



Low Emission
Strategies

Building on Good Practice



Government
Group

LOW EMISSION STRATEGIES for Local Transport
- *Building the Case for Action*

April 2011

Summary

Local action has potential to significantly reduce transport emissions in England and Wales. Associated health and environmental benefits are estimated at over £1 Billion per year by 2015.

1. Air pollution and climate change cause significant health and environmental harm and arise from common emission sources. Climate change is widely recognised as one of the greatest challenges facing the world today. Air pollution causes premature death and is linked to the worsening of lung conditions such as asthma and heart and circulatory disease. There are benefits to be gained from joined up action, particularly within the transport sector. [section 1]
2. Historically, action pursued under the Local Air Quality Management regime has enhanced our understanding of local air quality issues. However, it has not led to significant demonstrable health or environmental benefits and there remains an opportunity for councils to identify and take further action. Emission based management and delivery approaches, typified by the activities of the Low Emission Strategies Partnership, provide a practical mechanism for tackling transport emissions. [Section 2]
3. Local action may take various forms and there is a growing body of evidence upon which to draw. Emission reductions can be achieved through personalised travel support, improved fleet management practices, better public transport, installation of low emission fuelling/charging infrastructure, and investment in low emission fleets, vehicles and technologies. Councils may act directly on operations, fleets, vehicles and infrastructure under their own control. They may also set policy and take action, which encourages, facilitates or requires local people and organisations to play their part as well. [Section 3]
4. Impressive emission reductions can be achieved locally by building up packages of complementary interventions. In this way, councils can pursue flexible action, which is tailored according to local circumstances, priorities and needs. This is more realistic and effective than a 'one size fits all' approach, especially given the challenging financial climate in which councils are currently operating. The cumulative benefits derived from the adoption of similar approaches around the country open up the opportunity of nationally significant emission reductions and associated benefits. [Sections 4-5]
5. **Impact analysis suggests that area wide local action has potential to significantly reduce transport emissions in England and Wales. Associated health and environmental benefits are estimated at over £1 Billion per year by 2015.** Benefits of this scale would require concerted action by many councils across the country, leading to a reduction of up to 20% of total national transport emissions. From a local perspective, benefits may arise directly as a result of local action. Equally, due to trans-boundary processes, they are also provided by action taken in other parts of the region and the country. [Section 5]
6. The analysis also suggests that **council fleet management and low emission planning policies on their own each have potential to deliver benefits worth many millions of pounds every year.** These are important opportunities in their own right. They may also act as a springboard for taking on the more formidable challenge of *successful* area wide intervention. [Section 5]
7. Demonstrating *significant* transport emission reductions across an entire local area represents both a major opportunity and a major challenge. It is only achievable through well planned, coherent and determined action. Some councils have taken the step of pursuing an 'Authority Wide Low Emission Strategy,' while others are using existing frameworks and processes to similar effect. The detailed apparatus is less important than that the necessary focus and coordination be achieved. [Section 4]
8. **Recognising that councils are best placed to determine the most appropriate approach to, and level of, local action, the estimated figures are intended to provide a simple comparison of potential benefits arising from different policies and interventions. It should be noted that they derive from a developmental method, which includes a number of crude approximations. Pending further testing and refinement the reported figures should be treated as illustrative rather than definitive.** [Section 4]

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About This Report

This report presents evidence and arguments, presenting the case for effective local action to reduce transport emissions. It is a joint publication by the Low Emission Strategies Partnership and the Local Government Group:

The Local Government Group works on behalf of councils to support, promote and improve local government. For further information visit: www.local.gov.uk

The Low Emission Strategies Partnership is a partnership of local authorities working together to reduce air quality and carbon emissions from road transport. They do this by promoting the uptake of low emission fuels and technologies, by developing tools and resources and sharing best practice. For further information visit: www.lowemissionstrategies.org.uk

This publication was produced by Rob Pilling, Green Sphere Ltd on behalf of the above organisations.

1. Harm – Air Pollution and Climate Change

Air pollution and climate change cause significant health and environmental harm and arise from common sources, including road transport. Climate change is widely recognised as one of the greatest challenges facing the world today. Air pollution causes premature death and is linked to the worsening of lung conditions such as asthma and heart and circulatory disease. There are benefits to be gained from joined up action, particularly within the transport sector.

9. Climate change is one of the greatest challenges facing the world today. There is strong and indisputable evidence that climate change is happening and that man-made emissions are its main cause. Left unchecked, it will have profound impacts on our society and way of life. The risks are high, potentially catastrophic, and inertia within the climate system means that decisions today will have their most far reaching affects some way into the future. Tackling the problem is particularly challenging since the production and release to air of greenhouse gases, particularly carbon dioxide, is deeply embedded within our economic system and our way of life.
10. In contrast to climate change, which is a relative policy newcomer, air pollution has been a public and political concern for many decades. None the less, it continues to cause major harm to public health and the environment. The 2007 Air Quality Strategy estimates that man-made particulate air pollution reduces the life expectancy of every person in the UK by an average of 7-8 months, with health costs valued at between £8 and £20 billion per year. These figures were generated by the Interdepartmental Group on Costs and Benefits, which includes the Department for Environment, Food and Rural Affairs (Defra), the Department of Health and the Department for Transport. The estimate is based on life-years lost and the monetisation reflects estimates of the UK population's 'willingness to pay' to avoid these health impacts.^{1,5}
11. The £8–20 billion range is likely to be an *underestimate* of total health costs. The Air Quality Strategy ignores the impact on morbidity, costing only mortality. There are, for example, clear links between asthma and air quality. Asthma UK estimate the annual cost of asthma to society at £2.3 billion.⁵ This value includes financial costs to the NHS from respiratory hospital admissions, for example, in 2007/08, there were over 74,000 emergency admissions to hospital because of asthma, with associated costs to the NHS of £600 million.⁵
12. Air pollution has additional wide-ranging environmental impacts including loss of biodiversity and reduced crop yields. Excess nitrogen from emissions of ammonia and oxides of nitrogen (NO_x) leads to excessive plant growth and decay (eutrophication) that disturbs the biodiversity of both land-based and water-based ecosystems. Emissions of ammonia and NO_x also contribute to acidification of ecosystems. NO_x is also a precursor for ozone formation, which has a direct effect on plants, damaging their leaf structure, reducing growth and compromising their defence mechanisms. The 2007 Air Quality Strategy does not cost the impact of air pollution on ecosystems, since Defra argues that such valuation is complex and a robust methodology is yet to become available.⁵
13. A striking comparison is that even without taking these excluded costs into account, the estimates of health impacts of air pollution in the UK are up to twice that of physical inactivity, estimated to be £10 billion per annum, and are also comparable to those attributed to alcohol misuse, estimated at £12-£18 billion per annum.^{4,5}
14. The significant harm accrued every year as a result of air pollution, arises from the same sources and activities, which produce carbon dioxide the priority pollutant linked to climate change. National policy advises local authorities to consider *'[...] the added benefits to the local, regional and global environment of having an integrated approach to tackling both climate change and air quality goals.'* In this regard, joined up policies are particularly important for the transport sector, which is by far the most common cause for the declaration of air quality management areas.^{3,4,10}

2. Response – Evolution of Local Action

Historically, action pursued under the Local Air Quality Management regime has enhanced our understanding of local air quality issues. However, it has not led to significant identifiable health or environmental benefits and there remains an opportunity for councils to identify and take further action. Emission based management and delivery approaches, typified by the activities of the Low Emission Strategies Partnership, provide a practical mechanism for tackling transport emissions.

15. Historically, in performing their review and assessment duties, councils have contributed to the identification and understanding of local and national air quality. Many have also prepared and implemented Air Quality Action Plans. There is however little evidence that action arising from these plans has provided significant health or environmental benefits.³ Contributing factors have been suggested as:^{3,7}

- (i) Emphasis on monitoring and assessment at the expense of action to reduce emissions
- (ii) Complexity and uncertainty associated with assessing and demonstrating benefits
- (iii) The mobility of pollutants across council, and indeed national boundaries
- (iv) Local political and economic considerations acting as barriers to certain interventions
- (v) Limited direct control over emission sources

16. More recently, momentum is building behind a more action oriented approach, typified by the activities of the Low Emission Strategies Partnership.¹⁶ Characteristics of the approach include:

- (i) Emphasis on practical cost effective action to reduce emissions across the local area. This represents a shift from traditional Air Quality Action Planning, which is formally driven by consideration of micro-scale hotspots.
- (ii) Separation of strategic level assessment of pollution concentrations and their spatial resolution from practical action planning and delivery. This allows the latter to focus effectively on achieving significant area wide emission reduction.
- (iii) Consideration of air quality pollutants and carbon dioxide together in combined strategies. This helps to strengthen the benefits case, improve co-benefits of action, reduce management and delivery costs and actively manage potential tensions and trade-offs between the two drivers.
- (iv) Sharing good practice, learning and know-how regionally and nationally through local authority led networks, while at the same time encouraging flexibility and local tailoring of policies and interventions.

17. The Low Emission Strategies approach has evolved from local action and has gained national recognition and support. Notably, the Government's response⁹ to the recent Environmental Audit Committee report on air quality committed to '[...] *work with the Low Emissions Strategies Partnership to encourage local authorities to develop strategies based around emissions reduction. This will support the achievement of air quality objectives and help generally to drive down emissions of air pollutants.*'

18. The Low Emission Strategies Partnership has also produced other tools and resources, freely available to councils including: Low Emission Planning Guidance, Low Emission Toolkit, Low Emission Procurement Guidance. For information visit: www.lowemissionstrategies.org.uk

3. Interventions – Opportunities for Action

Local action may take various forms and there is a growing body of evidence upon which to draw. Emission reductions can be achieved through, for example, personalised travel support, improved fleet management practices, better public transport, installation of low emission fuelling/charging infrastructure, and investment in low emission fleets, vehicles and technologies. Councils may act directly on operations, fleets, vehicles and infrastructure under their own control. They may also set policy and take action, which encourages, facilitates or requires local people and organisations to play their part as well.

19. There is a range of possible interventions, which local councils may adopt, which will reduce transport emissions. They do so by one or a combination of three mechanisms:

- (i) Reduce total vehicle mileage
- (ii) Shift journeys to less polluting modes of transport; and
- (iii) Improve the on-road emissions performance of fleet vehicles.

20. Breaking bullet (iii) down further, improved emission performance may arise as either (a) operational improvements, resulting from how the vehicle is operated or driven; or (b) technical improvements, resulting from modification, improved maintenance or substituting for a lower emitting technology.

21. In reducing emissions, councils may act directly on operations, fleets, vehicles and infrastructure under their own control. They may also set policy and take action, which encourages, facilitates or requires local people and organisations to play their part as well.

22. Direct interventions include travel planning, improved fleet management, better public transport, installation of low emission fuelling/charging infrastructure and investment in low emission fleets, vehicles and technologies. Indirect influence can be achieved *via* a range of mechanisms including transport planning, spatial planning, public procurement, strategic finance, partnership working and local communications.

23. As low emission practice evolves and develops, there is a growing desire within councils to identify and understand which interventions lead to the most effective and most efficient emission reductions. There is also now a growing body of documented evidence on which to draw. Appendix 1 provides a listing of around 90 case examples from across the country. It includes a summary of impacts achieved where this is known.

24. Illustrative examples drawn from Appendix 1 are presented below (see Appendix 1 for references and other source information):

(i) TravelSmart Campaign

Car use reduced by over 10% in parts of Lancashire

In 2006 Lancashire County Council implemented a TravelSmart campaign to reduce the number of trips by car. It supported the Civitas sustainable transport programme in Preston and the Cycling Demonstration Town project in Lancaster. An initial baseline survey and a final evaluation were completed. The campaign targeted 50,000 households in Preston & South Ribble and Lancaster & Morecambe, including Torrisholme. It provided participating households with a wide range of high-quality personalised information, advice and support on local options for walking, cycling and public transport. The final report in September 2008 showed a significant shift to trips by sustainable modes. Reductions in car trips varied from 10% in Preston to 14% in Lancaster & Morecambe, producing an annual reduction in CO₂ emissions of 13,100 tonnes.

(ii) BT Fleet Management *30% emission reduction across a managed fleet*

(Note: Although this is a private sector example, the interventions are equally applicable to council owned fleets as well as to other locally operating fleets).

Since 2005, a range of measures have been implemented by BT including: (i) Specifying carbon efficiency in procurement and ensuring all vehicles are fit for purpose, (ii) Daily vehicle checks are completed by drivers; while operational managers undertake regular vehicle safety, condition and loading inspections, (iii) Trials of alternative fuels and technologies with electric vans introduced in 2010, (iv) The use of supporting IT and GPS systems, (v) A thorough Driver Skills Development and Monitoring Programme including SAFED. As a result, fuel usage has decreased and fleet CO₂ emissions have decreased by 30% since 2005.

(iii) Love Lane Development *Ground breaking Low Emission planning agreement in Greenwich*

Low Emission strategy for a major mixed use scheme comprising 960 residential accommodation, community and/or offices, retail store, retail, food and drink units, as well as 1,172 parking spaces and cycle parking. Transport measures include: Provision of a car club; emissions based charging for 500 residential parking spaces (annual charge ranging from £0 to £300 depending on VED banding); Controls on parking permits and transfers; Provision of ten electric vehicle charging points within the residential car park, 50% of delivery vehicles and 50% home delivery vehicles to meet Euro 5 rating by store opening and to be using bio-fuel (plus 100% within 5 years). An implementation report is required at time of store opening and subsequently after five and ten years respectively.

(iv) Oxford Low Emission Zone *Clean buses in the city centre by 2014*

It was established that buses were creating up to 80% of pollution in Oxford's city centre. In response, a Low Emission Zone (LEZ) was introduced. This requires that from 2014 all buses entering the city centre must be at least Euro V.

(v) Midlands Infrastructure Investment *Plugged in Leicester!*

Alongside other Midlands authorities, Leicester has secured funds from the second round of the Government's "Plugged in Places" initiative, for financing infrastructure to support use of electric vehicles. Leicester will use the funding to provide charging facilities for electric vehicles at a range of strategic locations across the city, thereby supplementing existing and planned installations already funded by low emission planning agreements. The initiative dovetails with the Government's 'Plug-In-Car Grant' of up to £5,000 per car for the new wave of electric vehicles to be launched in 2011. Together, these initiatives will enable motorists to switch to electric vehicles in the city.

(vi) Westminster Car Club *30% of car club vehicles to be hybrid or electric by 2012*

Westminster City Council launched a large scale car club using a model whereby the car club is owned and managed internally but run by a commercial operator. Westminster have also set up an 'EV-pod' dedicated to the car club for use by an all electric Citroën C1 ev'ie, and a hybrid Prius. They are aiming to have 400 vehicles by 2012, with about 30 per cent of which to be hybrids.

4. Integration – Fitting the Pieces Together

Successful and sustained local action requires a platform of linking provision, policies and practice. Some councils have taken the step of pursuing an ‘Authority Wide Low Emission Strategy,’ while others are using existing frameworks and processes to similar effect. The detailed apparatus is less important than that the necessary coordination be achieved.

25. Transport emissions arise from entrenched behaviours, activities and technologies; and also from the design and layout of our towns, cities and other locations. Reducing emissions is a complex task requiring vision, ambition and commitment. It needs joined up thinking and coherent sustained action across sectors and across the full range of council activities, services and sphere of influence.
26. There is growing recognition that there is no single solution or ‘one size fits all’ approach to local action. Instead, as part of their recommendations on air quality, the Environmental Audit Committee has suggested that ‘*what is needed is for all local authorities to develop wide ranging strategies that reduce emissions and drive down concentrations of key pollutants.*’ In its response⁹ the Government agreed that wide ranging strategies would be beneficial though emphasised that ‘*it will be for individual local authorities to decide which measures will be most appropriate and effective for their circumstances.*’
27. A key challenge for councils when selecting interventions is that their impact is often heavily dependent on the intensity or extent by which they are deployed. As such, they are rarely ‘off the peg’, requiring instead careful design and implementation, coupled with ongoing monitoring for benefits and cost-effectiveness.
28. The traditional mechanism for coordinating action on air pollution is the **Air Quality Action Plan**. However, a recent review³ identified weaknesses associated with action plans, including lack of quantification of anticipated benefits and cost effectiveness or detail on how progress would be measured. This reflects, at least in part, the challenges set out in paragraph 15 of this report.
29. In recent times, councils have been encouraged to incorporate air quality action plans within local transport plan documents; and also to undertake greater quantification of impacts.

Local Transport Plans provide a logical framework for pursuing transport based emission reduction, particularly if linked closely to complementary low emission planning policies within the Local Development Framework. The approach appears to work well for councils with good communication between environment, transport and planning teams, though can be more difficult where this is not already the case.

Quantifying the impact of air quality actions is particularly challenging if the intention is to do so in terms of changes to pollutant concentrations. Modelling uncertainties, the influence of meteorology and trans-boundary pollution and the limited impact of some action plan measures can combine to make it a near impossible task. Consequently, there is a growing interest in emission based impact assessment, which can provide a more practical basis for action planning and monitoring progress.⁷

30. Some authorities have taken the further step of pursuing an ‘**Area Wide Low Emission Strategy**’ to provide a coordinating framework for their local interventions. They believe that the new terminology helps to communicate and embed the twin philosophy of action focus and emission reduction into their work. For some it is also used to differentiate between efforts to accelerate the adoption of low emission technologies, from wider work on trip reduction and sustainable travel. As with the introduction of any new terminology and processes, it is important to ensure that new structures and plans are integrated with and avoid duplication of those already in existence.
31. Ultimately, it would appear that the detailed terminology and apparatus is less important than that the necessary focus and coordination be achieved. Appendix 1 provides case examples of integrating

mechanisms and tools, which have been adopted by some authorities. Three of these are illustrated in the table below.

Framework	Council	Aims
Air Quality Action Plan	Cambridge City Council	Air Quality Action Plan integrated into the Local Transport Plan (LTP2). Proposes a low emission zone for buses and taxis, expansion of road closure programme and 20 mph speed limits within the central city. Other measures proposed include: proactive stance on land use planning in relation to air quality, continued limitation of parking, full implementation of walking and cycling strategy.
Local Transport Plan	Liverpool City Region	<u>Aims:</u> Reducing emissions from transport to mitigate against climate change and improve local air quality (which will be delivered through a Low Emissions Strategy): (a) Provide a range of viable low emission travel options, (b) Educate about what travel options are available and when they are most appropriate, (c) Incentivise low emission travel choices, (d) Remove financial barriers to low-emission technologies, (e) Build, maintain and manage the transport network in a way that minimizes emissions. <u>(Note:</u> Underlying evidence base includes modelling of impacts on emissions).
Authority Wide Low Emission Strategy (under development)	York City Council	<u>Aims:</u> (a) Awareness raising, (b) Encouraging uptake of LES at new developments, (c) Reduce emissions from existing building and vehicles through incentives, (d) encourage inward investment by providers of low emission technology, fuels and support services. <u>(Note:</u> The Low Emission Strategy for York is currently under development. The aims listed above are not yet Council Policy)

Table 1: Three examples of coordinating frameworks adopting by councils
(see Appendix 1 for source information and further examples)

32. Whichever framework is adopted, a council may wish to consider opportunities provided by these evolving practices:

- (i) Strengthening action plan focus on area wide reduction of emissions from transport
- (ii) Identification of priority zones for emission reduction (e.g. 'emissions corridor approach')
- (iii) Improve integration of air pollution reduction with carbon reduction
- (iv) Review systems and structures for joined up working, especially the linking of environment teams, transport planning and development control
- (v) Monitoring and data provision and assessment protocols to support design, implementation and appraisal of emission reduction activities
- (vi) Ongoing learning and opportunities from current and emerging low emission practices from other parts of the country.

5. Benefits – What Can Local Emissions Management Achieve?

Impact analysis suggests that area wide local action has potential to significantly reduce transport emissions in England and Wales. Associated health and environmental benefits are estimated at over £1 Billion per year by 2015. From a local perspective, benefits may arise directly as a result of local action. Equally, due to trans-boundary processes, they are also provided by action taken in other parts of the region and the country.

Recognising that councils are best placed to determine the most appropriate approach for, and level of, local action, the estimated figures are intended to provide a simple comparison of potential benefits arising from different policies and interventions. It should be noted that they derive from a developmental method, which includes a number of crude approximations. Pending further testing and refinement the reported figures should be treated as illustrative rather than definitive.

33. Three scenarios were investigated:

Scenario A - Low Emission Fleet Management of Council Vehicles

Scenario B - Low Emission Planning and Development Control

Scenario C - Area-Wide Transport Emissions Management

34. The scenarios assume that all councils in England and Wales maintain or develop ambitious yet achievable policies and plans to achieve significant cost effective reductions in local transport emissions. In order to do so, they also assume that effective management, delivery and financing mechanisms are maintained or established.

35. The **council vehicles scenario** explores the use of low emission fleet management and transformation practices for vehicles directly under council control. For simplicity, the scenario is restricted to cars, light vans and heavy goods/service vehicles. It considers the following range of interventions:

- (i) Fleet policy reviews and re-organisation of fleets and services
- (ii) Improvements to fleet operations and management, including use of equipment such as on-board data gathering and speed/power limiters.
- (iii) Comprehensive driver skills training, reinforced through ongoing driver support.
- (iv) Modification and improved maintenance to existing vehicles (e.g. energy efficient tyres, wheel alignment, also where appropriate retrofit of exhaust after treatment)
- (v) Accelerated replacement of existing fleet with lower emitting technologies, vehicles and fuels (e.g. smaller/lighter, electric, bio-methane, hybrid, dual-fuel)

36. The **development control scenario** assumes that all local authorities adopt and implement Low Emission Planning Policies, as promoted by the Low Emission Strategies Partnership.^{2,8} For simplicity it only considers residential, office and retail developments. It also only considers emissions from car and bus journeys associated with these sites, i.e. excluding goods and service vehicles (note: these simplifications mean that projected benefits are smaller than would otherwise be the case).

37. The scenario assumes deployment of a full range of measures to tackle emission from cars, including:

- (i) Personalised Support: Site based travel plans, including advice/information, training, incentives and introduction of management/information systems/equipment, driver training, and encouragement of improved maintenance of vehicles.
- (ii) Traditional 'Hard' Interventions: parking re-allocation/charges, vehicle share/rental schemes (e.g. car club, bike rental), improved cycling and walking infrastructure and enhanced public transport. Also potentially more stringent responses could include interventions such as site-based congestion/user charging.

(iii) Low Emission Technology Interventions: provide additional emission savings by accelerating adoption of lower emitting technologies through *emission based* parking allocation/charging, *low emission* vehicle share/rental schemes, *emission based* entry or use controls and charges, financial support for *greener* vehicles and provision of supporting *low emission* infrastructure (e.g. electric charging points and biomethane refuelling).

38. The scenario includes options to reduce emission from bus travel. These rely on similar mechanisms to those described for council owned vehicles (i.e. improved service design, efficient management and operations, improved driver skills, modification and maintenance and introduction of lower emission vehicles).
39. It also assumes that additional proportionate off-setting contributions are pursued to enhance and de-risk site based emission reduction and mitigation. These contributions are assumed to be deployed in pursuit of strategic area wide measures to further reduce local transport emissions. (Note: see LES Partnership guidance^{2,8} for further information on off-setting approaches).

The **area-wide scenario** assumes that all councils pursue widespread deployment of a series of integrated low emission transport interventions, which in combination are capable of influencing the breadth of vehicle activity within the local area. It assumes that councils take full advantage of the powers and opportunities available to them both for acting directly, and also in encouraging, facilitating, and in some cases requiring local people and organisations to play their part as well. Direct interventions are assumed to include travel planning, improved fleet management, better public transport, installation of low emission fuelling/charging infrastructure and investment in low emission fleets, vehicles and technologies. Indirect influence is assumed to be exerted *via* a range of mechanisms including transport planning, spatial planning, public procurement, strategic finance partnership working and local communications.

Projected benefits

40. The scenarios demonstrate how emission reductions can be achieved locally by building up packages of complementary interventions. In this way, councils can pursue flexible action, which is tailored according to local circumstances, priorities and needs. This is more realistic and effective than a one size fits all approach, especially given the challenging financial environment councils are operating in.
41. The analysis indicates that council fleet management and low emission planning policies have potential to deliver significant emission reductions across England and Wales. Applying damage costs (see para. 50) to these reductions indicates health and environment benefits worth many millions of pounds every year. These are important opportunities for local action.
42. Scaling up benefits of fleet management and planning is limited by the relatively small proportion of total transport emissions, which can be influenced. Under the scenario assumptions, this is approx. 1% for council fleets and, taking exclusions and uncertainties into account (see paragraphs 36 and 46), a similar proportion is also indicated for planning based interventions.
43. Far greater benefits become possible as the reach of local action is extended. This is borne out by results from the area wide scenario with projected benefits rising to over £1 Billion per year by 2015. Benefits of this scale would require concerted area wide action by many, if not all, councils, leading to a reduction of up to 20% of total road transport emissions.
44. The benefits projected for the area wide scenario represent both a major opportunity and a major challenge. They will only arise out of well planned, coherent and determined action. If successful, the potential returns are enormous. In contrast, achieving effective emission reduction from council fleet and planning work, while still challenging, is already within the sights of many council.

45. The added flexibility and control which authorities have in own fleet management and with regards planning policy make them logical and complementary focus-points for targeted wins and innovation. They provide opportunities for learning by doing, establishing precedents, showing local leadership, developing effective management systems and generating seed finance. As such they provide (alongside other equally important component interventions) a potential spring board for taking on the more formidable challenge of significantly influencing area wide transport emissions.

Scenario A - Low Emission Fleet Management of Council Vehicles

Pollutant	Estimated Total Emissions from Council Vehicles (t/y)	Reduction (%)	Reduction (t)	Damage Costs Avoided (/y)
Carbon Dioxide	1,100,000	30	330,000	£16,500,000
Particles	100	30	31	£1,930,000
Nitrogen Oxides	2,800	30	840	£705,000
Combined Value =>				£19,100,000

Scenario B - Low Emission Planning and Development Control

Pollutant	Estimated Total Emissions from Developmet (t/y)	Reduction (%)	Reduction (t)	Damage Costs Avoided (/y)
Carbon Dioxide	740,000	40	296,000	£14,800,000
Particles	33	40	13	£818,000
Nitrogen Oxides	800	40	320	£268,000
Combined Value =>				£15,900,000

Scenario C - Area-Wide Transport Emissions Management

Pollutant	Estimated Total Emissions all road transport (t/y)	Reduction (%)	Reduction (t)	Damage Costs Avoided (/y)
Carbon Dioxide	100,000,000	20	20,000,000	£1,000,000,000
Particles	21,000	20	4,200	£260,000,000
Nitrogen Oxides	400,000	20	80,000	£68,000,000
Combined Value =>				£1,300,000,000

Table 2: Summary of emission benefits for study scenarios (England and Wales)

Reference data for comparison (see paragraphs 40-45 and 46-54 for notes on results and method respectively)

[1] Equivalent damage costs for estimated total road transport emissions: carbon dioxide (£5.0Bn/y), Particles (£1.3Bn/y), Nitrogen dioxide (£0.34Bn/y)

[2] Equivalent estimated emissions for England and Wales emission from all sources: carbon dioxide (470,000,000 t/y), Particles (120,000 t/y), Nitrogen dioxide (1,200,000t/y), with equivalent Damage Costs of carbon dioxide (£24Bn/y), Particles (£7.4Bn/y), Nitrogen dioxide (£1Bn/y)

[3] Damage costs applied: CO2 (£50/t), PM (£62,000/t), NOx (£840/t),

[4] Please note: 'estimated totals' are approximate and are derived from datasets reflecting position 2008-2010 (see Appendix 2 for further method details)

Method Notes

46. **The results presented in this report are derived from a developmental method, which includes a number of crude approximations. Pending further testing and refinement they should be treated as illustrative rather than definitive. The results for the development control scenario in particular are subject to high uncertainty and may conceivably be heavily conservative in the potential emission savings and benefits they predict (see Appendix 2 for further information on method applied).**
 47. The method is designed as a simple application for exploring and comparing potential emission benefits arising from different policies and interventions. It is flexible and each step of the analysis can be easily adjusted to incorporate improved evidence and data as and when it becomes available.
 48. The method estimates absolute emission reductions beyond national trends (i.e. the 'additional reductions' as a result of local intervention). This 'additionality' requirement is important both to help simplify the analysis and also, in practice, to enhance local accountability and transparency. Emission reductions are reported as absolute values in tonnes and also as percentages of the scenario baseline.
 49. Reductions are estimated by combining complementary emission reduction mechanisms and assigning impact factors to each. Assigned factors are based on summary review of known quantified studies. There is more quantitative data available for fuel or CO₂ savings than for air quality pollutants. It has therefore been necessary to extrapolate PM and NO_x savings from those for fuel and CO₂. There is no simple relationship between the two, however in the context of the approximate nature of this study, it is considered to be a reasonable (and in some cases conservative) assumption to assume that a linear relationship exists. Table 3 lays out the structure of emission reduction strategies for each scenario, and the impact factors assigned to each.
 50. Absolute emission reductions are also translated into 'damage costs avoided' – reflecting the environmental and health impacts of emissions. The values applied are consistent with DECC and Defra guidelines.¹³ None the less, damage costing is a controversial topic and care is needed in interpreting the figures.⁵ In particular, it should be emphasised that they include social benefits, so do not represent potential financial savings either to the council or to the local area.
 51. The analysis does not impose a specific timescale for achieving the indicated reductions. They will begin to accrue as soon as action is taken. An ambitious yet realistic timescale for achieving the scenario reductions is proposed as 2015.
 52. The analysis focuses on the 'benefits case for action.' Potential barriers associated for example with implementation costs and public acceptability of interventions are considered indirectly by drawing on case studies to determine what action is realistic and what level of benefits are achievable. None the less, further work to understand potential barriers, especially with regards costs would be informative.
 53. Sources and Acknowledgments: emission baselines are derived from national emission datasets, with additional fleet composition and activity estimates provided by RPS¹¹ and TTR¹². Method development, baseline definition, scenario definition and scenario analysis were completed by Green Sphere, in some places utilising the LES Partnership's proto-type Low Emission Toolkit.¹⁴ Impact estimates are based upon an examination of known cases studies, completed by Green Sphere drawing on LES Partnership reports, projects and network contacts, supplemented with additional case study information provided by TTR.¹²
 54. Appendix 2 provides full report tables and a more detailed description of the scenario approach, including method, key assumptions and data sources.
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Scenario A: Management of Local Authority Own Fleet Transport Emissions						
Intervention Categories				Distance	Tail-pipe	Total
A	Fleet Reduction	A1	Fleet Policy Review	5%	-	-
B	Efficient Operations	B1	Fleet Performance Management	5%	5%	10%
		B2	Driver Skills Development	-	5%	5%
C	Improved Technology	C1	Vehicle Modification & Maintenance	-	5%	5%
		C2	Fleet Vehicle Replacement	-	5%	5%
Overall Impact				10%	20%	30% all vehicles

Scenario B: Low Emission Planning Policies - Low Emission Developments						
Intervention Categories				Distance	Tail-pipe	Total
A	Reduce car travel	A1	Reduce/Shift personal car trips	10%	-	10%
B	Reduce car residual emissions	B1	Improve individual driving behaviour	-	5%	5%
		B2	Improve car technology	-	5%	5%
C	Reduce bus emissions	C1	Improve fleet management/operations	5%	5%	10%
		C2	Improve bus technology	-	10%	10%
D	Financial Contributions	A1	Contribution to strategic invest. fund	-	-	20%
Overall Impact				10% car, 5% bus	10% car, 15% bus	40% car, 40% bus

Scenario C: Area wide Emissions Management						
Intervention Categories				Distance	Tail-pipe	Total
A	Reduce car travel	A1	Reduce/Shift personal car trips	10%	-	10%
B	Reduce car residual emissions	B1	Improve individual driving behaviour	-	5%	5%
		B2	Improve car technology	-	5%	5
C	Reduce bus emissions	C1	Improve fleet management/operations	5%	5%	10%
		C2	Improve bus technology	-	10%	10
D	Reduce goods and service mileage	D1	Goods & Service Fleet Reduction	5%	-	5%
E	Improve efficiency of goods & serv. fleet	E1	Efficient fleet operations & drivers	5%	5%	10%
		E2	Maintenance & improved technology	-	5%	5
F	Off-set & mitigation by polluters	F1	Contribution to strategic invest fund (considered beyond current scope)	-	-	-
Overall Impact				10% cars, vans, trucks, 5% buses	10% cars, vans, trucks, 15% buses	20% all vehicles

Table 3: Structure of emission reduction mechanisms for each scenario, with applied impact factors
See paragraphs 46-54 for method notes, also Appendix 2 for further information and sources.
(Column Key: Distance = Reduction in distance travelled, Tailpipe - Reduction in tail pipe emissions, Total = Combined)

Please note: impact factors are applied to the scenario baseline, not the total emission for the area. (See paragraph 42 for the implications of this for the 'council vehicles' and 'planning' scenarios)

6. Further Information

55. Further information is provided as follows:

Appendix 1: List of low emission case examples, with summary impact data where known

Appendix 2: Report tables, with scenario descriptions, method outline and notes on data quality

See Also: Report¹⁰ by Environment Protection UK, which provides advice to local authorities on integrating air quality and climate change policy at local level.

56. The **Low Emission Strategies Partnership** has also produced other tools and resources, freely available to councils including: Low Emission Planning Guidance, Low Emission Toolkit,¹⁴ Low Emission Procurement Guidance. For information visit: www.lowemissionstrategies.org.uk

57. **Local Government Group has produced various resources to support councils' air quality work.** For information visit: www.local.gov.uk

58. This publication was produced by Rob Pilling, Green Sphere Ltd on behalf of the Low Emission Strategies Partnership and the Local Government Group.

7. References

Policy Reports (presented in chronological order highlighting their linked evolution).

- [1] The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Her Majesty's Government, July 2007)
- [2] Low Emissions Strategies: using the planning system to reduce transport emissions (Joint publication: Defra and the LES Partnership, January 2010)
- [3] Review of Local Air Quality Management: a report to Defra and the devolved administrations (ihpc, January 2010)
- [4] Air Pollution: Action in a Changing Climate (The Department for Food and Rural Affairs, March 2010)
- [5] Air Quality - 5th report of session 2009/10 (House of Commons Environmental Audit Committee, March 2010)
- [6] A clean bill of health: How Council's environmental protection work improves well being (LACORS (now LG Regulation), April 2010)
- [7] Discussion paper - Response to the Review of Local Air Quality Management (The Low Emission Strategies Partnership, September 2010)
- [8] Low Emission Strategies: Supplementary Planning Document Guidance (The Low Emission Strategies Partnership, January 2011)
- [9] Government response to the Environmental Audit Committee Report on Air Quality in the UK (Her Majesty's Government, Nov 2010)
- [10] Air Quality and Climate Change: Integrating Policy within Local Authorities (Environment Protection UK, March 2011)

Technical Reports (* indicates reports prepared for the LES Partnership to support impact analysis)

- [11] LES toolkit: Planning Measures, National Case*
(RPS, Oct 2010)
- [12] Local Authority Fleets: Composition, Activity and Interventions*
(TTR, Jan 2011)
- [13] Economic Principles for the Assessment of Local Measures to Improve Air Quality
(LAQM Practice Guidance: The Department for Food and Rural Affairs, February 2009)
- [14] The Low Emissions Toolkit: The LES Partnership has developed a toolkit to support emission based analysis for Transport interventions (www.lowemissionstrategies.org/les_toolkit)

Websites of Sponsoring Organisations

- [15] The Local Government Group (www.local.gov.uk)
- [16] The Low Emission Strategies Partnership (www.lowemissionsstrategies.org)