheme have impacts in one of the most deprived Lower Super Output Areas using the Index of Multiple Deprivation?	N/A		No direct impacts in one or more of Kent's 60% most deprived LSOAs	Direct impacts in one or more of Kent's 20% – 60% most deprived LSOAs	Direct impacts in one or more of Kent's 20% most deprived LSOAs
Congestion – what impact will the scheme have on congestion and journey time?	Strong negative impact	Negative impact	Neutral	Positive impact	Strong positive impact
Climate resilience - how will the scheme contribute to improved climate resilience in Kent?	Strong negative impact	Negative impact	Neutral	Positive impact	Strong positive impact

Outcome 2: Affordable and accessible door-to-door journeys					
Accessibility – what impacts will the scheme have on access to key services (jobs, education, healthcare, etc.)?	Strong negative impact	Negative impact	Neutral	Positive impact	Strong positive impact
Connectivity – what impact will the scheme have on creating connected door-to-door journeys?	Strong negative impact	Negative impact	Neutral	Positive impact	Strong positive impact
Local Masterplanning - has accessibility and reduced journey time been designed into the overall plan for the scheme area?	N/A		No	Yes	Yes – priority Masterplan area/ scheme
Outcome 3: Safer travel					
Safety – are there any secondary benefits to safety (road, cycleway, footway)?	N/A – scheme should not be progressed if it has a negative impact on safety		Neutral	Positive impact	Strong positive impact
Outcome 4: Enhanced environment					
Sustainable travel – what impact will the scheme have on sustainable travel (e.g. modal shift)?	Strong negative impact	Negative impact	Neutral	Positive impact	Strong positive impact
Townscape and heritage – what impacts will the scheme have on the historic and built environment (including severance)?	Strong negative impact	Negative impact	Neutral	Positive impact	Strong positive impact
Environment – what impact will the scheme have on…					
Biodiversity?	Strong negative impact	Negative impact	Neutral	Positive impact	Strong positive impact
Carbon Emissions?	Strong negative impact	Negative impact	Neutral	Positive impact	Strong positive impact

Water quality and resources?	Strong negative impact	Negative impact	Neutral	Positive impact	Strong positive impact
Natural & Cultural Heritage Landscape & Visual Impact?	Strong negative impact	Negative impact	Neutral	Positive impact	Strong positive impact
Noise & Tranquility?	Strong negative impact	Negative impact	Neutral	Positive impact	Strong positive impact
Material assets (i.e. materials, energy, waste & water resource use in construction & maintenance)?	Strong negative impact	Negative impact	Neutral	Positive impact	Strong positive impact
Technology & innovation (i.e. approaches to achieving sustainable outcomes)?	Strong negative impact	Negative impact	Neutral	Positive impact	Strong positive impact
Outcome 5: Better health and wellbeing					
Air quality – what impact will the scheme have on air quality?	Strong negative impact	Negative impact	Neutral	Positive impact	Strong positive impact
Active travel – what impact will the scheme have on promoting active travel?	Strong negative impact	Negative impact	Neutral	Positive impact	Strong positive impact
Scale of positive impact					
	N/A		Localised impact – few people benefit	Wider impact – a substantial number of people benefit	Very wide impact – many people benefit

The second part of the assessment deals with scheme deliverability, producing a deliverability score.

	-1	1	3	6
Scheme endorsement	N/A – scheme should not be assessed if it does not have a legitimate source	Derived from a recognised body, such as a Quality Bus Partnership, from Members	Scheme has been to JTB and is approved	Scheme derived from an adopted strategy (including district/borough transport

		or parish councils		strategies) or has been approved by Cabinet Committee or at a similar level
Scheme readiness	Substantial further design and feasibility work required	Minimal additional design work required some consultation necessary.	Minimal additional design work required, no further consultation necessary	Scheme is ready to construct
Is the scheme dependent on the completion of any other projects?	Yes	No	N/A	

This then produces a total combined score out of a maximum of 85 points.

Next the cost of the scheme is considered. This has three elements to it: the construction costs, the whole life maintenance costs, and any external funding contribution.

Cost element	**Cost**
Construction cost	£
Maintenance cost (commuted sum or selection of indicative costs supplied)	£
External funding contribution (funding from budgets other than the ITP, e.g. S106 money or Combined Member Grant fund)	-£
Total scheme cost	£

A cost-benefit analysis (CBA) can now be made by taking the total points scored by the scheme and dividing it by the scheme cost, producing a simplistic "points per pound" score that demonstrates the value for money a scheme achieves. Schemes targeting each LTP4 outcome can then be sorted by the CBA score and the best performing schemes prioritised for delivery the coming financial year.

Compiling the ITP

The cost-benefit analysis does not determine the ITP; rather it is a tool to guide officers. After the proposed schemes have been subjected to CBA they will be validated and scrutinised to ensure that a consistent approach to scoring has been used and that a balanced and deliverable programme is provided, for example so that schemes are not concentrated in one area. The final list will then be approved at senior management level using delegated powers.

Appendix C Final Options Report (LTP4 Annexe)

Annexe

Background and overview

A robust method of appraising and prioritising local transport schemes is required to ensure that those delivered help to achieve the outcomes specified by this fourth Local Transport Plan (LTP4). The previous prioritisation methodology, developed as a result of the third Local Transport Plan (LTP3), has been updated and modified to enable Kent County Council (KCC) to generate a score for every proposed scheme, with the highest scoring schemes representing the highest value for money and contributing towards the LTP4 outcomes.

This methodology applies to schemes seeking Integrated Transport Block funding and used to form the Integrated Transport Programme (ITP). In addition to the ITP, KCC implements a Crash Remedial Measure (CRM) programme, which identifies locations where statistical data shows that an unexpectedly high number of crashes occur. If suitable, schemes are then designed and implemented aiming to prevent future crashes from following the same pattern. More information can be found in the KCC Road Casualty Reduction Strategy. The funding for these schemes is top-sliced from the ITP budget representing the importance with which KCC views safety. CRM funding is allocated on a needs basis but KCC will endeavour to ensure a minimum of 50% of the total budget is allocated to these schemes (achieving Outcome 3: safer travel).

For the remainder of the funding forming the ITP, each proposed scheme will be assessed for the impact it achieves compared to the cost to implement and maintain it. As illustrated in Figure A4.1, at the beginning of the first financial year proposed schemes should be assessed and prioritised. The top schemes selected should form approximately 120% of the anticipated budget and then for the remainder of that year should be worked up to be deliverable in the second financial year, when the budget is formally allocated.

Pre-assessment criteria

Schemes should be put forward from valid sources, such as Transport Strategies that support district/borough Local Plans, approvals at Joint Transportation Boards (JTB) or similar bodies, or from Member and Parish Council suggestions. This requires that some public consultation must have been carried out. Members of the public are encouraged to go through their local Parish Council or County Council Member to gain community support; they will then be able to promote the scheme for inclusion in the ITP. They should also be at a stage where minimal additional design work is required so that a reasonable estimation of cost is available. For a scheme to be put forward for the ITP it must demonstrably achieve one or more of the outcomes from LTP4, these are:

Outcome 1: Economic growth and minimised congestion
Outcome 2: Affordable and accessible door-to-door journeys
Outcome 3: Safer travel
Outcome 4: Enhanced environment
Outcome 5: Better health and wellbeing

However, where a request has been investigated in the last three years and rejected, and the situation has not changed significantly enough to justify reconsidering, it will not be assessed.

Figure A4.1: ITP scheme prioritisation, design and delivery process.

Funding allocation

Consistent with LTP3, available funding will be allocated to the LTP4 outcomes so that the ITP is a rounded programme that targets all of KCC's outcomes. Funding will be allocated as follows:

Outcome	ITP budget allocation (once CRM budget has been top sliced)
Economic growth and minimised congestion	40%
Affordable and accessible door-to-door journeys	15%
Safer travel	15% (in addition to top slicing for safety critical schemes)
Enhanced environment	15%
Better health and wellbeing	15%

Value for money assessment

The value for money assessment considers both the positive and negative effects of a scheme to produce an overall score. However, it has no mechanism to cease the progression of a scheme in the case that the scheme has some strong positive impacts (resulting in a high score) and a wide range of weakly negative impacts (reducing that score slightly). In these cases, the officers need to ensure that sufficient consultation has been conducted and, where possible, alter the scheme to mitigate negative impacts.

The first part of the process is an assessment, producing a score for the scheme. These have broadly been grouped into the five LTP4 outcomes, although it is recognised that there is some crossover. Each scheme will be assessed against each criterion regardless of which LTP4 Outcome the scheme is targeting. When assessing the scale of the impact consideration should be given to the size of the scheme, for example it would be expected that large schemes should have stronger impacts than the smaller schemes and therefore a highly significant positive impact would be required for a small scheme to be awarded 6 points.

Score:	-6	-3	0	3	6
Outcome 1: Economic growth and minimised congestion					
Is the scheme directly connected with delivering development?	N/A		No	Yes	Yes – with developer funding contribution
Does the scheme have impacts in one of the most deprived Lower Super Output Areas using the Index of Multiple Deprivation?	N/A		No direct impacts in one or more of Kent's 60% most deprived LSOAs	Direct impacts in one or more of Kent's 20% – 60% most deprived LSOAs	Direct impacts in one or more of Kent's 20% most deprived LSOAs
Congestion – what impact will the scheme have on congestion and journey time?	Strong negative impact	Negative impact	Neutral	Positive impact	Strong positive impact
Outcome 2: Affordable and accessible door-to-door journeys					
Accessibility – what impacts will the scheme have on access to key services (jobs, education, healthcare, etc.)?	Strong negative impact	Negative impact	Neutral	Positive impact	Strong positive impact
Connectivity – what impact will the scheme have on creating connected door-to-door journeys?	Strong negative impact	Negative impact	Neutral	Positive impact	Strong positive impact
Outcome 3: Safer travel					
Safety – are there any secondary benefits to safety (road, cycleway, footway)?	N/A – scheme should not be progressed if it has a negative impact on safety		Neutral	Positive impact	Strong positive impact

Score:	-6	-3	0	3	6
Outcome 4: Enhanced environment					
Sustainable travel – what impact will the scheme have on sustainable travel (e.g. modal shift)?	Strong negative impact	Negative impact	Neutral	Positive impact	Strong positive impact
Townscape and heritage – what impacts will the scheme have on the historic and built environment (including severance)?	Strong negative impact	Negative impact	Neutral	Positive impact	Strong positive impact
Environment – what impact will the scheme have on the natural environment? Including landscape quality and considering the impact on protected landscapes, e.g. AONB.	Strong negative impact	Negative impact	Neutral	Positive impact	Strong positive impact
Outcome 5: Better health and wellbeing					
Air quality – what impact will the scheme have on air quality? Consider any relocation of traffic.	Strong negative impact	Negative impact	Neutral	Positive impact	Strong positive impact
Active travel – what impact will the scheme have on promoting active travel?	Strong negative impact	Negative impact	Neutral	Positive impact	Strong positive impact
Scale of impact					
How wide an impact will the scheme have?	N/A		Localised impact – few people benefit	Wider impact – a substantial number of people benefit	Very wide impact – many people benefit

The above criteria are to be subjectively assessed to be proportionate to the scale of the schemes being promoted and to ensure that there is not a cost burden on the assessment itself.

The second part of the assessment deals with scheme deliverability, producing a deliverability score.

	-1	1	3	6
Scheme endorsement	N/A – scheme should not be assessed if it does not have a legitimate source	Derived from a recognised body, such as a Quality Bus Partnership, from Members or parish councils	Scheme has been to JTB and is approved	Scheme derived from an adopted strategy (including district/borough transport strategies) or has been approved by Cabinet Committee or at a similar level
Scheme readiness	Substantial further design and feasibility work required	Minimal additional design work required some consultation necessary	Minimal additional design work required, no further consultation necessary	Scheme is ready to construct
Is the scheme dependent on the completion of any other projects?	Yes	No	N/A	

This then produces a total combined score out of a maximum of 85 points. Next the cost of the scheme is considered. This has three elements to it: the construction costs, the whole life maintenance costs, and any external funding contribution.

Cost element	Cost
Construction cost	£
Maintenance cost (commuted sum or selection of indicative costs supplied)	£
External funding contribution (funding from budgets other than the ITP, e.g. S106 money or Combined Member Grant fund)	-£
Total scheme cost	**£**

A cost-benefit analysis can now be made by taking the total points scored by the scheme and dividing it by the scheme cost, producing a simplistic "points per pound" score that demonstrates the value for money a scheme achieves. Schemes targeting each LTP4 outcome can then be sorted by the cost-benefit analysis score and the best performing schemes prioritised for delivery the coming financial year.

Compiling the Integrated Transport Programme

The cost-benefit analysis does not determine the Integrated Transport Programme; rather it is a tool to guide officers. After the proposed schemes have been subjected to cost-benefit analysis they will be validated and scrutinised to ensure that a consistent approach to scoring has been used and that a balanced and deliverable programme is provided, for example so that schemes are not concentrated in one area. The final list will then be approved at senior management level using delegated powers.

Appendix D Plans, programmes and policies relevant to LTP4

Other plan, programme or policy	Objectives or requirements of the other plan, programme or policy
International	
EU Environment Action Programme (2012)	Priority objectives to: · Protect nature and strengthen ecological resilience · Boost sustainable resource-efficient low-carbon growth, and · Effectively address environment-related threats to health.
The EU Biodiversity Strategy to 2020 (2011)	Strategy to halt the loss of biodiversity and degradation of ecosystem services in the EU by 2020, restoring them where feasible and stepping up the EU contribution to averting global biodiversity loss.
The Convention on Biological Diversity (CBD) (1992) CBD Aichi Biodiversity Targets - Strategic Plan 2011-2020 (2010)	CBD main objectives: · The conservation of biological diversity · The sustainable use of components of biological diversity · The fair and equitable sharing of the benefits arising out of the utilization of genetic resources Aichi Biodiversity Targets - strategic goals to: · Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society · Reduce the direct pressures on biodiversity and promote sustainable use · To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity · Enhance the benefits to all from biodiversity and ecosystem services · Enhance implementation through participatory planning, knowledge management and capacity building
European Landscape Convention (2007)	A convention aimed at promoting the protection, management and planning of all landscapes

Water Framework Directive (2000/60/EC)	Aims to protect and enhance Europe's water environment. Its main objectives are to improve water quality and resource use, reduce flood risk and improve aquatic habitats for wildlife. Establishes a framework for the long term protection of inland surface waters, transitional and coastal waters and groundwater. The Framework's implementation in the UK also covers alien invasive species, including aquatic and marginal plants, invertebrates and fish. Nearly all inland and coastal waters are required to reach 'good' status by 2015.
European Climate Change Programme (2000)	Programme aiming to identify and develop all the necessary elements of an EU strategy to implement the Kyoto Protocol. Key objectives by 2020: · A 20% reduction in EU greenhouse gas emissions from 1990 levels; · Raising the share of EU energy consumption produced from renewable resources to 20%; · A 20% improvement in the EU's energy efficiency.
Kyoto Protocol (1997)	The Protocol came into force in February 2005. Developed countries that have ratified the protocol are committed to reducing their emissions of greenhouse gases.
EU Habitats Directive (92/42/EU)	Aims to ensure biodiversity by conserving natural habitats of wild fauna and flora. It requires Special Areas of Conservation (SACs) to be identified.
Nitrates Directive (91/676/EEC)	Aims to reduce and prevent water pollution caused by nitrates from agricultural sources.
Directive on Conservation of Wild Birds (79/409/EEC)	Provides a framework for the conservation of wild birds in Europe. The Directive requires the identification of Special Protection Areas (SPAs) to conserve rare or vulnerable species which, together with SACs, form a network of protected areas called Natura 2000.
World Heritage Convention (UNESCO) (1972)	Parties to the Convention undertake to identify, protect, conserve and present national cultural and natural heritage that contribute to the world heritage of mankind as a whole.
National	

UK Climate Change Risk Assessment (2012)	Identifies the main priorities for adaptation in the UK under five key themes: Natural Environment; Buildings & Infrastructure; Health & Wellbeing; Business & Services; and Agriculture & Forestry.
Biodiversity 2020: A strategy for England's wildlife and ecosystem services (aka England Biodiversity Strategy) (2012)	National targets in the framework of the CBD Aichi biodiversity targets. Stresses that biodiversity needs should be integrated in the development of sustainable communities, urban green space and the built environment.
National Planning Policy Framework (2012)	Replacing previous planning policy guidance and statements, the NPPF aims to ensure sustainable development.
UK National Ecosystem Assessment (2011)	Assessment of the state and value of the UK's natural environment and ecosystem services. Includes an investigation into the monetary and non-monetary value to the economy, society and individuals from various ecosystem services, including how some of these may change in future.
Natural Environment White Paper (2011)	Statement outlining the Government's vision for the natural environment over the next 50 years, together with proposals for practical action to deliver that ambition. Informed by the Lawton Review (2010) that considered England's ecological network and concluded that what is needed is: more, bigger, better and joined.
Government Review of Waste Policy in England (2011)	Describes the Government's vision for managing waste better and decoupling the link between economic growth and increased waste.
Planning and the Historic Environment: Practice Guide (2010)	Guidance on recognising and appropriate means by which to consider heritage assets in the planning system.
The Conservation of Habitats and Species Regulations (2010)	Transposition of The Habitats (92/43/EEC) and Wild Birds (79/409/EEC) Directives into UK law.

Marine and Coastal Access Act (2009)	Seeks to improve management and increase protection of the marine environment and improve recreational access to England's coasts.
Climate Change Act (2008)	Makes provision for the development and promotion of a sustainable energy policy.
Natural Environment and Rural Communities Act (2006)	Establishes 'Biodiversity Duty' for all public authorities in the exercise of their functions. Requires the Secretary of State to publish a list of habitats and species of principal importance for the conservation of biodiversity (section 41 list)
Securing the Future: Delivering UK Sustainable Development Strategy (2005)	Strategy to enable the UK to move towards the goal of sustainable development. The five targets are: · Living within environmental limits; · Ensuring a strong, healthy and just society; · Achieving a sustainable economy; · Promoting good governance and; · Using sound science responsibly.
UK Geodiversity Action Plan	A framework for enhancing the importance and role of geodiversity across the UK. Targets are set out under six themes: · Furthering our understanding of geodiversity; · Influencing planning policy, legislation and development design; · Gathering and maintaining geodiversity information; · Conserving and managing our geodiversity; · Inspiring people to value and care for geodiversity; · Sustaining resources for our geodiversity.
Countryside and Rights of Way Act (2000)	Legislates for public access to the countryside, amends protected site and species provisions within the Wildlife & Countryside Act, and strengthens requirements relating to AONBs.
Wildlife and Countryside Act (as amended) (1981)	Principal legislative mechanism for the protection of wildlife in Great Britain. Protects specific species and Sites of Special Scientific Interest.
Local	

Kent Joint Strategic Needs Assessment and Sustainability Assessment (KCC) (2014)	The improvement of health outcomes through taking a sustainable, integrated approach that considers the economic, social and environmental impacts of decisions.
Renewable Energy Action Plan for Kent (KCC & partners) (2013)	A suite of work packages with actions to be delivered over the course of the plan period (5 years). Covering renewable energy aims including skills and training; planning and development; business and innovation; community energy; wind energy and bioenergy.
Thames River Basin Management Plan (EA) (2009) –updated version currently in progress (2015)	Prepared under the Water Framework Directive, a strategic plan for the long term management of the Thames river basin, setting out objectives for water bodies and broad measures to meet these objectives by catchment area, e.g. Darent & Cray catchment – monitoring and field work into the origins of, causes of and solutions to pollution and sedimentation.
South East River Basin Management Plan (EA) (2009) – updated version currently in progress (2015)	Prepared under the Water Framework Directive, a strategic plan for the long term management of the South East river basin, setting out objectives for water bodies and broad measures to meet these objectives by catchment area, e.g. Stour catchment –modification of abstraction licenses, reducing nutrient input from point sources and agricultural and urban diffuse pollution, improve fish passage and flow, protect and enhance water body ecology.
Catchment Abstraction Management Strategies (EA)	Describes the water resource availability in the area and the way the resources will be managed through abstraction licensing.
Catchment Flood Management Plans (EA)	Give an overview of the flood risk across each river catchment, considering inland flooding from rivers, ground water, surface water and tidal flooding.
National Character Area profiles (2014)	Descriptions of the key ecosystem services provided in each character area, how these benefit people, wildlife and the economy and identifying potential opportunities for positive environmental change.
Kent Biodiversity Action Plan (2004)	The Kent BAP sets out strategic objectives, activities and a spatial vision in order to guide wildlife and ecosystem conservation.
Kent Biodiversity Opportunity Areas (2009) – *updates currently in development (2015)*	Developed by the Kent Biodiversity Partnership, the BOAs indicate where the delivery of Kent BAP targets should be focused to secure maximum biodiversity benefits.

Parish/neighbourhood plans	Under the Localism Act 2011, local communities can prepare neighbourhood plans to establish general planning policies for the development and use of land in a neighbourhood.
Local Authority Local Plan / Local Development Frameworks	Strategic plans setting out development allocations and planning policies.

Appendix E Assessment Matrices – Options

Plan Options	Biodiversity	Air Quality	Health	Climate	Population	Water	Heritage	Landscape	Noise	Materials	Technology & Innovation	Overall	Comments
	Protect and enhance the county's habitats, biodiversity levels, and species of international, national, regional and local importance.	Improve air quality in urban areas and achieve the NAQS and AQMA objectives across the county.	Support transport solutions that promote positive health outcomes through active and sustainable travel choices and improved road safety.	Reduce vulnerability to climate change-related extreme weather events by creating a resilient transport infrastructure and identifying appropriate adaptation and mitigation measures.	Promote accessible, integrated and sustainable transport networks that support the needs of the economy and local communities	Coordinate across the county in parallel with other planning policy, in order to address water catchment quality and resource issues.	Protect and enhance cultural heritage, and access to areas and features of historic, architectural or archaeological importance.	Enhance and protect the character and diversity of all landscape assets through planning and policy decisions and ensure development does not decrease visual and recreational amenity	Seek to reduce noise at source, particularly in existing Noise Important Areas, and to prevent the creation of new Noise Important Areas; protect tranquil areas from impact, including cumulative impact.	Maximise resource efficiency in materials, energy, waste and water use by utilising sustainable construction and procurement methods, and ensuring appropriate ongoing maintenance of	Apply innovative and technological approaches to achieving sustainable outcomes.		
What will be the situation without LTP4 - Option 1: Business as usual – i.e. retain existing prioritisation methodology from LTP3 and keep the funding prioritised on growth points and growth areas as well as being unequally allocated among themes (in the context of LTP4: outcomes). GWG 45%; 15 others; 10 life in Kent	-	-	+	0	0	-	0	-	-	+	++	-2	Option 1's emphasis is housing and employment within the county to support GWG. Having this as a key independant theme by-passes the opportunity to develop sustainable solutions to support GWG (other than by CBA). The funding assessment methodology provides for spatial analysis, although this is based on the theme of LTP3 and therefore is not holistic. The CBA provides very limited ability for consideration of the environment. Funding to key growth points in the county will lead to increased environmental pressures on all areas of the environment will increase. The option does address wider social and commnuity needs in the improved access to non-vehicular travel. The theme for the environment relates primarily to climate change - which is a far-reaching subject in terms of the schemes that could support it. The main issue is the limited spatial distribution of the schemes, leading to an all or nothing outcome for areas. Top slicing of the budget for safety related schemes means that less budget is available for other themes as a wholes. This is despite there being a dedicated theme for safety.
What will be the situation with LTP4 - Option 2: Use the revised prioritisation methodology and make all outcomes equally weighted and of equal priority – i.e. equal allocation of funding. 20% each	+	+	++	+	++	+	+	+	+	+	++	14	Option 2 is a progression from Option 1, developing the issues found into solutions. Because the assessment scheme uses the themes in LPT4, each area is addressed. Funding is allocated to schemes based on their theme. Funding allocation is equalised - the environment based schemes benefits from a 5% increase (20% total) in allocation.Additionally, Outcome 2 has strong environmental and social benefits and so a 20% funding allocation to outcome 2 benefits outcome 4. Revised assessment scheme allows for consideration of the environment for each scheme. The impact of increased funding for economic growth may or may not have a residual negative impact - this will depend on the scoring for Outcome 4, whch may well be high. Scheme design will play a role in deciding the Outcome scores.
What will be the situation with LTP4 - Option 3 [preferred by KCC & captured in the LTP4 Draft for Cabinet Cttee] : Use the revised prioritisation methodology and give a priority order to the outcomes and weight them differently – i.e. more available funding for some outcomes (an alternative funding allocation). 40% ec; 15 others.	0	+	+	+	+	0	0	0	0	0	++	6	Option 3 is a progression from Option 2, developing the issues found into solutions. Because the assessment scheme uses the themes in LPT4, each area is addressed. Funding is allocated to schemes based on their theme. Funding allocation is equalised - the environment based schemes benefits from a 15% funding allocation. Revised assessment scheme allows for consideration of the environment for each scheme. The impact of increased funding for economic growth may or may not have a residual negative impact - this will depend on the scoring for Outcome 4, whch may well be high. Scheme design will play a role in deciding the Outcome scores.
What will be the situation with LTP4 - Option 4: Use the revised prioritisation methodology and give a priority order to the outcomes and weight them differently – i.e. more available funding for some outcomes (an alternative funding allocation). 55% ec; 15 others; 0 safety (as CRM already top sliced)	-	-	0	-	0	-	-	-	-	+	++	-5	Option 4 is a progression from Option 2, developing the issues found into solutions. Because the assessment scheme uses the themes in LPT4, each area is addressed. Funding is allocated to schemes based on their theme. Funding allocation is equalised - the environment based schemes benefits from a 5% increase in allocation. Revised assessment scheme allows for consideration of the environment for each scheme. The impact of increased funding for economic growth may or may not have a residual negative impact - this will depend on the scoring for Outcome 4, whch may well be high. Scheme design will play a role in deciding the Outcome scores. Outcome 3 'Safety' delivers little in environmental benefits and therefore a reduction in the funding allocation for Outcome 3 raises the amount available for Outcome 4 'Environment'. However, the allocation for Outcome 1 'Growth' has benefited directly from the lack of funding for Outcome 3 and this has the strongest negative effect on environmental outcomes.

Appendix F Assessment Matrices - VFM Prioritisation

F1 – Original Matrix as per Options Report v2