Derbyshire
Local Transport Plan 3
2011 - 2026

DERBYSHIRE
County Council
Improving life for local people

Habitats Regulations Assessment
Supplementary Evidence: Nitrogen Deposition
February 2011

Introduction

In October 2010, alongside the draft Derbyshire LTP3, we published our findings on the screening stage in relation to the Habitats Regulations Assessment (HRA), as required under the European Directive 92/43/ECC as transposed in England by the Conservation of Habitats and Species Regulations 2010. The statement was published following two previous screening consultations undertaken in August 2009 and June 2010. Unlike the previous two consultations, the Habitats Statement also included an assessment of nitrogen deposition which had been raised as a potential issue during the consultation on the Strategic Environmental Assessment Scoping Report.

Following consultation on the Habitats Statement, Natural England in their letter dated 18th January 2011, commented that the evidence provided suggests that there is uncertainty over the role of local and general traffic emissions and that a precautionary approach should be taken and should be subject to Appropriate Assessment.

Officers from Derbyshire County Council and Natural England met to discuss this and other issues relating to the Derbyshire LTP3 on 1 February 2011. Prior to the meeting, the evidence relating to nitrogen deposition was revisited by Derbyshire County Council Officers and the evidence was discussed at meeting. It became apparent that whilst a significant amount of assessment and analysis had been undertaken in relation to Habitats Regulations Assessment Screening, and particularly in relation to nitrogen deposition issues, the scope of this work was not immediately apparent from the Habitats Regulations Assessment Statement. Consequently, it was unclear how we were able to conclude that the LTP was unlikely to have a significant effect on European sites as a result of nitrogen deposition considerations. It was decided that subject to the supplementary information, as discussed, being presented to Natural England, and provided that the final Derbyshire LTP3 contains mitigation for unforeseen localised impacts, there would not be a need for Appropriate Assessment of the LTP in relation to nitrogen. This note provides the supplementary evidence as requested.

The key issues to consider are:-

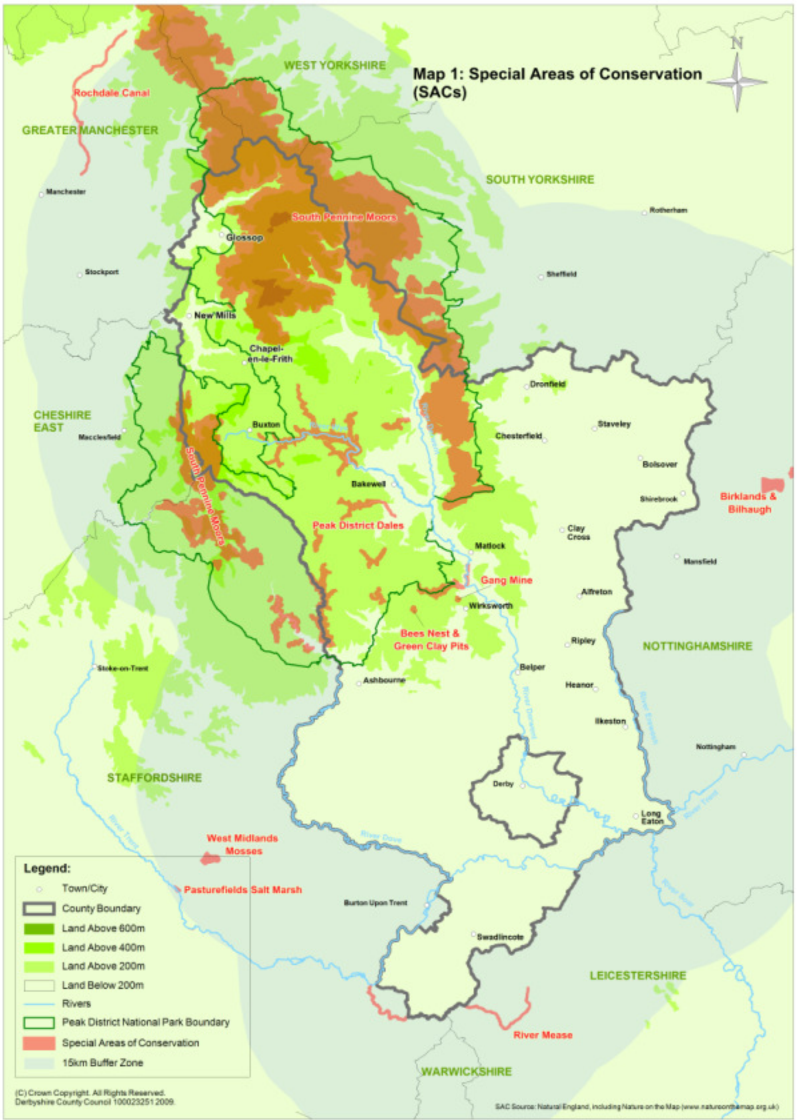
1. Current levels of nitrogen deposition and European sites affected
2. Consideration of relationship between nitrogen deposition and traffic
3. Establishing baseline and future trends of emissions from traffic
4. Consideration of what effect the Derbyshire LTP3 would have on this trend.

1. Current Levels of Nitrogen Deposition and European sites affected

Screening European Sites

During the Screening stage we identified nine Special Areas of Conservation (SAC) located within Derbyshire and a 15km buffer-zone which enabled us to examine any potential effects in Derbyshire and across boundaries. These SACs are listed below and also shown in Map 1:-

- Bees Nest and Green Clay Pits
- Birklands and Bilhaugh*
- Gang Mine
- Pasture Fields Salt Marsh*
- Peak District Dales
- River Mease*
- Rochdale Canal*
- South Penning Moors
- West Midlands Mosses*



To avoid duplicating work we examined the key environmental conditions to support site integrity using existing Habitats Regulations Assessments (HRAs) relating to land-use plans. This information was revisited to consider whether nitrogen deposition would likely be an issue for each SAC. Five of the SACs were screened out for nitrogen deposition because site integrity related to the management of the areas, rather than due to direct impacts. These are starred (*) in the list above.

The pre-screening and full screening assessments and associated consultations identified two SACs where nitrogen deposition was considered to be a potential issue and where we should examine this issue further:-

- Bees Nest and Green Clay Pits
- Peak District Dales

Bees Nest and Green Clay Pits SAC
This SAC was screened out of further assessment following an examination of its location in relation to key road links, using our geographical information system (GIS). This examination identified that the closest road to the site was a minor village road which is unlikely to be affected significantly by traffic increases during the LTP3 period. The closest main road to Bees Nest and Green Clay Pits SAC is the B5056, with a daily traffic flow of 1,670 vehicles (2008), which is located at a distance of 1km from the site. Because nitrogen deposition levels from traffic decrease significantly within 500m from source[1] this road was deemed unlikely to be having a significant impact on this site, and consequently, we were able to exclude this site from further consideration.

Other SACs - Peak District Dales, South Pennine Moors and Gang Mine SACs
In addition to Peak District Dales, since we had the opportunity to revisit the data to produce this supplementary note, we also examined South Pennine Moors and Gang Mine SACs because they

[1] www.apis.ac.uk

contained similar habitats to Peak District Dales and are either dissected, or close to main roads, as a precautionary approach and to provide a comparison to the Peak District Dales.

Current Nitrogen Deposition Levels

Mapping of nitrogen deposition at the national level is available on websites such as UK Pollution Deposition http://www.uk-pollutantdeposition.ceh.ac.uk/. These maps show that nitrogen deposition is an issue for many habitats across the UK, including those in Derbyshire.

To establish nitrogen deposition levels within these SACs, a number of locations were examined. Actual locations were governed by the position of monitoring sites where nitrogen deposition data was available, using the UK Air Pollution Information System[2] (APIS). Table 1 below summarises the extent to which sensitive locations exceed the established critical loads for nitrogen deposition (2010). As can be seen, all sites exceed both lower and upper critical loads range, which suggests that all sites are sensitive to any further levels of air pollution.

Table 1 Analysis of sample sites in SACs for Nitrogen Deposition

Map Ref	SAC Name	SSSI Name	Habitat	Easting	Northing	N/ha/year (kg): Critical Load Range[1] Lower	Critical Load Range[1] Upper	Nitrogen Deposition[2]	Exceedence Range[3] Lower	Exceedence Range[3] Upper
1	South Pennine Moors	The Dark Peak	Raised bog and blanket bog	408000	392000	5	10	23.7	18.7	13.7
14	South Pennine Moors	Eastern Peak District Moors (North)	Upland heathland	421000	387000	10	20	24.5	14.5	4.5
14	South Pennine Moors	Eastern Peak District Moors (South)	Upland heathland	428000	375000	10	20	23.4	13.4	3.4
23	Peak District Dales	Wye Valley	Ash woodland	414000	373000	10	15	66.1	56.1	51.1
			Calcarious grassland			15	25	38.6	23.6	13.6
			Scree			10	15	38.6	28.6	23.6
25	Peak District Dales	Topley Pike & Deep Dale	Ash woodland	409000	370000	10	15	57.3	47.3	42.3
			Calcarious grassland			15	25	33.2	18.2	8.2
			Scree			10	15	33.2	23.2	18.2
29	South Pennine Moors	Leek Moors	Upland heathland	402000	371000	10	20	27.6	17.6	7.6
42	Peak District Dales	Matlock Woods	Ash woodland	429000	357000	10	15	49.4	39.4	34.4
43	Peak District Dales	Via Gellia Woodlands	Ash woodland	426000	356000	10	15	49.4	39.4	34.4
46	Gang Mine	Gang Mine	Calcarious grassland	428000	355000	10	25	27.2	17.2	2.2

Definitions:-
[1] Critical load range relates to the habitat type. See www.apis.ac.uk for more information.
[2] Implied level of Nitrogen Deposition at the site. 5km resolution. See www.apis.ac.uk for more information.
[3]. This is how many kg N/ha/year the sites exceed their critical load thresholds.

Sources:-
www.apis.ac.uk/index.html
www.natureonthemap.co.uk/news.html

Web links to the reason for SSSI citation can be found below:-
The Dark Peak http://www.sssi.naturalengland.org.uk/citation/citation_photo/1003028.pdf
Eastern Peak District Moors http://www.sssi.naturalengland.org.uk/citation/citation_photo/2000354.pdf
Wye Valley http://www.sssi.naturalengland.org.uk/citation/citation_photo/2000186.pdf
Topley Pike and Deep Dale http://www.sssi.naturalengland.org.uk/citation/citation_photo/1000145.pdf
Leek Moors http://www.sssi.naturalengland.org.uk/citation/citation_photo/1003770.pdf
Matlock Woods http://www.sssi.naturalengland.org.uk/citation/citation_photo/1000510.pdf
Via Gellia Woodlands http://www.sssi.naturalengland.org.uk/citation/citation_photo/1003009.pdf
Gang Mine http://www.sssi.naturalengland.org.uk/citation/citation_photo/1005477.pdf

[2] www.apis.ac.uk

2. Relationship between traffic and nitrogen deposition

Nitrogen deposition is the term used to describe the input of reactive nitrogen species from the atmosphere to the biosphere. The pollutants that contribute to nitrogen deposition derive mainly from nitrogen oxides (NO_X) and Ammonia (NH_3) emissions[3].

Nitrogen oxides (NO_X) – The National Atmospheric Emissions Inventory[4] reports that approximately one third of the UK NO_X emissions arise from road transport, with vehicles travelling at high speeds contributing most. It says that since 1970, overall NO_X emissions have reduced by 53%. Decreases have not been constant, but since 1989 total NO_X emissions have declined by 49%. Road transport emissions have reduced 58% (to 2008) mainly due to the introduction of catalytic converters and stricter regulations.

Ammonia (NH_3) – The UK Pollutant Deposition Website[5] reports that NH_3 emissions are estimated to have at least doubled over the last century across Europe. Main sources of NH_3 emissions are related to agriculture, but emissions from catalytic converters on vehicles can contribute to this.

Examination of this relationship in Derbyshire

As part of the screening stage for HRA we examined the nitrogen deposition data contained in Table 1 alongside our traffic data. In particular we examined nitrogen deposition against calcarious grasslands habitat type both within and outside of SACs because this gave us the largest sample of sites to consider. The purpose of this assessment was to try to establish any existing relationships between nitrogen deposition levels within SACs, and their exposure to nearby traffic activity. The results of this exercise are contained in Table 2 below.

Table 2 Nitrogen Deposition and traffic levels at Derbyshire Calcarious Grassland Habitats

Map Ref (see maps 1 to 4)	SSSI Name	SAC?	Road Name	Annual Average Daily Traffic levels	Nitrogen Deposition N/ha/year (kg)
3	Castleton	✗	B6061	1,670	30.7
7	Bradwell Dale & Bagshaw Cavern	✗	B6049	4,450	29.0
15	Stoney Middleton Dale	✗	A623	5,820	25.3
17	Hollin Hill & Markland Grips	✗	A616/ B6417	5,700/ 7,070	20.9
23	Wye Valley	✓	B6049	2,320	38.6
25	Topley Pike & Deep Dale	✓	A6	5,270	33.2
40	Masson Hill	✓	A6	12,060	27.2
46	Gang Mine	✓	B5035/ B5036	3,070/ 4,810	27.2
49	Hipley Hill	✗	B5056	1,670	29.7

As can be seen, it is difficult to establish a clear relationship between traffic levels and nitrogen deposition levels using this data. A second methodology we examined was to consider whether deposition levels changed with distance from the road source. Again this was problematic due to data constraints, because accurate locations of monitoring sites are not known and observations of nitrogen deposition levels at non-road locations were in the same order as road locations e.g. in Dark Peak the road location was 23.7 N/ha/year (kg) compared to 30.0 N/ha/year (kg) 2km from a main road. Of course this is too small a sample to make overall judgements, but it does suggest that the data will not allow us to examine this relationship in any detail.

Data does suggest that topography may be a contributory factor, with deposition levels in valley locations showing greater concentrations which may be due to the funnelling effect for agricultural run-off and air-borne emissions. However, because of the difficulties identified in trying to precisely

[3] http://www.apis.ac.uk/overview/pollutants/overview_N_deposition.htm
[4] http://www.naei.org.uk/
[5] http://www.uk-pollutantdeposition.ceh.ac.uk/ammonia_network

locate monitoring sites there is sufficient uncertainty for us not to make any predictions based upon this.

To help us understand the degree of further risk to these sites, we need to consider what the current levels of pollutants are and how they are likely to change over the plan period. Against this baseline we can consider how the draft Derbyshire LTP3 will influence this trend.

3. Establishing baseline and future trends of emissions from traffic

Nitrogen Oxides

'Nitrogen Oxides' (abbreviated to NO_x) is the term used to describe nitric oxide (NO) and nitrogen dioxide (NO_2) [7], particularly in relation to air pollution. Nitrogen oxides are produced during combustion, as a result of chemical reactions between nitrogen and oxygen. Nitrogen oxides are largely derived from road transport emissions and other combustion processes such as the electricity supply industry. Car engines principally produce NO, although in the atmosphere, NO is usually very rapidly oxidised to nitrogen dioxide (NO_2), which is harmful to health. Nitrogen oxides also lead to acid rain and contribute to global warming.

To help us understand NO_X emissions, we have a well-established[8] spreadsheet model which enables us to estimate nitrogen dioxide (NO_2) emissions across Derbyshire's main road network (A and B road classifications). To calculate NO_2 emissions the model uses formulae contained within the Design Manual for Roads and Bridges (DMRB).

This data was used at the SEA Scoping Stage to investigate the potential impact of air pollution on vegetation and biodiversity. At that stage we scoped it out as an issue for the SEA, but we have revisited this data as part of the HRA in relation to nitrogen deposition.

In Table 3 below, we have extracted the data from the model relating to all county council controlled road links, either dissecting, or within 500m of the three SACs under consideration. The table contains a prediction of NO_2 emission levels in 2008 and predicts what they would be in 2026 (the end of the Plan period) for the scenarios of high or low growth as defined by National Road Traffic Forecasts (see below for more information on traffic growth).

To establish whether NO_2 emissions are having or are likely to have a detrimental impact on vegetation and biodiversity in the SACs, we compared the emissions for each road link against a threshold (Annual limit value for the protection of vegetation) contained within the UK Air Quality Standards Regulations[9] 2007 = $30\mu g/m^{-3}$ for NO_2.

The modelling shows that it is estimated that no county council controlled roads in SACs exceed the NO_2 emission threshold level in the baseline year (2008). Indeed, modelling predicts that by the end of the plan period (2026) NO_2 emission levels will have reduced in both the low and high traffic growth scenarios. This modelling uses a nationally developed methodology which predicts that whilst traffic levels will increase, air quality in relation to nitrogen oxides, should improve over this period.

Due to the modelling being an estimate of air quality, we also referred to actual recorded data. To do this we also referred to actual recorded data at national monitoring sites, known as Automatic Urban and Rural Network (AURN). There are two sites in Derbyshire which provide proxy data for an urban area (Chesterfield) and a rural area (Ladybower – located close to South Pennine Moors SAC). As can be seen from Table 4 below, annual averages for NO_2 emissions at these two sites are well below the UK Air Quality Standards Regulations threshold and show a trend of improving air quality - at the rural location where trend data is available.

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[7] http://www.airquality.co.uk/what_causes.php?n_action=pollutants&item=2

[8] The spreadsheet model was developed for predicting LTP2 effects for SEA in 2005

[9] http://www.legislation.gov.uk/uksi/2007/64/schedule/1/made

Table 3 Baseline and 2026 (High and Low) Projections for traffic levels and air quality on road links within Special Areas of Conservation

Road No	SSSI Name(s)	Link from	Link to	Link Length (km)	Link Average Gradient (%)	Area of SAC (Ha) within 300m	Approx length of link within 500m of SAC (km)	Traffic Levels			Air Quality [Note UK Air Quality Standards Regulations 2007 threshold for vegetation and ecosystems is 30µ/m^3 for Nitrogen Dioxide (NO_2)]			Nitrogen Deposition Analysis Ref (see separate table)
								2008 Base Traffic Levels (AADT)	2026 NRTF Low Growth (AADT)	2026 NTRF High Growth (AADT)	2008 Base (NO_2 µ/m^3)	2026 NRTF Low Growth (NO_2 µ/m^3)	2026 NTRF High Growth (NO_2 µ/m^3)	
Gang Mine SAC														
B5035	Gang Mine	B5023	B5036	0.98	4.07	6.0	0.9	3,070	3,590	4,050	18.5	14.4	14.5	46
B5036	Gang Mine	A5012	B5035	1.45	7.61	3.7	0.7	4,810	5,630	6,340	19.4	15.0	15.2	46
Peak District Dales SAC														
A623	Coombs Dale	B6521	A625	2.37	1.73	0.9	1.0	8,990	10,530	11,860	22.6	17.0	17.4	
A623	Cressbrook Dale	B6049	B6465	2.22	3.15	3.8	0.8	5,820	6,810	7,680	20.4	15.6	15.9	
A623	Cressbrook Dale	B6465	B6521	4.06	3.92	1.9	0.4	5,820	6,810	7,680	20.4	15.6	15.9	
B6465	Cressbrook Dale/ Wye Valley	A6020	A623	6.62	4.5	14.2	3.0	1,970	2,310	2,600	17.7	13.9	14.0	
B6049	Wye Valley, Monks Dale	A623	A6	7.44	4.07	63.6	4.6	2,320	2,720	3,060	18.0	14.1	14.2	23
A6	Wye Valley	B6049	A6020	8.71	2.45	78.9	4.8	4,850	5,680	6,400	20.1	15.4	15.6	
A6	Wye Valley/ Topley Pike & Deep Dale	B5059	A5270	5.98	2.34	43.6	4.6	5,270	6,170	6,950	20.0	15.2	15.4	25
A515	Topley Pike & Deep Dale	A5270	B5059	4.87	1.44	2.8	1.3	12,260	14,350	16,170	22.1	16.9	17.2	
A5270	Topley Pike & Deep Dale	A515	A6	4.20	2.62	5.6	1.7	2,110	2,470	2,780	18.5	14.4	14.5	
B5055	Lathkill Dale	A515	A6	9.65	3.6	0.3	1.2	4,680	5,480	6,170	18.8	14.6	14.8	
A6	Matlock Woods	A615	A5012	3.95	0.53	20.5	3.6	12,060	14,120	15,900	21.4	19.6	19.7	42
A5012	Via Gellia Woodlands	A6	B5023	4.15	1.93	143.7	4.15	2,660	3,110	3,510	19.7	15.0	15.2	43
A5012	Via Gellia Woodlands	B5023	B5056	2.65	2.27	76.1	2.65	2,650	3,100	3,490	19.1	14.8	14.9	
B5023	Via Gellia Woodlands	A5012	B5035	2.51	7.25	66.1	1.7	2,140	2,510	2,820	17.9	14.0	14.1	
A5012	Long Dale & Gratton Dale	B5056	A515	8.65	1.39	2.5	2.1	2,480	2,900	3,270	18.8	14.6	14.7	
A515	Dove Dale & Biggin Dale	B5056	A5012	11.89	2.29	2.4	2.7	3,580	4,190	4,720	19.3	14.9	15.1	
South Pennine Moors SAC														
A6024	Dark Peak	County	A628T	4.46	6.28	175.9	4.46	1,390	1,630	1,830	17.6	13.8	13.9	
B6105	Dark Peak	A57	A628T	8.6	2.93	58.2	6.0	5,160	6,040	6,810	18.3	14.4	14.6	
A57	Dark Peak	Hurst Rd	A6013	20.59	3.38	411.4	15.0	4,560	5,340	6,010	18.4	14.5	14.6	
A57	Dark Peak, Eastern Peak District Moors	A6013	County	3.5	4.2	151.7	3.5	5,920	6,930	7,810	19.4	15.1	15.3	14 North
A6013	Eastern Peak District Moors	A57	A6187	4.43	1.65	12.4	2.6	4,340	5,080	5,720	19.0	14.8	14.9	
A6187	Eastern Peak District Moors	County	B6001	4.33	3.95	108.8	2.7	4,280	5,010	5,640	18.2	14.3	14.5	
A619	Eastern Peak District Moors	A621	B6050	1.68	4.76	4.7	0.5	9,220	10,790	12,160	22.4	17.0	17.4	
A619	Eastern Peak District Moors	B6050	B6150	8.31	3.43	64.8	2.5	9,220	10,790	12,160	22.4	17.0	17.4	
A621	Eastern Peak District Moors	A619	B6054	6.93	2.93	269.0	6.3	5,020	5,880	6,620	18.9	14.8	14.9	14 South
A621	Eastern Peak District Moors	B6054	B6054	0.29	1.71	4.1	0.29	8,180	9,580	10,790	19.7	15.4	15.6	
A621	Eastern Peak District Moors	B6054	County	0.81	4.96	12.2	0.81	3,840	4,500	5,060	18.7	14.6	14.7	

Road No	SSSI Name(s)	Link from	Link to	Link Length (km)	Link Average Gradient (%)	Area of SAC (Ha) within 300m	Approx length of link within 500m of SAC (km)	Traffic Levels			Air Quality [Note UK Air Quality Standards Regulations 2007 threshold for vegetation and ecosystems is 30µ/m³ for Nitrogen Dioxide (NO_2)]			Nitrogen Deposition Analysis Ref (see separate table)
								2008 Base Traffic Levels (AADT)	2026 NRTF Low Growth (AADT)	2026 NTRF High Growth (AADT)	2008 Base (NO_2 µ/m³)	2026 NRTF Low Growth (NO_2 µ/m³)	2026 NTRF High Growth (NO_2 µ/m³)	
South Pennine Moors SAC (Continued)														
A625	Eastern Peak District Moors	B6001	B6054	5.74	4.14	97.2	5.1	2,510	2,940	3,310	18.2	14.2	14.3	
A625	Eastern Peak District Moors	B6054	County	0.55	0.73	34.4	0.55	4,870	5,700	6,420	19.1	14.8	15.0	
B6050	Eastern Peak District Moors	B6051	A619	8.75	3.5	30.3	3.7	2,900	3,400	3,820	17.7	14.0	14.0	
B6051	Eastern Peak District Moors	A621	B6050	7.98	3.27	2.7	0.7	1,220	1,430	1,610	17.4	13.7	13.7	
B6054	Eastern Peak District Moors	A621	A625	2.91	1.51	162.8	2.91	3,200	3,750	4,220	18.0	14.2	14.3	
B6521	Eastern Peak District Moors	A6187	B6001	3.82	5.36	39.2	2.2	2,490	2,920	3,280	17.7	13.9	14.0	
A5004	Goyt Valley	A53	B5470	10.83	3.42	17.0	1.9	2,870	3,660	3,780	18.0	14.1	14.2	
A53	Leek Moors	County	A54	3.91	4.22	82.6	3.6	2,620	3,070	3,460	19.1	14.7	14.9	29
A537	Leek Moors	County	A54	0.89	0.56	79.6	0.89	3,340	3,910	4,400	18.9	14.7	14.8	
A54	Leek Moors	County	A537	0.84	1.68	76.5	0.84	3,340	3,910	4,400	18.9	14.7	14.8	
A54	Leek Moors	A537	A53	2.76	4.89	108.2	2.6	4,690	5,490	6,190	20.2	15.5	15.7	

Table 4 Annual Averages of Nitrogen Dioxide at AURN Sites in Derbyshire

Year	Chesterfield (Urban)	Ladybower (Rural)
	NO_2 µ/m^{-3}	NO_2 µ/m^{-3}
2000	-	11.3
2004	-	9.2
2008	17.8	7.7

Table 5 Annual Mean Monitored Atmospheric Ammonia (NH3) gas concentrations at Derbyshire/Sheffield NAMN sites 1996-2008

Monitoring Site	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Wardlow Hay Cop (Derbyshire)	2.38	1.06	0.97	0.91	0.91	1.44	1.04	1.47	1.41	1.26	1.50	1.14	0.90
Sheffield	-	0.99	0.63	0.64	1.95	2.07	6.63	2.71	1.03	0.26	0.68	0.67	0.90

Table 6 Estimated traffic flows for all motor vehicles on all roads except trunk (Derbyshire & East Midlands: 1993 – 2009)

	Million vehicle kilometres																
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
East Midlands	20308	20708	20985	21317	21590	21908	22274	22447	22616	23870	26186	26700	27444	27787	28218	27905	27556
Derbyshire exc Derby	3,492	3,557	3,595	3,640	3,694	3,735	3,753	3,729	3,756	3,886	4,549	4,615	4,679	4,779	4,838	4,742	4,661

Source: Department for Transport's National Road Traffic Survey

Nitrogen Oxides Emissions Conclusion
Using the evidence examined, we can conclude that concentrations of nitrogen oxides have been reducing over recent years and modelling techniques forecast that this will continue to happen throughout the plan period, even where an increase levels are predicted. This means that with, or without the Derbyshire LTP3, concentrations of nitrogen oxides are likely to reduce.

Ammonia Emissions (NH_3)

The extracts on trends above, highlight that ammonia is a major contributor to nitrogen deposition. Agriculture is recognised as the main contributor. Traffic can contribute through vehicles with catalytic converters, but as a source it is not generally considered a significant one[10]. In precaution, we examined data relating to ammonia because our air quality modelling does not contain data relating to ammonia emissions. Therefore, to provide a proxy for levels in a rural and urban area we are able to use air-borne ammonia monitoring sites as part of the UK National Ammonia Monitoring Network (NAMN).

There is currently one site in Derbyshire, Wardlow Hay Cop (close to Peak District Dales SAC – Cressbrook Dale), which provides data for a rural location. We can also use data from a site in Sheffield to provide an urban context. Table 5 below shows the annual mean of atmospheric ammonia emissions at both sites. These figures can be compared to critical levels for the protection of mosses and vegetation adopted by the United Nations Economic Commission for Europe in 2007 of 3µg NH_3 m^{-3} for the annual mean of ammonia emissions. As can be seen both sites are currently significantly below threshold levels.

Ammonia Emissions Conclusion
Using this evidence, we can conclude that traffic is not a very significant contributor to ammonia emissions. Analysis of ammonia levels at two proxy sites show that these are significantly below threshold levels for mosses and vegetation, traffic-related ammonia is unlikely to be having a significant impact upon habitats in Derbyshire.

Traffic growth

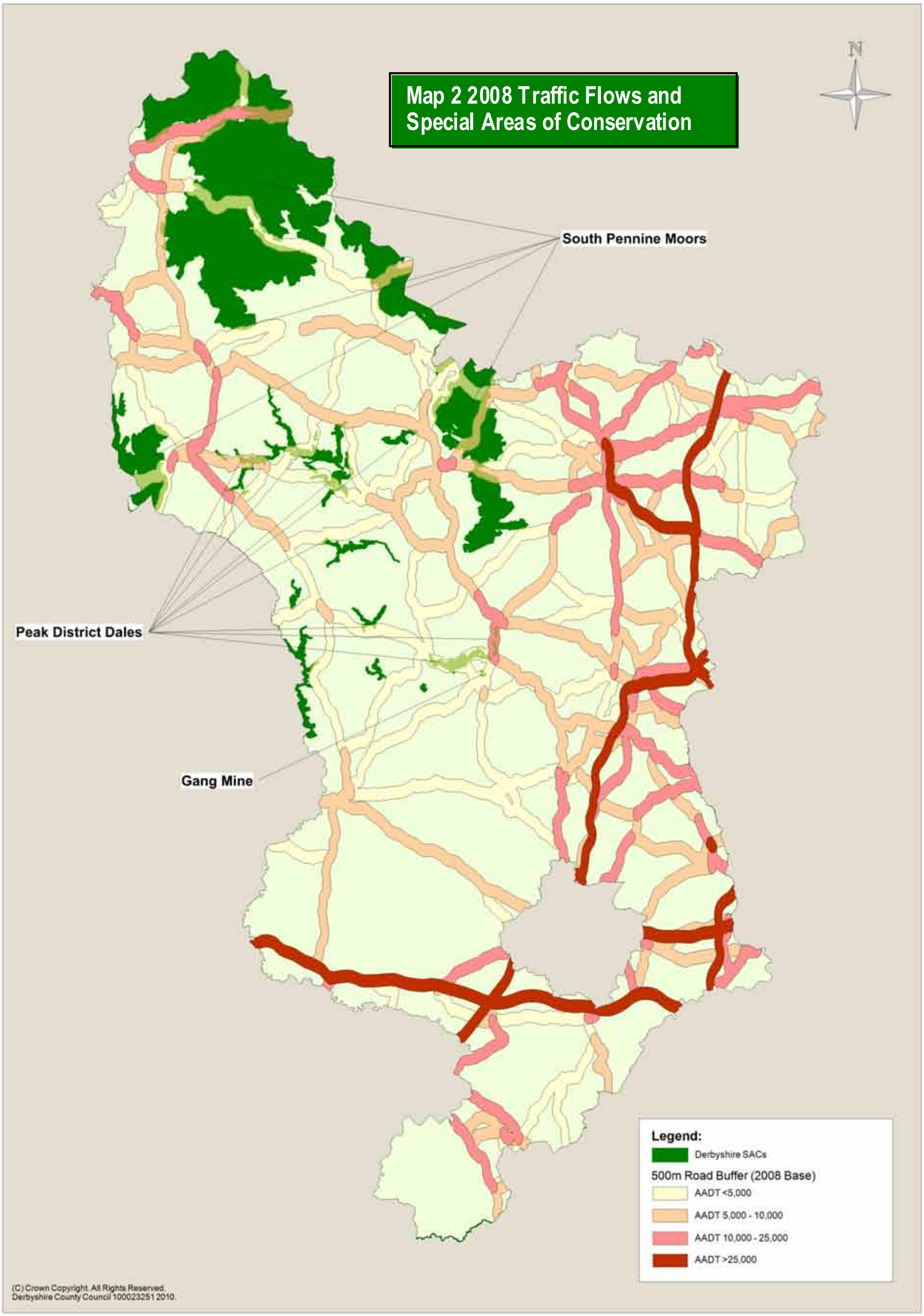
In the modelling above we used Government predictions on traffic growth, known as the National Road Traffic Forecast (NRTF). These forecasts provide a methodology to predict future traffic levels based upon a scenario of high and low growth:-

- 2008 – 2026 (NRTF Low growth scenario) 17% increase in annual average daily traffic (AADT)
- 2008 – 2026 (NRTF High growth scenario) 32% increase in annual average daily traffic

As a visual aide to viewing traffic growth in relation to SACs, we have also produced two maps. Map 2 shows the 2008 baseline levels and Map 3 2026 high growth levels.

We have used the two growth scenarios because traffic levels are influenced by many factors. Therefore we wanted to ensure that the extremities of likely evolution during the plan period were examined. The requirement for this is highlighted in Table 6, which shows that following a long period of unremitting growth in traffic levels, the recent economic downturn combined with a rise in fuel prices has contributed to a 3.7% reduction in traffic levels between 2007 and 2009.

[10] http://www.environment-agency.gov.uk/business/topics/pollution/5.aspx


Map 2 2008 Traffic Flows and Special Areas of Conservation
N
South Pennine Moors
Peak District Dales
Gang Mine
Legend:
Derbyshire SACs
500m Road Buffer (2008 Base)
AADT <5,000
AADT 5,000 - 10,000
AADT 10,000 - 25,000
AADT >25,000
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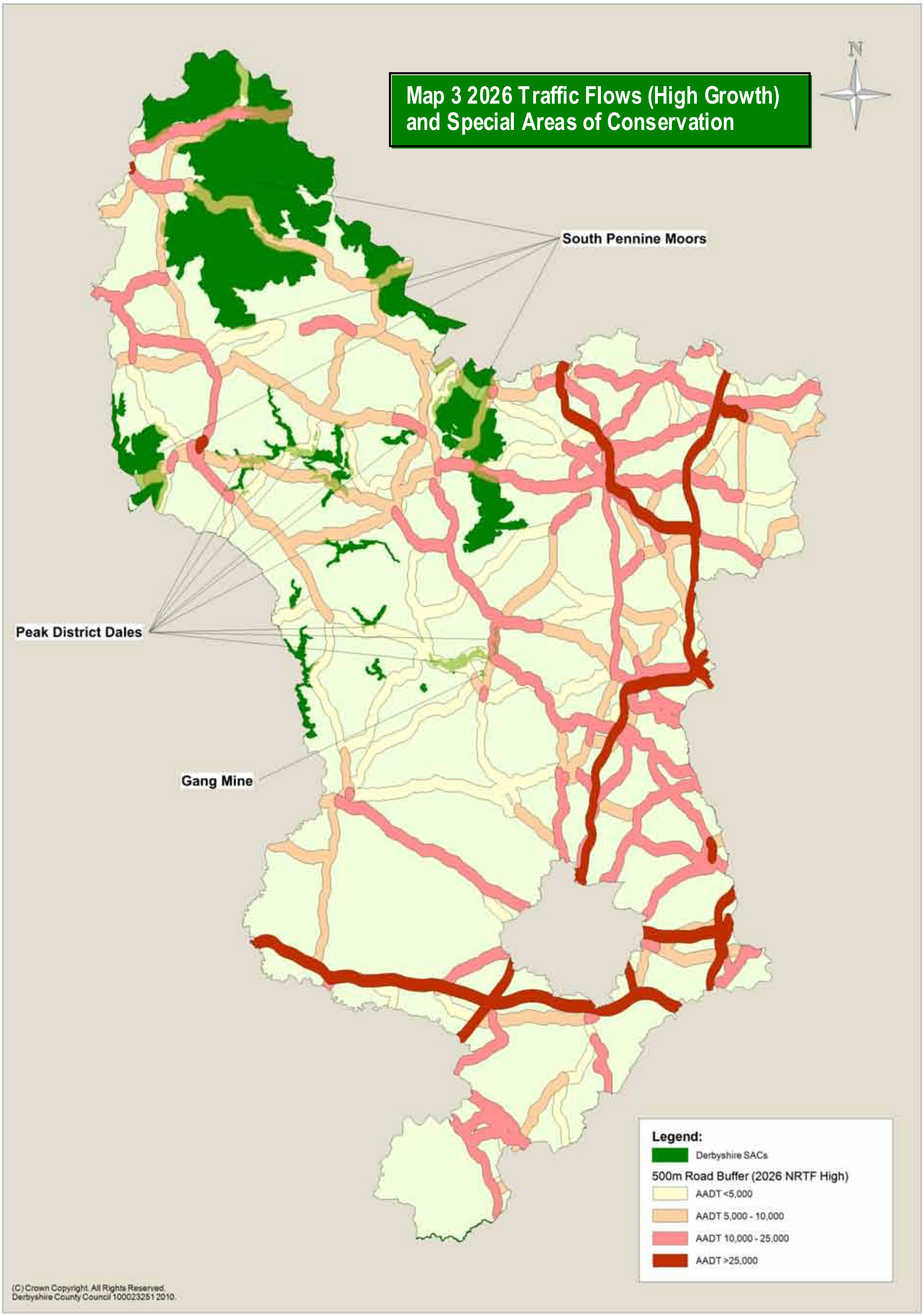
Map 3 2026 Traffic Flows (High Growth) and Special Areas of Conservation
N
South Pennine Moors
Peak District Dales
Gang Mine
Legend:
Derbyshire SACs
500m Road Buffer (2026 NRTF High)
AADT <5,000
AADT 5,000 - 10,000
AADT 10,000 - 25,000
AADT >25,000
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Baseline Summary

It is clear that the SACs considered exceed recommended nitrogen deposition threshold levels, as shown in table 1. Although it is difficult to establish a clear link between the impact traffic has on nitrogen deposition locally using site data, it is clear from national trends that traffic emissions are a contributory factor. National forecasts for traffic levels show that over the lifetime of the plan, traffic levels are likely to increase anywhere between 17% and 32%. Current trends show that traffic levels are particularly influenced by factors at a national level.

Future risks relating to levels of nitrogen deposition are therefore the level of pollutants relating to those increases in traffic and the degree to which LTP3 influences this. Our air quality modelling shows that NO_2 emissions from traffic are currently below threshold levels for vegetation and biodiversity across the county road network. Past trend data shows that NO_2 emissions have been decreasing since 1970 and our forecasts show that despite a predicted growth in traffic, NO_2 emissions will continue to reduce by the end of the plan period (2026). Consequently, it can be concluded that impacts arising within European sites as a result of vehicle related nitrogen deposition will reduce within the plan period, because of national trends.

The Impact of the Derbyshire LTP3 on this baseline

The Habitats Regulations require us to undertake Habitats Regulations Assessment for plans or projects not connected with the management of European sites, where that plan "is likely to have a significant effect on a European site" either alone or in combination with other plans or projects. From the above, we can see that traffic levels are mainly influenced by external (national) factors rather than local ones, and that the predicted national trend is for substantially reduced levels of NO_2 emissions on the county road network in and around the SACs studied, despite predicted traffic increases. It is difficult to envisage a scenario where the LTP could result in increased emissions sufficient to overturn this national trend and result in NO_2 emission levels above the current baseline.

The SEA Environment Report documents the processes we undertook to develop our plan alternatives and how we arrived at the preferred LTP3 strategy. The preferred strategy is based upon giving emphasis to the transport goals of:-

- Supporting a resilient local economy,
- Contributing to a better safety, security and health,
- Improving quality of life and **promoting a healthy natural environment**,
- and includes the elements that perform well in the long term from the other two goals – **tackling climate change**; promoting equality of opportunity we would achieve **carbon reduction** and social objectives.

Overarching these goals are key principles and a transport vision which promote environmental protection and enhancement. Since the meeting with Natural England, the Transport Vision has been updated to reflect the needs of the wider natural environment, rather than the person focus previously.

Key Principles

- **To adopt sustainable development[11] as the common purpose of our transport strategy**
- **To take a holistic approach in all we do, integrating economic, social and environmental needs**

[11] development that meets the needs of the present without compromising the ability of future generations to meet their own needs, Brundtland Report, 1987

Transport vision
At the heart of our vision is a transport system that is both fair and efficient.

Healthier lifestyles, safer communities, a safeguarded and enhanced natural environment and better access to jobs and services will be the result.

To get there, we will improve the choice and accessibility of transport whilst integrating economic, social and environmental needs.

The preferred LTP3 strategy includes our statutory duties, which in addition to the Habitats Regulations and biodiversity include:-

- Natural Environment and Communities Act 2006 – requires the County Council to have regard to biodiversity as far as is consistent with the proper exercise of their functions
- Environment Act (1995) Section 62 – Have regard to the purposes of the Peak District National Park

The plan also contains many priorities and measures which are complimentary to reducing growth in traffic and minimising vehicle emissions, these include:-

Efficient transport network management
- Managing events to reduce car use
- Reducing speeds
- Freight management

Improving local travel, achieving healthier travel habits
- Provision for and marketing of sustainable travel modes including bus, rail, walking and cycling
- Event management to reduce car use
- Behavioural change (to more sustainable travel modes)
- Sustainable tourism and leisure activity

Better safety and security
- Reducing vulnerable road user casualties (including sustainable travel users)
- Speed reduction schemes

A considered approach to new infrastructure
- Provision of new infrastructure for sustainable transport including bus, rail, walking and cycling
- Environmental mitigation measures
- Green infrastructure
- Packages for improvements where there are air quality issues due to local traffic
- Liaison between spatial and transport planning on an ongoing basis

The Conclusion

At a strategic level, the preferred LTP3 strategy has sustainability and the protection of the natural environment at it's core, with many priorities and actions identified which are clearly complimentary to the aim of improving air quality. The plan will be implemented over a period in which our modelling (based upon an accepted and well established methodology) already predicts a substantial fall in NO_2 emissions across the plan period, and it is therefore considered that the implementation of the LTP3 is only likely to contribute to a further reduction in vehicle-related emissions. Although the LTP3 is a strategic level plan, in our consideration of the need for HRA in relation to LTP3, we have not identified any actions that are likely to increase emissions within or around European sites. Based upon this, at a strategic level, the degree of risk to nitrogen deposition in Special Areas of Conservation from the draft Derbyshire LTP3 strategy is low. Therefore, we can conclude that a further appropriate assessment is not required.

Plan implementation

Although we have concluded that there is a low degree of risk from the draft Derbyshire LTP3, it is good practice to take forward these findings into the plan. To ensure that nitrogen deposition is considered at a localised level, we suggest that the following changes are made to the final LTP3:-

- Amend the biodiversity LTP objective to specifically highlight Special Areas of Conservation as requiring a high level of consideration at all times to ensure that European sites are protected and enhanced, as suggested below:-

LTP 2 Protect and enhance European sites[1], legally protected species and national sites[2] designated for their biodiversity and geological interests, ensuring these receive the highest level of consideration at all times, and consider other local sites, habitats and species[3], including measures to reduce habitat fragmentation and enhance connectivity. [1] Special Areas of Conservation and Special Protection Areas [2] Sites of Special Scientific Interest [3] Particularly including UKBAP/LBAP priority species and habitats

- Ensure the use of GIS and evidence collated in this note to consider localised interventions in relation to European sites.

- Make clear reference that Habitats Regulations Assessment may be required for individual schemes, and especially for major projects.