

7. Minimise the impacts of transport on people's lives, maximise opportunities to improve the environment and help tackle carbon emissions

The County Council's approach to minimising the impacts of transport on people's lives, maximising opportunities to improve the environment and helping tackle carbon emissions will focus on:

1. Adapting to climate change
2. CO₂ emissions
3. Congestion management
4. Air quality
5. Noise, and
6. Biodiversity, the natural, historic and physical environment.

1. The County Council's adaptation responses (including those relating to heritage assets) to the predicted impacts of climate change are detailed in section 7.1.
2. Addressing CO₂ emissions from ground transport (which is detailed in section 7.2) will involve:
 - effective spatial planning
 - supporting change to new vehicle technologies and lower carbon fuels
 - promoting lower carbon transport choices
 - encouraging a transfer to lower carbon vehicles, and
 - education on lower carbon transport issues.
3. Whilst congestion management will play a major role in minimising the impacts of transport on people's lives, maximising opportunities to improve the environment and helping tackle carbon emissions, the measures to be undertaken to manage congestion is detailed within Section 4.1 – Making best use of our existing transport networks.
4. Addressing transport related air quality issues, particularly within air quality management areas (which is detailed in section 7.4) will involve working with district councils to:
 - assess and monitor air quality, and
 - develop action plans to improve air quality where necessary.
5. Addressing the impacts of noise from transport activities (which is detailed in section 7.5) will involve:
 - implementation of the Nottingham Agglomeration Noise Action Plan
 - promotion of quieter modes of transport
 - highway improvements to address noise issues when appropriate
 - helping to manage commercial traffic when possible, and
 - the effective co-ordination of street works.
6. Maximising opportunities from transport to improve biodiversity, the natural, historic and physical environment (which is detailed in sections 7.6-7.8) will involve:
 - providing high quality spaces for people which are not dominated by motor vehicles through guidance on the provision for new developments; local centre improvements; the management and provision of street furniture and signage; and links to regeneration proposals
 - enhancing the historic urban cores, conservation areas and the public realm whenever possible
 - considering the impacts of transport improvements on heritage assets
 - the protection of sites, species and habitats, and
 - managing the impacts of transport projects and highway management on biodiversity, and using them to enhance biodiversity whenever possible.

The effects of transport on the environment, landscape and biodiversity, including wildlife, is assessed within the Strategic Environmental Assessment (SEA), which accompanies this Plan and was developed alongside the LTP3. The SEA can be found at www.nottinghamshire.gov.uk/ltp3. This chapter looks specifically at the strategy to minimise the impacts of transport on people's lives, maximise opportunities to improve the environment and help tackle carbon emissions.

7.1 Adapting to climate change

Existing highways construction and maintenance policies and standards are typically based on historical climate data but we now need to look to future predictions. In order for the highway network to be resilient in the face of a changing climate, the County Council needs to take action to adapt its policies and standards to help reduce CO₂ emissions from its activities, and to minimise the disruption and costs caused by climate change in the future. It is predicted that the impacts of climate change in the UK will be:

- increased annual average temperatures
- longer, hotter, drier summers
- milder, wetter winters
- soils will become drier on average
- decreased snowfall
- more frequent heavy and extreme rainfall, and
- potentially more extreme winds and storms.

These changes in climate could have significant impacts on the construction and maintenance of highways including roads and footways. For example:

- drier and hotter summers will lead to more incidences of pavement deterioration and subsidence
- wetter winters and more frequent heavy rainfall will result in more frequent incidences of flooding, particularly in low lying areas and floodplains, and a higher risk of landslides. This will have an impact on pavement performance and resilience, drainage capacity and condition, utilities and highways structures (such as bridges, culverts, road signs and street lighting)
- predictions of increased storms and extreme winds may have safety impacts and will have the potential to cause damage to structures and trees on or close to the highway
- reduced snowfall will reduce the need for gritting and snow and ice removal but will not necessarily reduce the need for the winter maintenance capacities, and
- changes to the growing season as a result of warmer year round temperatures will mean that plants will grow faster and for longer periods. New plant species may also start to thrive. This will lead to the need for more intensive maintenance programmes to prevent vegetation intrusion on the highway and 'sight line' impairments due to the increased growth of the soft estate (such as verges). Increased vegetation may also pose problems for drainage through gully blockages and erosion.

By acting now and identifying the work that needs to be carried out (including monitoring, maintenance, strengthening, reconstruction etc.), the network will be more resilient to the effects of climate change. This will help reduce the cost and inconvenience caused by any necessary emergency or reactive work required in the future. By working together to align and co-ordinate maintenance activities and changes to existing policies and standards, the 3CAP authorities of Derbyshire, Leicestershire and Nottinghamshire county councils will be able to plan for and adapt to climate change more effectively than if they work individually. The County Council, as part of the 3 Counties Alliance Partnership (3CAP) with Derbyshire and Leicestershire county councils, has therefore undertaken an assessment of the likely effects of climate change on policies and standards to:

- identify the potential impacts of climate change on the construction and maintenance of highways
- identify existing and potential methods of adaptation that can be implemented to minimise the effect of climate change on the highway network
- develop a comprehensive, local risk-based assessment of the highway network's vulnerabilities to weather and climate, both now and in the future, and to identify possible adaptation responses in order to achieve Level 1 of National Indicator (NI) 188: Planning to adapt to climate change
- identify the most effective adaptation responses based on a risk and probability assessment (i.e. a 'multi-criteria analysis' methodology), in order to achieve Level 2 of NI188, and
- develop an adaptation action plan, thereby achieving Level 3 of NI188.

The resulting 'The Effect of Climate Change on 3CAP's Highway Network Policies and Standards' report (which is summarised below) forms the County Council's strategy to adapt to climate change's impacts.

A risk and probability assessment of the effects of climate change on the highway network identified the ten effects posing the biggest risks from climate change to the highway network:

1. Pavement failure from prolonged high temperatures
2. Increased length of the growing season leading to prolonged and/or more rapid growth of the soft estate
3. Lack of capacity in the drainage system and flooding of the network
4. Surface damage to structures from hotter and drier summers
5. Scour to structures from more intense rainfall
6. Damage to pavement surface layers from more intense rainfall
7. Subsidence and heave on the highway from more intense rainfall
8. Scour and damage to structures as a result of stronger winds and more storms
9. Severe damage to lightweight structures from stronger winds and more storms
10. Less disruption by snow and ice due to warmer winters.

The risk and probability assessment was used to rank those climate change risks that are expected to have the most impact on the highway network and its associated policies and standards. Potential adaptation responses to the climate change risks were identified and a multi-criteria analysis (including impacts of the response; initial and whole-life costs; feasibility; acceptability; and sustainability) of each potential response was undertaken to help prioritise them. By applying a structured evaluation technique the responses have been assessed against relevant criteria and scored according to their overall likely effectiveness and probability of success. This has also allowed for the most realistic responses to be identified in terms of resource demand, public and government acceptance, scale, risk, impact, sustainability and practicality.

The County Council's strategy for adapting to climate change will involve undertaking a range of activities (or responses) to ensure that bridges and other structures; drainage; grass verges; highway network materials; carriageway surfacing; trees and hedges; and winter maintenance activities can all withstand the effects of climate change.

In order to effectively and efficiently adapt to the effects of climate change, the County Council needs to identify the level at which different parts of their network are vulnerable and most in need of attention. Consequently, many of the responses identified as potentially being the most effective involve undertaking a risk assessment and/or asset review. Undertaking this work will help ensure that the County Council has a clear indication of the location, condition and vulnerabilities of its assets (including structures, roads, footways, or the surrounding soft estate). A more targeted programme of action and improvement can then be developed.

The adaptation responses identified as the most realistic and effective at adapting the highway network to the effects of climate change are detailed in table 26 below. These responses will be reviewed periodically to ensure that they consider the differing priorities of the highway; are still the

most effective responses; to consider the findings of work undertaken (such as risk assessments or asset reviews); to consider changes in predictions and projections; and to consider new technologies and working practices. It is also important to note that the extent to which the adaptation responses are delivered will be determined by available future funding levels and will be affected by factors such as their potential impact on heritage, biodiversity and other linked environmental issues. Table 26 also includes the heritage impacts that will need to be considered.

In line with the requirements of NI 188 levels 1 and 2, the adaption responses will be used to start work towards adapting policies, standards, operations and strategies to the effects of climate change. The County Council has developed an adaptation action plan (which is detailed within 'The Effect of Climate Change on 3CAP's Highway Network Policies and Standards' report) as required to achieve NI188 level 3. The adaptation plan will be implemented, monitored and reviewed to ensure the progress with each measure as required to achieve NI 188 level 4.

Table 26: Climate change adaptation responses

Bridges and other structures	Drainage	Grass verges	Highway network materials	Carriageway surfacing	Tree and hedge maintenance	Winter maintenance activities	Heritage impacts
Increase the number and frequency of maintenance works carried out to increase the BCI average and critical values	Improve the knowledge of drainage assets	Increase the frequency of grass cutting where required for highway safety	Carry out an inspection and inventory to assess which parts of the network are most at risk from excessive heat	Undertake a risk assessment to identify the most vulnerable areas of the network and develop priority actions to be carried out	Develop a tree management strategy for implementation across the county council (to include all trees, not just those on or near the highway)	Carry out risk assessment surveys of the region to establish which routes are at highest risk from ice formation	Consider, assess and mitigate any negative impact of increased maintenance on designated and undesignated heritage
Carry out a risk assessment to identify which structures are most at risk from the effects of climate change	Undertake a risk assessment to determine vulnerable areas and establish a prioritised scheme for maintenance	Where required for safety reasons, consider treating grass with growth retardant to produce slower growing grass	Specification: Consider using high modulus base/binder materials and rut resistant surface course material	Review local experience of the durability of surface dressing and consider whether other measures may be more appropriate	Review the species choice for new trees to ensure the most appropriate species is selected, and taking into account biodiversity and landscape considerations	Re-assess and re-classify priority routes based on future climate change predictions	Consider and plan for impacts on designated heritage that will result from climate change and our response to it, e.g. increased gritting leading to increased salt damage to historic walls
Carry out flood studies with the help of other agencies and organisations	Change to an ad hoc gully emptying strategy based on demand and need	Develop a grass cutting strategy that balances the need to maintain highway safety with the nature conservation value of verges	Develop a long-term programme to locate and assess the adequacy and condition of the current drainage provision, and ensure it is well maintained	Implement measures to reduce the risk of 'root invasion' and vegetation ingress on the highway	Undertake a risk assessment to determine vulnerable trees and establish a prioritised scheme for maintenance		Be aware of archaeological implications of action to improve drainage. Be sensitive to designated heritage structures when designing solutions
Ensure that all strengthening and repair work that is outstanding for failed or below standard bridges is carried out	Invest in asset management and location reviews	Ensure that new verges are developed on low nutrient substrate and sown with fine, slow-growing seed mixes to reduce future management requirements	Use performance related specifications which promote properties which resist the adverse effects of climate change	Increase the frequency of carriageway surface inspections	Improve the knowledge of existing tree stock		Ensure that no work to heritage structures or that may affect archaeology is undertaken before considering impacts

Bridges and other structures	Drainage	Grass verges	Highway network materials	Carriageway surfacing	Tree and hedge maintenance	Winter maintenance activities	Heritage impacts
Ensure that all data (new and historical) is transferred into a single system to make assessments of maintenance and repair priorities and needs more effective	Carry out drainage condition surveys		Specification: Appropriate planting – tree types and locations				Ensure that alert and constraints mapping of heritage issues is included in data systems and referred to in scheme development
Evaluate the Depreciated Replacement Cost (DRC) for all highway structures to allow for an assessment of the impact of spending to be made	Increase the frequency of highway network drainage inspections		Avoid creating wind-throw risks when undertaking works such as copse or tree line thinning, removing hedgerows or earthworks				
			Review existing materials specifications – general				

Source: Nottinghamshire County Council

7.2 CO₂ emissions

It is widely accepted that climate change is already happening, that there is a need to act to avoid its worst impacts, and that decarbonising transport is an essential part of the solution. Moving to a low carbon transport system will not be cost free, but it should be viewed as ‘investing to save’ as not acting now will result in far greater costs in the future. Whilst it will be a major change, moving to a low carbon economy and transport system also presents opportunities not just for climate change but for the economy, improved health, and the wider environment. It will help people enjoy a better quality of life without compromising the quality of life of future generations.

Central Government, through the Climate Change Act, set targets to reduce UK greenhouse gas emissions by at least 80% by 2050. The Act also set five yearly carbon budgets for the UK economy for the periods 2008-12, 2013-17 and 2018-22. In line with the recommendations of the Committee on Climate Change, they require emissions reductions from 1990 levels of just over 22%, 28% and 34% in each of the four year periods respectively.

Nationally between 1990 and 2007, greenhouse gas emissions from domestic transport increased by 12% and in 2007 represented 21% of all UK domestic emissions; and travelling by road accounts for 92% of the domestic transport sector’s greenhouse gas emissions. Acting to reduce these emissions will help ensure that low carbon transport becomes a reality.

In 2008 CO₂ emissions from all road transport accounted for 31% of all CO₂ emissions in Nottinghamshire, higher than the percentages in both the East Midlands (28%) and England (26%). Transport emissions ranged from 37% of emissions in Broxtowe borough to 19% of emissions in Gedling borough.

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Table 27: CO₂ emissions

	Year	CO ₂ emissions			
		Road transport	Percentage of total emissions	Population ('000s mid-year estimate)	Per capita transport emissions (t)
Nottinghamshire	2005	1,848	30%	764.7	2.4
	2006	1,833	31%	766.9	2.4
	2007	1,864	32%	769.3	2.4
	2008	1,763	31%	773.3	2.3

Source: NI 186 – per capita reduction in CO₂ emissions in the Local Authority area

The carbon management plan 'Towards Carbon Neutrality' details how Nottinghamshire will reduce emissions from its own operations but the County Council's general strategy to reduce emissions from transport in the county will focus on (in no particular order):

- supporting change to new vehicle technologies and fuels
- promoting lower carbon transport choices, such as walking, cycling and public transport
- encouraging a transfer to lower carbon vehicles, such as take-up of low emission public transport vehicles; freight vehicles and the movement of goods; and private cars
- education on lower carbon transport issues, and
- congestion management.

Some of the challenges to delivering the required CO₂ reductions have been established over long periods of time and will similarly take a long period of time to overcome, including:

- existing vehicles, fuels and infrastructure are long established, and the economy, business and lifestyle has built up around them
- research shows that transport behaviours are amongst the most difficult to change. There are strong links between transport and lifestyle choices and some people see little reason to make smarter travel choices
- new technology can take a long time to develop and appear on the market
- changing transport infrastructure can be expensive, not only the significant investment required to develop new technology but also purchasing the new technology once it is on the market, and
- many non-transport Government policies can have a significant impact on transport demand and emissions, such as school admissions.

7.2.1 Spatial planning

Effective spatial planning and development control to ensure development is well served by public transport, walking and cycling networks is essential to help deliver CO₂ reductions from transport. Further detail on spatial planning's role in reducing the need to travel and provision of cycling, walking and public transport facilities are included within sections 4.1.3 – Reducing the need to travel; and 5.2.6 – Spatial planning, of this Plan. The County Council will also work with the district planning authorities to promote the inclusion of low emissions strategies at appropriate developments.

7.2.2 Supporting change to new vehicle technologies and fuels

Vehicle efficiency improvements

The European Union's Car CO₂ Regulation, agreed in 2008, establishes a clear, long-term framework for action by the industry to develop lower emitting vehicles. Consequently, vehicles are becoming vastly more fuel efficient and this is likely to continue throughout this Plan period and beyond. This will primarily be delivered through advances in the efficiency of the internal combustion engine. New ultra-low emission vehicles are also making their transition onto the mass market.

Various measures can be taken to further improve rail's energy efficiency and hence reduce carbon emissions. East Midlands Trains and Northern Rail have adopted comprehensive environmental policies that include commitments to reduce total energy consumption and thereby

reduce carbon emissions. Initial reductions have been around 4% per year, and continuation of this will further increase rail's environmental beneficial pre-eminence in this respect. Such initiatives will be driven by the train operators, Network Rail and DfT, but the County Council will strongly support these initiatives.

Electrification

The DfT is in the process of developing a nationwide strategy to promote the installation of electric vehicle infrastructure which is due to be completed by the end of June 2011. Whilst the measures the County Council aims to deliver during this Plan period are detailed below, the County Council will develop an electrification strategy to support that of the DfT following its publication.

The County Council will explore funding opportunities for the provision of electric charging points (such as the 'Plugged-in Places' funding) as and when they become available.

DfT is considering changes to the planning and/or building regulations to help accommodate electric vehicle infrastructure. The County Council will also explore opportunities through the local development framework process and development control policies to encourage the provision of electric vehicle charging points at new developments. The opportunity to install charging points at new employment and housing developments will also be identified through travel plans where appropriate. There may also be the opportunity to install electric vehicle charging points at key locations that attract large volumes of cars, such as at new park and ride facilities. If feasible, electric vehicle charging points would be powered using renewable energy, such as solar or wind power. The installation of charging points would also be accompanied by promotional information to ensure that users are aware of their location to maximise usage.

Such work will be undertaken in discussion and/or partnership with district councils and neighbouring transport authorities to help ensure the provision of an effective network of recharging points.

If the County Council proceeds with a car club (as detailed within Section 4.1.5 – Smarter choices, of this Plan) consideration will be given to the use of electric (or other low or ultra-low emissions) vehicles.

The County Council will promote the take-up of low and ultra-low emissions vehicles as detailed below in Section 7.2.4 – Encouraging a transfer to low carbon vehicles, of this chapter.

Bio-fuels

Bio-fuels are usually blended into the conventional transport fuels and are therefore a readily available renewable technology. As an emerging technology, however, there remains a lot of scientific uncertainty surrounding the full social and environmental impacts of bio-fuels. The 2008 Gallagher Review found that unless produced in the right manner, with appropriate crops, bio-fuels risk displacing existing agricultural production, which in turn may drive deforestation resulting in the loss of biodiversity and ecosystems. This could cause both an increase in net greenhouse gas emissions (above those associated with conventional fossil fuels) as well as contributing to higher food prices and food shortages.

Bio-fuels have the potential to emit millions of tonnes of global CO₂ less each year than the fossil fuels they replace. Promoting the use of sustainable bio-fuels is therefore an important part of the strategy to deliver a low carbon transport system but the County Council will only promote the use of those bio-fuels which are proven to be truly sustainable.

7.2.3 Promoting lower carbon transport choices

Switching to public transport or more active modes of travel (such as cycling and walking over shorter distances) can reduce CO₂ emissions. Active modes are a real possibility given that DfT analysis in 2009 found that 21% of CO₂ emissions arise from journeys of less than 5 miles, and 64% from journeys of less than 25 miles. The measures set out to address congestion and make journey times more reliable (see Section 4.1 – Making best use of the existing transport networks,

of this Plan); passenger strategy elements (see Section 6.2 – Provision of an affordable, reliable and convenient passenger transport system, of this Plan); walking, cycling and rights of way measures that reduce car use along with complementary education and awareness measures through travel plans and publicity materials (see Section 5.2.2 – Promotion, of this Plan); will all contribute to managing road traffic levels and improving vehicular flow, consequently reducing CO₂ emissions within the county.

7.2.4 Encouraging a transfer to lower carbon vehicles

In any organisation where transport represents a significant cost, there is the potential to work with the organisation to promote strategies to increase operational efficiencies, or to invest in more fuel efficient vehicles, technologies and infrastructure. Many businesses have demonstrated that cutting their carbon emissions in these areas can deliver significant benefits, from the cost savings that arise from more efficient operations, to the contribution these can make to an organisation's corporate social responsibility agenda. To support Central Government initiatives, the County Council will continue to promote the take-up of low emission vehicles to the public, organisations and amongst its own fleet.

Similarly the County Council will continue to work to increase operational efficiencies in its own fleet, and in partnership with other organisations through the development of travel plans as well as through the development of the Freight Strategy.

Through its travel planning work, the County Council provides funding and training for businesses to produce a site specific travel plan and fund measures for implementation. Cleaner vehicles for use as pool cars and fleet vehicles will be promoted as part of travel plans that are developed both internally within the County Council, as well as with employers and businesses throughout the county. The County Council will also act as promoters and signposts for national, regional and local advice and grants schemes.

The County Council monitors emissions from its own fleet and has a number of dual-fuel and electric vehicles within its fleet. The County Council will use the information it gathers to consider the role of electric vehicles and other low emission vehicles within the County Council's fleet.

Public transport

It is anticipated that lower emission buses will play a growing role in the UK's transport system. The County Council will continue to work in partnership with operators to improve the age and emissions of their fleets, including exploring opportunities to bid for funding for low emission vehicles. The potential for requiring low emission or electric vehicles for contracted bus services will also be investigated.

Electric powered buses provide environmental benefits through reductions in both air and noise pollution. Nottingham City Council has successfully obtained green bus funding from central government for four electric vehicles. These will be introduced on the 'centrelink' service operated on behalf of the City Council by Trent Barton. Other bus operators within Nottinghamshire do not currently have any plans to introduce electric or hybrid vehicles. The County Council will consider the provision of electric powered vehicles in partnership with passenger transport operators for possible local bus services, as well as demand responsive travel and interconnect style services within the county, but the Council will monitor progress on the City trial for use in future considerations.

Electric trains offer better environmental performance than diesel equivalents and can also increase capacity and reliability, as well as being cheaper to buy, maintain and operate.

In 2009 Network Rail published its Network RUS Electrification Strategy. This identified the electrification of the Midland Main Line (MML), from London to Nottingham and Sheffield, as having "*the strongest business case*" of any route in Britain. In fact the benefits are so great that "*In the case of Midland Main Line the value is technically infinite given that it involves a net industry cost saving rather than a cost*".

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As a result the MML was one of a small number of routes included in Network Rail's 'Core Strategy' for electrification.

As the Electrification Strategy states, the main benefits of electrification are:

- substantial (typically around 30%) reduction in operating costs
- easier to obtain new and/or additional rolling stock in future
- less pollution and noise at stations, and
- significant reduction in carbon emissions, the more so as Britain's electricity generation progressively becomes 'lower carbon'.

For these reasons the Council supports the electrification of the MML and will push Government for it to happen at the earliest opportunity.

It should, however, be noted that, contrary to what is often supposed, electrification will make very little difference to journey times. For long distance services like the MML, the time savings are estimated at "*half a minute per stop*". Nottingham-London 'fast' services have three stops and Nottingham-Beeston-London 'semi-fast' services have eight stops, so the time saving would be 1.5 or 4 minutes respectively. Indeed there are some circumstances - in particular the much touted transfer to the MML of the electric trains that currently operate on the East Coast Main Line - where the electric trains would be slightly slower, and hence journey time on the Nottingham-Beeston-London 'semi-fast' services would be slightly lengthened by electrification if it were implemented in the same way.

The Council's primary concern on the MML is to reduce standard Nottingham-London journey times from 104 to 90 minutes. To achieve that reduction, it is necessary to raise the various speed restrictions along the line and this is the Council's priority for the MML. This certainly would need to happen before the line was electrified, as wherever the electrification equipment was installed for the current lower speeds, it would need to be ripped out and replaced if speeds were ever to be raised - thereby hugely, and wastefully, raising the cost of speed improvements.

Freight

The County Council's Freight Strategy is to be developed following the completion of the LTP3. The Strategy will include the consideration of how emissions from freight can be constrained. This will include working in partnership with freight operators to promote low emission vehicles and also opportunities to make operational improvements.

The Council strongly supports the transfer of freight from road to rail or barge wherever possible as a way of reducing heavy lorry traffic on the county's roads, to reduce the safety risk associated with heavy lorries, and to reduce carbon emissions.

Network Rail is developing a 'Strategic Freight Network' that is planned to link all key British ports with the main centres of population via routes that are cleared for 'W10' loading gauge i.e. that have had bridges, tunnels etc. raised so as to be available for use by the taller 'high-cube' containers that are becoming standard for intermodal freight, and in which rail traffic is growing rapidly (10% per annum in 2010). By the start of the LTP3 period, this network will extend across the East Midlands on the Harwich/Felixstowe - Peterborough - Leicester - Nuneaton - Birmingham - Southampton axis, which joins the MML between Syston and Wigston.

The full 'Strategic Freight Network' is proposed to subsequently include the MML, the Erewash Valley line from Clay Cross and the north to Trent, and the Trent - Stoke - Manchester routes, which would make Nottinghamshire accessible from every main port and conurbation. However, no funding has been allocated yet to allow completion of this network. The County Council will press strongly for the MML, Erewash valley and Trent - Stoke sections to be completed at the earliest opportunity.

The former East Midlands Development Agency undertook a comprehensive assessment of all potential sites for multi-modal rail freight terminals within the entire region. The study assessed

various possible sites within Nottinghamshire, but all had difficulties of one sort or another. One site that has been the subject of previous proposals for a rail freight terminal was at Toton, which was assessed as having *“Excellent rail connectivity but very poor road access and close to urban area...may be able to provide a stabling facility for trains accessing other sites”* and so was not recommended as likely to be taken forward. Taking into account all relevant factors, including accessibility from the rail and main road networks, it identified three sites as most suitable, at Markham, Castle Donnington and Egginton. Although these are all just outside the Nottinghamshire boundary, such terminals serve a very large catchment area, including Nottinghamshire. The County Council would be supportive of developments at any, or all of these, three sites.

The County Council will support the provision of sidings for local factories, quarries etc. where they could practicably be served directly from the county’s rail network.

The River Trent is navigable as far upstream as Nottingham by barges of 300 tonnes, but currently, although there is water freight as far upstream as Gainsborough, there is no freight on the section of the river west of this point. A 2010 British Waterways Board study identified a number of potential new freight flows that could use the river as far upstream as Newark and/or Nottingham, and the Council will support any initiatives to transfer these flows to use the river. The Council will seek to bring Colwick wharf back into general use for water freight, by removing the section of the covenant that currently restricts such use.

Lighting

The electricity bill for street lighting has increased significantly from £1.05m in 2004/05 to an estimated £5.04m in 2010/11. Over the long term, energy prices are likely to continue to rise against a backdrop of the County Council having to make significant budget savings over the next three years.

The Government is encouraging large users of energy to reduce their usage through the mandatory Carbon Reduction Commitment Energy Efficiency Scheme. Under this scheme the County Council will have to purchase allowances for every tonne of CO₂ it emits. This will add £266,000 to the annual cost of street lighting unless electricity usage is reduced.

The County Council has therefore approved plans for changes to street lighting designed to save over 10m kWh per year which is about 25% of the 2009/10 usage, saving about 5,800 tonnes of CO₂ emissions per year. The changes will be implemented over four years and will include:

- switching off some lights where they are no longer considered necessary
- dimming of some lights on main roads between the hours of 10pm and 7am when traffic flows are low and a lower level of lighting will not affect road safety, and
- switching off some lights between midnight and 5.30am in residential areas in consultation with local communities.

All street lights are being considered but each site will undergo a risk assessment to decide which lights should be left on for reasons of safety or crime prevention. A small number of proposals, however, will be developed first for some rural villages that have expressed an interest in the project in order to test out the design and consultation process.

The equipment needed to dim lights is fairly expensive and the energy saved by dimming needs to be sufficient to pay back this initial expense within a few years to make it cost effective. Consequently, dimming is only justified on lights rated at 250 watts or more.

Efficient, light-emitting diode (LED) lighting has been considered as there are many advantages of LED lighting. Whilst LED lighting is not without problems (such as decreasing light output with age; design requirements; and costs), the County Council will continue to monitor the trials taking place in other authorities. Following the outcomes of these trials the Council will consider the implementation of LED lighting as part of a long-term investment programme if appropriate.

7.2.5 Education on lower carbon transport issues

The County Council will continue to promote key messages to make people and businesses more aware of the simple changes they can make which will have an impact on carbon emissions from transport.

Public transport does not always offer the same convenience as the car for many people outside larger towns and cities. Similarly, walking and cycling may not always be practical options for longer journeys. It is therefore important that people with access to a car have the information they need to use it efficiently and in the most environmentally friendly way possible. Eco-driving enables drivers to use their vehicles more efficiently and to reduce fuel consumption, costs and emissions of both CO₂ and local air pollutants. Estimates by the Energy Saving Trust show that drivers could reduce emissions and fuel consumption by around 8% simply by following six smarter driving tips; and this figure increases to an average of 15% immediately following a smarter driving lesson. The County Council will therefore encourage people to drive more efficiently through promoting key messages and supporting national campaigns to make people aware of the actions they can take to buy and run their car in a way that saves fuel, money and reduces CO₂. Such messages may include:

- the actions drivers can take to run their car in a more efficient way to reduce CO₂ emissions, such as keeping tyres inflated, changing up a gear a little earlier, driving more smoothly, and not having clutter in the car, and
- providing advice to consumers about buying the most fuel efficient car to meet their needs.

As part of the development of the County Council's Freight Strategy, the Council will consider how it can promote the Freight Best Practice programme. The programme is a Government funded initiative that offers free resources, tools and guides to help organisations with large or small fleets save money, reduce CO₂ emissions and improve efficiency throughout an organisation's freight operations.

The Driver Certificate of Professional Competence (Driver CPC), which includes an eco-driving element, came into effect on 10 September 2008 for passenger carrying vehicle (PCV) drivers; and 10 September 2009 for heavy goods vehicle (HGV) drivers. All professional bus, coach and minibus drivers (with 9 or more passenger seats) and HGV drivers of vehicles weighing over 3.5tonnes need to hold a Driver CPC in addition to any vocational licence. The County Council will continue to promote the Driver CPC through its partnership working with public transport and freight operators.

Encouraging people to think about reducing their car use, including through travel planning work, is a key element of the smarter choices work undertaken by the County Council (detailed in Section 4.1.5 – Smarter choices, of this document). This includes making people aware of the travel choices that are available to them, particularly relating to public transport, walking and cycling. To help people become more confident to adopt cycling as a means of transport, both off-road training for younger children and the national Bikeability cycle training scheme is offered to all school pupils in the county. Cycle training is also available to individual adults, groups and to businesses.

7.3 Congestion management

Improving journey times will lead to reduced congestion and therefore reduced CO₂ emissions. The County Council's strategy to address congestion and improve journey times is set out in Section 4.1 – Making best use of our existing transport networks, of this Plan. Specifically, the congestion management measures detailed within reducing the need to travel will play a key role in delivering carbon reductions from transport. Central to this strategy will be:

- effective spatial planning – ensuring that the planning system takes full account of the potential consequences of development for transport; putting employment and housing development in appropriate locations; and when necessary ensuring that sustainable public transport, cycling and walking facilities are funded by developers
- maximising new technology – using technology such as teleconferencing to transform the way people work; and use of information technology to enable people to access the goods and services they need without having to travel
- smarter travel choices – delivering a range of smarter choices measures to change personal behaviour and business practices, such as home working, and
- improving access to local centres – helping people to access their local shops and services easily by walking, cycling or public transport instead of making short car journeys.

More detail on reducing the need to travel is included in Section 4.1.3 – Reducing the need to travel, of this document.

7.4 Air quality

The Environment Act 1995 required the Government to develop a National Air Quality Strategy. This strategy, originally published in 1997, set challenging health based targets for eight main air pollutants. These are benzene; 1,3-butadiene; carbon monoxide; lead; nitrogen dioxide; ozone; fine particles (PM10); and sulphur dioxide. The predominant source for many of these pollutants is road traffic, but industrial and domestic sources are also major contributors. The National Air Quality Strategy was reviewed and a new Addendum was published in 2003 which introduced tighter objectives for particles, benzene and carbon monoxide and a new objective for polycyclic aromatic hydrocarbons. Local authorities are required to review and assess the strategy's objectives for seven air pollutants together with the new ones for benzene and carbon monoxide prescribed in regulations.

The Nottinghamshire Environmental Protection Working Group was established in the 1980s and is a partnership between all of the district councils, the City Council and the County Council, as well as the Health Protection Agency and Environment Agency. Part of the Group's remit is to co-ordinate the review and assessment of air quality in Nottinghamshire. The Nottinghamshire Air Quality Improvement Strategy was therefore developed in partnership with these organisations.

Following a review of the strategy, the Group published the revised strategy for Nottinghamshire in 2008, 'A Breath of Fresh Air for Nottinghamshire', which sets out the approach to reducing emissions of key pollutants across the county. The approach details the 'framework for action' to help local authorities manage and improve ambient air quality in Nottinghamshire and to protect the health and well being of the public in a co-ordinated and integrated manner. The Strategy will be reviewed periodically, the next review being due in 2011.

The Nottinghamshire air quality strategy identifies the need to reduce air pollution by encouraging alternative travel modes and promoting sustainable development through the Local Transport Plan and local development framework processes. The Strategy aims to provide a sustainable and efficient transport network that is accessible to everyone through:

- promotion and incentives for the use of cleaner vehicles and green fuels
- traffic management, including parking restrictions and vehicle restrictions, where appropriate
- travel planning
- encouragement of more sustainable travel
- provision of cycling and pedestrian routes
- better integration of transport systems
- improved public transport, particularly through bus quality partnerships
- provision of park and ride schemes, and
- improved spatial planning and development control.

Air quality across the county is generally good but there are locations which have transport related air quality issues relating to NO₂ levels due to high traffic volumes, such as adjacent to the motorway and trunk road network, or at 'pinch points', such as bridges across the River Trent.

7.4.1 Assessing and monitoring air quality

Every year local authorities are required to review and assess air quality within their districts under the provisions outlined in the Environment Act 1995 and the National Air Quality Strategy 2007. These set a number of air quality objectives (set in regulations for certain pollutants) for the protection of human health and the environment to be achieved between 2003 and 2020. The County Council will continue to use the opportunity of working in partnership with the authorities in the Nottinghamshire Environmental Protection Working Group to ensure a consistent approach to assessing and monitoring air quality throughout the county. Working within the Group also aids the cross-boundary work that may be required to address any locations where air quality objectives are unlikely to be met.

A review and assessment of air quality is the first step in the local air quality management process. Part IV of the Environment Act 1995 requires each local authority to review air quality 'from time to time'. The National Air Quality Regulations 2000 and the Air Quality (Amendment) Regulations 2002 prescribe air quality objectives and the dates for meeting them. For each objective, local authorities have to consider present and future air quality and assess whether the objectives are likely to be achieved by the prescribed date.

Review and assessment is undertaken using a phased approach, initially conducting an 'Updating and Screening Assessment' (USA). This is based on a checklist approach to identify those matters that have changed since the first round of review and assessment was completed and which now require further assessment. A 'Detailed Assessment' is then undertaken where the USA indicates that an air quality objective may be compromised.

Where objectives set for air quality are unlikely to be met, local authorities must issue orders designating these areas as air quality management areas (AQMA). In these areas local authorities are required to draw up action plans to ensure air quality objectives are met. Action plans may include measures to be taken both within and outside an AQMA and could extend beyond a single district council's area involving several councils working together, and where necessary the Highways Agency where trunk roads are involved. The action plans will also involve the setting of targets to ensure that the air quality objectives are met within agreed timescales. The County Council will continue to work in partnership with district councils to produce specific action plans for air quality improvements in AQMAs.

Sites that are identified as borderline, or requiring further investigation, but do not require an AQMA to be declared, receive more regular monitoring to help predict future air quality levels. Such sites are also factored into the prioritisation of programmes of work, such as 'smarter choices' and integrated transport schemes to help improve air quality, and ensure that exceedences do not occur.

Ongoing assessment will continue to be undertaken across the county to monitor levels of pollutants to help identify existing or potential exceedences in the future. If issues arise there are existing mechanisms whereby they can be raised and tackled through a partnership approach. Given the close links between air quality and congestion, the measures detailed within Section 4.1 – Making the best use of our existing transport networks, are used to manage congestion and therefore help maintain air quality and will form the basis for air quality action plans. Where assessments identify existing or likely future exceedences additional resources will, however, be prioritised to address such exceedences.

7.5 Noise

Improving the health, wellbeing and quality of life of communities is the main reason for addressing noise issues. Noise and sleep disturbance can have serious effects on physical and psychological health. Whilst annoyance created by noise does not necessarily lead to more serious health issues, it can have adverse impacts on general wellbeing and reduce quality of life.

Reducing night time noise is therefore important because of the potential effects on sleep and consequent health impacts. Daytime impacts, however, also need to be considered as people can be disturbed by noise during the day; changes to working patterns can lead to a variety of sleeping times; and daytime noise has significant impacts on the quality of life.

Noise from vehicles (private, freight and public transport) can be a significant problem and reducing it is the main area of influence that the County Council can have on noise. Tranquillity is a factor in the character and quality of many parts of the county's landscape and settlements and is inter-woven with the character of the historic environment.

Priority will be given to highway measures that reduce noise in areas where there are high levels of road traffic and significant noise sensitive properties affecting a high number of people. However, greater priority will be given to measures that will lead to both the biggest noise benefits and other transport objectives (such as tackling congestion and encouraging active travel) as it is essential to ensure that resources are targeted appropriately.

7.5.1 Nottingham Agglomeration Noise Action Plan

The Nottingham Agglomeration Noise Action Plan is designed to address the management of noise issues and effects in the Nottingham agglomeration under the terms of the Environmental Noise (England) Regulations 2006 as amended (the 'Regulations'). These Regulations transpose Directive 2002/49/EC relating to the Assessment and Management of Environmental Noise. This directive is commonly referred to as the Environmental Noise Directive or END. In particular, the Action Plan covers the noise issues arising from road, railway, aviation and industrial sources (as described in the Directive) that affect the Nottingham agglomeration. The management of noise issues and effects from major roads, major railways and major airports that are located outside first round agglomerations are addressed within the Action Plans for those sources.

The DEFRA Noise Action Plan for Major Roads outside agglomerations identifies 'Important Areas' with respect to major road and rail noise where 1% of the population is affected by the highest noise levels. Locations where noise mapping indicates levels of at least 76 dB $L_{A10,18h}$ are to be investigated as a priority.

There are an estimated 7,300 dwellings to be investigated due to noise from major roads across the East Midlands with 2,100 to be investigated as 'First Priority Locations'. The Noise Action Plan requires the County Council to investigate 'Important Areas' (giving priority to those containing 'First Priority Locations') on its highways during July 2010-June 2011. The County Council is then required to implement any actions or secure budget for actions from April 2011 onwards. From April 2012 the County Council is required to investigate and implement measures on the remaining 'Important Areas' on its highways.

There are locations along 54 routes across the County Council's highway network that have been identified as First Priority Locations which require investigation.

7.5.2 Promotion of quieter modes of transport

Walking and cycling are the most sustainable modes of travel and offer a quieter and healthier alternative to motorised vehicles. But technology is advancing and vehicles with reduced noise impacts are emerging. New technology may offer a range of additional benefits, for example electric and hybrid vehicles are being used because of reduced emissions but also have the potential to be quieter than other vehicles. An expansion in the use of quieter technology has significant potential to reduce noise levels. The County Council will promote quieter modes of transport such as walking, cycling and electric vehicles and provide the necessary infrastructure

where these will also contribute to wider transport objectives, such as tackling congestion and encouraging healthy active travel. Further detail on this work is included in Chapter 5 – Encourage sustainable and healthy travel, and Section 7.2.4 – Encouraging a transfer to lower carbon vehicles, of this chapter.

7.5.3 Highway improvements

Quieter road surfaces can play a part in reducing noise from road traffic because they can have a significant effect, but the noise from vehicles travelling at lower speeds tends to be less. This means that on roads where average speeds are very low, changing the road surface may not have the same acoustic impact that would be expected if average speeds were greater. Quieter road surfaces can also deteriorate faster than conventional surfaces which highlights the need to consider the most locally appropriate response to ensure resources are targeted effectively. The County Council will investigate the use of quieter road surfaces and consider their implementation if they are considered appropriate, feasible and cost effective over the whole of their life-cycle. Noise reduction measures such as fencing, bunds, etc. will also be considered when appropriate as mitigation on new transport improvements and where traffic noise is considered significantly high.

7.5.4 Commercial traffic

A range of measures can also be considered to address issues of noise from commercial transport, including traffic management, such as the consideration of restrictions on coaches and heavy goods vehicles. The County Council will also support schemes which lead to quieter deliveries and servicing of commercial and residential properties. Such schemes will emerge from the Freight Strategy which will be developed following the completion of LTP3 but may include investigating the feasibility of a retail freight consolidation centre; the promotion of quieter, low carbon vehicles; and the promotion of freight routes.

7.5.5 Street works

Noise from street works and the maintenance of the highway infrastructure can also affect residents and local businesses. The County Council will attempt to ensure these works are not undertaken late at night or at weekends, to allow residents some respite from noise. Seeking to minimise and, where possible, limit the noise impacts of street works may however, need to consider extended working hours to reduce the duration of the works. The County Council will also need to consider its network management duty under the Traffic Management Act, 2004 when determining these issues.

7.6 The physical environment

The wellbeing of people living in the county is a central strand of the County Council's Sustainable Community Strategy 2010-2020 and that of a range of other partner organisations, such as borough, district and parish councils. The quality of the environment in Nottinghamshire and its communities has a major impact on many aspects of the county's life. The County Council has long recognised the need for a continued programme of investment to improve the environment. Improvements to the environment can have a positive social and economic regeneration impact. There is clear evidence that the response of individuals to their environment is closely linked to the quality of their everyday surroundings. It affects the pride that people have in their community and has a major influence on their outlook on the wider world.

Poor streetscape and quality of public spaces which are not up to the public's expectations do not engender pride, and can lead to anti-social behaviour. Improving streetscape quality and public spaces can therefore encourage public activity and allows pedestrians to move freely through uncluttered streets. It assists the orderly, efficient and safe movement of people and goods and encourages people to drive less and walk more.

Nottinghamshire is a diverse county that ranges from idyllic rural villages in prosperous farming areas to run down deprived urban areas and isolated ex-mining villages. The countryside equally reflects those differences with some areas still showing the scars of heavy industry that has long

gone, whilst other areas exhibit the undisturbed maturity of ancient forests and arable land. The urban environment ranges from the picturesque settlements of Southwell and Newark, to the heartland of previous heavy industry in Mansfield, Worksop, Sutton in Ashfield, Kirkby in Ashfield and Hucknall. High density living in poor quality housing built for previous generations, still typifies many settlements along the industrial spine to the west of the county.

The LTP3 plays an important role in shaping the environment that we live in. The integration of the LTP3 strategy with the continued endeavours by the Council to lift the quality of the county's environment will provide added value in meeting many common objectives. The attractiveness of the physical environment plays a vital role in creating sustainable communities, thereby reducing the need to travel.

Some key pressures on the environment include:

- housing – it is currently estimated that approximately 100,000 new dwellings may be required in Nottinghamshire between now and 2026
- transport – whilst road traffic has reduced between 2005 and 2009, road traffic is likely to increase as the economy improves
- waste – industry, commerce and households in Nottinghamshire produce around 2.5m tonnes of waste each year
- wildlife – Nottinghamshire contains fewer protected landscapes and wildlife sites than neighbouring counties. The county has 50% less ancient woodland than in 1920; 90% less heathland than in 1922; and 97% less wildflower-rich grassland than in 1930, and
- heritage – the county contains over 4,500 listed buildings; 300 scheduled ancient monuments; 150 conservation areas; and 20 registered parks and gardens; and a historic battlefield. The 'buildings at risk' rate for the county is above the national average at just under 7%.

Nottinghamshire has a well respected tradition for environmental improvement work over the last 30 years through specific programmes and the drawing in of external funding, such as Alliance SSP and WREN. These programmes have complemented and added value to many schemes funded through other programmes. The County Council will continue to try and draw in available external funding for such works during the LTP3 period.

Landscape character assessment (LCA) have been undertaken to identify the differences between landscapes based on sense of place, local distinctiveness, characteristic wildlife, and natural features. Landscape character assessment is therefore a useful tool for understanding, planning and managing landscape change and will be considered as part of proposed highway improvements as necessary. This may be to avoid large areas (e.g. at a parish scale) that need conservation or protection when considering large new infrastructure projects; or at a smaller scale (e.g. sub-parish) to minimise the impacts of smaller schemes by using the LCA as a mechanism for identifying design elements that are either in-keeping with the landscape, or look to provide enhancements where the landscape needs reinforcement.

7.6.1 Local Improvement Scheme initiative

The importance given to the local environment by Nottinghamshire residents resulted in the introduction of the Building Better Communities initiative in 2004, re-launched as the Local Improvement Scheme (LIS) initiative in 2009. The LIS initiative has been very successful at delivering a wide range of environmental improvements across the county for the benefit of local communities which have been recognised locally, regionally and nationally. The vast majority of the projects are requested directly by local communities which are then endorsed by their local County Council members.

The LIS initiative will continue as a countywide programme to improve the environment of Nottinghamshire. The new LIS programme will retain its effective, flexible and unique formula developed under the old banner of Building Better Communities and will continue to support a wide range of projects under the broad headings of:

- better neighbourhoods (landscaping, footway improvements, conservation of local distinctiveness, and general refurbishments)
- better countryside (safeguard biodiversity and strengthen rural character)
- better business (regeneration of local shops and businesses)
- better leisure and tourism (promote the attractiveness and accessibility of places of interest), and
- better awareness (promotion of local 'pride of place').

Project selection will be re-prioritised to focus on a number of areas considered to have been under-represented to date. The areas that will be promoted are:

- rural initiatives (for example, village distinctiveness/village gateway projects)
- market town projects that improve the centre's attractiveness and economic viability
- projects that develop greater local pride and responsibility for the environment (for example, conservation projects, heritage projects and the development of pocket parks)
- projects that support wider local community involvement and accessibility, and
- projects that encourage economic and cultural regeneration and tourism.

Since the inception of the Building Better Communities initiative (now the LIS initiative) over £11m of external funding has been secured for environmental improvements, in addition to the £35m that the County Council has spent on this initiative. A key target of the LIS initiative will remain to draw in external funding that would not have otherwise been invested in the county.

7.6.2 New development

The County Council's Highway Design Guide (developed with regional partners) and Sustainable Developer Guide detail the standards that are required of developers, creating sustainable communities (thereby reducing the need to travel) that provide high-quality spaces for people which are not dominated by motor vehicles.

7.6.3 Local Accessibility Transport Studies

Improvements to local centres will be identified through consultation undertaken as part of Local Accessibility Transport Studies (LATS) which are used to identify a range of town or local centre transport improvements in a holistic manner. More detail on LATS is included in Section 6.1.6 – Local Accessibility Transport Studies of this Plan.

7.6.4 Local centres and town centres

By making town centres, other shopping areas, residential streets, and rural roads places for all road users, as well as motorists, the quality of life in these areas can be greatly improved. Making better provision for walking and cycling can also contribute to wider objectives such as improving community health. The County Council will continue to invest in the infrastructure of urban and rural town centres as well as local shopping centres to ensure that they remain or become attractive, vibrant places to live, work and visit. Such work will enhance the attractiveness, appearance and safety of these centres to make them attractive to both businesses and the community. This investment may include a range of measures such as small environmental improvements to shopping parades; improvements to walking and cycle routes to local facilities; bus facilities; and additional street lighting. Such investment will be prioritised on under performing and run-down town and local centre areas.

Accessibility planning analysis, local transport needs studies and economic health-check surveys will be integrated to help establish appropriate master plans and action plans for towns and villages in partnership with the local community and local planning authority.

7.6.5 Street furniture and signage

Unnecessary street clutter, including street furniture and signage can have a detrimental impact on the physical environment. The County Council will therefore periodically review the clarity, effectiveness and level of signing as well as other infrastructure provided. Such reviews will have regard for the convenience and safety of road users; asset management; directional requirements

to reduce congestion and unnecessary mileage; in addition to the physical landscape and its character.

7.6.6 Public transport

The County Council recognises that the design and maintenance of public transport infrastructure (e.g. bus stops and shelters, stations and interchanges) are also important in improving perceptions of the ease, security and comfort of travelling by public transport to deliver the congestion, pollution, accessibility, and safety benefits of increased public transport patronage. Consequently the Council will continue to invest in the upgrade of all bus stops in the county as well its programme of passenger interchange (bus station) improvements (both of which are detailed within the Integrated Passenger Transport Strategy; and summarised within Section – 6.2 Provision of an affordable, reliable and convenient passenger transport network).

7.6.7 Links to regeneration proposals

The decline of traditional industries has resulted in the need to regenerate specific areas in the county, particularly those classed as the most deprived (as detailed in Section 4.2 – Regeneration, of this Plan). The County Council will continue to target environmental improvements to urban and rural areas of deprivation to complement the regeneration and renewal work carried out by itself, as well as that of other organisations, such as district councils.

7.7 The historic environment

The county's heritage makes a key contribution to the quality of life of its communities. Access to, knowledge and understanding of the historic environment makes a positive impact on people's health and wellbeing. The historic environment plays a key role in promoting a vibrant economy, as it contributes to the leisure and tourism industries and is fundamental to local economic regeneration. The existing road network is a part of the county's historic environment. Some of the road infrastructure is historic and of considerable heritage significance, in particular many bridges around the county are protected as listed buildings or scheduled ancient monuments. There are also many examples of protected signposts, milestones and way markers along the county's roads.



The settlements and landscape that the road network passes through are historic and contain the rich and varied remains of the past, some of it is protected as listed buildings, scheduled ancient monuments, conservation areas, battlefields or historic parks and gardens, but much of it is undesignated local heritage. It is impossible to disentangle this cultural heritage from the natural heritage represented by ancient hedge rows, woodland and other landscape types of which the road network is a part.

Modern roads are the same routes that our ancestors used to move around the county for hundreds and, in some cases, even thousands of years. For instance, the A46 is well known as the route of the Roman Road the Fosse Way, and there are examples of routes that have probably been in use even earlier than this. The archaeological remains of our past lay under and alongside the road network, so the potential for highway development to reveal interesting and important information is often high. Construction of new routes has a predictable likelihood of encountering archaeological remains, sometimes of very high significance.

The modern rail and waterways network is linked closely to the industrial heritage of the county, (especially the coal mining and textile industries) as well as the phenomena of commuting that developed rapidly in the late 18th and 19th century heritage forms

an integral part of the modern network in bridges, tunnels, stations, locks and other structures many of which are protected as 'designated heritage assets'.

Planning Policy Statement 5 'Planning and the Historic Environment' 2010 (PPS5) sets out how the local planning authority should take into account the designated and undesignated heritage assets during their preparation of local plans. This includes requiring that there is access to an appropriate Historic Environment Record. The County Council considers that use of the County Historic Environment Record, held by the council, is the key to ensuring all transport proposals follow the requirements of PPS5.

It is acknowledged that some proposals for improvements to Nottinghamshire's local transport network may impact on the historic environment. Detailed below are some of the impacts that can occur. The extent of these impacts can be both individual and cumulative but it is important to note that impact on the historic environment may not necessarily be negative, and can also be positive when the significance and value of the heritage asset is considered at the outset. Where there are opportunities to enhance and protect the historic environment these will be integrated within proposals for the development of the network. The impact of and response to climate change on the transport network's heritage is discussed in this chapter in table 26, within Section 7.1 – Adapting to climate change.

7.7.1 Historic urban cores, conservation areas and the public realm

Most of Nottinghamshire's settlements have a historic urban core reflecting their medieval origins. Over 150 of these are designated conservation areas. These places range from urban market town centres to small rural villages and hamlets. The roads that run through them form part of their character and can be soft and rural with grass verges and hedges, suburban green avenues with formal planting, or urban streetscapes tightly packed within commercial centres. The archaeological evidence of the earlier history of a place can be revealed during road and public realm works. Issues are particularly prevalent in the county's market towns where the public realm is a key component of their economic and cultural vitality and where there is often very acute pressure from transport related issues. Opportunities for enhancement of the 'character' of conservation areas through carefully considered public realm improvements and highway schemes are widespread. Archaeological impact and opportunities for enhancing historic character will be considered at the outset of a scheme and incorporated when possible.

7.7.2 Impacts on heritage assets

Listed buildings

There are many listed structures within highway boundaries, often owned by the highway authority that can be inadvertently damaged or easily overlooked, such as milestones and old market crosses. The road network includes listed bridges and viaducts which will be treated appropriately. Listed buildings that bound the highway network have a 'setting' that may include the character of the road itself and which can be easily eroded, but which may also be enhanced when opportunity arises. Such opportunities will therefore be considered on a scheme by scheme basis and will be delivered where feasible and appropriate.

Scheduled ancient monuments

Some listed bridges are also designated archaeological sites, and many others immediately bound modern roads. Several protected Roman sites are intrinsically linked to the Roman/modern road itself. Damage to the protected archaeology of the county will very rarely be acceptable. Impact on the setting of these assets (see below) may also need to be considered in developments.

Undesignated archaeological sites

The County Council's Historic Environment Record records many thousands of sites that could be damaged by highway schemes. Highway developments off the line of existing roads may encounter archaeological remains and therefore as part of scheme development, records will be investigated and mitigation considered where appropriate. Drainage improvements will often require archaeological input.

Historic parks and gardens

Roads often pass through and alongside designated (registered) and undesignated historic parks and gardens. For example, the main entrance to Rufford Abbey is off the A614 and Newstead Abbey is accessed off the A60. All of the 'Dukeries' estates have entrances off the surrounding roads, often with listed gate lodges and boundary walls immediately alongside the road. The setting and significance of places like these is affected by changes to the roads that bound and cross them.

Historic battlefield

East Stoke is the site of the county's single designated battlefield. The A46 runs right past this site and on through the designated conservation area of the village, past listed and local interest buildings, scheduled ancient monuments and other archaeological sites. The realignment of the A46 and de-trunking of the existing A46 in this area provides an opportunity to enhance the setting of the battlefield and other heritage assets through removal of traffic, reduction in highway infrastructure and reinstatement of the rural character of the vicinity. Archaeological potential in this area is high.

Setting

The setting of designated heritage assets is protected and is the aspect most easily damaged inadvertently by highway developments. New lighting schemes, pedestrian crossings, and road alignments (with their accompanying signage, road markings, guard railing and other infrastructure) will erode the townscape and landscape setting of designated heritage assets if this is not considered at the outset.

Historic landscape character

The county's historic landscape character map and landscape character zones contain the source information for establishing the wider historic environment issues affected by transport. Tranquillity is a measurable dimension of the character of the landscape (and settlements) and can be a key contributor, along with night time light levels, to the quality of places and to their sensitivity to impacts arising from transport schemes.

Cumulative impacts

The county's archaeological resource is non-renewable and there is a presumption in favour of its preservation. Statutory assessments undertaken at many of the county's conservation areas indicate that the treatment of the roads within them has eroded their special interest, significance and character, and continues to do so. The historic landscape of the county is under constant pressure to accommodate the demands of the modern network. Pressure to improve capacity and safety can erode rural character and tranquillity and dilute the distinctive qualities of the county's historic landscape character. Major schemes will always impact on the historic environment and require appropriate impact assessments.

The County Council's heritage asset information plays a vital role in ensuring that we maintain the assets through streamlining its effective use into early feasibility and design work for transport improvements. Cross-service working will be undertaken to ensure effective consideration of the impacts of transport improvements on the county's heritage assets and, where appropriate, mitigation. Such working will also help identify where proposed transport schemes that involve conservation of heritage sites provide opportunity to lever in external funding. A flexible approach to design will also help ensure transport improvements are sympathetic and appropriate when impacting on heritage assets.

Given the close links between heritage assets, traffic volumes and congestion, the measures detailed within Section 4.1 – Making best use of the existing transport networks, will be used to manage traffic volumes and congestion and therefore help maintain the county's heritage assets.

7.8 Biodiversity and the natural environment

Biodiversity is the variety of life, encompassing the whole of the natural environment. As well as being important for its own sake, it provides us with vital commodities such as food, shelter and industrial materials, and with a suite of ‘ecosystem services’ including atmospheric, climatic and hydrological regulation, nutrient cycling, pest control and pollination. Biodiversity and a healthy natural environment are also an important component of the quality of life for local communities – contributing to people’s health and wellbeing, including by offering opportunities for outdoor recreation, thereby encouraging physical activity; improving the quality of the environment; and supporting a vibrant economy.

Biodiversity can be found virtually everywhere, but there are features in our towns and countryside that are especially important for wildlife, such as those that support rare or scarce plants and animals, or particular habitats such as species-rich grasslands, heathland, woods, hedgerows, rivers, and wetlands. Many of these habitats occur within the highway network, or immediately adjacent to it.

Areas can also be important through their role as ‘stepping stones’ or ‘wildlife corridors’, allowing the migration and dispersal of species between sites – something that is increasingly important as our climate changes, and plants and animals need to move into new areas to survive. They also allow genetic exchange between populations which might only otherwise exist in small, fragmented patches of habitat, and for areas to be recolonised by species which have become locally extinct.

The highway network plays an important role as an extensive wildlife corridor, where suitable habitats exist which are sensitively managed. These corridors are especially important in linking small or isolated sites, or in areas dominated by intensive agriculture where there is little other habitat.

7.8.1 Protection of sites, species and habitats

The most important sites in Nottinghamshire for the conservation of biodiversity are legally protected and are detailed below.

Sites of Special Scientific Interest

Sites of Special Scientific Interest (SSSIs) are nationally important sites that are legally protected, representing the finest places for wildlife and natural features in Britain, supporting many characteristic, rare and endangered species and habitats. There are 68 SSSIs wholly or partly in Nottinghamshire, covering areas of woodland, heathland, grassland, wetland and old quarry. SSSIs are often located next to roads and other transport infrastructure and in some cases, fall within areas of active railway land or the highway boundary – for example, areas of verge in Sherwood Forest near Budby, at Spalford, and between the villages of Eaton and Gamston, are designated as SSSIs and are subject to special management in order that their interest is retained.

Special Areas of Conservation

Nottinghamshire has one site that is of international importance for its wildlife – the Birklands and Bilhaugh Special Area of Conservation (SAC), in Sherwood Forest. This site is designated in response to the EU Habitats Directive, and is subject to a very strict protection regime. Detailed assessment will be undertaken of any plans or projects that may impact the site, directly or indirectly, and both alone and in-combination with other plans and projects, with damaging development only being allowed in imperative cases of over-riding public interest. A Habitats Regulations Assessment of the LTP3 has been undertaken and is available from the County Council’s website at www.nottinghamshire.gov.uk/ltp3.

Special Protection Areas

The Sherwood Forest area has been identified as a prospective Special Protection Area (SPA). Although not yet formally designated, official advice is that a ‘risk-based approach’ should be adopted when considering plans and projects within the prospective SPA area. SPAs are covered by the same strict protection regime as SACs.

Sherwood Forest may become a SPA in the future due to its wildlife habitat. If this occurs, consideration will be given to the development of a transport sub-strategy for the SPA.

National Nature Reserves

As well as being designated as a SSSI, part of Sherwood Forest is also designated as a National Nature Reserve (NNR), recognising the habitat that it holds as one of the best examples in the country, and its value for access, education and enjoyment of the natural world by the public.

Local Nature Reserves

Local Nature Reserves (LNRs) are places which hold wildlife or geological features that are of special interest locally, and offer people opportunities to study or learn about nature, or simply to enjoy it. Although legally notified, they are not protected in the same way as the aforementioned sites. National guidelines recommend that there should be 1ha of LNR per 1,000 head of population. Nottinghamshire is very close to reaching this target, and has a total of 42 LNRs across the county (with a further eight in Nottingham City).

Those sites which are not legally protected, but are of more local importance, are offered protection through the planning system and are detailed below.

Sites of Importance for Nature Conservation

Sites of Importance for Nature Conservation (SINCs) are sites that have been identified as having at least county-level importance for their wildlife. SINCs, also known as Local Wildlife Sites, are used throughout the UK, and are included in relevant national planning policy (Planning Policy Statement 9 – Biodiversity and Geological Conservation) and national guidance. They are a non-statutory designation, used principally in relation to land-use planning and development, and are protected through policies in local planning documents. There are currently just over 1,400 SINCs in Nottinghamshire, the majority of which are designated because of their botanical interest or the type of habitat they represent, although others are designated because of the particular species of animal they support.

Notified Road Verges

In Nottinghamshire, a number of SINCs occurring on road verges are also designated as Notified Road Verges (NRVs). The NRV scheme has run since 1979, and was introduced in recognition of the fact that verges have considerable potential for nature conservation. The aim of the NRV scheme is to manage some of our best verges in a favourable way, so as to maintain their interest and contribute to the biodiversity resource of the county, through a regime of traditional hay meadow management. There are currently 25 NRVs, which support a wide range of species, and include the area of roadside verge in the Gamston & Eaton Woods & Roadside Verges SSSI.

Away from designated sites, there are still further areas of habitat of biodiversity value which need to be safeguarded and enhanced, in order to allow species to continue to exist in the wider countryside, to provide linkages between areas of higher value, and to allow people to experience nature. The importance of many of these habitats is recognised through their listing in both the UK Biodiversity Action Plan (UKBAP), and the Nottinghamshire Local Biodiversity Action Plan (LBAP), which aim to protect, enhance and expand our most important habitats, along with a number of rare and endangered species, some of which are protected by law and many of which occur outside designated sites.

As well as having regard to specific legislation covering sites and species, the County Council also has a more general duty under the Natural Environment and Rural Communities Act 2006. This requires local authorities to have regard to the purpose of conserving biodiversity – a so-called ‘Biodiversity Duty’.

7.8.2 Transport projects and highway management

Transport projects can have the potential to cause negative impacts on particular sites, including all those designated sites listed above, and on other habitats and species. The magnitude of such impacts will vary depending on the relative importance of the site or species involved, and the degree to which the site is affected. Impacts may be temporary, for example occurring only during the construction phase, or permanent, and can be direct (such as land take) or indirect (such as changes to local hydrology or increased nitrogen deposition as a result of vehicle emissions). The County Council will therefore assess the impacts of all transport projects on biodiversity.

In order to sustain and improve the quality of life of our local communities, and to safeguard biodiversity itself, the County Council will seek to ensure that transport projects avoid damage to areas of significant biodiversity interest through the design process, providing mitigation where damage cannot be avoided, and compensatory works as a last resort. The County Council will involve relevant stakeholders, such as the Nottinghamshire Wildlife Trust and Natural England, at an early stage in the design process to ensure that projects are properly considered, and that opportunities are not missed.

As well as seeking to avoid harm to biodiversity, transport projects will, wherever possible, also be used to find opportunities to contribute towards the aims and objectives of the LBAP, by enhancing and restoring existing areas of habitat, and by creating new areas. This will be done by identifying the most suitable habitats for creation, including habitats which might support particular species known to be present in the area. Such opportunities might include the use of SUDS systems to create new wetlands, the creation of new areas of species-rich grassland or heathland along the verges of road schemes, or the planting of new native hedgerows and woodland.

The County Council will also take steps to increase the biodiversity value of the highway network as a whole. This will include it continuing to run the Notified Road Verge scheme, whilst also looking at opportunities to bring other areas of habitat within, or adjacent to, the highway verge into sensitive management which maintains and enhances its value, thereby allowing the highway network to function more effectively as a wildlife corridor and contributing towards the LBAP.

