

**Somerset County Council Local Transport Plan SEA:  
Approach to Significance**

**by Emma James**

**UPR SE/097/04  
Client Reference Number TL003830**

**UNPUBLISHED PROJECT REPORT**

**TRL Limited**



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**SOMERSET COUNTY COUNCIL LOCAL TRANSPORT PLAN SEA:  
APPROACH TO SIGNIFICANCE**

Version: Final

by **Emma James**

**Prepared for: Project Record:      Client Reference Number TL003830**  
**Somerset County Council (Mike O Dowd Jones)**

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<b>Approvals</b>	
<b>Project Manager</b>	<b>Emma James</b>
<b>Quality Reviewed</b>	<b>Chris Fry</b>

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## 1 Introduction

This report has been written by TRL on behalf of Somerset County Council. TRL were commissioned by Somerset County Council in August 2004 to undertake research on significance assessment and provide Somerset County Council with a method they could use to judge the significance of environmental effects arising from their LTP. A literature review report (James and Tomlinson, 2004) was published and is available via [www.sea-info.net](http://www.sea-info.net). This report constitutes the second deliverable of the project, the significance assessment system.

Section 2 onwards provides text that Somerset County Council can use directly within their environmental report and other reports on the SEA process.

Significance is an issue which has not always been addressed well within environmental assessment in the past and there is little guidance available to practitioners. This method is an early attempt to define what an assessment system for significance should include. This method (and others) will be further refined as they are used and the expertise of the SEA community in the UK (and overseas) develops. It is hoped that over the next few years other practitioners will develop alternative methods and a dialogue can begin over exactly what attributes a significance system should have. In order to aid this dialogue TRL would welcome feedback on this report from any interested parties. Feedback should be directed to Emma James 01344 770192 [ejames@trl.co.uk](mailto:ejames@trl.co.uk).

## 2 What is significance?

The SEA regulations<sup>1</sup> require that the significant environmental effects of a plan or programme are identified, described and evaluated. The likely significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage and landscape need to be reported as do the interrelationships between them.

The assessment of significance is well established within environmental assessment. With project EIA, significance is first assessed at the scoping stage. At this stage all likely effects are given a cursory examination and only those deemed to be significant are examined in full detail in the Environmental Statement.

SEA is different to EIA in that at there is more uncertainty regarding the effects of the plan or programme in relation to the potential alternative strategies. Therefore, for SEA it is not always possible to examine the potential significance of the impacts of the strategy during scoping. Scoping is more associated with identifying the valued environmental resources of the area and establishing objectives.

To ensure rigorous examination of environmental effects the following two stage process has been adopted for impact identification and assessment of significance for the Somerset LTP SEA:

- As the LTP alternative strategies are developed, all potential impacts have been identified through the SEA and consultation with statutory bodies;
- An impact assessment system comprising significance criteria has been used to score these impacts according to their significance. This assessment helps to prioritise action on mitigation and monitoring. This system has been developed after a review of best practice on significance assessment in the UK and overseas.

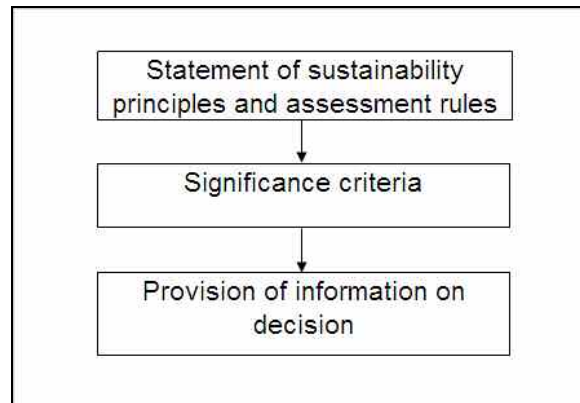
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<sup>1</sup> *Environmental Assessment of Plans and Programmes Regulations Statutory Instrument 2004 No. 1633.*

The second stage of the process is explained in detail in the next section.

### 3 Significance assessment for the Somerset LTP SEA

The Somerset LTP SEA impact assessment system has three sub-stages as shown in Figure 1



**Figure 1: Suggested significance framework for the Somerset LTP SEA**

#### 3.1 Statement of sustainability principles and assessment rules

The statement of sustainability principles will be used to guide the SEA assessment in general and the assessment of significance in particular. Box 1 shows a suggested statement of sustainability principles for the Somerset LTP SEA.

#### **Box 1: Statement of sustainability principles for the Somerset LTP SEA**

**Statement of Sustainability Principles for the Somerset LTP SEA**

The following sustainability principles will be followed throughout the SEA of the LTP and in particular when assessing the significance of the effects:

- the principles of precaution and optimisation of environmental benefits;
- the principle of reducing and eliminating significant environmental effects through promotion of alternatives;
- safeguarding a high level of environmental protection with a view to promoting sustainable development (the preservation, protection and improvement of the quality of the environment);
- the protection of human health;
- the prudent and rational utilisation of natural resources;
- the conservation and sustainable use of biological diversity;
- the promotion of a planning and transport planning system which allows access to a wide range of opportunities for residents of Somerset.

These sustainability principles aim to define what needs to be protected in order to maintain environmental sustainability. The aim of the assessment is to ensure that the LTP adheres to these principles.

It could be argued that if the SEA objectives are comprehensive, such sustainability principles are not needed. However, the principles have been written in such a way as to help assessors decide how to proceed if elements of the plan score well against some objectives and negatively against others.

### 3.2 Assessment rules

Assessment rules have also been designed for the Somerset SEA. These rules should be referred to when carrying out the assessment of significance and are designed to give stakeholders reassurance that the assessment of significance has been undertaken rigorously. They are based on best practice in significance assessment. Box 2 shows the suggested assessment rules.

#### **Box 2: Assessment rules for the LTP SEA**

##### **Assessment Rules for the Somerset LTP SEA**

- The assessment's level of detail and certainty matches the one of the plan to be examined. As the level of detail in a LTP is sometimes relatively broad, the assessment may also be relatively broad in some places. Therefore, the assessment should focus mainly on qualitative criteria and not on rigid quantitative thresholds (such as the area in square metres);
- Significance is assessed using experts guided by systematic and structured criteria in line with the current state of the art;
- Criteria should be considered as guidelines not absolute rules. Cases should be judged individually;
- All types of effect are to be identified and assessed including direct and indirect, secondary, cumulative and other effects;
- Positive effects are also considered, but the assessment does not weigh negative against positive effects;
- The assessment covers the entire range of strategies and policies included within the plan. This includes the examination of the following aspects:
  - The plan's alternative strategies; and
  - The plan's costed implementation strategy;
- Reasons will be given and documentation prepared related to all decisions taken on significance;
- Significance should taken into account the likely success of proposed mitigation measures.

### 3.3 Significance criteria

The main part of the development of the significance assessment system has been designing significance criteria which are based around Somerset's SEA objectives. Somerset County Council employed TRL to carry out a literature review on significance assessment within SEA (James and Tomlinson, 2004) and this showed that the main way that significance is assessed for SEA is through expert judgement. However, to make that expert judgment rigorous, systematic and structured criteria are important.

Significance criteria have been designed to ensure that any decisions made are clear and auditable. These are shown in Appendix A. These criteria have been designed for use at the beginning of the impact assessment process to provide early guidance to assessors on what strategies and policies within the LTP may cause significant effects and, therefore, need further investigation. Appendix A firstly gives more guidance on the SEA Regulation's own significance criteria for each SEA topic. This is to guide the assessment and to ensure

assessors have all the information they need to make a judgement on the likely impacts on each criterion. Specific significance criteria are then suggested for each SEA topic. Some topics have more criteria than others. This does not mean that these subjects are more important but is merely a reflection of the complexity of certain topics. It should be noted that the term traffic within the criteria refers not just to car based road traffic but refers to the movement of any vehicle on the transport system. This includes (but is not limited to) cars, buses, light rail and heavy rail.

These criteria have been discussed and agreed with external bodies (Environment Agency, English Nature and the Somerset Wildlife Trust).

A decision was made by the steering group for the project not to include a scoring system within the significance framework. This is not required by the SEA Regulations and it was felt that at the relatively broad scale of a SEA the information needed to make a judgment on this is not available.

### **3.4 Information on the decision**

In the interests of transparency in SEA, information should be provided on decisions taken regarding significance. The literature review suggested that any table used to record decisions for the SEA should include the following:

- A column which includes a cross reference to significance criteria;
- A column entitled “how the judgment was reached” to include details of who was involved in making the judgement;
- A column to record any assumptions that were made during the assessment;
- A column to indicate whether there are any uncertainties inherent in the assessment; and
- A column entitled “next steps”. This column will be more useful at early stages of the assessment if more details are expected to become available related to strategies to be assessed.

Table 1 has been designed to record decisions on impact assessment. A separate table should be completed for each SEA criteria.

**Table 1: Impact assessment table**

SEA Criteria ▶	Bio Diversity	Is it clear what is proposed? Have any assumptions been made?	Uncertainties	How the judgement was reached	Next Steps including mitigation
Plan Element ▼					
	<i>This should include a descriptive summary of the assessment cross referenced to the significance criteria.</i>				

## Appendix A. SCC Significance Criteria

### Noise

#### Magnitude

<b>Duration, frequency and reversibility</b>	<p>Increased noise at night will cause more annoyance than increased day time noise.</p> <p>Noise from construction will be reversible, whereas general increases in traffic or noise from new roads will not be.</p> <p>Policies will have different effects on the frequency of traffic noise. Some policies may cause an increase in traffic at weekends, at peak traffic times and some policies may cause peak spreading so traffic noise increases more generally.</p>
<b>Cumulative nature</b>	Are there other developments that are likely to increase the levels of noise or the levels of traffic in addition to policies within the plan?
<b>Probability of effect</b>	Noise from a new road is more likely to be predicted. General traffic changes resulting from other policies within the plan will be more difficult to predict and the probability will be more uncertain.
<b>Risks to human health / environment</b>	Noise can have impacts upon breeding of certain sensitive species. Noise is predominantly a form of annoyance and can cause stress.
<b>Magnitude and spatial extent</b>	According to the Design Manual for Roads and Bridges, noise from traffic sources can generally affect people within 200m of a road. The magnitude of the effect varies with the level and nature of traffic. i.e. % of HGVs in the traffic mix and traffic speed. Traffic is a significant factor in the general increases in ambient noise in the UK.

#### Value of environment

<b>Special characteristics</b>	<p>Impacts will be more significant around sensitive receptors including schools, hospitals and care home facilities. Significance will also increase if noise levels are expected to increase in areas with no buffer zones. For example, houses which face directly onto a main road without the buffer of a footpath.</p> <p>Noise can also have a more general effect on tranquillity of the landscape. Impacts will be more significant where a new source of traffic noise is being introduced into an area of relative tranquillity.</p> <p>Road surfacing also affects noise levels. Concrete is generally more noisy than asphalt. Stone Mastic Asphalt (SMA) can generally give a noise reduction of 3 decibels compared to traditional asphalt.</p>
<b>Inequities in impact distribution</b>	Plans could cause impacts that are inequitable on a geographical basis or that are inequitable according to social group. For example, concentrating development in town centres could cause a disproportionate increase in noise for town centre residents.
<b>Exceed environmental quality standards or limit values</b>	There are no legal limits on noise levels. The World Health Organisation produced “Guidelines for Community Noise” which suggests some urban noise limits. However, these are likely to underestimate the impact in rural areas. Government guidance contained within the Guidance for Methodology for Multi Modal Studies (see <a href="http://www.webtag.org">www.webtag.org</a> ) suggests that relatively large changes in traffic flows are required to bring about a perceived change in noise. Only a 25% increase or 20% decrease in traffic flow will generally be noticed in noise terms. However, according to research

	much smaller changes are required to have an effect on ecology.
<b>Recognised status</b>	Not applicable

**Criteria**

Will the plan (in combination with other plans and projects) result in:

- A change in traffic flows or the nature of traffic (especially HGVs including buses) that would cause intolerable increases or significant decreases in annoyance in any community? (the 25% increase or 20% decrease in traffic flow can be used as a guideline but this is not a rigid threshold)
- A change in road surfacing materials that would change the nature of traffic noise in one or more community?
- Changes to road maintenance that could increase or decrease noise annoyance from traffic in one or more community?
- Changes in traffic speed in combination with changes in traffic levels that would increase / decrease annoyance in one or more community?
- Changes to traffic management measures that would change the nature of traffic noise in one or more community?
- An increase or decrease in noise at breeding times of sensitive species? (any changes in traffic flow could be considered significant)
- An increase or decrease in night time noise? For example freight policies or an increase in night flights at airports.
- Changes to the timings of road noise such as peak spreading, increase in weekend traffic etc that are likely to result in increased / decreased noise annoyance?
- A general increase or decrease in traffic noise affecting particularly sensitive receptors such as schools and hospitals and areas without a buffer zone? (any changes in traffic flow could be considered significant)
- Construction impact noise that is likely to be unacceptable in one or more communities?
- Inequitable increases in noise for some groups of people (either defined geographically or socially)?
- Changes to the nature of traffic that may increase / decrease vibration in historic structures?

## Air quality

### Magnitude

<b>Duration, frequency and reversibility</b>	Air pollution impacts from construction will be temporary, whereas general increases in traffic or air pollution from new roads will be more permanent.  Policies will have different effects on the frequency of air pollution incidents. Some policies may cause an increase in traffic at weekends, at peak traffic times and some policies may cause peak spreading so traffic noise increases more generally. Attitudinal measures may reduce traffic and have permanent positive effects on air pollution.
<b>Cumulative nature</b>	Are there other developments that are likely to increase the levels of air pollution or the levels of traffic in addition to policies within the plan?
<b>Probability of effect</b>	A new road will have impacts on air quality. General traffic changes resulting from other policies will be more difficult to predict and the probability will be more uncertain.
<b>Risks to human health / environment</b>	Air pollution impacts (i.e. impacts on such pollutants as carbon monoxide, PM10s and NOx) can damage natural systems and can have very serious effects on human health. Increases in summer heat due to global warming may make air pollution and health effects such as asthma worse.
<b>Magnitude and spatial extent</b>	Similarly to noise, air quality impacts are directly related to levels and types of traffic. Air pollution typically affects people up to 200m away from the traffic source, although ozone (a secondary pollutant) is a concern and can result from primary pollutant from a source a long distance away pollutant which is more serious in the summer. Topography of the environment is also a factor. Transport is a major contributor to poor air quality with traffic producing 70% of carbon monoxide emissions, 48% of nitrogen oxide emissions and 22% of particulates. In Somerset air pollution is primarily linked to domestic fuel use and transport. Generally, because of the traffic changes needed to change air quality, only traffic flows of over 10% are considered significant. However, in areas of particular sensitivity or areas of congestion any changes should be considered significant.

### Value of environment

<b>Special characteristics</b>	Impacts can be more significant around sensitive receptors including schools, hospitals and care home facilities. Topographical characteristics are also important. If traffic increases on a road that is at the bottom of canyon type topography, air pollution will not be as easily dispersed and the impact will be more significant.
<b>Inequities in impact distribution</b>	People with respiratory disorders and people living in areas already suffering poor air quality are most vulnerable.
<b>Exceed environmental quality standards or limit values</b>	There are ambient air quality standards for the UK for nitrogen dioxide, suspended particles and sulphur in air. These should not be exceeded. The most significant are nitrogen dioxide and suspended particles.
<b>Recognised status</b>	Air quality management areas (AQMA) are those that are not expected to comply with future air quality standards. Any future traffic changes in these areas will be particularly significant. In Somerset, central Yeovil, A358 at Henlade and East Reach in Taunton have been declared AQMA. There are also potential air quality problems identified along the A303 in South Somerset, Crewkerne and Frome town centres. These areas of concern are primarily related to traffic related air quality problems.

## Criteria

Will the plan (in combination with other plans and projects) result in:

- A change in traffic flows or the composition of traffic (increased HGVs for example) that would cause increases / decreases in air pollution that may exceed air quality standards? (the 10% guide can be used in most areas but is not a rigid threshold);
- A change in traffic flows or the composition of traffic (increased HGVs for example) that would cause increases / decreases in air pollution in AQMAs or areas of concern? (any change in flows would be a concern);
- A change in traffic flows in already congested areas (that is not a AQMA) or heritage areas? (any change in flows would be a concern);
- Deterioration or improvement in existing health problems from environmental pollution (this may only be possible if data are available on geographical distribution of hospital admissions, for example)?
- A general increase or decrease in air pollution affecting particularly sensitive receptors such as schools and hospitals and areas without a buffer zone? (any change in flows would be a concern);
- Inequitable increases in air pollution for some groups of people (either defined geographically or socially)?
- Air pollution from construction activities that is likely to be unacceptable in one or more communities (for example, from a major scheme). It will be important to raise this issue to be addressed within an EIA.
- Changes to traffic patterns related to timing such as peak spreading, increase in peak traffic, weekend traffic etc that are likely to result in increased air pollution?
- Air pollution adjacent to species and habitats known to be susceptible to deterioration in air quality? There are no standards set for this as air quality objectives are set to reflect effects on human health.

## CO<sub>2</sub> emissions

### Magnitude

<b>Duration, frequency and reversibility</b>	Climate change impacts related to traffic change are mainly related to traffic levels (although average CO <sub>2</sub> emissions from new cars has decreased).
<b>Cumulative nature</b>	Are there other developments that are likely to increase the levels of traffic in addition to policies within the plan? Climate change is likely to be the most significant and complex cumulative effect.
<b>Probability of effect</b>	Increases in CO <sub>2</sub> from a new road is likely to be easily predicted. General traffic changes resulting from other policies will be more difficult to predict and the probability will be more uncertain.
<b>Risks to human health / environment</b>	Climate change is one of the biggest risks to human health and the environment. Increases in flooding, changes in weather patterns and storm intensity are predicted unless climate change can be slowed or stopped.
<b>Magnitude and spatial extent</b>	The magnitude of climatic effects is difficult to predict because of the cumulative nature of the effect. Unlike other environmental impacts the impacts are likely to have a global extent rather than a local or regional extent. Transport is a major factor, as is the domestic and business sector with the implementation of structure plan policy.

### Value of environment

<b>Special characteristics</b>	Not applicable
<b>Inequities in impact distribution</b>	There are likely to be global inequities in the impacts of climate change. Local inequities related to flooding are discussed in the water section
<b>Exceed environmental quality standards or limit values</b>	There are no environmental limit values. Any increase would be seen as significant. Following Kyoto, the UK's target is to cut its emissions by 12.5% below 1990 levels by 2008-2012.
<b>Recognised status</b>	Not applicable

### Criteria

Will the plan (in combination with other plans and projects) result in:

- A change in traffic flows or a change in the nature of traffic that would cause increases in CO<sub>2</sub>? (*N.B. climate change is such a significant issue that it is felt that any change in CO<sub>2</sub> should be considered significant and mitigation considered*).

## Landscape

### Magnitude

<b>Duration, frequency and reversibility</b>	New road schemes will have a permanent long term effect on land take and landscape by introducing new infrastructure and traffic into areas where traffic did not exist. This can cause effects on landscape in terms of visibility and more general changes in countryside character including tranquillity and sense of place. Changes in traffic flows on existing roads will also have an effect on landscape and tranquillity by making areas more urbanised.
<b>Cumulative nature</b>	The effects of many developments can work together to change landscape character and erode landscape quality.
<b>Probability of effect</b>	Landscape effects from a new road are likely to be easily predicted. General traffic changes resulting from other policies will be more difficult to predict and the probability will be more uncertain.
<b>Risks to human health / environment</b>	There are no serious risks to human health although deterioration in landscape quality can cause a decline in quality of life. Risks to the natural environment will be considered under biodiversity.
<b>Magnitude and spatial extent</b>	The magnitude depends on the measure. A new road will cause significant visual and landscape changes. Policies which lead to increased traffic will have varying magnitudes depending on the magnitude of the traffic changes. Even local landscape changes such as highways signage and lighting can be significant.

### Value of environment

<b>Special characteristics</b>	Landscape has been used within this SEA to refer to visual effects, character change, cultural effects and sense of place. Therefore, all areas are potentially vulnerable to landscape impacts.
<b>Inequities in impact distribution</b>	Plans could cause impacts that are inequitable on a geographical basis if many developments are concentrated in one area.
<b>Exceed environmental quality standards or limit values</b>	Not applicable.
<b>Recognised status</b>	National parks, AONBs, the Levels and Moors and the coastline are areas within Somerset valued for their landscape. Landscape character areas have also been defined, within each area development should respect the specific nature of the landscape.

### Criteria

Will the plan (in combination with other plans and projects) result in:

- A change in traffic flows in areas that are valued for their landscape character?
- Changes to the landscape that are at variance with the character of the area? This can include changes to highways signing, lighting and highway furniture such as noise barriers.
- Introduce traffic to previously tranquil areas?
- Promote schemes that reflect the character of the landscape or include public art?

## Townscape

### Magnitude

<b>Duration, frequency and reversibility</b>	Increased traffic can have effects on townscape in terms of impacting upon the form of a town, its important views and panoramas. New road schemes can have a permanent long term effect on townscape in town centres and out to the rural-urban fringe. Changes in traffic flows on existing roads will probably also be permanent and will have a long term effect on townscape if traffic volumes change considerably.
<b>Cumulative nature</b>	The effects of many developments can work together to change townscape character and erode townscape quality. With planning policies of concentrating development in towns, townscape is particularly at risk.
<b>Probability of effect</b>	Townscape effects from a new road are likely to be easily predicted. General traffic changes resulting from other policies will be more difficult to predict and the probability will be more uncertain.
<b>Risks to human health / environment</b>	There are no serious risks to human health although deterioration in townscape quality can cause a decline in quality of life.
<b>Magnitude and spatial extent</b>	The magnitude depends on the measure. A new road can cause significant changes to the form and scale of a town and can negatively affect valued buildings, monuments and other landmarks. Policies which lead to increased traffic will have varying magnitudes depending on the magnitude of the traffic changes. Even local townscape changes such as changes to highways signage and lighting can be significant.

### Value of environment

<b>Special characteristics</b>	All towns are potentially vulnerable to impacts.
<b>Inequities in impact distribution</b>	Plans could cause impacts that are inequitable on a geographical basis if many developments are concentrated in one area.
<b>Exceed environmental quality standards or limit values</b>	Not applicable.
<b>Recognised status</b>	Outstanding heritage settlements, such as Glastonbury, Ilminster and Wells, and conservation areas in other towns and villages are likely to be considered more sensitive to change.

### Criteria

Will the plan (in combination with other plans and projects) result in:

- A change in traffic flows or the nature of traffic (an increase in HGVs for example) in any part of town that could alter the character of the town or benefit townscape?
- Changes to the townscape that are completely at variance with the character of the area? This can include new infrastructure, changes to highways signing and lighting etc;
- Promote enhancement schemes that reflect the character of the townscape through good design or include public art?

## Cultural heritage

### Magnitude

<b>Duration, frequency and reversibility</b>	Traffic can have effects on roadside historic buildings, monuments, conservation areas and historic landscapes. It is considered that any new road schemes will have a permanent long term effect on cultural heritage if archaeological or heritage sites and monuments are affected. Changes in traffic flows on existing roads will probably also be permanent and can have a long term effect on cultural heritage.
<b>Cumulative nature</b>	The effects of many developments can work together to affect historic landscapes and conservation areas. Archaeological and heritage sites and monuments may also be impacted upon by more than one development.
<b>Probability of effect</b>	Cultural heritage effects from a new road are likely to be easily predicted. General traffic changes resulting from other policies will be more difficult to predict and the probability will be more uncertain.
<b>Risks to human health / environment</b>	There are no serious risks to human health although deterioration in conservation areas and historic landscapes can cause a decline in quality of life.
<b>Magnitude and spatial extent</b>	The magnitude depends on the measure. A new road can cause significant changes to sites, areas and monuments. Policies which lead to increased traffic will have varying magnitudes depending on the magnitude of the traffic changes. Even small changes can be significant if they affect internationally valued areas.

### Value of environment

<b>Special characteristics</b>	Depends on the location of specific monuments and sites. Historic landscapes lack statutory protection but are valuable culturally.
<b>Inequities in impact distribution</b>	Plans could cause impacts that are inequitable on a geographical basis if many developments are concentrated in one area.
<b>Exceed environmental quality standards or limit values</b>	Not applicable.
<b>Recognised status</b>	Conservation areas, listed buildings, Historic Parks and Gardens, Scheduled Ancient Monuments

### Criteria

Will the plan (in combination with other plans and projects) result in:

- A change in traffic flows or the nature of traffic (an increase in HGVs for example) that affects sites and monuments valued for their cultural heritage?
- Changes to the landscape that are completely at variance with the historic character of the area? This can include changes to highways signing and lighting.
- Changes to infrastructure that affect sites and monuments valued for their cultural heritage?
- Promote enhancement schemes that benefit cultural heritage?

## Biodiversity, fauna and flora

### Magnitude

<b>Duration, frequency and reversibility</b>	Transport can have wide ranging effects on biodiversity. Some effects will definitely be considered permanent and irreversible, for example, if a new road destroys a valued habitat. Some effects can be considered temporary as long as the traffic effect is temporary. For example, levels of road kill.
<b>Cumulative nature</b>	Biodiversity can be affected in many ways through cumulative effects. This may be a general decline in air quality that can change the nature of ecological communities or can result from developments causing habitat fragmentation. Even developments that are geographically separate can have cumulative effects by impacting upon the same habitat or species. The adoption of an ecosystem approach (which values all biodiversity not just the rarest and protected) means that all impacts that can potentially have an impact on biodiversity should be assessed.
<b>Probability of effect</b>	Biodiversity effects from a new road are likely to be easily predicted. General traffic changes resulting from other policies will be more difficult to predict and the probability will be more uncertain.
<b>Risks to human health / environment</b>	Transport poses great risk to biodiversity. The links between human health and biodiversity are complex although it is a factor in quality of life.
<b>Magnitude and spatial extent</b>	The magnitude depends on the measure. A new road can cause significant changes to biodiversity. Policies which lead to increased traffic will have varying magnitudes depending on the magnitude of the traffic changes. Even small changes can be significant.

### Value of environment

<b>Special characteristics</b>	The adoption of an ecosystem approach (which values all biodiversity not just the rarest and protected) means that potentially all areas have special characteristics. Rather than only assessing direct impacts on valued ecosystems components a variety of issues needs to be considered concerning function and viability including potential habitat fragmentation, land take and habitat loss, hydrological changes and other outside influences such as air quality and water quality.
<b>Inequities in impact distribution</b>	Plans could cause impacts that are inequitable on a geographical basis if many developments are concentrated in one area.
<b>Exceed environmental quality standards or limit values</b>	Biodiversity Action Plans have a number of targets.
<b>Recognised status</b>	A variety of sites and species have designated status from international status through to local status.

### Criteria

Will the plan (in combination with other plans and projects) result in:

- Increased / reduced habitat fragmentation or habitat loss – see Government policy in PPS9/Section 74 of CroW Act?
- Exacerbate creation, loss or fragmentation of habitat affecting important/rare\* species?"

- Exacerbate environmental deterioration such that critical thresholds are reached – for example is there enough habitat to support the existing population of important/rare species in the geographic area?
- Effects on an area of high biodiversity value whether designated or not?
- Effects on an area in a way that could have long term effects in relation to species lifestyles or irreversible effects where there are no known mitigation techniques?
- Effects on areas where biodiversity is already exposed to significant threat, eg through habitat loss or fragmentation
- Help to reach targets or compromise targets of BAPs (either local or national BAPs) (Section 74 of CroW Act)?
- Affect Natura 2000 sites, SSSIs or other designated site?
- Promote design that helps conservation of species or includes unsympathetic design of mitigation?

\* Important/rare species – those afforded legal protection, listed in section 74 of the CRoW Act, are listed within the Red Data Books and/or are listed in the Birds of Conservation Concern (JNCC) and also Local BAP species.

## Water quality

### Magnitude

<b>Duration, frequency and reversibility</b>	The use and construction of transport infrastructure can cause water pollution impacts, although standard mitigation measures are available and mitigation measures such as reed beds can increase the biodiversity value of the roadside environment.
<b>Cumulative nature</b>	Pollution of watercourses can occur through the organic content of silt, other organics (e.g. oil, bitumen, rubber), de-icing salt (and impurities), metals (mainly vehicle corrosion), plant nutrients and pesticides from verge maintenance, and accidental spillage of toxic materials. Other sources of diffuse pollution include agriculture. Water quality in Somerset is generally improving whereas road traffic is generally increasing. Therefore, traffic related water pollution is likely to become more important related to other sources of water pollution.
<b>Probability of effect</b>	Water pollution effects from a new road are fairly predictable but generally can be mitigated. Ensuring that adequate mitigation is in place should be an important focus of assessment. Increased traffic flow on traditionally low trafficked roads is very likely to have an effect because of the likely lack of drainage and pollution abatement measures.
<b>Risks to human health / environment</b>	There can be serious risks to human health and the environment of water pollution and flooding. In terms of water pollution the greatest risk to health probably comes from accidental discharges.
<b>Magnitude and spatial extent</b>	Water quality in Somerset is generally improving whereas road traffic is generally increasing. Traffic related water pollution is potentially likely to become more significant. Spatial extent depends on the type of pollution. Moderate impacts occur on roads with 15000 to 30000 vehicles per day. Below 15000 vehicles per day minor impacts still occur.

### Value of environment

<b>Special characteristics</b>	See section on environmental quality standards
<b>Inequities in impact distribution</b>	Not applicable
<b>Exceed environmental quality standards or limit values</b>	Water quality objectives are set for each stretch of river in the UK. It is part of Highway Authorities' duty of care to ensure that these are not breached.
<b>Recognised status</b>	Groundwater is subject to special status such as Groundwater Protection Zones. Surface waters are also subject to quality objectives as noted above.

### Criteria

Will the plan (in combination with other plans and projects) result in:

- Traffic flows or new infrastructure that could cause a further decline or improvements in existing poor water quality especially affecting good quality watercourses or those known to be of a high biodiversity value?
- Design of infrastructure that could increase / decrease the potential for water pollution. Sustainable Urban Drainage Systems (SUDS) schemes, for example.

## Water quantity

### Magnitude

<b>Duration, frequency and reversibility</b>	The use and construction of transport infrastructure can cause flooding, although standard mitigation measures are available.
<b>Cumulative nature</b>	Flood risk is increasing generally due to climatic factors so this needs to be considered in any assessment.
<b>Probability of effect</b>	
<b>Risks to human health / environment</b>	There can be serious risks to human health and the environment of flooding.
<b>Magnitude and spatial extent</b>	Flooding caused by roads can be relatively localised but also depends on the topography of the surrounding areas. However, roads may cut off a floodplain causing upstream or downstream effects. Effects should be mitigated on a catchment basis.

### Value of environment

<b>Special characteristics</b>	Roads in low lying areas of Somerset would be more prone to flooding. Other roads, located along the coast or located in valleys would be more vulnerable to flooding.
<b>Inequities in impact distribution</b>	Not applicable
<b>Exceed environmental quality standards or limit values</b>	Not applicable
<b>Recognised status</b>	The Environment Agency holds information related to floodplains.

### Criteria

Will the plan (in combination with other plans and projects) result in:

- Alteration of existing hydrological regimes whereby flows or retention are adversely affected?
- Further impact on existing flooding or cause flooding to existing and / or new development?

## Soil

### Magnitude

<b>Duration, frequency and reversibility</b>	The use and construction of transport infrastructure can cause impacts on soil. The construction of transport infrastructure obviously has permanent physical impacts on soil including loss and compaction of topsoil. Traffic also has impacts on soil through pollution which can also alter the soil structure. Most impacts on soil are relatively irreversible in the medium term. Flooding and drainage from highways can also cause problems and wash topsoil away.
<b>Cumulative nature</b>	All development has some impact on soil – increasing urbanisation is having a major effect on soil.
<b>Probability of effect</b>	All infrastructure development will have some impact on soil. Increases in traffic and changes to the de-icing regime, for example, without mitigation will have impacts upon soil. However, guidance on SEA and biodiversity (Countryside Council for Wales et al, 2004) recognises that transport will have relatively minor impacts on soil composition compared to other forms of development.
<b>Risks to human health / environment</b>	Soil supports the basis of human life so degradation can have a serious effect. However, transport alone is unlikely to have a significant effect on soil. Effects from more general development and agricultural management practices are much more significant.
<b>Magnitude and spatial extent</b>	The majority of soil loss through transport is due to development and construction / maintenance of roads.

### Value of environment

<b>Special characteristics</b>	Not applicable
<b>Inequities in impact distribution</b>	Not applicable
<b>Exceed environmental quality standards or limit values</b>	Not applicable
<b>Recognised status</b>	The best and most versatile agricultural land is particularly vulnerable to changes in soil structure.

### Criteria

Will the plan (in combination with other plans and projects) result in:

- An increase / decrease in existing soil erosion problems including effects of road maintenance?
- The loss or pollution of soils which support valued habitats?

## Material assets

### Magnitude

<b>Duration, frequency and reversibility</b>	Material assets in the context of this SEA are use of materials in road repair and construction. Impacts upon natural resources can be considered permanent and irreversible.
<b>Cumulative nature</b>	Obviously road repair is not the only use of aggregates but it is a major use.
<b>Probability of effect</b>	The effect is definite.
<b>Risks to human health / environment</b>	The risk to the environment and human health could be significant as increased use of aggregates will mean increased quarrying in areas such as the Mendips.
<b>Magnitude and spatial extent</b>	The main impact is within areas of quarrying such as the Mendips

### Value of environment

<b>Special characteristics</b>	Most of the impact related to this is concentrated in one area, the Mendips, where aggregate is quarried.
<b>Inequities in impact distribution</b>	
<b>Exceed environmental quality standards or limit values</b>	
<b>Recognised status</b>	See above.

### Criteria

Will the plan (in combination with other plans and projects) result in:

- An increase in aggregate use?
- A change in the amount of recycled materials used for road construction and maintenance?
- Use of traditional materials in scheme build and maintenance?

## Human health, physical fitness and safety

### Magnitude

<b>Duration, frequency and reversibility</b>	Impacts on human health and fitness are likely to be very variable and will vary with the levels of traffic. Examples include health effects such as asthma and road traffic accidents. Other effects may be temporary related to construction of infrastructure.
<b>Cumulative nature</b>	Many other factors play a part in human health. Even traffic safety and security will be affected by outside factors that cannot be controlled through transport policy.
<b>Probability of effect</b>	The probability of effects is also likely to be variable but evidence is increasing related to the negative health effects of transport. The effects of the plan on safety and security can also be variable because of other factors. The effects of the plan on physical fitness will be difficult to judge because it involves decisions being taken by individuals whether to use facilities provided for them such as new cycleways. Some judgements should be made, however.
<b>Risks to human health / environment</b>	Not applicable
<b>Magnitude and spatial extent</b>	The magnitude of the effect can be very large depending on what is proposed within the plan.

### Value of environment

<b>Special characteristics</b>	Not applicable
<b>Inequities in impact distribution</b>	People with predispositions towards certain health disorders are likely to be more affected
<b>Exceed environmental quality standards or limit values</b>	Air quality standards may apply.
<b>Recognised status</b>	Not applicable

### Criteria

Will the plan (in combination with other plans and projects) result in:

- Cause increased / decreases risk of accidents on existing infrastructure?
- Affect hospitals, health centres and residential homes?
- Increased / decreased opportunities for physical exercise?
- Increased / decreased security on the transport network?
- Decrease / increase the access to public services and amenities?

*Other effects have been covered within the air quality and noise categories.*

## Population: Community severance

### Magnitude

<b>Duration, frequency and reversibility</b>	Severance has different severities. When a new road is built, severance can be seen as permanent and severe. However, traffic changes on existing roads also has an effect on severance which for the least mobile is as permanent as the traffic change.
<b>Cumulative nature</b>	Any development which is likely to change the volume or nature of traffic is likely to have an effect on severance.
<b>Probability of effect</b>	Any changes can have effects on the least mobile, especially if mitigation measures are not included.
<b>Risks to human health / environment</b>	Severance can also have psychological effects and this can affect not just the health of the individual but the health of the community.
<b>Magnitude and spatial extent</b>	<p>Community severance will be relatively localised but magnitude can vary. A high trafficked main road can cause almost complete severance in a community.</p> <p>DMRB contains a scoring system of slight, moderate and severe severance which could be useful in deciding which impacts are significant on a scheme basis.</p> <p>Slight = Pedestrian at grade crossing of a new road carrying below 8,000 vehicles a day, a new bridge will need to be climbed or a subway traversed; or Journeys will be increased by up to 250m;</p> <p>Moderate = Two or more hindrances set out under slight applying to single trips, pedestrian at grade crossing of a new road carrying between 8,000 and 16,000 vehicles a day or journeys will be increased by up to 250 - 500m.</p> <p>Severe = Pedestrian at grade crossing of a new road carrying over 16,000 vehicles a day, an increase in length of journeys of over 500m or three or more of the hindrances set out under slight or two more set out under moderate</p>

### Value of environment

<b>Special characteristics</b>	Not applicable
<b>Inequities in impact distribution</b>	Less mobile people will be more affected by severance.
<b>Exceed environmental quality standards or limit values</b>	Not applicable
<b>Recognised status</b>	Not applicable

### Criteria

Will the plan (in combination with other plans and projects) result in:

- Increased traffic or a change in the nature of traffic (more HGVs for example) to communities where no crossing facilities are available?
- Decreased traffic or a change in the nature of traffic (less HGVs for example) to communities enabling easier access to facilities?
- New infrastructure that would sever a community from vital community services?

## Population: Accessibility

### Magnitude

<b>Duration, frequency and reversibility</b>	Accessibility in the context of SEA relates to access to public and community transport. This is dependent on what is proposed as part of the LTP.
<b>Cumulative nature</b>	The LTP is an influencing factor on the provision of public and community transport but decisions by private operators are the most important influence on accessibility.
<b>Probability of effect</b>	This is dependent on what is proposed as part of the LTP.
<b>Risks to human health / environment</b>	There are risks to health if people cannot get access to health care services.
<b>Magnitude and spatial extent</b>	The magnitude can be great and can affect many people.

### Value of environment

<b>Special characteristics</b>	Not applicable
<b>Inequities in impact distribution</b>	Access to public transport is likely to be more important to those without access to a car and also rural dwellers who have to travel further to access services.
<b>Exceed environmental quality standards or limit values</b>	Not applicable
<b>Recognised status</b>	Not applicable

### Criteria

Will the plan (in combination with other plans and projects) result in:

- Changed overall provision in public and community transport?
- Changed provision in public and community transport that is likely to affect a certain group of people or community? The accessibility planning process may provide information that can be used to judge significance.

## References

Countryside Council for Wales, English Nature, Environment Agency, Royal Society for the Protection of Birds (2004): *Strategic Environmental Assessment and Biodiversity: Guidance for Practitioners*.

James, E and Tomlinson, P (2004): *Significance in Strategic Environmental Assessments of Transport Plans: Findings of a Literature Review*. TRL report UPR SE/080/04.