



5 Assessment of Preferred Strategy

5.1 Significant Environmental Effects

5.1.1 The initial assessment of the effects of option 3 (see) was taken as a starting point in undertaking a more detailed environmental assessment of the preferred strategy.

5.1.2 Although the strategy already had a number of environmental mitigation measures built in, a second more detailed analysis was undertaken to see if any further mitigation measures could be included to further reduce the adverse effects and enhance of positive effects of the plan

5.1.3 Table 5.1 provides a detailed commentary on the significant environmental effects and the integrated policy mitigation for the Provisional LTP.

Table 5.1 Predicted environmental effects of preferred LTP strategy and mitigation measures

SEA topic	Description of LTP strategy and environmental effects	Integrated mitigation actions in LTP	Final assessment of impact on environment
Local air quality	<p>Air quality is still a relatively small, but growing problem in Shropshire. The trends towards increased traffic levels and congestion are likely to further exacerbate air pollution particularly in town centres.</p> <p>The LTP strategy will address this issue through air quality action plans in the designated AQMAs. However, this would not in itself prevent further problems occurring in other areas. The plan therefore also includes a number of further mitigation measures to encourage modal shift, fuel efficiency and alternative fuel use and control the levels of traffic in urban areas</p>	<ul style="list-style-type: none"> • Enhancing and encouraging use of public transport • More park and ride • Improving conditions for cycling and walking • Smarter choices • Parking strategies to control car parking supply and charges and DPE • Effective signing and routing of traffic and HGV restrictions • Encouraging fuel efficiency and more fuel efficient fuels 	Moderately beneficial
Greenhouse gases	<p>Climate change is recognised as one of the greatest, if not, the greatest threat facing the world today. In Shropshire, transport is the biggest single contributor to greenhouse gas emissions.</p> <p>The LTP strategy aims to reduce the rate of growth in car use, as well as encouraging a switch to more efficient driving practices and alternative fuels. This should result in lower levels of emissions of greenhouse gases than would have occurred without the plan.</p>	<ul style="list-style-type: none"> • Enhancing and encouraging use of public transport • More park & ride • Improving conditions for cycling and walking • Smarter choices • Improve emission standards of bus fleet through quality partnerships and SCC contracts; • Raise awareness off the links between car based travel & climate change 	Slightly adverse



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		<ul style="list-style-type: none"> Promote fuel efficiency within the authority by promoting greener driving techniques; purchasing more fuel efficient vehicles; using alternative fuels; and seek to increase the proportion of new, more fuel efficient buses in use in the County Investigate use of solar powered infrastructure 	
Landscape	<p>Shropshire’s landscape plays an important role in the quality of life of local people and is one of the main reasons that Shropshire is an attractive place to visit, so contributes to the local economy.</p> <p>The LTP aims to reduce rates of growth in traffic levels, and implement traffic management measures to encourage HGV’s and other vehicles to avoid the most sensitive landscape areas of Shropshire.</p> <p>The LTP also includes polices to reduce inappropriate design of road improvements and use of inappropriate materials which can “urbanise” rural roads and lanes, impacting on local character and distinctiveness.</p>	<ul style="list-style-type: none"> Enhancing and encouraging use of public transport, cycling and walking Ensure traffic uses the most appropriate routes; Effective signing and routing of traffic & HGV restrictions; Quiet lanes Parking restrictions and provisions to reduce visual intrusion from parked vehicles Guidance for management of roads in the AONB to ensure that our transport activities and practices minimise the impact on the Shropshire Hills AONB Decriminalised parking enforcement 	Moderately beneficial
Townscape and heritage	<p>Shropshire’s historic environment is one of the county’s greatest assets with features ranging from: prehistoric monuments; structures of the industrial revolution; historic townscapes to fields and gardens; castles to mansions.</p> <p>The Local Transport Plan, aims to improve the historic and built environment, through specific town centre enhancement schemes as well as ensuring that all schemes incorporate good design, sensitivity to historic styles, the use of quality materials and the reduction of unnecessary clutter.</p>	<ul style="list-style-type: none"> Enhancing and encouraging use of public transport, park and ride, cycling and walking Parking strategies and other measures to manage traffic levels in urban areas Consideration of congestion charging in Shrewsbury HGV routing and restrictions Public realm enhancements including improved paving; better co-ordinated street 	Moderately beneficial

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	The plan also aims to manage levels of traffic including HGV's in or historic urban centres, reducing levels of noise, fumes and vibrations.	<ul style="list-style-type: none"> furniture; more trees and planting Use of appropriate materials when implementing traffic & transport schemes in rural are historic areas Decriminalised parking enforcement 	
Biodiversity (flora & fauna)	<p>The most significant impacts on biodiversity from transport include wildlife casualties from collisions with cars; severance of populations by new roads or increased traffic; disturbance from noise and light and road maintenance cutting; spraying and planting practices that can have significant impacts on habitats and biodiversity.</p> <p>The plan aims to reduce rates of traffic growth therefore minimising impacts on biodiversity. It has specific policies to engage highway maintenance practices which support biodiversity. Furthermore, it will seek to reduce visual impacts and noise and to enhance biodiversity when undertaking new highway schemes and maintenance.</p>	<ul style="list-style-type: none"> Enhancing and encouraging use of public transport, park and ride, cycling and walking; Roadside verge & hedgerow cutting practices which enhance habitats and minimise wildlife impacts; Take opportunities to create new habitats as part of improvement schemes e.g. habitat for bats and sand martins in replacement bridge structures; Reducing severance and possibilities of road collisions through crossing provisions such as badger tunnels in upgraded or new highway infrastructure; Minimising winter salt to reduce impacts from salt run-off on habitats; Guidance for management of roads in the AONB to ensure that our transport activities and practices minimise the impact on the Shropshire Hills AONB. 	Slightly beneficial
Soil and geology	Shropshire County Council currently has a shortage of data concerning soil and geology. This is an area where detailed information is likely to improve with the use of a soil map, which the Council is currently preparing.	No direct mitigation actions	No Significant impacts



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	<p>It is considered unlikely that the LTP will have any significant effects on soil and geology</p>		
<p>Water resources, quality and flooding</p>	<p>Both the construction and use of transport infrastructure can affect the quality of water. Roads with flows of between 15,000 and 30,000 vehicles per day have a moderate impact on water quality while roads with flows of below 15,000 vehicles per day have a minor impact.</p> <p>The LTP aims to reduce the rate of traffic growth on roads in Shropshire, thereby keeping the traffic levels on many roads below the threshold where significant impacts on water quality could be expected.</p> <p>It has specific policies to engage highway maintenance practices which minimise environmental impacts. and any implications to nearby water ways would be considered when undertaking new highway schemes and maintenance.</p>	<ul style="list-style-type: none"> • Enhancing and encouraging use of public transport, park and ride, cycling and walking • Using appropriate construction methods and materials in highway enhancements and new schemes to prevent excessive run-off • Minimising winter salt to reduce impacts from salt run-off 	<p>Slightly adverse</p>
<p>Human health and population - noise</p>	<p>The impact of noise on quality of life is increasing. Noise is a less obvious form of pollution because people learn to live with gradual change. Noise does not just cause annoyance; it can affect people's health.</p> <p>The main generator of background noise in Shropshire is traffic. The majority of Shropshire is rural and it should be noted that smaller volumes and changes to volumes of traffic are more noticeable in tranquil areas.</p> <p>The plan will seek to reduce rates of growth of traffic levels and encourage appropriate routing HGVs and traffic to reduce impacts of noise from road traffic.</p> <p>In addition where appropriate the use of low noise road surfaces will be used when road maintenance is undertaken</p>	<ul style="list-style-type: none"> • Enhancing and encouraging use of public transport, park and ride, cycling and walking • Effective signing and routing of traffic & HGV restrictions; • Quiet lanes • Utilise low surfacing materials where appropriate when undertaking road maintenance 	<p>Slightly beneficial</p>

SEA topic	Description of LTP strategy and environmental effects	Integrated mitigation actions in LTP	Final assessment of impact on environment
Human health and population – Physical Fitness	<p>Physical fitness levels have a major impact on the occurrence of obesity and circulatory diseases (coronary heart disease, stroke and other related conditions). The trend towards increasing car dependency is a significant factor in reduced levels of physical activity</p> <p>The Local Transport Plan will seek to improve provision for and promotion of walking and cycling, and will also ensure that active modes of transport are made as safe and attractive as possible. This should help to increase levels of physical activity as part of everyday lifestyles.</p>	<ul style="list-style-type: none"> • Better conditions for and promotion of cycling; • Better conditions for and promotion of walking; • Smarter travel choices • School travel plans • Workplace travel plans • Trial vulnerable road user audits for new schemes • Quiet lanes 	Moderately beneficial
Human health and population – accidents	<p>Road accidents are the largest cause of accidental death in Shropshire. The LTP aims to improve the safety of existing roads in Shropshire based on accident records and other risk factors.</p> <p>The LTP also includes extensive provisions for enhanced enforcement, publicity, education and training to enhance road safety.</p> <p>These measures should work to reduce the number of accident casualties on Shropshire roads</p>	<ul style="list-style-type: none"> • Local safety schemes • More road crossings for pedestrians • Provision of safer cycle routes • Addressing motorcycle accidents • Addressing young driver accidents • Safer routes to schools • Road safety education, publicity and training • Speed limit enforcement • Decriminalised parking enforcement 	Moderately beneficial
Human health and population - security	<p>Fear of crime is an important aspect of quality of life and is linked to the quality of the environment. Despite the crime statistics which show that although Shropshire is a relatively low crime area, there appears to be a high fear of crime amongst the public which impacts on the way that people live.</p> <p>To tackle issues of security the plan contains programmes which see the undertaking of measures to improve surveillance and to provide secure vehicle parking facilities.</p>	<ul style="list-style-type: none"> • Enhanced provision for walking and cycling • Town centre enhancement schemes • Quality walking routes • Real time information • More CCTV on buses • CCTV at rail stations • Improve walking routes to key stops & stations • Improved lighting & security for pedestrians 	Slightly beneficial



SEA topic	Description of LTP strategy and environmental effects	Integrated mitigation actions in LTP	Final assessment of impact on environment
Human health and population – accessibility	<p>In rural areas of Shropshire those people without access to a car can have poor accessibility to essential services.</p> <p>Through the plan, our aim is to work with a range of partners to narrow the ‘accessibility gap’ and improve opportunities for those most in need. This will be both through enhancing transport services and encouraging greater provision of electronic access, mobile services and local provision.</p>	<ul style="list-style-type: none"> • Making public transport a more attractive travel option • Further development of demand responsive transport services • Passenger transport services which better meet travel needs • Better quality & more accessible services and infrastructure • Better integration of services • Effective partnerships • Better conditions for cycling • Better conditions for walking • Mobility enhancements 	Moderately beneficial
Material assets	<p>The Local Transport plan through the detailed Asset Management Plan aims to ensure effective maintenance of Shropshire’s highway and transport infrastructure in a way which minimising the use of natural materials.</p> <p>Particularly important will be the use of recycled materials in highways maintenance schemes.</p>	<ul style="list-style-type: none"> • Seek to use appropriate construction materials to reduce whole life material asset use; • Use of recycled materials in highway maintenance • Through quality partnerships and SCC contracts, improve emission standards of bus fleet; • Promote fuel efficiency within the authority by promoting greener driving techniques; purchasing more fuel efficient vehicles; using alternative fuels; and seek to increase the proportion of new, more fuel efficient buses in use in the County. 	Slightly beneficial

5.2 Environmental Assessment of Major Schemes

5.2.1 In line with DfT guidance major transport schemes costing more the £5 million have been considered separately to the main Local Transport Plan. The environmental impacts are therefore also considered separately to the impacts of the main plan which have been identified in the previous section.

5.2.2 There are proposals that up to three major transport schemes may be progressed by SCC within the 5 year lifetime of the LTP. These are:

- Shrewsbury North West Relief Road
- Sandford Bypass
- Shrewsbury Parkway Station

5.2.3 An overview of the potential environmental impacts of the Shrewsbury North West Relief Road are provided below. With further detail provided in the appraisal summary tables in .

5.2.4 At present there is insufficient detail available on the other two potential major schemes to undertake a environmental assessment.

Shrewsbury North West Relief Road

5.2.5 The potential environmental impacts of the potential north west relief road major scheme are summarised here and more details provided in . This assessment is set out separately to the overall LTP strategic environmental impact assessment, in line with DfT guidance which asked for potential major scheme to be treated separately to core LTP strategies.

5.2.6 A stage 2 environmental assessment of route options was carried out in May 2005 within the DfT's framework.⁽¹⁾

5.2.7 This showed that, in general, a North West Relief Road would have more environmental benefits than disadvantages, with benefits in the following areas:

- local and regional air quality
- climate change (greenhouse gases)
- noise
- townscape
- built heritage
- journey ambience

5.2.8 Disbenefits would result in the following areas:

- landscape
- archaeological heritage
- biodiversity
- the water environment
- agriculture
- accessibility and physical fitness

5.2.9 The impacts of a NWRR would vary according to which of six different route options currently being developed is constructed. The six proposed route alignments are shown in . The outline conclusions of the report on these options are summarised below.

1 Design Manual for Roads and Bridges, Volume 11 Environmental Assessment (Incorporating Amendments up to and including March 2000), HMSO 1994



Noise

5.2.10 Implementation of any of the proposed options for the NWRR would give rise to some increases in noise level for properties adjacent to the alignment but there would also be many properties within Shrewsbury itself that would benefit from reductions in level. The study has also shown that in all cases there would be more dwellings with reductions in noise levels than with increases with the proposals in place. The Orange option provides the largest reduction in Estimated Population Annoyed by Noise of 128, closely followed by the Green and Black options with 124. The Blue option performs least well with a reduction of only 35.

Air quality and greenhouse gases

5.2.11 With all of the NWRR route options under consideration more properties are expected to experience an improvement in air quality than deterioration. Red route option 1 is predicted to result in the greatest number of properties experiencing a decrease in concentrations of NO_2 and PM_{10} and the least number of properties experiencing deterioration in concentrations of NO_2 and PM_{10} . The Blue route is predicted to result in the least number of properties experiencing a decrease in concentrations of NO_2 and PM_{10} and the greatest number of properties experiencing deterioration in concentrations of NO_2 and PM_{10} .

5.2.12 The TAG regional air pollution assessment predicted a decrease in annual NO_x emissions with NWRR in place along any of the route options.

5.2.13 The TAG Greenhouse Gases assessment predicted a decrease in CO_2 emissions with a North West Relief Road in place for all options under consideration compared with the Do-minimum. The greatest decrease would result from Red route option 2, and the least from the Orange route.

Landscape

5.2.14 The route corridors of all options considered in this assessment pass through landscape of diverse and complex character. Some of the most unusual landscape is to be found along the Old River Bed, which is skirted by all options except for the Blue route, which crosses this feature at Berwick Road. Mitigation may to a certain extent be achieved through alignment, landform and planting; the loss of tree cover could also be minimised by alignment, although some landform of particular value would inevitably be lost. The character of the river valley would be altered by any new river crossing; however, a positive bridge design would create a new landmark and minimise the negative impact. Both Red route options would have the least landscape impact, being *slight to moderate adverse*, whereas the Blue and Orange routes would result in *large adverse* impacts.

5.2.15 All route options would result in visual impacts on properties along the edge of the urban area and in the vicinity of the new road. This would be mitigated by screen planting and landforming where appropriate, to blend the road in with its surroundings. However, the most significant visual effects could not be entirely mitigated – these include those due to large scale cuttings and interference with the natural landform, such as at the Crosshill escarpment for the Orange route or Round Hill for the Blue route. The route option presenting the least visual impact is Red route option 1.

5.2.16 Overall, Red route option 1 is considered to have the minimal landscape and visual impacts.

Townscape

5.2.17 Of the six route options under consideration, only the Blue route and Red route option 2 would result in direct impacts on townscape. These would be limited to the immediate vicinity of junctions with existing roads falling within the urban area. Indirect impacts on townscape would be due to noticeable changes in traffic flow elsewhere in the road network. The majority of these would be reductions resulting in improved townscape

and greater potential for enhancement. Overall, a slight beneficial impact is recorded for the four longer routes; however, benefits are slightly outweighed by the negative effects of new junctions and increased traffic on neighbouring roads in the case of Red route option 2 and the Blue route.

Heritage

5.2.18 A number of archaeological sites were identified within and immediately adjacent to the study area. These sites included probable Bronze Age ritual and funerary sites, Iron Age and Romano-British farmstead enclosures, remains of medieval ridge and furrow ploughing, and medieval (and possibly Roman) roads.

5.2.19 No direct impacts on built historic features would result from any of the NWRR options under consideration. The impacts of any route would comprise impacts on the setting of features due to both the presence of a new road and noticeable traffic changes on existing routes. The most significant impacts on heritage character would be the effect on the setting of The Mount Conservation Area and its buildings – including some listed – and the setting of Gravel Hill Farm for the Blue route.

5.2.20 The Blue route would have the least impact on the archaeological resource whilst the impact of all other routes would be similar. However, the Blue route would have the most significant adverse effects on built heritage, whilst the Red route options would be the least detrimental.

Biodiversity

5.2.21 The area off the north-western fringe of Shrewsbury is deemed to be of significant ecological value. Of the options examined, it is considered that the Blue or Red routes would incur the least ecological impact and provide the most opportunities for successful ecological amelioration. Some refinement of these options is desirable in order to minimise potentially adverse impacts on existing botanically diverse habitats. Measures should also be taken to ameliorate other potentially adverse impacts. The Green, Orange and Black routes are considered less ecologically desirable primarily as a result of greater habitat fragmentation and proximity to designated sites.

5.2.22 There is a need to design out adverse impacts on the following features:

- the Hencott Pool SSSI and Ramsar site
- the Old River Bed SSSI Shropshire Wildlife Sites
- veteran trees

5.2.23 Other features of concern which should be protected as far as possible include:

- other high quality wetlands
- species-rich 'important' hedgerows
- legally protected animal species including
- badger setts and territories
- bats and bat roosts
- great crested newts
- otters
- water voles
- nesting and nest-building birds

5.2.24 The need to minimise ecological impact will require the adoption of a range of precautions, including protected species survey prior to refinement of route options, and measures taken during construction.



5.2.25 All options would require the bridging of the River Severn and the crossing of its floodplain. Potential ecological impacts of this aspect of the works should be considered with a view to maintaining existing ecological interest and its function as a wildlife corridor.

Water

5.2.26 Given their proximity to the River Severn the route options under consideration for a North West Relief Road could have a major impact on the local and regional water environment. However, through the correct use of sustainable drainage systems these impacts can be minimised.

5.2.27 Any new road increases the risk of accidents and potential pollution in the route corridor. However, the drainage and attenuation mechanisms which would be implemented for a NWRR would be equipped to deal with this effectively and minimise the effect on local watercourses and groundwater.

5.2.28 It is highly likely that the four longest route options crossing the River Severn adjacent to the Shelton extraction point would require the relocation of this facility.

5.2.29 Attenuation systems in the form of balancing ponds would be implemented for any route option, requiring significant land take; this would be greatest with the longer route options.

5.2.30 The Environment Agency are currently developing proposals for a flood barrage spanning the River Severn upstream of Shrewsbury. The favoured location for this facility corresponds with the crossing point of the four longer route options for a NWRR. There is currently no connection between these two projects; however, ongoing liaison will ensure that any NWRR proposals do not preclude the construction of the barrage in its preferred location and that as far as possible proposals are co-ordinated.

Agriculture

5.2.31 Most of the land affected by all options except the Blue route falls into the “best and most versatile land” category. However, this land-take is relatively small in strategic terms and should not play a major role in determining the environmental impact of options.

5.2.32 The majority of agricultural businesses affected by route options would suffer moderate adverse impacts. The Blue route would affect the fewest businesses (4), whilst the Orange route and the Red route option 1 would affect the greatest number (11).

5.2.33 Overall, the greatest overall impacts on agriculture, including loss of BMV land and impacts on farm holdings would result from the Green and Orange routes and Red route option 1. The Blue route would have the least agricultural impact.

Accessibility and physical fitness

5.2.34 Feedback obtained through public consultation and workshops indicates a high proportion of Shrewsbury residents travel within the town on foot or and by cycle, and that this would increase if urban roads were less busy. Access to the open countryside is also of key importance to the public.

5.2.35 Any NWRR would create some severance of existing footpaths, with crossing facilities being included for the most significant. New junctions and traffic flowing near junctions may deter some journeys for the Blue route and Red route option 2. It is considered that the Orange route would have the least impact on accessibility. All routes may result in minor reductions in physical fitness, with a slightly greater impact resulting from Red route option 2.

5.2.36 Measures which may be implemented to minimise accessibility and physical fitness impacts include the provision of pedestrian crossings at all junctions crossed by footways and the incorporation of cycle lanes along both the new road and junctions with the urban area. For the longer routes, an additional bridge crossing at Clayton Way is recommended.

Journey ambience

5.2.37 The pleasant environment through which a NWRR would pass represents a small improvement in journey ambience compared with journeys through the town, which include areas of both high quality and relatively poor townscape. No new travelling facilities would be provided as part of any route option; however, routes would reduce journey times, improving access to known facilities either side of the town. The relative simplicity of the new road and reduced congestion for any route option would reduce travellers' stress, both in the urban area and along the route itself.

5.2.38 It is considered that with the combination of travellers' views, factors affecting traveller care and traveller stress, the option resulting in the greatest benefits for Journey Ambience would be Red route option 1.

Policy integration

5.2.39 A NWRR along any route would support certain areas of policy whilst being less in line with other aspects, both at national and local level. In general, policies on transport – particularly in relation to the road network – would be advanced, whilst compliance with environmental policy would be more mixed.

5.2.40 The differences between options in terms of their "fit" in the planning and policy context are slight. However, the Blue route, the Orange route and Red route option 1 would be the most integrated with policy and local planning aspirations generally.

Proposed Actions

5.2.41 In light of the results of the technical and environmental assessments, and public consultation undertaken in 2005 it is proposed to include a NWRR proposal in the final Local Transport Plan. To further develop the proposal we will undertake further design work to develop a single preferred route between the A5/A458 junction and the Battlefield link road, based upon the:

- **Green route** - A5 Churncote roundabout to Holyhead Road north of Shelton Water Tower, crossing the river at Shelton Rough following an alignment north of Cross Hill and joining the eastern end of Battlefield Link Road;
- **Black route** - A5 Churncote roundabout to Holyhead Road north of Shelton Water Tower running parallel to Laundry Terrace between the river and Berwick Road and joining the eastern end to Battlefield Link Road; and the
- **Red route (option 1)** - A5 Churncote roundabout to Holyhead Road north of Shelton Water Tower, crossing the river at Shelton Rough, running parallel to Laundry Terrace between the river and Berwick Road then south of Cross Hill and

5.2.42 As part of this further work it is proposed to undertake a Stage 3 environmental assessment, with the particular aim of mitigating the environmental concerns identified in the stage 2 assessment and consultation.