

STRATEGIC ENVIRONMENTAL ASSESSMENT

BACKGROUND

The European Directive 2001/42/EC (the 'SEA Directive') was transposed into UK law in July 2004 by means of The Environmental Assessment of Plans and Programmes Regulations. These regulations apply to a number of plans and programmes (including LTPs) that either set a future development consent for projects requiring an EIA or may cause damage to sites designated under the EU Habitats Directive.

The aim of the SEA is to assess the likely impact of strategic level plans and programmes on the environment and to inform decision-making throughout the development of the LTP2, ensuring that sustainable development is promoted throughout the process. Basic principles of SEA include:

- Promoting stakeholder participation through the consultation process, providing the opportunity for issues of concern beyond the main area of focus in the LTP to be considered throughout development of the Plan;
- To identify and focus on the main environmental constraints for implementation of the Plan;
- To identify and assess the best option for strategic action in terms of environmental performance;
- To minimise the negative effects of the Plan, optimise the positive impacts and compensate for any loss of valuable features/benefits;
- Ensure that actions resulting from the Plan do not incur irreversible damage to the environment, including consideration of cumulative and indirect impacts; and
- SEA is an iterative process that takes place during the development of the Plan, rather than a 'bolt-on' appraisal of the final draft.

Key stages in the SEA process include: Scoping and the Environmental Report.

SCOPING

- Identifying other plans/programmes being implemented within/affecting the LTP plan area to ensure conflicting policies are identified and considered and that potential cumulative impacts can be identified.
- Describing the current and likely future environmental baseline for the LTP2 plan area, providing an evidence base against which to assess impacts and set a monitoring framework.
- Identifying any environmental problems and opportunities in the Plan area, and highlighting any uncertainties regarding either data collection or knowledge of the environment in West Yorkshire. As uncertainty is inevitable when dealing with data at a strategic level, it is important that uncertainties are raised throughout the process to make decision-making more robust.
- Development of a set of SEA objectives against which the LTP2 will be assessed. The SEA objectives are listed below, and have been developed to meet the requirements of the SEA Regulations and specific DfT guidance on SEA for LTPs, and to complement objectives identified in other strategic plans effecting West Yorkshire.

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The objectives used in the LTP2 SEA were:

1. to reduce transport-related impacts on local/regional noise climate;
2. improve local/regional air quality and mitigate transport-related AQMAs;
3. reduce transport-related emissions of greenhouse gases;
4. improve the ability of transport systems to adapt to climate change;
5. to protect and enhance landscape and townscape diversity;
6. avoid loss or damage to historic buildings, land, structures, Conservation Areas and historical rescues;
7. to help protect and enhance habitats and species of local, European or international importance;
8. reduce the detrimental impact of transport on water quality;
9. to secure improvements to health;
10. reduce the number of vehicular, pedestrian, and other transport-user casualties;
11. reduce the risk and fear of crime for pedestrians and public transport users;
12. reduce community severance and fragmentation to aid community cohesion;
13. improve access to education, jobs, leisure (including sustainable tourism), community services and the countryside;
14. to support employment, economic competitiveness and the revival of priority regeneration areas;
15. to protect and retain soil; and
16. maximise the efficient and effective use of materials and minimise the amount of waste generated.

Scoping Appraisal

This was an appraisal of initial strategic alternative options for the LTP2 against the SEA objectives. The scoping process was based on expert subjective advice, as no specific modified data for the LTP2 alternatives was available. Five alternative LTP2 strategies were developed and are listed below, each composed of a specific group of transport instruments which will achieve LTP2 objectives, each emphasising a different policy area. These transport instruments are categorised within the themes of 'public transport', 'network', road safety' and 'mobility management initiatives', within which they are further sub-divided into elements relating to 'services', 'information' and 'infrastructure'.

Option One: the existing situation that can be treated as a "do-minimum" or background situation. For the purposes of the hypothetical situations that follow, it can be assumed that the development / investment in the policy instruments here would be effectively frozen and simply maintained without being grown any further.

Option Two: an alternative consisting of Option One (existing) plus policy instruments skewed towards constraining the strong demand for car travel.

Option Three: an alternative consisting of Option One (existing) plus policy instruments skewed towards sustainable transport modes.

Option Four: an alternative consisting of Option One (existing) plus policy instruments skewed towards unconstrained demand for car travel.

Option Five: an alternative consisting of Option One (existing) plus policy instruments skewed towards targeted improvements to roads together with improvements for walking, cycling and public transport.

The results of the appraisal of alternatives have been included in the scoping report allowing comparison between the five different possible alternatives and flagging up, where relevant, how negative impacts may be minimised and positive effects enhanced. A matrix was created (an example of which is shown in table K.1. Matrices for each alternative are available in full in the Scoping Report) in which all SEA objectives could be scored against the given transport instruments for each alternative, categorised by theme and element. The scoping appraisal was scored by a small team of multi-disciplinary environmental experts using their subjective judgement of the likely strategic environmental effects - at the scoping stage of a SEA it was found to be neither practicable or feasible to use modified data to aid scoping appraisal.

Option 1 was appraised using past knowledge of the environmental performance of LTP1. In addition, it was assumed that the current momentum in providing alternative solutions and initiatives to reduce car dependency would slowly diminish over time. It was also anticipated that traffic growth and associated congestion would continue to increase at its current rate in West Yorkshire. Due to the lack of detailed information a simple colour coded scoring system was devised to indicate that the impacts are thought to have either a 'likely beneficial impact', 'possible slight beneficial effect', 'no likely effect', 'possible slight negative effect' or 'likely negative effect'.

The Option 1 matrix was scored using the above assumptions and scoring system. Options 2, 3, 4 and 5 were scored on a consistent basis using Option 1 as the baseline or do-minimum situation. Each LTP2 option was described relative to Option 1, i.e. information provided on the transport instruments in terms of the transport themes and elements would be improved or relaxed relative to Option 1. Using this approach, a consistent but relative comparison of environmental performance could be achieved. Comprehensive tabulation of comments describing the appraisal team's thoughts and reasoning behind the scores given.

Brief summary of scoping results

Table K.2 provides a basic summary of the scoping results in terms of likely strategic environmental effects. This scoping appraisal has not attempted to weigh any of the potential adverse or beneficial effects, or take account of interactions or cumulative effects between different SEA objectives.

Option 4 is clearly illustrated as the worst LTP2 strategy regarding its environmental performance. This would be expected as the strategy promotes car usage and would create significant environmental conflicts. Conversely options 2 and 3 are likely to give the best environmental performance. Both of these strategies have an effect on promoting sustainable modes of transport and generally constrain car demand.

Option 5 gives an intermediate performance, although it provides a more balanced LTP strategy targeting some improvements to the highway network, public transport and sustainable modes of transport. This option performs generally better than the existing LTP strategy described in option 1.

The scoping report also highlights areas for each of the options where negative impacts can be reduced and positive impacts be included or enhanced. Once a decision has been made regarding LTP2 strategy options, a more detailed assessment will be performed and reported in the Environmental Report. At this stage, information will be available from the STM which will provide the basis for assessing the environmental effects of the draft LTP2, together with advice on appropriate mitigation measures.

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Table K.1: Example of scoping appraisal matrices

OPTION 2: Existing plus policy instruments skewed towards constrained car demand

SEA OBJECTIVES	Public Transport			Network			Road Safety			Mobility Management Initiatives		
	Services	Information	Infrastructure	Services	Information	Infrastructure	Services	Information	Infrastructure	Services	Information	Infrastructure
1 To reduce transport-related impacts on local/regional noise climate.	0	0	0	0	0	+	0	0	+/0	0	0	+/0
2 Improve local/regional air quality and mitigate transport-related AQMAs.	+	-/0	+/0	+/0	+/0	+	0	0	+	+/0	+/0	+/0
3 Reduce transport-related emissions of greenhouse gases.	+	-/0	+/0	+/0	+/0	+	0	0	+	+/0	+/0	+/0
4 Improve the ability of transport systems to adapt to climate change.	0	0	-/0	0	+	-/0	0	0	-/0	0	0	-/0
5 To protect and enhance landscape and townscape diversity.	+/0	0	0	+/0	-/0	+/0	0	0	-	+/0	0	+*
6 Avoid loss or damage to historic buildings, land, structures, Conservation Areas and historical rescues.	+/0	0	0	0	0	+/0	0	0	-/0	0	0	+/0
7 To help protect and enhance habitats and species of local, European or international importance.	+/0	0	0	0	0	0	0	0	0	0	0	+/0
8 Reduce the detrimental impact of transport on water quality.	0	0	0	0	0	0	0	0	0	0	0	0
9 To secure improvements to health.	+/0	0	0	0	0	+	0	0	0	+/0	0	0
10 Reduce the number of vehicular, pedestrian, and other transport-user casualties.	+/0	0	0	+/0	+/0	+/0	+/0	+/0	+	0	0	+/0
11 Reduce the risk and fear of crime for pedestrians and public transport users.	+/0	0	+/0	0	0	+/0	0	0	0	0	0	+/0
12 Reduce community severance and fragmentation to aid community cohesion.	0	0	0	0	0	+	0	0	+	0	0	+/0
13 Improve access to education, jobs, leisure (including sustainable tourism), community services and the countryside.	+	0	+/0	0	0	+/0	0	0	0	0	0	0

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SEA OBJECTIVES	Public Transport			Network			Road Safety			Mobility Management Initiatives		
	Services	Information	Infrastructure	Services	Information	Infrastructure	Services	Information	Infrastructure	Services	Information	Infrastructure
14 To support employment, economic competitiveness and the revival of priority regeneration areas.	+	0	+/0	+/0	+/0	+/0	0	0	0	0	0	+/0
15 To protect and retain soil.	0	0	0	0	0	0	0	0	0	0	0	0
16 Maximise the efficient and effective use of materials and minimise the amount of waste generated.	0	0	0	0	0	0	0	0	0	0	0	0

* = Presuming other measures are introduced to back up this policy.

+	Likely beneficial effect
+/0	Possible slight beneficial effect
-/0	Possible slight negative effect
-	Likely negative effect
0	No likely effect

? = effect still to be determined

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Table K.2: Summary of scoping results

	Likely adverse effect	Possible slight adverse effect	No likely effect	Possible slight beneficial effect	Likely beneficial effect	Environmental rating
Option 1	0	15	150	27	0	4th
Option 2	1	8	126	42	15	1st (best performing)
Option 3	0	14	131	35	12	2nd
Option 4	9	30	138	13	2	5th (worst performing)
Option 5	0	12	147	26	7	3rd

THE ENVIRONMENTAL REPORT

An Environmental Report is required by the regulations to provide a detailed account of the SEA process. This has built upon the findings of the Scoping Report and includes:

- Prediction of any significant environmental effects of the chosen Plan and its alternatives, and to evaluate the predicted effects to direct refinement of the Plan to better meet sustainable development principles.
- Mitigation measures for consideration to be included in the Plan.
- A wider consultation (statutory, non-statutory consultees and all other interested parties) of the SEA Environmental Report, to enable relevant comments to be assessed and improvements incorporated within the provisional LTP2.
- A framework to monitor the environmental effects of the Plan's implementation in order to determine whether its effects are as anticipated, and therefore inform future revisions to the monitoring programme / SEA of future plans.

SEA Assessment Tables.

The Assessment Tables summarise the environmental objective findings and identifying the likely LTP2 environmental effects, associated with:

- relevant legislation and policies;
- environmental constraints and location of proposed schemes;
- STM output;
- use of expert opinion; and
- cumulative or other secondary effects

Based on this information, an independent judgement has been made on the strategic significance of the LTP2 environmental effects

and whether appropriate mitigation, or enhancements could be introduced to improve the performance of the LTP2.

SEA Mitigation and Enhancement Tables.

These Tables identify the likely strategic environmental effect of the LTP2 associated with each SEA objective. The environmental effects are assessed using consistent terminology to describe either "Beneficial" or "Adverse" effects. In addition, the opportunities for mitigation and enhancement have been clearly indicated.

Relevant strategic or scheme specific mitigation measures for each SEA objective have been identified to reduce likely significant environmental effects of the LTP2. Appropriate strategic and scheme specific measures to enhance and improve the overall environmental performance of the LTP2 have also been incorporated.

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ASSESSMENT TABLES

Table K3: SEA Objective 1: Reduce transport related impacts on Local / regional noise climate

Issue	Assessment
Environmental Constraints	No strategic data for West Yorkshire. Main sources road transport, local aircraft and rail noise. Areas of Tranquillity/ Quiet urban areas e.g. Parks.
Relevant Legislation or Targets	Environmental Noise Directive. Noise Insulation Regulations Quality of Life Indicator Potential Noise Target when noise mapping available.
Location of Potential Schemes	New Highways most relevant. Other Strategy Approaches mainly insignificant effect on noise. Maps of major schemes provided for each District. Improved surface access to Leeds/ Bradford International Airport may have an indirect effect on encouraging additional aircraft movements, with possible adverse effects on local noise climate.
Strategic Transport Model	"Trips through" data provides a general proxy for change in traffic flows across District wards. But, lacks any detail that would be provided from Noise Mapping.
Expert Opinion & General Issues	Agreed that we may need to develop our own Noise Mapping model for West Yorkshire as the latest information from Defra suggests that the proposed noise map for South and West Yorkshire would be very basic. The model would not be available to local authorities to assess the effects of road schemes. Development of an independent West Yorkshire Noise Mapping model would provide a source of strategic noise data for the sub-region. Major noise issues include: <ul style="list-style-type: none"> • Motorway noise effects • Road Surfacing Policies. • Use of Speed Management • Design of Barriers
Significance of Effects	Strategic Effect of LTP2 is Minor Beneficial STM evidence indicates that proposed modal shift & associated change in vehicle flows will create an imperceptible change in noise climate. There will be some local perceptible improvements in noise climate associated with new road schemes, road surfacing and speed management. Cumulative effects may create minor strategic benefits in noise climate. Without the use of noise mapping it will be difficult to determine where, if any, changes will occur in the local/strategic noise climate.

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Issue	Assessment
Other Policies and Programmes	Effects of the Regional Spatial Strategy (RSS) Vision: <ul style="list-style-type: none"> • Airport developments. • ii) Economic growth effects for new housing, jobs and commuting. • Highway Agency Policies.
LTP2 Mitigation	Strategic: Yes
	Scheme Specific: Yes
LTP2 Enhancements	Strategic: Yes
	Scheme Specific: Yes

Table K.4: SEA Objective 2: Improve local/regional air quality and mitigate transport related AQMAs

Issue	Assessment
Environmental Constraints	AQMAs and AOCs. Air Quality considerations for both health & biodiversity.
Relevant Legislation or Targets	EU Air Quality Directives/ NAQS LTP2 Targets: <u>Mandatory LTP2 target</u> : reduce annual average NO ₂ in Leeds AQMA by 10%. <u>Local LTP2 target</u> : reduce NO _x emissions by 20% across West Yorkshire. Potential to develop a local particulate matter target when new standards are established
Location of Potential Schemes	Overlay of STM data with Air Quality constraints, using GIS. Consider effects of new highways and motorway network. Consider any highway modifications within contained environment.
Strategic Transport Model	The STM output for LTP2 predicts reductions in NO _x & PM ₁₀ , (pollutants of concern), across West Yorkshire of between 2 & 5%. The most significant benefits are predicted within the Urban Centres, where several AQMAs and AOCs exist. The STM predicts similar reductions of hydro-carbons and CO, which are photo-chemical pollution pre-cursors, a summertime phenomena likely to increase with climate change.

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Issue	Assessment				
Expert Opinion & General Issues.	<p>All Districts except Kirklees have declared or will be declaring AQMAs, mainly to help mitigate background levels of NO₂ & occasionally for PM₁₀.</p> <p>Other concerns :- Tackling effects of congestion, Motorway emissions, Heavy Duty Vehicle emissions, Atmospheric Chemistry and Climate Change. Secondary effects associated with climate change may aggravate Photo-chemical & PM₁₀ air quality issues.</p> <p>The most significant improvements to air quality will result from reductions of around 35% (PM₁₀) and 30% (NO_x), expected through general improvements in the vehicle fleet between 2006 and 2011. (Based on the Design Manual for Roads and Bridges/STM emissions output, difficult to assess congestion effects).</p> <p>The LTP2 Strategy will help to reduce congestion & associated vehicle emissions by enabling AQAPs, including the combined use of:- Demand Management, Encouraging More Sustainable Travel & by Technical Actions, including UTMC, and supporting the use of Emission Control & Cleaner Fuels.</p> <p>These combined cumulative effect of these actions will help reduce emissions & improve Air Quality across all Districts. Some actions will mitigate AQMAs/AOCs more directly, examples include:- (Leeds Inner Ring Road Stage 7, UTMC for Leeds Inner Ring road & City Centre Loop, A62 Leeds Road Improvements in Kirklees).</p>				
Significance of Effects	<p>STM results for the LTP2 indicate minor beneficial effects, especially for urban centres, but unlikely to mitigate many AQMAs, without the benefits of a “cleaner vehicle fleet”.</p> <p>Difficult to assess air quality effects of Public Transport priority systems and TravelWise/ Smart Choice Initiatives.</p>				
Other Policies and Programmes	<p>Need to integrate District AQAPs into the LTP2. Most Districts will need to amend, or develop their own AQAP's. This will be co-ordinated by WYTEG.</p> <p>There may be difficulties integrating up to 4 separate AQAPs into one LTP. The Leeds AQAP is incorporated into the LTP2, but has had limited effects on directing the Strategy Approach. Need to ensure greater weighting is given to the new AQAPs and that these actions influence the LTP2 transport schemes.</p> <p>Effects of RSS and resultant development and traffic growth.</p> <p>HARMS and SWYMBUS effects.</p> <p>The Metro Bus Strategy will investigate use of new vehicle technologies & cleaner fuels.</p>				
LTP2 Mitigation	<table border="1" data-bbox="528 1163 2063 1241"> <tr> <td data-bbox="528 1163 824 1198">Strategic:</td> <td data-bbox="824 1163 2063 1198">Yes</td> </tr> <tr> <td data-bbox="528 1198 824 1241">Scheme specific:</td> <td data-bbox="824 1198 2063 1241">Yes</td> </tr> </table>	Strategic:	Yes	Scheme specific:	Yes
Strategic:	Yes				
Scheme specific:	Yes				
LTP2 Enhancements	<table border="1" data-bbox="528 1249 2063 1327"> <tr> <td data-bbox="528 1249 824 1284">Strategic:</td> <td data-bbox="824 1249 2063 1284">Yes</td> </tr> <tr> <td data-bbox="528 1284 824 1327">Scheme specific:</td> <td data-bbox="824 1284 2063 1327">Yes</td> </tr> </table>	Strategic:	Yes	Scheme specific:	Yes
Strategic:	Yes				
Scheme specific:	Yes				

Table K5: SEA Objective 3: Reduce transport-related emissions of greenhouse gases

Issue	Assessment
Environmental Constraints	Local, regional and Global climate change effects established through net change in CO ₂ emissions across West Yorkshire. Other effects such as Air Quality, Biodiversity, Health, Economic Development and Climate Change Adaptation.
Relevant Legislation or Targets	<p><u>Kyoto</u>: (12% reduction from 1990 to 2010)</p> <p><u>UK</u>: (20% reduction from 1990 to 2010)</p> <p><u>Royal Commission on Environmental Pollution (RCEP)</u>: (aspirational 60% reduction by 2050)</p> <p>The Institute of Public Policy Research (IPPR) and the International Climate Change Task Group advise the UK should reduce CO₂ emissions relative to 1990, by 40% & 90% for the years 2020 & 2050 respectively, to avoid serious climate change, i.e. a 2°C rise in global surface temperature.</p> <p><u>LTP2</u>: Local indicator to prevent any further increase (0%) in road transport CO₂ emissions, from the West Yorkshire PRN, between 2004/05-2010/11.</p> <p>The Regional Climate Change Action Plan 2005</p>
Location of Potential Schemes	<p>Not relevant</p> <p>Total strategy emissions most important</p>
Strategic Transport Model	<p>STM output for the LTP2 strategy for 2011 indicates that emissions of CO₂ will reduce by less than 2%, whilst STM output for the Do-Minimum 2011 situation, indicates emissions of CO₂ would increase by less than 2%.</p> <p>The overall net reduction in CO₂ emissions across West Yorkshire resulting from the implementation of LTP2 Strategy is expected to be approximately 3% by 2011.</p> <p>The greatest reductions in emissions are predicted across the central urban areas with the least improvements expected across the rural areas.</p>

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Expert Opinion & General Issues	<p>There should be a mandatory LTP2 target to reduce road transport CO₂ emissions.</p> <p>The transport sector accounts for approximately 24% of total UK CO₂ emissions, of which road transport accounts for around 22%. The LTP provides a major opportunity to constrain road transport emissions, but the proposed LTP2 does not include sufficient demand management measures to achieve any significant reduction in CO₂ emissions over the Plan period.</p> <p>Other concerns based on evidence involving road transport CO₂ emissions:-</p> <ul style="list-style-type: none"> • Department for Environment Food and Rural Affairs (DEFRA)/National Environment Technology CENTre (NETCEN) trends project very small annual increases. • Past APR increasing emission trends for West Yorkshire PRN. • Lack of control over Strategic Road Network (approximately 35% of West Yorkshire's road transport CO₂ emissions, based DfT/NRT survey). • Additional "life-style" changes are required for transport & other major sectors, before long term advisory & aspirational goals to reduce CO₂ can be achieved.
Significance of Effects	The STM indicates a minor beneficial effect possible compliance with Local target, but that the strategies will not deliver the aspirational targets.
Other Policies and Programmes	RSS for Climate Change policy. But there is little evidence of any dissemination into LTP2. Recent set up of WYTEG considers transport CO ₂ & appropriate mitigation measures.
LTP2 Mitigation	Strategic: Yes
	Scheme Specific: No
LTP2 Enhancements	Strategic: Yes
	Scheme Specific: No

Table K.6: SEA Objective 4: Improve the ability of transport systems to adapt to climate change.

Issue	Assessment
Environmental Constraints	<p>Areas of infrastructure vulnerable to climate change, including:-</p> <ul style="list-style-type: none"> • Flood prone areas (flash floods, winter valley floods) • Drought effects on subsidence, trees and landscaping. • Thermal stress effects on carriageways and structures. • Thermal comfort for travelling public. • Wind stress effects on structures, street furniture & vehicles.

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Issue	Assessment
Relevant Legislation or Targets	No present legislation, but advisory information.
Location of Potential Schemes	Identify any proposed new build within :- <ul style="list-style-type: none"> • Environment Agency flood risk areas. • Clay/Peat soils, prone to shrinkage during drought. • Routes exposed to prevailing winds and valley funnelling.
Strategic Transport Model	Not relevant
Expert Opinion & General Issues	<p>Ensure new highway design of schemes can adapt to climate change (refer to above environmental constraints). Provisional LTP2 makes a commitment to introduce a number of adaptation measures, e.g:</p> <ul style="list-style-type: none"> • Improve Asset Management procedures, i.e. gully cleaning, maintenance & inspection of watercourses to reduce risk of flooding.. • Improve foundations of street furniture / lighting to cope with extra wind stress. • Adapt winter maintenance to cater for increased run-off. • Adapt Highway maintenance / verge & landscaping for change/variability in growing season. <p>A cost effectiveness exercise would identify priorities for effective adaptation methods according to budget and other constraints. Highway design now considers effects on flooding and increase in rainfall intensity. Climate change adaptation is generally considered less important than mitigation. The profile of adaptation should be raised to give equal importance. Insufficient actions & resource allocations for adaptation will result in spiralling adverse impacts & associated costs.</p> <p>Links with other SEA objectives include:</p> <ul style="list-style-type: none"> • Increased summer temperatures and likely heatwaves and drought are likely to: • Increased risk of photochemical pollution (STM output indicates slight reductions in ozone precursors (CO, hydrocarbons and NO_x). • Increase summer PM_{10/2.5} due to periods of drought. • Increase risk of heatstroke and other health problems. • Climate change will affect various aspects of biodiversity. • Increase in flood risk zones will affect various aspects of economic development.

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Significance of Effects	Current LTP2 proposals will lead to minor/moderate benefits . Increased significance as climate change effects gains momentum. Major benefits possible for new schemes. For LTP2 strategy approach, need to raise awareness of increased benefits likely to arise from adaptation measures.
Other Policies and Programmes	RSS Climate Change Policy and some District climate change working groups. Yorkshire & Humberside Climate Change Action Plan RSS – Development and transport within flood prone areas. UKCIP advice on Climate Change adaptation DEFRA Draft climate change Adaptation Policy Framework.
LTP2 Mitigation	Strategic: Yes Scheme Specific: Yes
LTP2 Enhancements	Strategic: Yes Scheme Specific: Yes

Table K. 7: SEA Objective 5: To protect and enhance landscape and townscape diversity

Issue	Assessment
Environmental Constraints	It is difficult to assess landscape impacts at strategic level, due to highly subjective interpretation of 'landscape quality' and the fact that many impacts are highly localised (e.g. views). Light pollution in West Yorkshire is already a serious concern – currently no 'truly dark' or even 'intermediate' land is evident on the latest satellite images.
Relevant Legislation or Targets	<ul style="list-style-type: none"> • World Heritage Sites. • National Parks and Access to the Countryside Act. • Listed buildings and Scheduled Ancient Monuments. • Local designations / polices (e.g. Conservation Areas).
Location of Potential Schemes	Identify any proposed schemes likely to affect important sites or their setting, such as Sites of Special Scientific Interest (SSSIs), Sites of Ecological or Geological Importance (SEGIs), Landscape Character Areas, Conservation Areas etc.
Strategic Transport Model	Not relevant.

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Expert Opinion & General Issues	<p>Light pollution is an issue of concern, and the maintenance programme could address this issue through replacement of old highway lighting with improved directional high pressure sodium lights.</p> <p>Lighting can be beneficial to improving townscape character, highlighting attractive features and enhancing perceptions of safety. However, particularly in rural areas, the lack of dark skies is considered by many to be detrimental to the landscape character.</p> <p>Increased signage, parking controls and meters could create 'visual clutter' in urban areas.</p> <p>Cross links with conservation areas and historical environment, where many of the effects and issues will be similar. Increased use of low noise surfacing will help improve landscape quality by reducing background noise levels.</p> <p>Improving accessibility for pedestrians and cyclists would reduce conflict with cars and lorries making the environment of urban areas more attractive. Measures to encourage modal shift away from private vehicles and, in particular, to reduce congestion, will improve the visual appearance of areas and reduce pedestrian/cyclist intimidation. However, this may in reality be offset by the predicted increase in demand for private car use in West Yorkshire over the life of the LTP2.</p> <p>The quality of public space invariably features as a key issue for local communities. The LTP2 should show that proposals would not just minimise any adverse impacts but seek to actively enhance the amenity value.</p>
Significance of Effects	The LTP2 will have a minor beneficial effect across West Yorkshire. Although there may be some negative impacts from inappropriate signage and structures, many of the LTP2 policies should generally improve the appearance of public spaces (e.g. ROWIP, reducing congestion and associated environmental impacts).
Other Policies and Programmes	<p>UDps/LDFs – in particular designation of Conservation Areas, listed buildings, etc.</p> <p>National Parks' landscape policies.</p> <p>Landscape Character Areas / Countryside Quality Counts.</p> <p>Areas of Tranquillity</p>
LTP2 Mitigation	Strategic: Yes
	Scheme Specific: Yes
LTP2 Enhancements	Strategic: Yes
	Scheme Specific: Yes

Table K.8: SEA Objective 6: Avoid loss or damage to historic buildings, land, structures, Conservation Areas and archaeological areas or their setting.

Issue	Assessment
Environmental Constraints	<p>The Yorkshire and Humber region has a higher proportion of grade I and II listed buildings at risk than the national average.</p> <p>Difficulty in determining to what extent transport has attributed to the decline in quality of the historic environment.</p> <p>There is currently no indicator to assess the condition of conservation areas or designated historic landscapes.</p>

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Issue	Assessment
Relevant Legislation or Targets	<ul style="list-style-type: none"> • Scheduled monuments • Listed buildings • Register of Parks and Gardens of Special Historic Interest • Historical Battlefields.
Location of Potential Schemes	Identify any proposed schemes likely to affect designated sites or their setting.
Strategic Transport Model	Not relevant
Expert Opinion & General Issues	<p>The impact of transport policy approaches included in the LTP2 are unlikely to have any significant effect at strategic level. Appropriate professional advice should be taken when schemes are planned which have a potential impact on sites or structures of historical significance.</p> <p>For most locations and in particular Conservation Areas, many of the issues regarding lighting and visual street clutter, etc., discussed in the landscape and townscape assessment table will also be relevant.</p> <p>The Plan could have beneficial as well as negative effects. For example, modal shift towards non-motorised forms of transport and other measures aimed at reducing congestion will help to enhance the amenity of historic areas and make sites more accessible for non-car users.</p> <p>As there are a higher than average number of listed buildings on the region's 'at risk' register, more listed buildings may be more vulnerable to cumulative effects of the LTP2.</p>
Significance of Effects	There are uncertainties as to the existence of as yet undiscovered / undesignated features of importance. The extent of any effect on important sites is also dependant upon the implementation of policies or scheme design / location.
Other Policies and Programmes	<ul style="list-style-type: none"> • World Heritage Sites designation. • Local designations / policies (e.g. Conservation Areas). • Listed buildings and scheduled monuments.. • UDPs/LDFs
LTP2 Mitigation	Strategic: Yes
	Scheme Specific: No
LTP2 Enhancements	Strategic: Yes
	Scheme Specific: No

Table K.9: SEA Objective 7: To help protect and enhance habitats and species of local, European or international importance.

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Issue	Assessment
Environmental Constraints	<p>Biodiversity is particularly vulnerable to the cumulative effects of numerous threats or pressures, and the reaction of natural systems is often difficult to predict. The complexity of ecological systems is still not fully understood. Actions which appear insignificant on their own may contribute to significant and occasionally irreversible impacts on ecosystems.</p> <p>A number of sites and species exist in the plan area that are considered to be of strategic importance – these are detailed in the ‘environmental baseline’ section of this report.</p>
Relevant Legislation or Targets	<p>Biodiversity is well covered by a range of legislation at all levels, including:</p> <ul style="list-style-type: none"> • Convention on Biological Diversity. • Bern and Bonn Conventions. • Habitats Directive. • Birds Directive. • Convention on Biological Diversity. • Wildlife and Countryside Act 1981. • CROW Act 2000. • National Parks and Access to the Countryside Act. • Environmental Protection Act. • Conservation (Natural Habitats &c.) Regulations 1994. • Various local level plans and policies.
Location of Potential Schemes	Identify any proposed new build within or very close to designated sites of ecological importance.
Strategic Transport Model	Not relevant
Expert Opinion & General Issues	<p>The LTP2 strategy approaches are considered to have a slight cumulative beneficial effect on biodiversity. Main benefits would come through encouraging modal shift towards public transport and speed restrictions. Opportunities for wildlife improvements could arise through the maintenance programme, (e.g. implementation of SUDS/balancing ponds) and improvements to air quality. Increased low-level lighting can also affect nocturnal animals. However, these benefits may be countered by the expected increase in demand for private travel as a result of other housing and economic development plans in West Yorkshire.</p> <p>The impact of LTP2 schemes could potentially be significant at a strategic level if affecting any sites of strategic biodiversity importance, particularly schemes involving additional landtake. However, most LTP2 schemes are located in less sensitive urban/suburban areas.</p> <p>Impacts will also depend on the cumulative effects of other plans and actions in the areas, the specific area affected, and the timing of works. Impacts may also change throughout the plan lifetime as the biological significance of areas can vary over time. Each scheme should be considered on a case-by-case basis.</p>

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Issue	Assessment
Significance of Effects	Implementation of the LTP2 is likely to have a minor beneficial effect on biodiversity. However, the effect of specific schemes and cumulative effects are uncertain.
Other Policies and Programmes	Biodiversity Action Plans (local and national). District Councils' Environmental Policy or Management Systems. Unitary Development Plans / Local Development Frameworks.
LTP2 Mitigation	Strategic: Yes
	Scheme Specific: Yes
LTP2 Enhancements	Strategic: No
	Scheme Specific: Yes

Table k.10: SEA Objective 8: Reduce the detrimental impact of transport on water quality

Issue	Assessment
Environmental Constraints	Proximity to water-courses (both natural and man-made) Location of land contamination. Designated sites for Biodiversity protection or conservation. Flood risk areas, including Flash floods and winter valley floods.
Relevant Legislation or Targets	The Water Framework Directive require all water courses to reach "good status" by 2015 Close links with Biodiversity Legislation
Location of Potential Schemes	Location of new schemes or corridor treatments relative to above environmental constraints
Strategic Transport Model	Not relevant

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Issue	Assessment
Expert Opinion & General Issues	<p>In general the Water Quality in West Yorkshire continues to improve and transport related incidents are reducing. However, road transport is the most likely mode of transport to affect water quality.</p> <p>The following issues should be considered:-</p> <ul style="list-style-type: none"> • Drainage design and capacity. • Maintenance and cleaning of highway gullies/ adjacent water courses (cross-links with climate change adaptation). • Effects of Winter maintenance and verge management (cross links with climate change adaptation and biodiversity issues) • Routes with high percentage HGV's, or incidence of vehicular casualties/ highway spillage events. • Flooding of the highway due to poor drainage can restrict traffic flow and create localised congestion. • The use of SUDS is well addressed with the TAMP. • Encourage use of SUDS to replace existing drainage systems
Significance of Effects	<p>Generally minor beneficial strategic effect on West Yorkshire's water quality.</p> <p>However, minor opportunities will exist to further reduce potential impacts and enhance local water quality and other indirect environmental effects.</p>
Other Policies and Programmes	RSS and associated Plans, including the River Basin Management Plan. EMAS/ ISO 14001
LTP2 Mitigation	Strategic: No
	Scheme Specific: No
LTP2 Enhancements	Strategic: Yes
	Scheme Specific: Yes

Table K.11: SEA Objective 9: To secure improvements to health

Issue	Assessment
Environmental Constraints	<p>High levels of private car use contribute towards low levels of physical activity amongst people living in the region. However, people's lifestyles are often complex and it is difficult to apportion the amount of physical inactivity directly related to transport modes. Similarly, transport is known to contribute to mental health problems (noise, road rage/ stress, etc), although again this relationship is difficult to quantify.</p> <p>There are also clear cross-links with accessibility, as there are known issues with people finding transport to healthcare, food shops and sporting activities difficult. This may have indirect effects on personal health.</p>
Relevant Legislation or Targets	<ul style="list-style-type: none"> • National Air Quality Strategy, includes health based air quality standards.

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Issue	Assessment
Location of Potential Schemes	Route alignments and gradients can affect the attractiveness of sustainable modes of transport.
Strategic Transport Model	Possible indications from predicted modal shift to non motorised users and public transport
Expert Opinion & General Issues	<p>Many of the strategy approaches to promote sustainable modes and reduce congestion will help improve local air quality and encourage more physical exercise.</p> <p>Measures aimed at encouraging walking and cycling along strategic routes will have a direct impact on improving health.</p> <p>Measures aimed at discouraging private car use, reducing speeds and encouraging the use of public transport may have an indirect impact on health, by creating a safer and more attractive environment, which will further encourage people to walk or cycle.</p> <p>Although improved facilities can be provided for cyclists and pedestrians they are likely to require further measures, such as suitable promotion, to encourage an increase in their use.</p> <p>Several of the measures aimed at reducing congestion should help reduce driver stress & promote health benefits. The increased use of low noise asphalt will reduce noise induced stress for residents on busy/noisy roads & improve their quality of life.</p> <p>Potentially negative effects may occur through policies to provide additional car parking at rail stations, which may encourage some people currently walking or cycling to the stations to drive.</p> <p>Reference to efforts at improving facilities for cyclists / pedestrians at work places but not at public transport interchanges.</p> <p>Cross links exist between increasing the number of people walking and cycling and risk and fear of crime through 'natural policing'.</p> <p>Potential health problems for vulnerable groups associated with exposure when waiting for public transport in extreme conditions.</p>
Significance of Effects	Minor beneficial effect, if policies are carefully implemented and promoted.
Other Policies and Programmes	<ul style="list-style-type: none"> • DfT's 'Walking and Cycling: an action plan'. • National Cycling Strategy. • West Yorkshire Walking Strategy. • District health improvement plans. • District walking and cycling action plans.
LTP2 Mitigation	Strategic: Yes
	Scheme Specific: No
LTP2 Enhancements	Strategic: Yes

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Issue	Assessment
	Scheme Specific: No

Table K.12: SEA Objective 10: Reduce the number of vehicular, pedestrian, and other transport-user casualties

Issue	Assessment
Environmental Constraints	Accommodating the predicted increase in demand for private car use in West Yorkshire may compromise road safety initiatives.
Relevant Legislation or Targets	<p>There are three mandatory targets for the LTP2:</p> <ul style="list-style-type: none"> • 40% reduction in number of people killed or seriously injured (KSI) from the 1994/98 average by 2010. • 50% reduction in children KSI from the 1994/98 average by 2010. • 15% reduction in number of people slightly injured from the 2002/04 average by 2010. <p>There is also a local target of 50% reduction of pedestrians KSI in road traffic collisions from the 1994/98 average by 2010, and stretched to a 30% reduction from the 2002/04 average by 2010.</p>
Location of Potential Schemes	Schemes will target problem areas identified throughout the period of the Plan.
Strategic Transport Model	Not relevant
Expert Opinion & General Issues	<p>Many of the strategy approaches included in the LTP2 focus on reducing dependency on private car use and providing safer strategic routes for pedestrians and cyclists, which if successful will improve the safety of all transport users. Speed management measures should significantly improve safety for all groups, particularly pedestrians and cyclists. However, increasing the number of pedestrians on the streets will inherently increase the risk of an accident – the walking phase of a journey is more dangerous than using public transport or driving.</p> <p>At current levels, cycling remains a relatively less safe mode of transport and there is a risk that policies intended to encourage cycling could, at least initially, result in an increase of accidents. Measures to encourage cycling should therefore be accompanied by suitable safe provision for cyclists to reduce the actual and perceived risk of travel by this mode.</p> <p>Cross link with objective to use materials effectively and minimise waste. Road stone is in limited supply. Recycling of road materials into highway surfacing works in the maintenance programme indirectly improves skid resistance by freeing up more good quality road stone for the top surface over longer stretches.</p> <p>Low noise surfacing reduces spray and therefore lowers the risk of accidents at speed, however skid resistance is lower when newly laid. Measures to reduce/eliminate this problem are currently under investigation.</p> <p>Proposed investment in raised bus stops will also help to reduce pedestrian casualties. Falls from buses are significant in the West Yorkshire casualty statistics.</p>
Significance of Effects	<p>Major beneficial effect. Safer Roads are an LTP2 shared priority and much emphasis placed on improving safety for transport-users).</p> <p>There are only minor opportunities for enhancement because this topic is already well covered by LTP2 policies.</p>

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Issue	Assessment
Other Policies and Programmes	<ul style="list-style-type: none"> • Transport 10-year plan. • DfT's 'Walking and Cycling: an action plan'. • National Cycling Strategy. • West Yorkshire Walking Strategy. • West Yorkshire Road Safety Strategy. • District's walking/cycling action plans (where applicable).
LTP2 Mitigation	Strategic: Yes
	Scheme Specific: Yes
LTP2 Enhancements	Strategic: Yes
	Scheme Specific: No

Table K.13: SEA Objective 11: Reduce the risk and fear of crime for pedestrians and public transport users

Issue	Assessment
Environmental Constraints	Causes of the risk and fear of crime are more widely embedded in society than can be tackled through the LTP2. Some opportunities exist however for the LTP2 to improve the perception of risk and to reduce opportunities for crime and anti-social behaviour on the transport network.
Relevant Legislation or Targets	CCTV cameras are included in the LTP2 as a background indicator. No targets are set, but the desired movement is for an increase in cameras at car parks, rail and bus stations and town/centre streets.
Location of Potential Schemes	Not relevant
Strategic Transport Model	Possible use of modal shift data towards public transport and non motorised users.

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Issue	Assessment				
Expert Opinion & General Issues	<p>If School buses gain modal shift from pupils that previously walked to school, risk and fear of crime may increase through the reduction of “natural policing” on their previous routes.</p> <p>Measures for restricting parking may lead to concerns for vulnerable groups, e.g. those working unsociable hours.</p> <p>“Stranger danger” particularly with children is over perceived and may act against other measures to encourage more physical activity or use of public transport/school buses.</p> <p>Using vehicle recognition systems to remove illegal vehicles from the network will have direct and indirect benefits as illegal car users are often found to be involved in many other crimes / illegal activity.</p> <p>Research undertaken for DfT showed that bus users felt that CCTV was the most reassuring measure to reduce fear of crime, and that 11.5% more journeys would be made on public transport if passengers felt they were more secure.</p> <p>There is reference within the Bus Strategy to taking action to reduce the fear of crime for public transport users. But there does not appear to be any reference to measures aimed at helping to reduce crime itself.</p> <p>Rights of Way Improvement Plans (ROWIP) will improve lighting and open up paths / bridleways for non-motorised transport users.</p>				
Significance of Effects	<p>The LTP2 will have a moderate beneficial effect. (personal safety and fear of crime are being addressed in the LTP2 through CCTV schemes, awareness campaigns and improved public rights of ways) and the METRO bus strategy.</p> <p>There may be minor opportunities for enhancement.</p>				
Other Policies and Programmes					
LTP2 Mitigation	<table border="0" style="width: 100%;"> <tr> <td style="width: 70%;">Strategic:</td> <td style="text-align: center;">No</td> </tr> <tr> <td>Scheme Specific:</td> <td style="text-align: center;">No</td> </tr> </table>	Strategic:	No	Scheme Specific:	No
Strategic:	No				
Scheme Specific:	No				
LTP2 Enhancements	<table border="0" style="width: 100%;"> <tr> <td style="width: 70%;">Strategic:</td> <td style="text-align: center;">Yes</td> </tr> <tr> <td>Scheme Specific:</td> <td style="text-align: center;">Yes</td> </tr> </table>	Strategic:	Yes	Scheme Specific:	Yes
Strategic:	Yes				
Scheme Specific:	Yes				

Table K.14: SEA Objective 12: Reduce community severance and fragmentation to aid community cohesion

Issue	Assessment
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Issue	Assessment
Environmental Constraints	<p>The LTP2 Accessibility Strategy has identified a number of issues in West Yorkshire that contribute to severance and barriers to travel within communities. These include</p> <ul style="list-style-type: none"> • rural deprivation and isolation from jobs and services; • limited travel horizons within disadvantaged communities; • cost of public transport; • closure of local services; • inadequacy of pedestrian and cycle access to local services; • concerns over crime and road safety.
Relevant Legislation or Targets	
Location of Potential Schemes	Road safety schemes and crossing facilities may have localised improvements to severance through reduced fear of crossing the road.
Strategic Transport Model	Irrelevant
Expert Opinion & General Issues	<p>Generally positive but insignificant. Some cross linking with improving accessibility and safer roads.</p> <p>Traffic flows would need to reduce by around 30% for a noticeable reduction in severance to occur.</p> <p>Localised improvements through improved crossing facilities.</p> <p>Non-motorised user (NMF) schemes can have a reasonable impact at local level.</p> <p>The experimental trials undertaken by Leeds UTC looking at reducing pedestrian delay at mid-block crossings (described in section 3.1.2 of the Environmental Report) could improve severance if implemented across the sub-region.</p> <p>Promotion of Home Zones and 20mph zones will help to improve community cohesion, but are unlikely to have a strategic-level effect.</p> <p>Most schemes result in better and safer facilities for all non motorised users.</p> <p>Improving provision for non-motorised transport users in both urban and rural areas may reduce severance issues.</p>
Significance of Effects	Localised improvements for new /improved crossing facilities and road safety schemes, but minor benefits regionally.
Other Policies and Programmes	West Yorkshire Road Safety Strategy
LTP2 Mitigation	Strategic: No
	Scheme Specific: No
LTP2 Enhancements	Strategic: No

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Issue	Assessment
	Scheme Specific: Yes

Table K.15: SEA Objective 13: Improve access to education, jobs, leisure (including sustainable tourism), community services and the countryside

Issue	Assessment
Environmental Constraints	There are difficulties in being able to introduce a feasible public transport system into rural and other less accessible areas – public transport works best where there are large population densities and strong demand to major destinations.
Relevant Legislation or Targets	Countryside and Rights of Way Act. Walking and Cycling Action Plan LTP2 mandatory targets including:- Travel Times, Bus Punctuality, Bus Satisfaction etc.
Location of Potential Schemes	Road safety schemes and crossing facilities may have localised improvements to access through reduced fear of crossing the road. Schemes aimed at reducing fear will improve Access.
Strategic Transport Model	Irrelevant
Expert Opinion & General Issues	Generally positive but small strategically. Some cross links with improving community cohesion. Localised improvements through improved crossing facilities. The Action Plan for the Accessibility Strategy has not yet been produced and therefore information in the LTP2 is limited with regard to how accessibility objectives are to be realised. Enhancements to public transport routes should improve access generally for non-car users. Maintenance can have improvements built in through better specifications such as Bus Station refurbishment schemes. Commuter belt villages such as those in rural West Yorkshire often become dominated by cars as people living there commute into towns/cities. Rural roads are often unsuitable for high volumes of traffic, and problems can arise with regard to pedestrian/cyclist safety, social exclusion of non-car users and the deterioration in the sense of community. Rural public transport provision is an important element of accessibility. It is not clear how the LTP2 intends to improve the provision of public transport for otherwise socially excluded groups, particularly in rural areas. This should however be incorporated into the Accessibility Action Plan when it is produced. LTP2 proposals to improve surface access to Leeds Bradford International Airport
Significance of Effects	Uncertain benefits. The Accessibility Action Plan is still not published resulting in a lack of clarity of the measures to be adopted within the LTP2. An improvement on public transport generally increases accessibility for users. But much depends on whether the routes coincide with the desired destinations.

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Issue	Assessment
Other Policies and Programmes	Aviation White Paper – supports better public transport and road links to LBIA. West Yorkshire Access Strategy West Yorkshire Road Safety Strategy Yorkshire and Humber Assembly “Strategic Rural Transport Framework” (November 2005)
LTP2 Mitigation	Strategic: No
	Scheme Specific: No
LTP2 Enhancements	Strategic: Yes
	Scheme Specific: Yes

Table K.16: SEA Objective 14: To support employment, economic competitiveness and the revival of priority regeneration areas.

Issue	Assessment
Environmental Constraints	Potential conflicts between the impacts of economic growth and the need to protect the environment.
Relevant Legislation or Targets	No specifically transport-related targets are set for economic growth, although the LTP2 will support such targets set out in other plans included in the regional strategic framework.
Location of Potential Schemes	Increased LTP2 provision targeted at West Yorkshire Regeneration Areas.
Strategic Transport Model	Outputs reflect the general predicted increases in desire to travel including specific targeted for major economic regeneration,
Expert Opinion & General Issues	Strengthening of bridges and other highway constraints can improve access to commercial premises. Some cross links to improving air quality Safer roads and resultant decrease in casualties will reduce costs to employers and to the economy as a whole. Reduced congestion will benefit freight movements to commercial premises and allow people to be economically active As economic growth leads to increased demand for travel, suitable transport planning is required to reduce as much as possible the environmental impact of that demand. Development of Leeds Bradford International Airport could lead to net income to the region through business travel or net outgoing due to increase in holiday/ leisure market.
Significance of Effects	Uncertain measurable benefits due to the complex relationship between transport provision and other requirements of businesses. Strategy approaches will not have a significant effect, but specific major schemes likely to play an important role in supporting other housing and commercial developments.

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Issue	Assessment
Other Policies and Programmes	RSS on economic development of West Yorkshire Regional Economic Strategy - emphasises importance of transport to the future success of the region. Aviation White Paper - supports better public transport and road links to LBIA Energy White Paper - promoting sustainable economic growth. West Yorkshire Investment Plan
LTP2 Mitigation	Strategic: No
	Scheme Specific: Yes
LTP2 Enhancements	Strategic: Yes
	Scheme Specific: No

Table K.17: SEA Objective 15: To protect and retain soil quality

Issue	Assessment
Environmental Constraints	Agricultural Land Classifications, Grade 2 highest quality in West Yorkshire, restricted to small area in east of West Yorkshire. Potential erosion vulnerability of soils (Pennine Moors most at risk) Location of known land contamination.
Relevant Legislation or Targets	Environmental Protection Act (Part II), refers to waste on land Environment Act (Part II), refers to contaminated land
Location of Potential Schemes	Location of new schemes regarding land-take and effects of constraints above. Asset Management issues for existing network, involving application of salt/grit and pesticides.
Strategic Transport Model	Not relevant
Expert Opinion & General Issues	There are close links with water quality, as any highway flooding or accidental spillage, can contaminate and reduce soil quality. Highway maintenance and verge management issues relating to application and quantity of grit/ salt and pesticides. Possible contamination or acidification of roadside soil, resulting from vehicle emissions. Depending on location of individual schemes there will be scope to treat or remove existing contaminated land Highway design issues relating to construction should:- <ul style="list-style-type: none"> • Minimise land-take and balance use of soil/ fill material • Avoid soil compaction and site contamination.

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Issue	Assessment	
Significance of Effects	Generally a minor adverse effect on West Yorkshire's soil quality from new schemes. As for water quality, minor opportunities for enhancement exist through improved practices.	
Other Policies and Programmes	RSS and associated Plans, for example the Leeds Countryside Strategy Contaminated Land Regime	
LTP2 Mitigation	Strategic:	Yes
	Scheme Specific:	No
LTP2 Enhancements	Strategic:	Yes
	Scheme Specific:	Yes

Table K.18: SEA Objective 16: Maximise the efficient and effective use of materials and minimise the amount of waste generated

Issue	Assessment
Environmental Constraints	Reduced usage of National Resources e.g. Road stone chippings Limestone hardcore Stone Sets / kerbs Reduced need for quarrying and transport of materials.
Relevant Legislation or Targets	EMAS / ISO 14001 Waste Strategy and need to reduce waste to landfill.
Location of Potential Schemes	Not relevant.
Strategic Transport Model	Not relevant
Expert Opinion & General Issues	Ensure that the recycling of materials is effectively promoted and occurs wherever practicable. <ul style="list-style-type: none"> • Re-use of road/footway planings for base courses reduces need for high quality wearing course road chippings. Cross links to safer roads objective by allowing higher grade materials to be used as wearing course and use of low noise surfacing. • Additional premium costs of recycling materials should be offset against disposal costs • Quality of final product, regarding safety and durability needs addressing Cross links between re-use and recycling of materials and the protection of soil and water quality through reduced need for landfill and quarrying. Strategy approaches regarding new schemes and maintenance of infrastructure will indicate demand for future use of materials.

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Issue	Assessment
Significance of Effects	Generally minor beneficial effect. Further minor enhancements can be gained, but need to further promote the benefits of using of recycled highway/footway materials.
Other Policies and Programmes	RSS on waste. District approach to waste management and recycling. EMAS ISO 14001
LTP2 Mitigation	Strategic: No
	Scheme Specific: No
LTP2 Enhancements	Strategic: Yes
	Scheme Specific: Yes

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MITIGATION AND ENHANCEMENT TABLES

Table K.19: SEA Objective 1: To reduce transport-related impacts on local/regional noise climate.

ISSUES	MITIGATION		ENHANCEMENT	
	Strategic Measures	Scheme Specific	Strategic Measures	Scheme specific
<p>The LTP2 will generally have MINOR BENEFICIAL effect on the noise climate across West Yorkshire. But without the use of regional noise mapping any changes in noise climate are difficult to quantify.</p> <p>There are MINOR opportunities to mitigate transport noise impacts and enhance the noise climate.</p> <p>Noise mitigation & enhancement measures will create a perceptible change in local noise climate. The cumulative effects beyond the lifetime of LTP2, may create further beneficial effects on the strategic noise climate.</p>	<p>The Transport Emissions Working Group propose to develop a Noise Mapping model for West Yorkshire.</p> <p>Use noise modelling to highlight the worst affected areas, regarding noise exposure and population density.</p> <p>Develop a Road Surfacing Policy to ensure the most effective use of “low noise” surfacing.</p>	<p>Use of Urban Traffic Management Control (UTMC) to help smooth flows.</p> <p>Use of Speed Management in noise sensitive areas.</p> <p>Appropriate Traffic Calming, or 20mph Zones to restrict “rat-runs” and associated noise nuisance</p> <p>As a last resort, ensure effective Implementation of the Noise Insulation Regulations for new and improved highways, i.e. Provision of acoustic insulation within dwellings.</p>	<p>Use of Noise Mapping model to appraise scheme specific noise mitigation measures, ie. “What If” scenarios and prioritise resurfacing works.</p> <p>Appropriate use road surfacing policy and use of “Low Noise” asphalt for worst affected areas. L10(18hour) noise reductions up to 5dB(A) can be achieved, equivalent to a 70% reduction in traffic flow.</p> <p>Use of UTMC for smoothing traffic flows and speed management in sensitive areas can create a noticeable noise reduction.</p>	<p>Highway Design to consider appropriate use of :-</p> <p>Roadside barriers, earth mounds, living barriers or cuttings as effective noise screening.</p> <p>Use of Variable Message Signs, Speed Reactive Signs, or Speed Cameras to calm traffic flows in noise sensitive areas.</p> <p>Enhance noise planning conditions at Leeds/Bradford International Airport</p>

Table K.20: SEA Objective 2: Improve local/regional air quality and mitigate transport-related AQMA's

ISSUES	MITIGATION		ENHANCEMENT	
	Strategic Measures	Scheme Specific	Strategic Measures	Scheme specific
<p>The LTP2 will have a MINOR beneficial effect on reducing emissions of NOx and PM10 across West Yorkshire.</p> <p>MODERATE opportunities exist for improvements in air quality.</p> <p>Greater benefits are expected within urban centres, where most of the AQMA/AOC exist.</p> <p>The most significant emission reductions expected between 2006-2011 will result from Vehicle Fleet Improvements.</p> <p>Caution: A 27% reduction in NOx emissions between 2000 and 2004 were predicted for West Yorkshire's principal road network. However monitored data indicated that reductions in NO₂ concentrations have been much lower.</p>	<p>LTP2 measures to reduce vehicle emissions and improve local air quality are based on 3 general themes (see appendix D of LTP2):-</p> <p>Demand Management</p> <p>Encourage More Sustainable Travel</p> <p>Actions to Reduce Vehicle Emissions</p> <p>Additional air quality improvements could be gained by developing stronger Demand Management measures. Such measures would help promote further modal shift away from the private car and help restrain & counteract the environmental effects of Economic growth within the West Yorkshire sub-region.</p> <p>Transport planners should try to integrate each District's Air Quality Action Plan (AQAP) into LTP2 as they are published.</p>	<p>Where proposed schemes/Corridor treatments are likely to be located adjacent to AQMA's/AOC, the following mitigation issues should be considered:-</p> <p>Where possible, avoid congestion, or slow moving traffic that maybe induced by UTMC demand management/ priority measures.</p> <p>Where possible, re-locate queues outside region of air quality constraint.</p> <p>Avoid locating queues in contained locations e.g. Street canyons, where dispersion of traffic emissions is poor.</p>	<p>Transport planners should ensure that they work closely with the district's air quality specialists to secure the most cost effective measures contained within the LTP2 are incorporated where practicable within LTP2 schemes.</p> <p>The Transport Emissions Working Group should develop a much closer working relationship, or partnership with the Highway Agency, to discuss:-</p> <ul style="list-style-type: none"> • Measures to mitigate Strategic road network AQMA's /AOC. • Work with Highway Agency on their motorway proposals for SWYMBUS and RMS. • Consider effects these proposals may have the West Yorkshire local road network. <p>Continue partnership working with Leeds University, Institute of Transport Studies, to help better understand the effects of atmospheric chemistry and use of "Instrumented Vehicles" for emissions monitoring of UTMC measures.</p> <p>Develop Air Quality initiatives within new Quality Bus Partnerships, especially for sensitive routes.</p> <p>Engage with appropriate UK & EU Air Quality Research projects, e.g Intergaire, LANTERN & FUTURES.</p>	<p>Work with Highway Agency to investigate possible mitigation of specific AQMA's & AOC's, adjacent to a strategic highway.</p>

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Table K.21: SEA Objective 3: Reduce transport-related emissions of greenhouse gases

ISSUES	MITIGATION		ENHANCEMENT	
	Strategic Measures	Scheme Specific	Strategic Measures	Scheme specific
<p>The LTP2 will have a MINOR BENEFICIAL effect on helping to reduce greenhouse gas emissions.</p> <p>During LTP2 there are MAJOR opportunities for improvement to further reduce transport CO2 emissions.</p> <p>The STM predicts the LTP2 is likely to reduce the net CO2 emissions by approx. 3% below the do minimum situation in 2011 across West Yorkshire.</p> <p>Caution: In order to achieve the more aspirational CO2 targets and avoid serious climate change, much stronger transport demand management needs to be implemented within the LTP2.</p> <p>Conflict exists between regional / sub regional economic growth & GHG emissions.</p>	<p>The LTP2 strategic measures to reduce West Yorkshire wide vehicle emissions of CO2, are consistent to those for air quality mitigation.</p> <p>These include:-</p> <ul style="list-style-type: none"> • Demand management • Encourage sustainable travel • Technical/practical action to reduce emissions <p>(Examples shown in appendix LTP2).</p> <p>The LTP2 should make greater use of potent demand management to encourage significant modal shift away from the private car. However, a balanced strategy approach must provide a substantial improvement in public transport , including alternatives, efficiency and capacity, before introduction of strong demand management, e.g. appropriate use of fiscal / charging mechanisms.</p>	<p>Not relevant to specific schemes, as local CO2 emissions and associated concentrations do not affect local environment.</p> <p>The important issue for CO2 / GHG being the cumulative net change in West Yorkshire emissions, and their subsequent affect on regional & global climate change.</p>	<p>Encourage use of renewable fuels for general road transport and district vehicle fleets, including:-</p> <ul style="list-style-type: none"> • Bio-diesel • Biogas <p>Encourage use of low carbon vehicles:</p> <ul style="list-style-type: none"> • Hybrids • Use Common Rail • Diesels • Electric, using Green • Electricity • Fuel cell technology <p>Use of UTMC to smooth flows and discourage aggressive driving.</p> <p>Use of both stronger demand management, or greater use of “Smart Choices” to reduce travel demand and promote modal shift.</p> <p>Need for “lifestyle” changes in personal travel behaviour, for all journeys.</p>	<p>Not relevant, as explained for mitigation by schemes.</p>

Table K.22: SEA Objective 4: Improve the Ability of Transport to Adapt to Climate Change

ISSUES	MITIGATION		ENHANCEMENT	
	Strategic Measures	Scheme Specific	Strategic Measures	Scheme specific
<p>The LTP2 will have a MINOR / MODERATE beneficial effect on Climate Change Adaptation.</p> <p>There are MODERATE opportunities for improvement of the LTP2 ability to adapt against Climate Change</p> <p>Despite increasing budget resources, adaptation measures will prove increasingly cost-effective as Climate Change progresses</p> <p>The LTP2 will not be significantly affected by climate change. However, as climate change progresses, it is important that adaptation measures are incorporated.</p>	<p>Ensure Strategy Approaches/ Corridor Treatments are aware of EA Flood Risk Areas. If unavoidable there is a need for inclusion of relevant SUDS.</p> <p>Ensure closer working with Planning Development Control & Environment Agency to reduce risk of flooding on transport infrastructure.</p> <p>Establish the most cost-effective measures from those introduced within the Effective Asset Management section of the LTP2 (see assessment table) and establish priority actions.</p> <p>METRO to encourage Bus & Train operators to improve thermal comfort for passengers in transit.</p> <p>METRO & public transport operators should consider appropriate adaptation for passenger waiting facilities.</p>	<p>Consider vulnerability of each scheme to future climate change effects.</p>	<p>Include provision for on-going dissemination of advice / actions from District climate change working groups throughout LTP2 period. Examples of such may include:-</p> <ul style="list-style-type: none"> • Adapt horticultural maintenance/ tree or shrub species for longer growing seasons & increased drought resistance. • Emergency Response measures to help mitigate impacts of flooding, e.g. partnership working with WY Fire and Rescue Services & the Environment Agency. • Consider use of Woodland planting for highway shelter belts. • Adapt highway design for increased incidence of summer drought & resultant subsidence. 	<p>Consider adaptation opportunities for enhancement for each scheme</p>

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Table K.23: SEA Objective 5: To protect and enhance landscape and townscape diversity

ISSUES	MITIGATION		ENHANCEMENT	
	Strategic Measures	Scheme Specific	Strategic Measures	Scheme specific
<p>The policies within the LTP2 will have MINOR BENEFICIAL effects.</p> <p>Potential MINOR BENEFICIAL opportunities through further Mitigation and enhancement opportunities</p> <p>Light pollution is an issue of concern in West Yorkshire, and can be improved through LTP policies.</p> <p>Other impacts considered to have little effect, but individual assessment of schemes in important areas may be required.</p>	<p>Some generic mitigation measures could be introduced to reduce potential negative effects, including:</p> <ul style="list-style-type: none"> • Introduce more low-level directional lighting. • Use of materials that complement the landscape character features of the area. • Avoid over-engineering of schemes such as bus priority/guided bus ways. • Avoid unnecessary signposts for new signs – e.g. consider mounting signs to buildings. 	<p>Ensure schemes design in beneficial features that are sympathetic to the local environment and important landscape / townscape features.</p> <p>Reduce unnecessary signage, street furniture and road markings.</p>	<p>Highway lighting and maintenance programmes should address the issue of light pollution and sky glow.</p> <p>Where possible old lighting stock should be replaced with more directional high pressure sodium lighting. Particular importance should be given to urban fringe / rural areas where light pollution is most noticeable.</p>	<p>Look for opportunities to include measures suggested in specific scheme mitigation as part of maintenance programmes.</p>

Table K.24: SEA Objective 6: Avoid loss and damage to historic buildings, land, structures, Conservation Areas and archaeological areas or their setting

ISSUES	MITIGATION		ENHANCEMENT	
	Strategic Measures	Scheme Specific	Strategic Measures	Scheme specific
<p>The effect of the LTP2 is UNCERTAIN</p> <p>There will be MINOR opportunities for enhancement</p>	<p>Transport Planners should refer to the English Heritage Policy Statement “Transport and the Historic Environment” (see Appendix 5 of the Environmental Report) early in the feasibility / design process.</p> <p>Impacts will be very site specific – where schemes are planned that may affect important sites, further advice should be sought from the West Yorkshire Archaeological Advisory Service, English Heritage and the relevant District’s Conservation Officer.</p>		<p>Any schemes in Conservation Areas or other areas of historical importance should design in beneficial features to be sympathetic to the local environment, or reduce unnecessary signage, street furniture, etc.</p>	

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Table K.25: SEA Objective 7: To help protect and enhance habitats and species of local, European or international importance

ISSUES	MITIGATION		ENHANCEMENT	
	Strategic Measures	Scheme Specific	Strategic Measures	Scheme specific
<p>LTP2 policies likely to have a MINOR BENEFICIAL effect on biodiversity.</p> <p>There are MINOR OPPORTUNITIES for enhancement.</p> <p><u>Schemes</u>: Potentially significant if affecting important habitats/species, particularly through cumulative impacts.</p> <p>High levels of uncertainty in assessment of biodiversity effects result from lack of detailed scheme information.</p>	<p>Any proposed LTP2 schemes likely to pass through or close to, designated sites of biodiversity importance should be considered in more detail.</p> <p>Advice should be sought from a relevant biodiversity expert as to how negative effects could be avoided, or mitigated.</p> <p>Specialist advice should also be focused on Local / District Biodiversity Action Plans.</p>	<p>Biodiversity improvements can be incorporated into maintenance schedules and for schemes that may adversely affect wildlife, with little or no extra cost.</p> <p>Transport planners and scheme designers are referred to Appendix 6 of the Environmental Report for examples of how such measures could be incorporated into the LTP2.</p>	<p>If further advice is required, officers from the West Yorkshire Biodiversity Action Forum or District Conservation Officers, should be consulted.</p>	<p>Some enhancement to local habitats can gained by incorporating some of the measures listed in Appendix 6 into maintenance schedules and other schemes again.</p> <p>If further advice is required, officers from the West Yorkshire Biodiversity Action Forum or District biodiversity officers will be able to offer further advice.</p>

Table K.26: SEA Objective 8: Reduce the detrimental impact of transport on water quality

ISSUES	MITIGATION		ENHANCEMENT	
	Strategic Measures	Scheme Specific	Strategic Measures	Scheme specific
<p>The LTP2 will have MINOR BENEFICIAL effects.</p> <p>The measures incorporated in the LTP2 are well suited to meet the objective. However the measures are not likely to be sufficient to make widespread improvements.</p> <p>The opportunity for further MINOR BENEFICIAL enhancements exist through wider implementation to areas over and above new LTP2 schemes.</p> <p>The scale of the LTP2 schemes and policies will not have a significant effect on West Yorkshire's water quality at a strategic level..</p>			<p>Consider adopting enhanced gritting procedures to ensure more efficient use of salt to reduce contamination of highway runoff.</p> <p>Seek to replace existing drainage with SUDS. District Drainage Sections to advise on most appropriate systems and locations.</p> <p>Research improved verge management practice.</p>	<p>Highway design/ scheme specific mitigation, especially where sited close to environmental constraints, including:</p> <ul style="list-style-type: none"> • Drainage interceptors/ storm tanks. • Improvements to gully cleaning in areas prone to highway flooding.

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Table K.27: SEA Objective 9: To secure improvements to health

ISSUES	MITIGATION		ENHANCEMENT	
	Strategic Measures	Scheme Specific	Strategic Measures	Scheme specific
<p>The LTP2:will have MODERATE BENEFICIAL impacts if the desired outcomes are achieved</p> <p>There are MINOR opportunities for enhancement.</p>	<p>Particular efforts should be made to ensure that improvements to walking and cycling routes are linked to a strategic network, ensuring a safe journey for users from start point to destination.</p> <p>Where junction improvements are planned to ease congestion, scheme designers should take account of the road user hierarchy to avoid compromising the safety of pedestrians and cyclists.</p>		<p>Ensure encouragement to use public transport is targeted primarily towards those using private transport and not existing non-motorised transport users.</p> <p>Investigate development of improved facilities for cyclists at rail / bus stations as well as work places.</p> <p>Continue the promotion of the health benefits of cycling and walking through TravelWise and Smarter Travel Choice units.</p>	<p>Use of Low Noise surfacing will help reduce local noise levels & potential stress induced health problems.</p> <p>Improve Public Transport information & waiting facilities, to reduce exposure of vulnerable groups to extreme conditions. Eg. Improved Shelters.</p>

Table K.28: SEA Objective 10: Reduce the number of vehicular, pedestrian and other transport-user casualties

ISSUES	MITIGATION		ENHANCEMENT	
	Strategic Measures	Scheme Specific	Strategic Measures	Scheme specific
<p>There are MAJOR BENEFICIAL effects of the LTP2</p> <p>The opportunities for enhancement are MINOR</p>	<p>Counter the increased risk to the increased numbers of pedestrians on the street by improving pedestrian links to public transport and creating safer routes to school and play for children.</p>	<p>Junction and other highway improvements should take account of the road user hierarchy in their design.</p> <p>Introduce measures to provide pedestrians and cyclists with safe and convenient ways of making journeys. Scheme designers should contact the relevant District's Cycling Officer for further advice.</p>	<p>Measures to encourage more cycling and walking should be accompanied by suitable, safe provision for cyclists to reduce the actual and perceived risk of travelling by these modes.</p>	

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Table K.29: SEA Objective 11: Reduce the risk and fear of crime for pedestrians and public transport users

ISSUES	MITIGATION		ENHANCEMENT	
	Strategic Measures	Scheme Specific	Strategic Measures	Scheme specific
<p>There are MODERATE BENEFICIAL effects of the LTP2</p> <p>The opportunities for enhancement are MINOR</p>			<p>Investigate methods of improving conditions for those who work unsociable hours.</p> <p>Partnerships with transport operators, police, community groups, etc. should look to reduce incidence of crime as well as the fear of crime.</p> <p>Benefits may be gained from highlighting the low risk of attacks and the negative physical and social effects of preventing children from interacting through walking and using public transport.</p> <p>Investigate the inclusion of 'stranger danger' in education and awareness campaigns particularly for parents.</p>	<p>Consider increasing CCTV coverage in off-road car parks and on streets where necessary.</p>

Table K.30: SEA Objective 12: Reduce community severance and fragmentation to aid community cohesion

ISSUES	MITIGATION		ENHANCEMENT	
	Strategic Measures	Scheme Specific	Strategic Measures	Scheme specific
<p>There are MINOR BENEFICIAL effects of the LTP2</p> <p>The opportunities for enhancement are MINOR</p>				<p>Ensure that the road user hierarchy is considered when designing new or altered crossing facilities and road safety schemes, to provide easier and safer crossing for pedestrians.</p>

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Table K.31: SEA Objective 13: Improve access to education, jobs, leisure, community services and the countryside

ISSUES	MITIGATION		ENHANCEMENT	
	Strategic Measures	Scheme Specific	Strategic Measures	Scheme specific
<p>Although LTP2 measures are generally positive, the degree of benefit will be UNCERTAIN at a strategic level.</p> <p>There appear to be MODERATE opportunities</p>			<p>Ensure that improved public transport routes coincide with desired destinations for passengers and aim to synchronise rural services with mainline public transport wherever possible.</p> <p>Investigate the opportunities of Increasing bus services in rural areas at times suitable for working commuters.</p> <p>METRO need to ensure suitable links between the LTP2 and Bus strategies exist with the Rural Transport Partnership.</p>	<p>Investigate the possibility of trialling rural transport initiatives targeted particularly to areas where the need is greatest.e.g. Bookable shared taxis</p>

Table K.32: SEA Objective 14: To support employment, economic competitiveness and the revival of priority regeneration areas

ISSUES	MITIGATION		ENHANCEMENT	
	Strategic Measures	Scheme Specific	Strategic Measures	Scheme specific
<p>The impacts of the LTP2 will be UNCERTAIN but it is likely to be beneficial to some degree.</p> <p>Reducing congestion would lead to less time lost to businesses through traffic jams and delays. There are MINOR opportunities for enhancement.</p>		<p>Access issues will need to be considered (e.g. including non motorised user access in development of highways).</p>	<p>Improving non-car options can reduce barriers in accessing job opportunities, particularly for some socially excluded groups without access to a car.</p> <p>Investigate the opportunities of Increasing bus services in rural areas at times suitable for working commuters.</p>	

Table K.33: SEA Objective 15: To protect and retain soil

ISSUES	MITIGATION		ENHANCEMENT	
	Strategic Measures	Scheme Specific	Strategic Measures	Scheme specific
<p>The impact of the LTP2 will be MINOR ADVERSE due to the small amount of new build schemes proposed.</p> <p>There may be MINOR opportunities to enhance soil quality across West Yorkshire.</p>	<p>Develop measures to mitigate potential soil impacts caused during highway construction and maintenance activities</p> <p>Encourage use of Sustainable Drainage systems, which will mitigate flooding incidents and associated risk of soil contamination.</p>		<p>Raise awareness of potential effects caused by winter maintenance and use of pesticides and enhance procedures where practicable.</p>	<p>If best practice is followed during scheme construction, any existing contaminated land can be improved or removed.</p>

Table K.34: SEA Objective 16: Maximise the efficient and effective use of materials and minimise the amount of waste generated

ISSUES	MITIGATION		ENHANCEMENT	
	Strategic Measures	Scheme Specific	Strategic Measures	Scheme specific
<p>There will be MINOR BENEFICIAL impacts from the LTP2.</p> <p>There is further MINOR opportunities for enhancement</p>			<p>Promote the re-use or recycling of highway materials.</p>	<p>Look for opportunities to contribute to the enhancement of conservation areas through the re-use of stone sets and kerbs etc.</p>

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