

AIR QUALITY ACTION PLAN FOR SOUTH HAMS DISTRICT COUNCIL

1. INTRODUCTION – AIR QUALITY REVIEW AND ASSESSMENT IN THE SOUTH HAMS.

1.1 Local Authority Duties

Under Part IV of the Environment Act 1995 Local Authorities are required to review and assess air quality within their districts on an annual basis. If any of the air quality objectives given in table 1 are likely to be exceeded, then the local authority must officially declare an Air Quality Management Area (AQMA). If an AQMA is declared, the local authority is legally obliged to undertake a further review of air quality in that location and, as a result of the further review, to develop an Air Quality Action Plan (AQAP) that outlines local measures which should reduce concentrations of air pollution and therefore help to achieve the air quality objectives.

Table 1. Air Quality Objectives included in Regulations for the purpose of Local Air Quality Management in England.

The objectives are mostly shown in units of micrograms per cubic metre $\mu\text{g}/\text{m}^3$ (for carbon monoxide the units used are milligrams per cubic metre, mg/m^3 the number of permitted exceedences in any given year (where applicable) are also shown.

Pollutant	Concentration		Measured as	Date to be achieved by
Benzene	16.25 $\mu\text{g}/\text{m}^3$		Running annual mean	31.12.2003
	5.00 $\mu\text{g}/\text{m}^3$		Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu\text{g}/\text{m}^3$		Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3		Running 8-hour mean	31.12.2003
Lead	0.5 $\mu\text{g}/\text{m}^3$		Annual mean	31.12.2004
	0.25 $\mu\text{g}/\text{m}^3$		Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 18 times a year		1-hour mean	31.12.2005
	40 $\mu\text{g}/\text{m}^3$		Annual mean	31.12.2005
Particles (PM ₁₀) (gravimetric)	50 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year		24-hour mean	31.12.2004
	40 $\mu\text{g}/\text{m}^3$		Annual mean	31.12.2004

Sulphur dioxide	350 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.2 The Air Quality Situation in the South Hams District Council Area

Review and Assessments in South Hams have taken place annually since 1999. Reports of most of these assessments can be seen on the air quality pages of the Council web site at www.southhams.gov.uk. All of the work has been undertaken in the light of Defra guidance (eg. Technical Guidance LAQM TG (09), Defra, 2009) which allows local authorities to 'screen out' many of the less common pollutants by applying certain specified criteria to the local situation. Where it is impossible to screen out a certain pollutant as being extremely unlikely to cause a problem, it must be modelled or monitored. Whilst some air quality modelling has been undertaken in the South Hams, the majority of air quality assessment has been by monitoring.

1.3 Air Quality Management Areas (AQMAs) in the South Hams

Air Quality monitoring in the South Hams has been undertaken for Nitrogen Dioxide, particulate matter (PM_{10}) and, to a small degree, for sulphur dioxide. The results of all of this monitoring are available in the annual reports mentioned above or directly from South Hams District Council. The only pollutant which has consistently been measured at higher concentrations than its objective level, at relevant locations, is Nitrogen Dioxide (NO_2). This has been found to exceed the annual mean level of $40\mu\text{g}/\text{m}^3$ at three locations at which Air Quality Management Areas (AQMAs) have now been declared; the areas are;

Dean Prior, close to the A38 Devon Expressway,
Totnes, at locations close to the A385.

Ivybridge, at locations along Western Road (the B 3213).

The 1-hour mean objective level has not been routinely measured but, according to defra guidance, '*...authorities may assume that exceedences of the 1 hour mean objective for NO_2 are only likely to occur where annual mean concentrations are $60\mu\text{g}/\text{m}^3$ or above*' (para 2.34, p2-9, defra 2009)

Therefore the only location where hourly levels are likely to be exceeded is at Dean Prior (table 2).

Table 2; Measured concentrations of Nitrogen Dioxide at South Hams 'high spots'. These values represent the worst case locations measured in AQMAs in the South Hams.

Concentrations of NO₂ in µg/m³

	2008	2009	2010	2011
Dean Prior	71.4	65.1	65.7	70.1
A385- Bridgetown Hill (Totnes)	42.0	43.4	43.4	43.8
B..-(Western Road) Ivybridge	53.6	47.6	44.0	42.7

The Dean Prior AQMA was declared first (in 2005); this area affects only one property and is caused by traffic on the A38 Devon Expressway which is under the control of the Highways Agency. A Further Assessment and Action Plan was produced for this AQMA in 2006, though this was not given the status of a formal document because the Council was not at the time obliged to produce an Action Plan (as it had been deemed an 'excellent authority' under the Corporate Review Process) and because there were so few realistic actions that could be taken by the Council regarding this particular AQMA. However, monitoring continues to be undertaken there and the results are passed to the Highways Agency which collates them. Progress regarding air quality within this AQMA is reported in the annual Air Quality review documents produced by South Hams District Council and referred to above.

Air Quality Management Areas for the Totnes and Ivybridge locations were declared in the summer of 2009 and these form the focus of this Air Quality Action Plan (see figures 1 and 2 for plans of AQMAs). The AQMAs cover all receptors where annual average NO₂ objective levels are exceeded plus some locations where the objective is met – this is in line with government guidance which allows local authorities some judgement in drawing up AQMA boundaries so long as 'all known and predicted areas of exceedence where there is relevant exposure' are encompassed (chapter 3, (PG09), defra, 2009b).

1. 4 Action Plan Development Approach

The following two sections of this report provide the Air Quality Action Plans for Totnes and Ivybridge AQMAs respectively.

Over the last two years (2010-12), there have been a number of local initiatives that have specifically included looking at actions to control traffic within and around the two AQMAs, and it was felt that it would be a duplication of work to undertake a further tier of specific action planning. This Air Quality Action Plan Report therefore pulls together a number of initiatives, involving various organisations, which could potentially reduce NO₂ levels in the two AQMAs. The organisations involved include South Hams District

Council Foreword Planning teams, Devon County Council area transport teams, South Hams District Council Green Team, Totnes on the Move transport forum, Ivybridge Community Plan team and the Prince's Foundation.

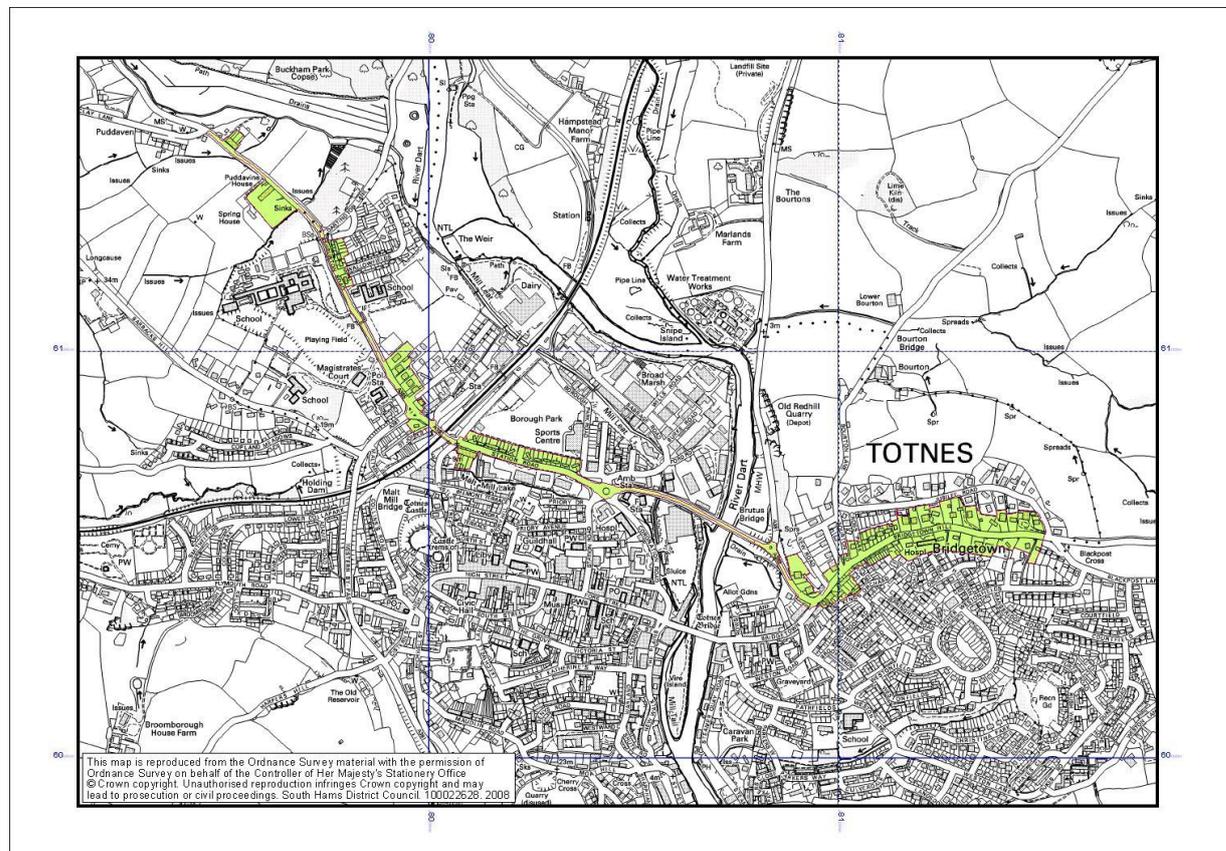
Throughout this period, the air quality officer has ensured that members of the various organisations and initiatives have been informed of the relevant air quality issues and has attended many of the meetings and discussions. This air quality Action Plan Report will, in turn, be open to consultation by all involved in the different strands of action described.

2. TOTNES – FURTHER ASSESSMENT AND AIR QUALITY ACTION PLAN FOR TOTNES

2.1 Summary of Further Assessment Results for Totnes AQMA

The Totnes AQMA follows the length of the A385 road as it passes through the town and includes all properties that are immediately adjacent to this section of the road (see figure 1). The A385 carries most traffic that enters or leaves or bypasses Totnes. It is one of the main routes into and out of the Torbay area from the western end of the A 38 Devon Expressway. A significant amount of traffic travelling on this road is likely to be merely bypassing Totnes.

Figure 1; Totnes AQMA



A Further Assessment for the Totnes AQMA was undertaken in 2009 by 'Air Quality Consultants.' The company modelled the annual mean concentrations of nitrogen dioxide from road sources in 2008 within the Air Quality Management Area. The modelling tool used was ADMS Roads (version 2.3). Further details of the input parameters and the modelling methodology are available in the full Further Assessment document (SHDC 2009).

Road traffic is the only significant source of nitrogen dioxide in the Totnes AQMA and vehicle flows are shown in table 3. These data, along with some for other roads entering and leaving the AQMA were used to model the predicted percentage contribution of each source to the total concentration of nitrogen dioxide at various receptors within the AQMA; the results can be seen in table 4. It is apparent that cars are the single largest road traffic contributor to emissions, contributing around 30% to the overall concentration at each receptor. Also, although they make up only a relatively small proportion of the total traffic volume (Table 3), OGVs and HGVs (combined) contribute significantly to the overall concentration (20%) on average, (SHDC, 2009).

Air Quality Consultants also modelled the impacts on overall (modelled) concentration levels, given specified reductions in road traffic emissions. Although NO₂ concentrations are not very much higher than the objective; considerable reductions in vehicle emissions are still required to bring them below the 40µg/m³ level, (table 5). Such reductions can theoretically be tackled by reducing vehicle numbers and/or improving vehicle performance (regarding NO₂ emissions). A reduction in overall vehicle emissions may also be achieved by improving traffic flow; it is generally accepted that; *'(pollutant) concentrations are often higher where traffic is slow moving, with stop/start driving, and where buildings on either side reduce dispersion'* (LAQM TG. (09), p5-10). This is quite frequently the case for much of the Totnes AQMA

Table 3; Summary of Traffic Flows (AADT) in 2008 on the A385 at Bridgetown Hill, Totnes and proportions of the total (in brackets), from Further Assessment (note 1)

	Motor-cycle	Cars	LGV	Bus	Other Goods Vehicle	HGV	Total
Station Road (A385)	373 (1.5%)	20,181 (79.9%)	3,575 (14.1)	313 (1.2)	600 (2.4)	231 (0.9)	25,273 (100)
Bridgetown Hill (A385)	220 (1.3%)	13,353 (80%)	2,475 (14.8%)	225 (1.3%)	332 (2%)	94 (0.6%)	16,700 (100%)
Ashburton Road (A385)	111 (0.8%)	10,672 (80.6%)	1,779 (13.4%)	145 (1.1%)	371 (2.8%)	167 (1.3%)	13,245 (100%)

Table 4 (from FA). Modelled Percentage Contributions of sources to total NO₂ levels at listed receptors (all receptors are along the A385 and are located within the AQMA).

All values are Percentages

Receptor location	Back-ground	Motor-cycle	Cars	Bus	LGV	Other Goods Vehicle	HGV	Total
Barn Close	31.7	0.4	27.8	4.8	9.0	18.7	7.5	100
Queens Terrace	40.0	0.5	25.8	4.8	7.8	15.0	6.0	100
Bottom B'Hill	49.4	0.4	25.0	3.8	7.3	10.4	3.7	100
Top B'Hill	41.2	0.5	28.2	5.0	8.4	12.8	4.0	100
House-N side B'Hill	33.7	0.5	31.4	5.9	9.4	14.8	4.4	100
B'Hill Terrace (A)	27.4	0.6	34.5	6.5	10.3	16.1	4.7	100
B'Hill Terrace (B)	28.5	0.6	34.0	6.4	10.1	15.9	4.6	100
Puddavine	30.5	0.4	29.9	5.2	7.3	18.2	8.5	100
Devon Terrace	44.5	0.4	26.7	4.2	8.2	11.9	4.1	100
Station Road	41.1	0.5	26.3	4.7	7.4	14.3	5.7	100

Table 5 Predicted Annual Mean Nitrogen Dioxide Concentrations in 2008 assuming hypothetical emission reductions. Values in bold are predicted exceedences of the objective

Vehicle type	% reduction in emissions	Barn Close	Qu. Tce.	B'Hill bottom	B'Hill Top	B'Hill Hse.	B'Hill Tce (A)	B'Hill Tce (B)	Pudd.	Dev. Tce.	Stn. Rd.
MCL	10	31.0	41.4	33.5	40.2	30.2	37.1	35.7	30.5	37.2	40.3
	25	31.0	41.3	33.5	40.2	30.2	37.1	35.7	30.5	37.2	40.3
	50	31.0	41.3	33.5	40.2	30.1	37.1	35.6	30.4	37.2	40.2
Cars	10	30.3	40.6	32.8	39.3	29.4	36.2	34.8	29.7	36.4	39.4
	25	29.2	39.3	31.7	37.9	28.2	34.6	33.3	28.6	35.2	38.1
	50	27.3	37.0	29.8	35.5	26.1	31.9	30.7	26.5	33.0	35.9
LGV	10	30.9	41.2	33.4	40.1	30.1	37.0	35.5	30.4	37.1	40.1
	25	30.7	41.0	33.3	39.8	29.8	36.7	35.3	30.2	36.9	39.9
	50	30.4	40.6	33.0	39.4	29.5	36.2	34.8	29.8	36.6	39.5

Buses	10	30.8	41.1	33.3	40.0	30.0	36.9	35.4	30.3	37.0	40.1
	25	30.4	40.8	33.0	39.6	29.6	36.4	35.0	30.0	36.6	39.7
	50	29.9	40.1	32.5	38.9	29.0	35.7	34.3	29.5	36.0	39.8
OGV	10	30.5	40.9	33.2	39.8	29.8	36.7	35.3	30.0	36.9	39.8
	25	29.8	40.2	32.8	39.2	29.3	26.0	34.6	29.3	36.3	39.1
	50	28.6	38.9	32.0	38.2	28.3	34.8	33.4	28.1	35.4	38.0
HGV	10	30.8	41.2	33.4	40.1	30.1	37.0	35.6	30.3	37.1	40.1
	25	30.5	40.9	33.3	39.9	29.9	36.8	35.4	29.9	36.9	39.8
	50	30.1	40.4	33.0	39.6	29.7	36.5	35.1	29.4	36.9	39.4
All Vehs	10	29.2	39.4	32.0	38.3	28.5	35.0	33.7	28.7	35.5	38.4
	25	26.4	36.3	29.7	35.3	25.8	31.6	30.4	25.9	32.8	35.3
	50	21.4	30.4	25.6	29.7	21.0	25.3	24.4	20.8	27.8	29.7
Do nothing		31.0	41.4	33.5	40.2	30.2	37.2	35.7	30.5	37.3	40.3

2.2 South Hams District Council Corporate policies potentially affecting air quality in Totnes

2.2a Local development framework

The South Hams Local Development Framework (LDF) comprises a number of documents that provide the future planning strategy for the South Hams (www.southhams.gov.uk). A core strategy for the LDF was adopted in 2006.

The Core Strategy requires approximately 400 dwellings and 5 hectares of employment land to help meet the needs of Totnes up to 2016. The aim of the LDF is to deliver sustainable development that addresses local priorities and meets all of the Council's corporate priorities, particularly to;

*Secure a supply of housing for local people at affordable levels

*Create the conditions for the growth and maintenance of quality economic activity and

*Maintain the district's distinctive environment whilst enabling access and sensitive development.

2.2b Environment priority

These corporate priorities have also been highlighted in a set of 4 further documents, which have evolved as the Council has moved toward a more shared approach to service delivery with a neighbouring authority; West Devon Borough Council. The importance of maintaining and improving air quality has been emphasised in the Environment priority document (<http://swdevon.gov.uk/>).

2.2c Green Travel Policy

There is a joint South Hams/West Devon green travel policy which aims to reduce the environmental impact of travel by staff and Members in the course of Council business and commuting to work (<http://www.south-hams.gov.uk/newintranet/NavFrame.htm>). As the main Council offices are in Totnes, the implementation of this plan could help to reduce, albeit slightly, commuter traffic on the A385

2.2d Taxi License policy

The South Hams District Council taxi license policy is currently being revised; measures will be included to encourage the use of cleaner fuels in taxis. The policy will also specify a minimum age and/ or environmental performance standard of the cars which are to be used.

2.3 Totnes Policies potentially affecting air quality; the Development Plan Document (DPD)

A more specific plan for Totnes is the Totnes Site Allocations Development Plan Document (DPD) which was adopted in February 2011, and which focuses on the allocation of sites to accommodate the requirement of the adopted Core Strategy). The DPD must also look to needs beyond 2016 to help to ensure an adequate supply of development sites and associated infrastructure for the next 15 years or so. See http://www.southhams.gov.uk/index/residents_index/ksp-development_and_planning-forward/sp-forward_planning-local_development_framework/sp-development_and_planning-allocations.htm

Three policies explicitly refer to the congestion and/or air quality issues in Totnes, see below.

6.8 Traffic congestion is a significant issue for the town, particularly during the summer and at peak times. The County Highway Authority (Devon County Council) does not consider that the levels of development proposed for the town will have a substantial impact on current traffic levels. However, the high levels of development proposed west of Torbay will have a significant impact on traffic flows at Totnes. The development proposed for the town cannot be expected to remedy existing traffic issues or overcome traffic difficulties resulting from Torbay's future growth. Each site allocated will be required to provide measures that enable sustainable modes of travel and help to minimise the use of the private car. Each site will also be required to provide a financial contribution to critical corridor management measures for the A385 to help reduce the congestion in the town as indicated in the infrastructure delivery programme. The council will also press for significant contributions towards the A385 corridor management scheme from the major development west of Torbay.

6.9 Air quality is an issue for part of the town, particularly the A385 corridor and Bridgetown Hill, where air pollutants exceed the recommended levels. Detailed assessment of Nitrogen Dioxide levels has resulted in the declaration of an Air Quality Management Area at this location.

6.10 The development proposed for the town will need to consider the current air quality situation and provide appropriate mitigation measures to minimise the impact on the AQMA. Appropriate measures may include improved traffic management or improvements to public transport, walking or cycling provision to help reduce the number of trips made by private car. Such measures will be required on site wherever possible, although a financial contribution towards off-site improvements may be more appropriate in some cases.

2.4 Devon County Council Local Transport Plan (LTP); Devon and Torbay Strategy 2011-2026 - context for Totnes, see www.devon.gov.uk

As noted in section 2.1 above, traffic on the A385 road running through Totnes is the cause of the failure in meeting the annual average NO₂ objective. This road, and all roads around Totnes, is managed by Devon County Council which is the Highways Authority for all areas in Devon which are not within unitary authority boundaries. It has been noted that much traffic travelling through the Totnes AQMA is likely to be travelling to or from Torbay. Torbay is a unitary authority but the current local transport plan for Torbay has been incorporated with the Devon one, which is useful for the purposes of tackling the AQMA in Totnes.

The LTP gives no specific measures to tackle air quality issues in Totnes but, in its chapter on 'Market and Coastal Towns and Rural Devon', it gives the following five transport priorities;

- *Assist in supporting existing and future development of the towns
- *Work with the community to demonstrate a low carbon approach to travel
- *Improve accessibility by developing a core bus and rail service supported by community transport
- *Make Devon 'the place to be naturally active' through investment in the leisure network
- *Develop an approach to parking policy which supports the vitality of town centres.

In particular the middle three of the priorities listed above should help to reduce air quality problems in all Devon's market and coastal towns by promoting the use of alternative means of travel than the private car. Measures to implement a low carbon approach to travel and to improve rail service may also help to reduce the air quality impact of road-based freight traffic.

In addition, the LTP section on 'The Torbay Strategy' emphasises the importance of constructing the 'South Devon Link road'. This is a proposal that would improve road transport into and out of Torbay along the A380 corridor. Although situated some distance from Totnes, and not a direct alternative route, it is likely that the construction of this link road could remove a small amount of traffic currently moving through the town by providing a

much easier and quicker access to Torbay from the main trunk roads, albeit from the eastern end of the Devon Expressway, than is currently available (see section 2.1 above).

2.5 Totnes on the Move (TotM)

This community-led group began in the spring of 2011 via an initiative from the County Council and has grown substantially since then. It is funded by DCC and the Department of Transport via a share of the 'Local Sustainable Transport Fund (LTSF)'. It has been facilitated by DCC officers and a DCC Councillor and has successfully organised a series of workshops and meetings involving representatives from throughout the local Totnes community including town and district councillors, local business people, community transport operators and other interested individuals. A Community Transport Board has now been set up to develop and deliver the Totnes on the Move projects, which include projects at various locations such as Redworth junction, the station and the Old Bridge. The aim of Totnes on the Move is 'to make the existing transport network in and around Totnes perform better for people who live and work in the area, as well as changing travel behaviour and reducing carbon emissions', (DCC 2011) while also meeting the LTSF objectives. So it specifically encompasses many of the issues associated with the Totnes AQMA, though is not limited to them.

2.6 A385 Management Plan

The DPD refers to the development of an A385 management plan (section 2.3 above) and describes it as 'a set of possible options to reduce congestion and improve the management of traffic using the A385 Totnes corridor'. DCC is working with 'Totnes on the Move' to develop sustainable transport solutions which will form part of the plan. The A385 corridor management scheme therefore will become a package of measures that will include; improved travel choices to encourage and make it easy for people to use alternatives to the car; traffic management measures to relieve congested points on the A385; and a campaign of travel awareness and travel planning with large employers. Possible traffic measures that the scheme could include are;

Alterations to Redworth Junction

Control of the flow of traffic at Newton Road

Design and deliver a pedestrian link from the railway to Castle Street

Traffic management around the main Totnes community college (which is adjacent to the A385); (see also Table 6 below).

The A385 Management Plan should ultimately seek to add detail to the suggested improvements and to cost them.

2.7 Summary of Action Plan Measures proposed

Three categories (cost, AQ impacts and feasibility) are used to quantitatively assess the various action plan measures mentioned in the preceding sections. Measures are allotted scores such that the highest scores indicate the most desirable outcome (see Tables 6 & 7). Eg. High scores are obtained for:

relatively inexpensive measures; measures which should significantly reduce NO₂ pollution in the AQMA and the measures which are the most feasible.

Table 6; Scoring Method for Action Plan Measures (adapted from Mid Devon District Council 2009)

Cost	Air Quality impact (pollution reduction)	Feasibility
> £1million = 1	Very High = 5	Definitely feasible = 5
£500k-1million =2	High = 4	Very feasible = 4
£100k – 500k =3	Moderate = 3	Moderately feasible = 3
£25k-100k = 4	Low = 2	Unlikely to be feasible = 2
£<25k = 5	Very low = 1	Very unfeasible = 1

Based on these assessments the measures are ranked in order of highest score (see Table 8.) It is clear from Table 8 that the most favoured measures would be; travel planning and the promotion of non car alternatives, followed by improved cycle and walking links. As can be seen in Table 7 below, many of these options are currently under consideration by Devon County Council and their partner organisations. Most of these measures would have other benefits to the Totnes community such as reductions in traffic congestion and associated economic benefits. The provision of cycling and walking paths and travel planning would also have health and well-being benefits for many.

Financial contributions for some of these measures will be sought from developers, where appropriate, eg. regarding measures in the A385 management plan – see section 2.3 above.

South Hams District Council officers will also look into the possible adoption of the Eco Stars Scheme, or similar, to encourage transport fleet operators to reduce emissions from their vehicles. .

Table 7; Quantification of proposed AQAP measures

Measure	Est. cost (A)	AQ impact (B)	Feasibility (C)	Tot (AXBXC)	Comments	Lead organisation	Other Non –AQ impacts
Bypass for Totnes	1	5	1	5	There is no funding available for such large road schemes.	DCC	Reduction in traffic congestion and noise along A385 in Totnes; faster journey times.
Traffic management measures for A385	3	4	3	36	Jacobs (consultants for DCC) have reviewed potential physical measures, however possible options are limited. An A385 corridor management plan is required by the DPD.	DCC	Reduction congestion and journey times
Improvements to Redworth Junction	3	3	3	27	Jacobs are currently designing improvement options for Redworth junction	DCC	Reduction in congestion and journey times
New footpath under Redworth bridge	3	3	3	27	Feasibility and cost dependent on position of Network Rail	DCC	Reduction in congestion, improved pedestrian safety
Changes to pedestrian crossing on Bridgetown Hill	4	2	3	24	Unknown feasibility dependent on road safety considerations	DCC	Reduction in waiting times for traffic on Bridgetown Hill
Creation of Park and change site(s)	2	3	3	18	Dependent on the deliverability of sites based on the construction cost and level of bus service available	DCC/SHD C	Reduction in congestion

Creation of Totnes Station transport hub	3	2	3	18	Feasibility study underway on improvement options for station forecourt. The potential is heavily affected by viability. There is a potential to link the station with a future park and change system to create integrated transport alternatives. Unknown impact of new rail franchise.	TotM, DCC, NR	Reduction in congestion, easier mobility for public transport users
Improvements to local bus fleet	1	3	4	12	Introduction of higher Euro standard vehicles and alternative technologies.	Local Transport Authorities and local transport operators	Reduction in carbon emissions, improved buses for existing users and increased attractiveness of travel by bus
Promote and expand alternative transport to private cars, eg. 'Bob the Bus' (community run bus in Totnes)	3	2	3	18	Bob the Bus is currently financed by... future expansion would be dependent upon further financial support and availability of volunteers to run it??		Would help those without private cars, therefore can help address inequality issues including those of age and disability, as well as helping those with less money.
Improved cycle and walking links	4	3	4	48	This is essential to providing attractive alternatives to the car for travel within the town. An aspiration map is being produced and studies are underway on the old Totnes bridge and Plymouth Road to see how provision for cyclists and walkers could be improved.	TotM, DCC	Reduction in congestion, improvement in health and well being.

Fleet Recognition Scheme	5	1	4	20	A scheme to encourage fleet operators to improve their vehicle emission standards through a formal process of recognition eg. Ecostars (Mid Devon)	Fleet operators, SHDC	Potential carbon benefits and encourages training of drivers in more efficient driving techniques
Changes to freight transport	2	4	2	16	Replacing large HGVs with smaller vehicles may improve air quality however it may increase the number of trips. It is also heavily dependent on economic viability.	(DCC, haulage operators.)	Reduction in noise
Travel planning	5	2	5	50	Targeted travel planning should be available for new development, employers and schools. The LSTF Roadshow will provide travel advice and information at events	TotM, DCC	Reduction in congestion, improved journey times
Promotion of and education about non-car alternatives	5	2	5	50	General promotion of these ideas to public By DCC and TotM via Totnes on the Move roadshow and SHDC eg. Via Green Travel Policy.	TotM, DCC, SHDC	Reduction in congestion, improvement in well-being
South Hams Green Travel policy & control of specified vehicle emissions	4	1	5	20	Encourage sustainable travel by staff and, where SHDC has direct control of vehicles, eg. of its own fleet (refuse vehicles, vans) and also via taxi licensing – to implement emissions controls/standards	SHDC	Small reduction in Totnes traffic.

Abbreviations; DCC= Devon County Council, SHDC=South Hams District Council, TotM = Totnes on the Move, NR = Network RailLSTF= Local Sustainable Transport Fund

Table 8

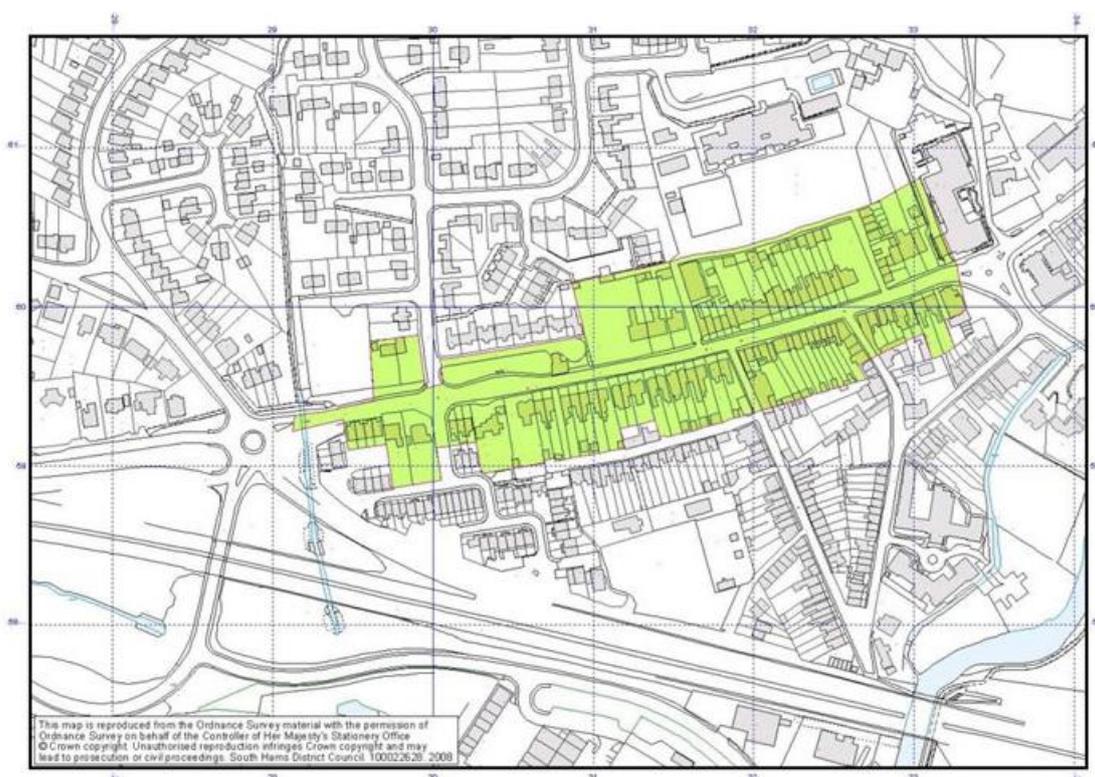
Rank	Cost benefit score	Action plan measure
1	50	Promotion and education of non-car alternatives and Travel planning
1	50	Travel Planning
2	48	Improved cycle and walking links
3	36	Traffic Management measures for A385
4	27	Improvements to Redworth Junction; New foot path under Redworth bridge.
5	24	Changes to pedestrian crossing on Bridgetown Hill
6	20	Green travel policy and control of specified vehicle emissions
6	20	Adoption of Fleet recognition scheme
7	18	Promote and expand alternative transport to private cars (eg. Bob the Bus); Creation of Park and changes site(s) Creation of Totnes station transport hub
8	16	Changes to freight transport
9	12	Improvements to local bus fleet
10	5	Bypass for Totnes

3. IVYBRIDGE; FURTHER ASSESSMENT AND AIR QUALITY ACTION PLAN `FOR WESTERN ROAD, IVYBRIDGE

3.1 Summary of Further Assessment for Ivybridge AQMA

The Ivybridge AQMA runs along the length of 'Western Road' in Ivybridge. This is part of the B 3213 and is the main (and virtually the only) current route into and out of the town to the west. Thus nearly all traffic travelling to or from Ivybridge from Plymouth, which is just 10 miles west, will use this route. The AQMA encompasses all properties fronting on to Western Road (see Figure 2).

Figure 2, Ivybridge AQMA



A Further Assessment for the Ivybridge AQMA was undertaken in 2010 by 'Air Quality Consultants.' The company modelled the annual mean concentrations of nitrogen dioxide from road sources in 2009 within the Air Quality Management Area. The modelling tool used was ADMS Roads (version 2.3). Further details of the input parameters and the modelling methodology are available in the full Further Assessment document (SHDC 2010).

Road traffic is the only significant source of nitrogen dioxide in the Ivybridge AQMA and vehicle flows, for both Western road and other roads close by, are shown in table 9.

These data were used to model the predicted percentage contribution of each source to the total concentration of nitrogen dioxide at various receptors within

the AQMA; the results can be seen in table 10. It is apparent that HGVs are the single largest road traffic contributor to emissions, contributing around 35% to the overall concentration at each receptor. Also, cars are important, contributing around 20% to NO₂ concentrations and background concentrations contribute around 25-30% to the overall levels of NO₂. Table 11 shows the predicted concentration of NO₂ in (µg/m³) produced by each of the sources, according to the modelling exercise undertaken for the Further Assessment (SHDC, 2010).

Table 9 similarly indicates that HGVs provide the single biggest source of NO₂ in most locations along Western Road, the actual contribution of HGVs exceeds even the background contributions.

Air Quality Consultants also modelled the impacts on overall (modelled) concentration levels, given specified reductions in road traffic emissions, the results of this exercise can be seen in Table 12 below. As would be expected, big reductions in HGVs do help to bring down the overall NO₂ concentration by several micrograms but unfortunately, even with 50% reduction in HGVs some locations remain just over the objective level. Big reductions (more than 25%) in all vehicles however enable the objective to be met at all locations.

Table 9; Summary of Traffic Flows (AADT) on and around Western Road, Ivybridge

	Motor-cycle	Cars	LGV	Bus	HGV	Total
Western Rd	129	13,147	1,964	193	1,219	16,652
Fore Street	46	4,941	738	25	568	6,319
Marjorie Kelly Way	99	10,104	1,510	170	671	12,555
Cornwood Road	82	4,391	653	80	131	5,336
Cleeve Drive	27	1,442	214	26	43	1,752
A38	493	36,722	6,491	231	2,192	46,129
A38 EB on slip	5	878	131	6	45	1,065
A38 WB on slip	78	5,840	873	68	171	7,030

Table 10 (from SHDC 2010). Modelled Percentage Contributions (2009) of sources to total NO₂ levels at listed receptors (all receptors are along Western Road and located within the AQMA).

All values are Percentages

Receptor location	Back-ground	Motor-cycle	Cars	LGV	Bus	HGV	Total
Kimberley Villas	32.9	0.2	19.3	8.1	6.5	33.0	100
Oate Villas	31.4	0.2	19.4	8.0	6.8	34.1	100
Imperial	37.5	0.1	17.8	7.4	6.1	31.1	100
Terrace	25.9	0.1	20.6	8.4	7.6	37.4	100
1 Western Road	25.5	0.1	20.3	8.3	8.1	37.8	100
Moor view	26.9	0.1	18.9	7.9	8.7	37.5	100

**Table 11 Modelled annual mean (2009) concentrations and the contribution of each source to the total.
Concentrations of NO₂ in µg/m³**

Receptor location	Back-ground	Motor-cycle	Cars	LGV	Bus	HGV	Total
Kimberley Villas	11.7	0.1	6.9	2.9	2.3	11.7	35.5
Oate Villas	11.7	0.1	7.2	3.0	2.5	12.7	37.2
Imperial	11.7	0.0	5.5	2.3	1.9	9.7	31.1
Terrace	11.7	0.1	9.3	3.8	3.5	16.9	45.1
1 Western Road	11.2	0.1	8.9	3.7	3.6	16.7	44.1
Moor view	11.2	0.1	7.9	3.3	3.7	15.7	41.8

Table 12 Predicted Annual Mean Nitrogen Dioxide Concentrations assuming hypothetical emission reductions.

Values in bold are predicted exceedences of the objective

Vehicle type	% reduction in emissions	Kimberley Villas	Oate Villas	Imperial	Terrace	1 Western Road	Moor View
MCL	10	35.5	37.2	31.1	45.1	44.1	41.8
	25	35.5	37.2	31.1	45.1	44.1	41.8
	50	35.5	37.1	31.1	45.1	44.1	41.8
Cars	10	35.1	36.7	30.8	44.6	43.6	41.4
	25	34.5	36.1	30.3	43.9	42.9	40.8
	50	33.5	35.0	29.4	42.6	41.7	39.7
LGV	10	34.8	36.4	30.5	44.2	43.2	41.0
	25	33.8	35.3	29.6	42.9	41.9	39.7

	50	31.9	33.4	28.1	40.5	39.5	37.4
Buses	10	35.4	37.0	31.0	44.9	43.9	41.6
	25	35.2	36.8	30.8	44.7	43.6	41.3
	50	34.8	36.4	30.6	44.2	43.2	40.8
HGV	10	34.8	36.4	30.5	44.2	43.2	41.0
	25	33.8	35.3	29.6	42.9	41.9	39.7
	50	31.9	33.4	28.1	40.5	39.5	37.4
All Vehs	10	33.6	35.1	29.5	42.6	41.6	39.5
	25	30.5	31.8	26.8	38.6	37.7	35.7
	50	24.8	25.8	22.2	31.1	30.2	28.7
Do nothing		35.5	37.2	31.1	45.1	44.1	41.8

3.2 South Hams District Council Corporate policies potentially affecting air quality in Ivybridge

3.2a Local development framework

The South Hams Local Development Framework (LDF) comprises a number of documents that provide the future planning strategy for the South Hams (www.southhams.gov.uk). A core strategy for the LDF was adopted in 2006. The Core Strategy requires approximately 100 dwellings and 5 hectares of employment land to help meet the needs of Ivybridge up to 2016. The aim of the LDF is to deliver sustainable development that addresses local priorities and meets all of the Council's corporate priorities, particularly to;

- *Secure a supply of housing for local people at affordable levels
- *Create the conditions for the growth and maintenance of quality economic activity and
- *Maintain the district's distinctive environment whilst enabling access and sensitive development.

3.2b Environment priority

These corporate priorities have also been highlighted in a set of 4 further documents, which have evolved as the Council has moved toward a more shared approach to service delivery with a neighbouring authority; West Devon Borough Council. The importance of maintaining and improving air quality has been emphasised in the Environment priority document, (<http://swdevon.gov.uk>).

3.2c Green Travel Policy

This is less relevant for Ivybridge than for Totnes as there are unlikely to be many (if any) trips made by large numbers of South Hams staff to the town.

3.2d Taxi License policy

The South Hams District Council taxi license policy is currently being revised; measures will be included to encourage the use of cleaner fuels in taxis. The policy will also specify a minimum age and/ or environmental performance standard of the cars which are to be used.

3.3 Ivybridge Policies potentially affecting air quality; the Development Plan Document (DPD)

A more specific plan for Ivybridge is the Ivybridge Site Allocations Development Plan Document (DPD) which was adopted in February 2011, and which focuses on the allocation of sites to accommodate the requirement of the adopted Core Strategy). The DPD must also look to needs beyond 2016 to help to ensure an adequate supply of development sites and associated infrastructure for the next 15 years or so. See http://www.southhams.gov.uk/index/residents_index/ksp-development_and_planning-forward/sp-forward_planning-local_development_framework/sp-development_and_planning-allocations.htm

Two policies explicitly refer to the congestion and/or air quality issues in Ivybridge, see below.

6.8 Air Quality is an issue for part of the town, particularly along Western Road, where air pollutants exceed the recommended levels. Detailed assessment of Nitrogen Dioxide levels has resulted in the declaration of an AQMA at this location.

6.9 The allocation proposed for the town will need to consider the current air quality situation and provide appropriate mitigation measures to minimise the impact on the Western Road AQMA. Appropriate measures may include improved traffic management or improvements to public transport, walking or cycling provision to help reduce the number of trips made by private car. Such measures will be required on site wherever possible, although financial contributions towards off-site improvements may be more appropriate in some cases.

3.4 Devon County Council Local Transport Plan (LTP); Devon and Torbay Strategy 2011-2026 - context for Ivybridge, see www.devon.gov.uk

Western Road is managed by Devon County Council which is the Highways Authority for all areas in Devon which are not within unitary authority boundaries.

The LTP gives no specific measures to tackle air quality issues in Ivybridge but, in its chapter on 'Market and Coastal Towns and Rural Devon', it gives the following five transport priorities;

*Assist in supporting existing and future development of the towns

*Work with the community to demonstrate a low carbon approach to travel

- *Improve accessibility by developing a core bus and rail service supported by community transport
- *Make Devon 'the place to be naturally active' through investment in the leisure network
- *Develop an approach to parking policy which support the vitality of town centres.

In particular the middle three of the priorities listed above should help to reduce air quality problems in all Devon's market and coastal towns by promoting the use of alternative means of travel than the private car. Measures to implement a low carbon approach to travel and to improve rail service may also help to reduce the air quality impact of road-based freight traffic.

3.5 Local Initiatives – Devon County Council parking initiative

In 2010, DCC local service group officers investigated the possibility of removing parking from the northern side of Western Road (see figure 3 below). The parking on this side of the road means that vehicles pass closer to those properties on the southern side of the road which are set so close to the kerb and at which the worst excesses of the annual NO₂ objective are measured. Properties on the northern side however have front gardens and are set back from the road. A modelling exercise was undertaken to predict what would happen if the parking was removed from the northern side to the southern side, with the road centreline also being moved further from the properties on the southern side; the results are given in Table 13, below and they indicate that this would certainly improve air quality at the properties on the southern side of the road. Receptors 3,5 and 7 for example are all situated on or close to the terrace on the southern side.

Figure 3



Table 13 Predicted results of changing parking arrangements from north to south side of Western Road, and adjusting road centre line accordingly.

Receptors 1-7 are at locations along Western Road on both north and south side. Specifically numbers 5 and 6 are adjacent to the terrace on the south side which is the main area of concern regarding the NO₂ exceedence.

Receptor	Do Nothing Scenario (µg/m ³)	Moved Car Parking and Road Centreline Scenario (µg/m ³)	Change in Concentration ^a (µg/m ³)
1	47.2	47.2	0.0
2	35.5	35.2	-0.4
3	37.2	34.0	-3.1
4	31.1	34.1	+2.9
5	45.1	38.3	-6.8
6	44.1	41.7	-2.4
7	41.8	41.8	0.0

^a Based on unrounded values

Devon County Council officers amended this proposal slightly to suggest that *all* parking be removed from Western Road during the day, with hatched areas to be drawn alongside the kerbs on both sides of the road to keep traffic in the centre and away from both kerbs (and therefore also from houses on the southern side). The officers organised a public meeting to discuss the idea but the weight of public opinion was so strongly set against them, the proposal was shelved. Residents voiced concerns about the removal of parking facilities and the safety of pedestrians on the north side pavement if parking was removed. Although both Devon and South Hams officers enquired as to whether other parking arrangements could be provided (to ease residents' worries about the lack of parking); none could be found at the time.

3.6 Ivybridge Community Plan

A community plan was developed for Ivybridge in response to the requirements for development of the town put forward in the SHDC Development Plan Documents and Core Strategy (see above). This plan was developed by the Prince's Trust, SHDC and Ivybridge town council, together with key stakeholders and residents during an intensive period of engagement and consultation which began in July 2011 and culminated in a community workshop in November 2011 (Prince's Foundation, 2011). The planning process was fully informed of the air quality situation in Western Road by both the District Council's air quality officer and the chief of transport planning in the area. Indeed, the issue of traffic pressure on Western Road came up as a key concern throughout the exercise.

Proposals that were included in the final plan, and which are of relevance to air quality in Western Road, were as follows.

Bus services to and from Plymouth and Exeter could be improved, and an hourly town centre-only loop service instigated. Train services could also be improved – currently many trains do not stop at Ivybridge because the platform is short and the train operator claims that it cannot technically resolve this matter (eg by selective door opening on the trains). In the long run, it was felt that an objective should be the lengthening of the platforms as part of a delivery of a ‘sustainable transport hub’.

Walking and cycling all around the town could be encouraged by enhancing footways and generally improving the town centre public realm. *‘A town cycle network should (also) be defined, featuring loops through the western and eastern parts of town. This should be supported by appropriate signage, local priority measures... and, critically, by more and better cycle parking in key locations, such as around the town centre’.* All new development should encourage walking, cycling and travel by public transport though the layout of new streets and footpaths and careful planning of development in proximity to the railway station and bus routes (Prince’s Foundation, 2011).

The possibility of re-routing traffic away from Western Road entirely was investigated during the community planning process. It was believed that a new junction to the A38 would be virtually impossible in the foreseeable future because of Highways Agency objections and cost. However a more achievable option was suggested of construction of a new or improved link from the eastern part of town to the existing A38 junction.

2.7 Summary of Action Plan Measures proposed

Three categories (cost, AQ impacts and feasibility) are used to quantitatively assess the various action plan measures mentioned in the preceding sections. Measures are allotted scores such that the highest scores indicate the most desirable outcome (see Tables 14 & 15). Eg. High scores are obtained for; relatively inexpensive measures; measures which should significantly reduce NO₂ pollution in the AQMA and the measures which are the most feasible.

Table 14; Scoring Method for Action Plan Measures (adapted from Mid Devon District Council 2009)

Action Plan Measures (adapted from Mid Devon District Council AQAP)

Cost	Air Quality impact (pollution reduction)	Feasibility
> £1million = 1	Very High = 5	Definitely feasible = 5
£500k-1million =2	High = 4	Very feasible = 4
£100k – 500k =3	Moderate = 3	Moderately feasible = 3
£25k-100k = 4	Low = 2	Unlikely to be feasible = 2
£<25k = 5	Very low = 1	Very unfeasible = 1

Based on these assessments the measures are ranked in order of highest score (see Table 16.) It is clear from Table 16 that the most favoured measures, on this basis, would be;

Removing parking from Western Road – though this has been proven to be extremely unpopular with local residents and there is no alternative parking available to offer them at the moment. Equally favoured are targeted travel planning and improving the number of train services and developing a transport hub at the station.

A new road link from the east of Ivybridge to the existing A38 junction is also a favourable option.

Financial contributions to some of these measures could be sought from developers, where appropriate,

South Hams District Council officers will also look into the possible adoption of the Eco Stars Scheme, or similar, to encourage transport fleet operators to reduce emissions from their vehicles. .

Table15; Quantification of proposed AQAP measures

Measure	Est. cost	AQ impact	Feasibility	score	Comments	Lead organisation(s)	Other Non –AQ impacts
New link from East of Ivybridge to A38	1	4	1	4	The Highways Agency does not want to add any more junctions to this stretch of the A38, this would be very expensive. Also may be land purchase issues. However a new link would be likely remove a lot of traffic from Western Road	HA, DCC	Reduction in congestion and noise along Western Road,
New road link from East of Ivybridge to A38 junction – to effectively bypass Western road	2	5	3	30	Suggested in the Ivybridge community plan (see s3.6 above), would be expensive and may be land purchase issues, but would be likely remove a lot of traffic from Western Road	DCC, SHDC planners, Highways Agency	Reduction in congestion and noise along Western Road. If combined with new commercial development, could provide better value.
Remove parking from north side of Western Road	4	4	2	32	Apparently a relatively straightforward way to improve air quality at most vulnerable properties but was unacceptable to local residents.	DCC	May reduce congestion, alleged safety issues for pavement walkers. Is locally unpopular.
Improvements in bus	3	3	2	18	Unlikely in current LA financial context. Would only help AQ	DCC	Would help those without private cars, therefore can help

services through and around the town					situation if drivers persuaded to use instead of driving		address inequality issues including those of age and disability, as well as helping those with less money.
Alterations to the trains to allow more stopping at Ivybridge	4	3	2	24	Cross country train services claim that their trains cannot stop at Ivybridge because they cannot install selective door opening (for technical reasons) which is necessary for the short platforms at Ivybridge (Prince's Trust, 2011). May even be a need to protect existing train services because of changes in rail contracts etc	Train companies (Cross Country),	If more train services could stop at Ivybridge, more commuters and other travellers to Plymouth or Exeter could be encouraged to use the train.
Extension of platforms at Ivybridge station to allow more stopping and development of transport hub	3	3	3	27	More frequent train services and a hub with better station and rail-bus interchange facilities could be developed in phases alongside adjacent development (Prince's Trust, 2011). May even be a need to protect existing train services because of changes in rail contracts etc	Train companies, network rail,	If more train services could stop at Ivybridge, more commuters and other travellers to Plymouth or Exeter could be encouraged to use the train. Also could help those without private cars, therefore can help address inequality issues including those of age and disability, as well as helping those with less money.

Improvements to walking and cycle ways through Ivybridge	4	2	4	32	This is essential to providing attractive alternatives to the car for travel within the town. However, the impact on Western Road could be limited if most users of that road are travelling further than around the town.	DCC, SHDC planners	Reduction in congestion, improvement in health and well being.
Freight transport	2	4	2	16	Replacing large HGVs with smaller vehicles may improve air quality however it may increase the number of trips. It is also heavily dependent on economic viability.	Freight operators	Reduction in HGVs and consequent reduction in noise and fumes etc. along W. Road
Signposting to industrial estates	2	2	4	16	A check should be made that there are suitable signposts to the industrial estates at Lee Mill and Langage to ensure that HGVs stay on the A38 to the correct junction, rather than travelling through Ivybridge.	HA, DCC	Reduction in HGVs and consequent reduction in noise and fumes etc. along W. Road
Travel planning	4	2	4	32	Targeted travel planning should be available for new development, employers and schools. The LSTF Roadshow will provide travel advice and information at events	DCC	Reduction in congestion, improved journey times
Promotion	2	2	5	20	General promotion of these ideas	DCC	Reduction in congestion,

and education of non-car alternatives					to public		improvement in well-being
South Hams Green Travel policy & control of specified vehicle emissions	4	1	5	20	Encourage sustainable travel by staff and, where SHDC has direct control of vehicles, eg. of its own fleet (refuse vehicles, vans) and also via taxi licensing – to implement emissions controls/standards	SHDC	
Fleet Recognition Scheme	5	1	4	20	A scheme to encourage fleet operators to improve their vehicle emission standards through a formal process of recognition eg. Ecostars (Mid Devon)	Fleet operators, SHDC	Potential carbon benefits and encourages training of drivers in more efficient driving techniques

Table 16

Rank	Cost benefit score	Action plan measure
1	32	Remove parking in Western Road Improvements to walking & cycle ways Targeted travel planning
2	27	Longer platforms & development of transport hub at train station
3	24	Alterations to trains to allow more stops at Ivybridge New road link from East of Ivybridge
4	20	Promotion and education-non-car alternatives Green travel policy & control of specified vehicle emissions
4	20	Adoption of Fleet Recognition Scheme
5	18	Improvement in bus services
6	16	Check signposting of industrial estates Changes to freight transport
7	15	Domestic energy efficiency promotion
8	4	Completely new road link to A38

References

Defra (2009a) LAQM.TG(09) Technical Guidance, available at www.defra.gov.uk

Defra (2009b) LAQM (PG09) Policy guidance, available at www.defra.gov.uk

DCC 2011 – Information on Totnes on the Move

Mid Devon District Council (2009) AQAP for Cullompton, see <http://www.middevon.gov.uk/index.aspx?articleid=3806>

SHDC 2009; Further Assessment on Totnes AQMA by Air Quality Consultants, available from S.Harcombe at SHDC

SHDC 2010; Further Assessment on Ivybridge AQMA by Air Quality Consultants, available from S.Harcombe at SHDC

Prince's Trust 2011Ivybridge Community Plan, Dec 2011, draft for consultation.