

A Collaborative Approach to Improving Air Quality

“I Feel a Change Coming On”

Eleanor Pratt, Scottish Environment Protection Agency
 Drew Hill, Transport Scotland

1 Introduction

1.1 The Purpose of This Paper

This paper examines the recent 3 year journey in building a collaborative cross professional, cross organisational, cross political community to help shape, form and deliver a new Low Emission Strategy (LES) for Scotland, with the common aim of ensuring Scotland’s air quality is amongst the best in Europe.

The main purpose of this paper is as follows.

- Outline the current air quality challenge in Scotland.
- Explain why a cross cutting multi-organisational approach has the potential to deliver a more effective solution.
- Describe the journey to date on developing such an approach in Scotland.
- Present conclusions on the new approach and suggested next steps.

1.2 Scotland’s Air Quality

Great strides have been made over recent decades in tackling air pollution in Scotland, by successfully reducing the polluting outputs from industry and the internal combustion engine. Nevertheless, despite these efforts, pockets of poorer air quality still remain in many of our towns and cities. The main pollutants of concern in Scotland are outlined in Table 1, with the majority of related emissions being caused by road transport (from cars, heavy and light goods vehicles, and buses). Transport generates around 25% of Scotland’s total PM10 and close to 50% of the total NOx emissions. These emissions are generated at the road side, and today the air pollution in our towns and cities is overwhelmingly associated with transport emissions delivered in close proximity to residents. Whilst seven in ten households in Scotland in 2013 had a car available for private use (Scottish Household Survey, 2014), the Scottish Transport Statistics datasets show that traffic vehicle kilometres travelled have largely plateaued between 2003 and 2013, whilst vehicle traffic distances for urban roads have actually fallen slightly between 2006 to 2013 (Scottish Transport Statistics, 2015).

Pollutant	Source	Effect	Key targets	Breached
Oxides of nitrogen (NOx)	Oxides of nitrogen (NOx) are produced during combustion activities in the presence of air and are a mixture of nitrogen dioxide (NO2) and nitric oxide (NO). Biggest sources are from transport activities (exhaust gases), power generation, industry and households.	NO ₂ at high concentrations can cause respiratory health impacts (such as inflammation of airways and lungs, reduced lung function, reduced resistance to respiratory infections and exacerbation of pre-existing health conditions).	200 µg m ⁻³ not to be exceeded more than 18 times a year (1 hr mean) 40 µg m ⁻³ (annual mean)	Yes at 24 locations over 12 Local Authorities

Pollutant	Source	Effect	Key targets	Breached
Particulate matter (PM10 and PM2.5)	PM is made up of a wide range of substances and comes from a variety of transport and industrial combustion sources and non-combustion sources through tyre, break and road wear.	Exposure to PM (in both the short and long-term) is associated with respiratory and cardiovascular health impacts, with special significance for susceptible members of society (such as the young, elderly and those with pre-existing health conditions). There is currently no safe exposure to PM.	35 µg m ⁻³ , not to be exceeded more than 7 times a year (24 hr mean) 18 µg m ⁻³ (annual mean)	Yes at 22 locations over 11 Local Authorities
Sulphur dioxide (SO ₂)	SO ₂ emissions arise mostly from power generation, the combustion of sulphur-containing fuels (such as oil and coal) and from industry (e.g. petroleum refineries).	Respiratory health impacts such as constriction and irritation of the airways and exacerbation of pre-existing health conditions such as asthma	350 µg m ⁻³ , not to be exceeded more than 24 times a year (1-hour mean) 125 µg m ⁻³ , not to be exceeded more than 3 times a year (24-hour mean) 266 µg m ⁻³ , not to be exceeded more than 35 times a year (15 minute mean)	Yes At 1 location in 1 Local Authority
Non-methane volatile organic compounds (NMVOCs)	Use of solvents in industry, road vehicles, household heating and power generation	NMVOCs are a key component in the formation of O ₃ .	Benzene 3.25 µg m ⁻³ (running annual mean) 1,3-Butadiene 2.25 µg m ⁻³ (running annual mean)	No
Ground-level ozone (O ₃)	Secondary pollutant produced by chemical reactions in the atmosphere between NO _x , NMVOCs and sunlight (O ₃ is not released as a primary pollutant from human activities).	At high concentrations can cause respiratory health impacts, such as inflammation/irritation of airways, reduced lung function and exacerbation of pre-existing health conditions and irritation of the eyes	100 µg m ⁻³ not to be exceeded more than 10 times a year	No

Table 1 – Main pollutants

1.3 Air Quality Legislation and Policy

Legislation and Policies aiming to further minimise and track the impact of air pollution on health and the environment have been introduced in Europe, the UK and Scotland are outlined in Table 2.

Europe	UK	Scotland
Directive 2001/81/EC on National Emissions Ceilings	Environment Act 1995	Air Quality (Scotland) Regulations 2000
Directive 2004/107/EC relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air	Clean Air Act 1993	Air Quality (Scotland) Amendment Regulations 2002
Directive 2008/50/EC on ambient air quality and cleaner air for Europe	The revised air quality strategy (AQS) for England, Scotland, Wales and Northern Ireland 2007 Volume I & Volume II , UK Government and the devolved administrations 2007	Air Quality Standards (Scotland) Regulations 2010
Directive 2010/75/EC on industrial emissions	Local Air Quality Management Technical Guidance TG(S)09 , UK Government and devolved administrations 2009	The Road Traffic (Vehicle Emissions) (Fixed Penalty) (Scotland) Regulations 2003
	PM2.5 concentrations, sources, and regulatory impacts of new policy framework , Sniffer 2011	Pollution Prevention and Control (Scotland) Regulations 2012
		Local Air Quality Management Policy Guidance PG(S)09 , Scottish Government 2009

Table 2 - Europe, the UK and Scotland legislation and policy related to air quality

Under the auspices of Part IV of the Environment Act (1995), the Air Quality (Scotland) Regulations (2000) and the Air Quality (Scotland) (Amendment) Regulations (2002), the Local Air Quality Management (LAQM) assessment process in Scotland requires local authorities to review and assess air quality within their geographical areas, to identify any exceedances of the Scottish Air Quality Strategy Objectives. Where limits are breached, local authorities must declare an Air Quality Management Area (AQMA), and implement an AQMA plan with stakeholders to improve air quality within the area.

1.4 Scotland's Air Quality Management Areas

There are currently 33 AQMAs in Scotland covering 14 local authorities. These 33 Local Authorities represent around 66% of the population of Scotland (including voters and tax payers), however, the size of, and the population affected by, the individual AQMA within these Local Authority areas is significantly smaller and varies in size, from the Paisley town-centre wide AQMA in Renfrewshire (Figure 1), to the specific street designation AQMA in East Dunbartonshire (Figure 2). Table 3 does not include the area, and population of the individual AQMAs, and for most AQMA (as can be seen from Figure 1 and Figure 2) this will be only a small part of the total Local Authority area of 66% .

Local authority	Total AQMA	Declared AQMA Name	Main Location	Exceedance pollutant
Glasgow City Council	3	Glasgow City Centre Parkhead Cross Byres Road/Dunbarton Road	- - -	NO2 and PM NO2 NO2
Dundee City Council	1	Dundee		NO2 and PM
City of Edinburgh Council	5	Edinburgh No 1 Edinburgh No 2 Glasgow Road Great Junction Street Inverleith Road	City Centre St Johns Road - - -	NO2 NO2 NO2 NO2 NO2
Aberdeen City Council	3	Aberdeen City Centre Anderson Drive Wellington Road	- - -	NO2 and PM NO2 and PM NO2 and PM
North Lanarkshire Council	5	Coatbridge Chapelhall Motherwell Moodiesburn Croy	- - - - -	PM PM PM PM PM
Renfrewshire Council	1	Paisley Town Centre	-	NO2 and PM
East Dunbartonshire Council	2	Kirkintilloch Road, Bishopbriggs A809	- -	NO2 and PM NO2 and PM
Falkirk Council	5	Grangemouth Falkirk Centre Haggs Banknock Falkirk	- - - - -	SO2 NO2 and PM NO2 PM NO2 and PM
West Lothian Council	1	West Lothian	Broxburn	NO2 and PM
Fife Council	2	Bonnygate, Cupar Appin Crescent, Dunfermline	- -	NO2 and PM PM
South Lanarkshire Council	1	Whirlies Roundabout	-	PM
East Lothian Council	1	High Street, Musselburgh	-	NO2
Perth and Kinross Council	2	Perth main built up area Perth No 2	- Crieff, High Street	NO2 and PM NO2 and PM
Highland Council	1	Inverness City Centre	-	NO2
Combined total	33	-		-

Table 3 – Local Authority AQMAs

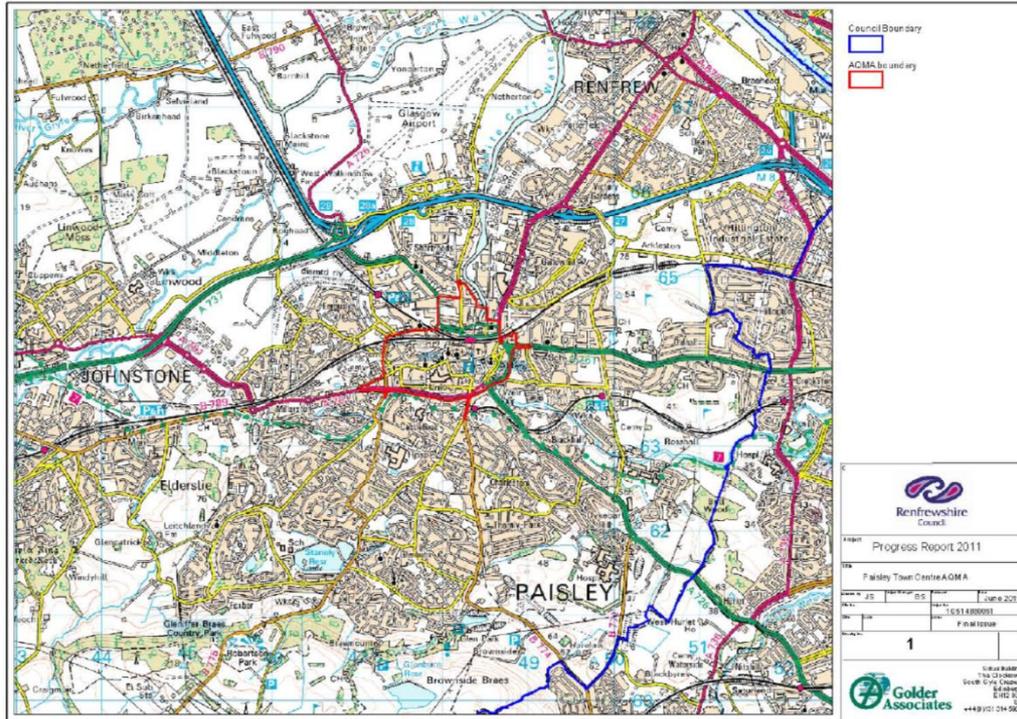


Figure 1 – Map of typical town-centre wide AQMA in Renfrewshire; AQMA is designated by the red boundary area (Golder Associates, 2011).

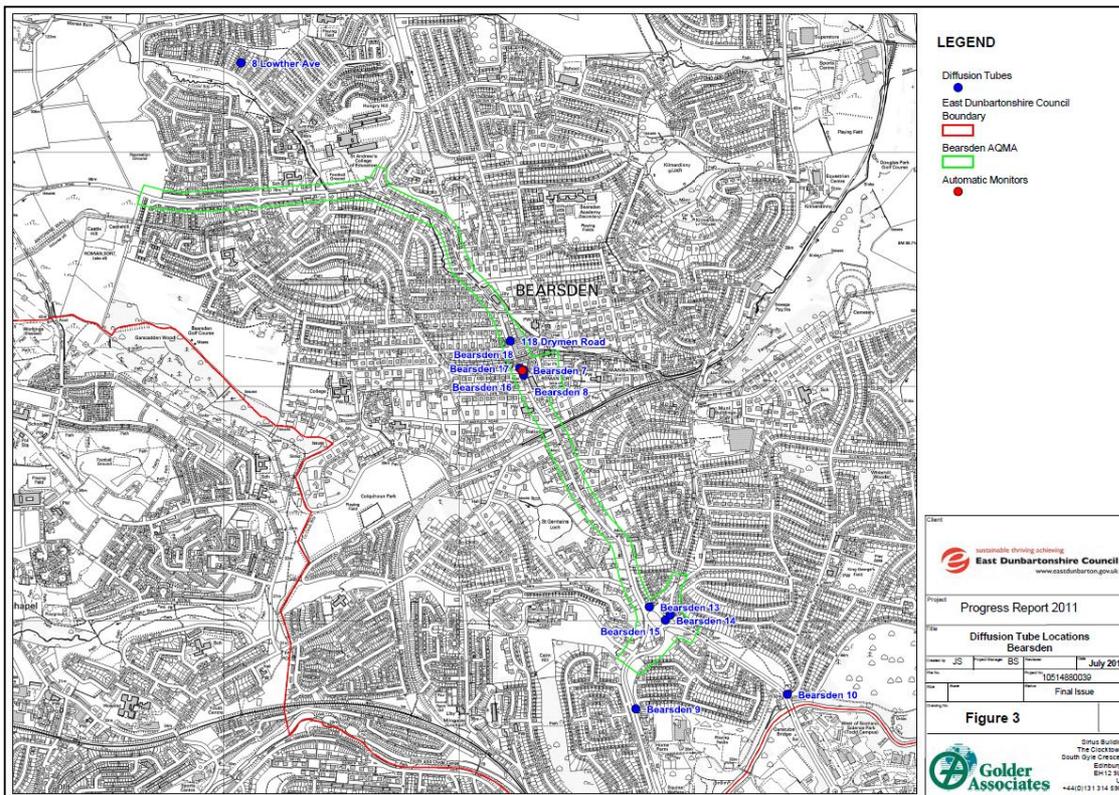


Figure 2 – Map of typical street corridor AQMA in East Dunbartonshire; AQMA is designated by the green boundary area (Prescott, 2011).

1.5 Air Quality and Health

The 2014 publication by the UK Government Environment Audit Committee (Walley et al., 2014) draws attention to the health statistic estimate promoted by the 'Committee on the Medical Effects of Air Pollutants' that approximately 29,000 deaths per year in the UK could be attributable to man-made particulate matter pollution, equivalent to a loss of 340,000 life-years (Public Health England, 2014) and suggests 5.3% of deaths in the UK in 2010 were attributable to long-term exposure to pollution. Details are shown in Figure 3.

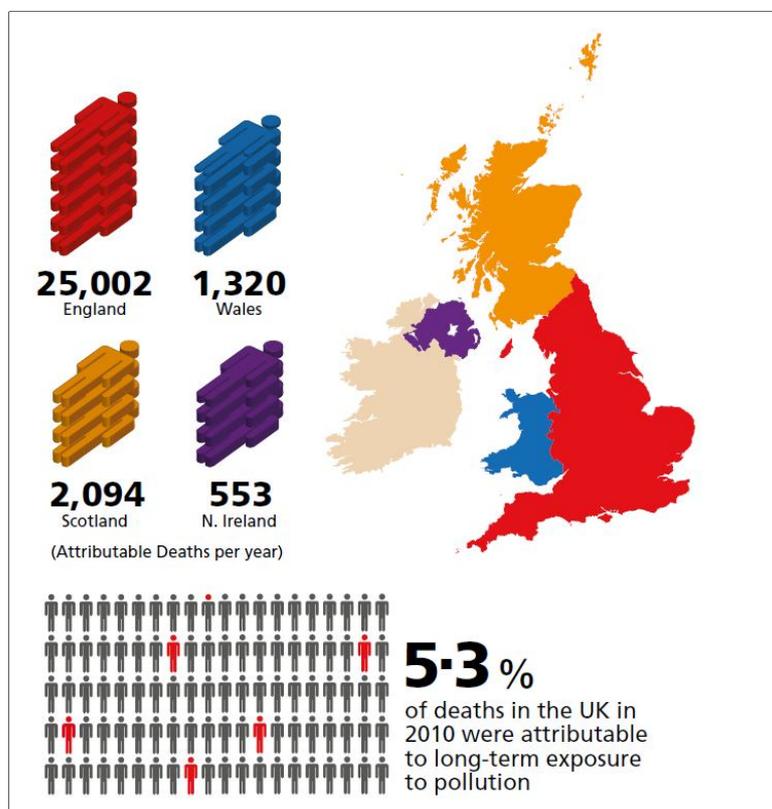


Figure 3 – Deaths attributable to air pollution, 2010 (Walley et al, 2010)

What is also clear is that the most vulnerable members of society – the elderly, the very young, and those with cardiovascular and respiratory conditions – bear the largest burden. There is also evidence (Walker et al, 2003) the relationship between poor air quality and deprivation is particularly strong for peak pollutant values, including exceedances of standards.

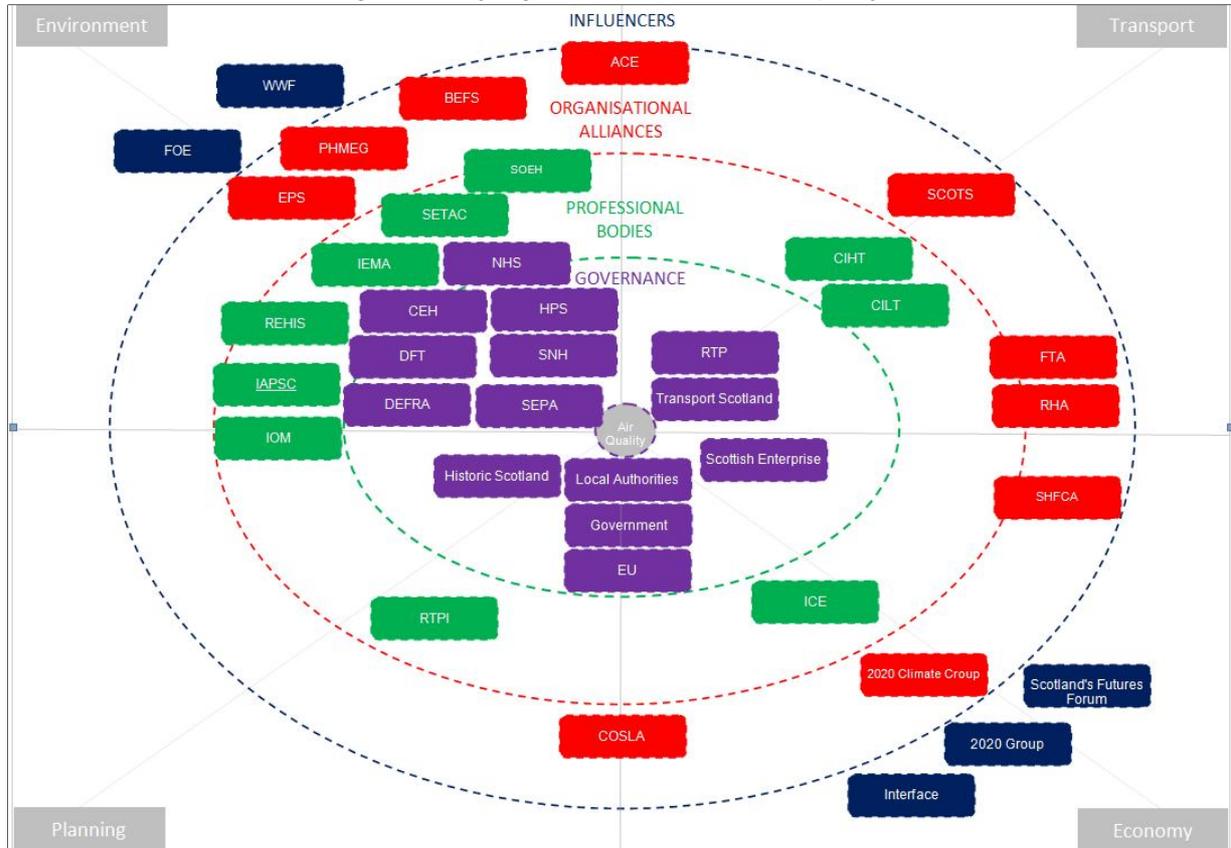
1.6 The Stakeholders and Collaborative Groups

A range of professions can, and do, offer analysis and commentary on air quality along with its impacts, management, and delivery of solutions. A profession is 'a vocation founded upon specialised educational training, the purpose of which is to supply objective counsel and service to others, for a direct and definite compensation, wholly apart from expectation of other business gain' (Wikipedia, 2015).

A mix of some of the various professions, public bodies and non-governmental organisations with an interest in Scottish air quality are outlined in Figure 4, and are organised across the four quadrants of environment, transport, planning, or economy. Each organisation has a role to play in terms of governance, professional support, organisational alliance, or influencing, but the authors have found that the disparate list of organisations that operate in Scotland may not have been aware of, or interacted with, each other in a collaborative manner. Following the 'tragedy of the commons' economic theory of Garrett Hardin (Hardin, 1968), independent and rational thinking drives self-interest, which leads to individuals behaving in a manner

which is contrary to the best interests of the whole group by depleting some common resource. This paper explores how the common resource of air quality can be improved through stakeholder collaboration.

Figure 4 – Key organisations involved in air quality



Org	Title	Org	Title	Org	Title
ACE	Association of Consulting Engineers	EU	European Union	REHIS	Royal Environmental Health Institute of Scotland
BEFS	Built Environment Forum Scotland	FOE	Friends of the Earth	RHA	Road Haulage Association
CEH	Centre for Ecology and Hydrology	FTA	Freight Transport Association	RTP	Regional Transport Partnerships
CIEH	Chartered Institute of Environmental Health	HPS	Health Protection Scotland	RTPI	Royal Town Planning Institute
CIHT	Chartered Institution of Highways and Transportation	IAPSC	Investigation of Air Pollution Standing Conference	SCOTS	Society of Chief Officers of Transportation in Scotland
CILT	Chartered Institute of Logistics and Transport	ICE	Institution of Civil Engineers	SEPA	Scottish Environment Protection Agency

Org	Title	Org	Title	Org	Title
COSLA	Convention of Scottish Local Authorities	IOM	The Institute of Occupational Medicine	SETAC	Society of Environmental Toxicology and Chemistry
DEFRA	Department for Environment Food and Rural Affairs	IEMA	Institute of Environmental Management and Assessment	SHFCA	Scottish Hydrogen and Fuel Cell Association
DFT	Department for Transport	NHS	National health Service	SNH	Scottish Natural Heritage
EPS	Environmental Protection Scotland	PHMEG	The 5 Nations Public Health Medicine Environmental Health Group	SOEH	Society for Occupational and Environmental Health
				WWF	World Wildlife Fund

2 The Challenge and Opportunities

2.1 Previous Approach and Challenge

Historically, Local Authorities have engaged with the Scottish Government and SEPA through the LAQM process (as noted in 1.3 above) to manage improvements in air quality. Following the steady implementation of the air quality management plans in Scotland, over the 2000s, significant but gradual improvements have been achieved. More recently, in the 2010s, limitations on air quality improvements have been noted, and progress has slowed. These limitations are associated with a number of reasons, including the following.

- Emissions reduction technology has improved individual vehicle emissions, but these benefits have not been fully realised due to the slow pace of fleet renewal.
- From the 1990s to the present the proportion of diesel vehicles to petrol vehicles in the fleet has increased, providing benefit for climate change in reduced CO₂ emissions, but has introduced problems for air quality with increased NO_x and particulate emissions.
- Progressively tougher engine emissions standards not delivering the full predicted benefits in real world drive cycles, especially for diesel vehicles.
- Persistence of older buses in many cities and towns, and limited progress in integrating air quality across other policy areas.
- For urban mobility car use is increasing, the encouragement of increased walking and cycling is not proving effective, and public perception of air quality as an issue is low.
- Complex, and 'non joined up' legal framework with limited integration across professions and organisations, together with the presentational challenge associated with large scale measures.

In addition the LAQM process, while effective in managing effective change, has not been effective in reducing the number of AQMAs in Scotland. Although some have been removed through improvements, others have been added due to expansion of the monitoring network.

For the above reasons, the current LAQM approach, in isolation, will struggle to yield the improvements in air quality the nation, and legislation, require. A more collaborative approach across the selection of stakeholders outlined in Figure 4 could provide a richer, more joined up and effective, resource. During 2012, the Scottish Government, who are ultimately responsible for air quality policy delivery in Scotland, recognised this opportunity and the need to develop a process to ensure the key stakeholders work together to make improvements in air quality.

2.2 A "Harms" Based Approach"

Professor Malcolm Sparrow's approach in "The Character of Harms: Operational Challenges in Control" has attracted the attention of public servants world-wide, with a focus on actions to address crime, poverty, pollution, fraud and many other public problems, such as air quality. Professor Sparrow believes that governmental issues, like air quality management, are traditionally managed by setting up processes (like LAQM), and the more defined and shaped these processes are, then the easier it is to demonstrate the "apparent" successful delivery. However he believes the processes themselves tend to generate work to fill them, and he argues that organisations should instead organise around concentrations of "harms", that is, the "problems" or "knots" when seeking to deliver the key objectives, and to deal with these "harms", rather than relying solely on existing, perhaps silo based, processes to manage the problem.

This new approach focusses on problems, rather than processes, and challenges the traditional paradigm. A "harms" based approach also resonates with the concept of adaptive leadership, where the "leadership of the many by the many", is preferred to the "leadership of the many by the few", and where individuals are empowered to become part of the solution, working within a clearly defined strategy and framework.

In such an approach, Professor Sparrow points out the importance of charting the "textured landscape" below the level of generalities and broad definitions, and getting to a clearer understanding of how groups can work together. In effect he looks at the detail of "applied policy" and he emphasises the need for a clear

understanding of how organisations and processes actually work, and where the silos exist and blockages lie. Arguing this is important to improving the outcome. At the heart of the “Harms” based approach is problem solving. In this he advises the user to “pick important problems, get people to work hard together to fix them, and then tell lots of people of the effective outcomes”. He accepts that there are always practical problems of implementation and culture change to be overcome in moving to this approach.

Some key elements of a “Harms” based approach applied to air quality management are as follows.

- Finding new metrics to demonstrate success and building new relationships and methods to tell the compelling series of short stories to underpin success.
- Identifying the “barriers” to achieving the 5 and 10 year goals and evaluating the catalysts for success.
- Classifying and organising the complex array of the harm-reduction challenges.
- Reconciling the various paradigms operating within the machinery of government i.e. health, social care, education, social justice, to manage a more collaborative approach.

This “Harms” based approach underpins the new direction for air quality management described later in this paper and the current approach of working together to provide a Low Emission Strategy for Scotland.

The “Harms” based approach aligns well with the interview evidence (from around 40 stakeholders, from European cities, companies, networks, support organisations and NGOs), for the TRANSFORM Innovation Procurement workshop on 3 December 2013. The evidence considered the following points on how to accelerate progress towards sustainable, zero carbon transport systems.

- What is going wrong.
- What can different stakeholders do.
- The potential for collaboration.
- Examples of good practice and scope.

The synthesis of evidence concluded by noting a new transformative approach (Figure 6) similar to a “Harms” based approach bringing elements of the supply chain behind ambitious goals could make a real difference, as opposed to collaborations around near term objectives that would probably happen anyway. A new Transformational approach described in Figure 5 was suggested.

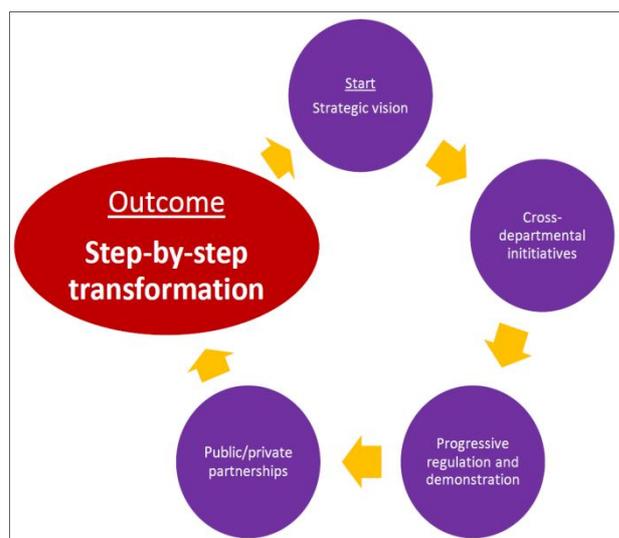


Figure 5 – Suggested transformational approach

3 Applying a “Harms” Based Approach to Air Quality Management

3.1 Creating STEP and the SUAQ steering group

In early 2012, the Scottish Government and its agencies, including Transport Scotland and the Scottish Environment Protection Agency (SEPA), held several joint lunchtime seminars on air quality. The seminars were intended to be one-off meetings, to provide a continuous professional development opportunity for staff. However, discussion quickly turned to the “Harms” based approach which was of particular interest to SEPA and the wider Scottish Government at that time. A follow up workshop with key stakeholders was arranged later in the year to discuss the key topics of Transport, Planning, Behaviour, Cross Cutting Issues, Ideas, and Objectives associated with collaboration on air quality policy and actions on this. The outputs from this workshop were used to shape partnership-building meetings with a range of the organisations shown in Figure 3, and thereafter to develop a terms of reference and series of forward actions for a communication group called the Scottish Transport Emissions Partnership (STEP, initiated in early 2013). At the same time, while STEP was developing and maturing, a joint-enterprise called the Scottish Urban Air Quality steering group (SUAQ steering group, initiated in late 2013) was created to provide strategic direction. The members of both groups are outlined in Table 4.

Organisations	Sector	STEP	SUAQ
2020 Scotland’s Climate Group	Business	•	
Environmental Protection Scotland	Environment	•	
Scottish Environment Protection Agency	Environment	•	•
Central and East Scotland Pollution Liaison Group	Government	•	
Glasgow City Council	Government		•
Scottish Government	Government	•	•
South East Pollution Liaison Group	Government	•	
South West Pollution Liaison Group	Government	•	
North Pollution Liaison Group	Government	•	
Regional Transport Partnerships	Government	•	
Transport Scotland	Government	•	•
Health Protection Scotland	Health		•
NHS Scotland	Health	•	•
Royal Town Planning Institute in Scotland	Planning	•	•
Confederation for Passenger Transport	Transport	•	
Road Haulage Association	Transport	•	
Society of Chief Officers of Transportation in Scotland	Transport	•	

Table 4 – Key organisations involved in air quality

Both STEP and the SUAQ steering group were designed to evolve in time to suit the requirements of the membership, and their current key objectives are shown in Table 5.

Organisation	Key Objective
STEP	To improve Scotland's urban air quality, through a combination of collaborative partnership working and close working relationships with key stakeholders and other interested parties' to provide technical support and assistance to organisations that are working to improve poor air quality caused by emissions from road transport.
SUAQ steering group	To provide support to the Scottish Government in the delivery of the Low Emission Strategy (LES) for Scotland, as well as to organisations involved in work to improve urban air quality in Scotland.'

Table 5 – Current key objectives of the SUAQ steering group and STEP

3.1 STEP and the SUAQ steering group collaborative approach

As accepted by Sparrow in section 2.2, there are practical problems of implementation and culture change to be overcome in moving to a new approach, and behaviours, attitudes and habits can be extremely deep rooted and difficult to change. With this in mind, it was not unexpected in setting up STEP and SUAQ that working together across professions to improve air quality could be challenging, if not managed carefully and inclusively. Developing a shared understanding of the skills and drivers of the various professions, and the joint development of a comprehensive package of measures, and collaborative opportunities across the transport, environment, planning and health sectors was the keystone of the STEP SUAQ approach to working collaboratively in this area. In this way a definition of the "Harms" and a working together to challenge and solve these was taken. The encouragement of an adaptive leadership approach, with the "leadership of the many by the many", working within a strategy, vision, and shared support structure was very important to progress of STEP and SUAQ. A key approach of both STEP and SUAQ was to encourage a Chatham House rules approach to meetings, with no implied criticism and the ability to share openly and honestly across all member organisations.

This collaborative approach was underpinned by the recruitment of a STEP and SUAQ policy officer, jointly funded by SEPA and Transport Scotland and with the role split across both organisations. The commitment to this shared resource helped develop joint organisational commitment to STEP and SUAQ, and a more open and transparent approach to the "Harms" based approach would not have been possible; or at best, without resource, the approach would have remained theoretical with little momentum.

This joint approach across the partners in the "Harms" based approach has been supported by SEPA who, over the last 3 years have embraced a strategic thinking role, in addition to the traditional legislation enforcement role. This is supported by the note in their website, SEPA (2015) which notes "we work in partnership with other agencies, organisations and policy makers, to increase environmental understanding and build consensus on environmental priorities and issues".

3.1 STEP work to date

STEP's core activities consist of quarterly meetings of core members, with an annual conference in November. The Minister for Transport and Veterans provided the keynote speech at the STEP 2014 conference, which indicates the level of support created in a relatively short space of time. Table 6 provides a summary of the main STEP activities to date, together with key "Harm" outputs (all available via the STEP website www.stepscotland.com), however STEP has also supported a number of collaborative work streams, including development of an air quality training package for land use and transport planning professionals in conjunction with the Royal Town Planning Institute and local authorities, and advertising the ECO Stars fleet management scheme.

Date and Progress		Key "Harm" outputs
2012	Early 2012 Lunchtime Seminars	<ul style="list-style-type: none"> Built shared air quality agendas between Scottish Government, Transport Scotland and SEPA. Identified need to engage proactively with the wide range of air quality stakeholders in Scotland. Developed terms of reference for STEP and the SUAQ steering group Recognised the need for a partnership approach to identifying and disseminating examples of best practice.
	October Workshops and inaugural meeting of STEP.	<ul style="list-style-type: none"> Key stakeholders identified and approached for participation in STEP/workshops. Strengthened links between air quality stakeholders by discussing key topics on collaboration and actions required. STEP remit and membership agreed. Agreed journey and shape of groups.
	November STEP up and running.	<ul style="list-style-type: none"> Identified further opportunities for collaboration, developed programme of activities. Recognised the need for assistance to be provided to bodies seeking funding opportunities for air quality projects.
2013	January Quarterly Meeting	<ul style="list-style-type: none"> Technical workshop to identify measures to improve local air quality in Appin Crescent, Fife Council.
	February Twitter feed established	<ul style="list-style-type: none"> Building partnerships and sharing information
	April Quarterly Meeting	<ul style="list-style-type: none"> Presentations from SESTrans and NHS. Planning for LEZ and Conference events.
	July Low Emission Zones Summit – 'NOx and the City'	<ul style="list-style-type: none"> 1-day, free event to consider the use of Low Emission Zones to improve air quality in Scotland's urban centres. This event also established appetite for a Low Emission Strategy for Scotland.
	October Quarterly Meeting	<ul style="list-style-type: none"> Knowledge-sharing presentations, conference planning.
	November STEP 1 Annual Conference	<ul style="list-style-type: none"> Range of presentations/workshops. Key focus was creation of a new Low Emission Strategy for Scotland.
2014	January Quarterly Meeting	<ul style="list-style-type: none"> Knowledge sharing presentations and updates on key projects (ECO Stars Scotland, air quality training package for planners, health study etc.)
	April Quarterly Meeting	<ul style="list-style-type: none"> Contributions to LES workshop content. Creation of STEP website. Joint-funded (SEPA/Transport Scotland) Technical Secretariat role agreed. Updates on key projects. Knowledge-sharing presentations.

Date and Progress		Key "Harm" outputs
	June Quarterly Meeting	<ul style="list-style-type: none"> Review of LES literature review and workshop outputs. Outline LES circulated for review. Planning for conference. Knowledge-sharing presentations.
	September Quarterly Meeting	<ul style="list-style-type: none"> Input to LES steering group. Update on key projects (citizen science, air quality training package for planners, air quality messages). Planning for conference. Dedicated STEP policy officer in place.
	November STEP 2 Annual Conference	<ul style="list-style-type: none"> Update on development of draft Low Emissions Strategy for Scotland provided. Range of presentations on Health, Transport, Planning, Modelling and Behaviour Change.
2015	January Quarterly Meeting	<ul style="list-style-type: none"> Input to LES working group process (managed by SUAQ SG). Draft LES published for consultation. Development of Corresponding Member role. Agreed review of Community Planning Partnership Single Outcome Agreements to establish current focus on air quality. Planning for STEP Bus Technology event and STEP Conference.
	March Quarterly Meeting	<ul style="list-style-type: none"> Input to LES working group process (managed by SUAQ SG). Knowledge-sharing presentations. Partnership with Greenfleet in place.
	May Bus Technology Event	<ul style="list-style-type: none"> Seminar aimed at Transport, Planning, Policy, Environmental Health, and Public Transport professionals to provide information on funding, technology and collaboration opportunities within the bus sector.

Table 6 – Main STEP Activities

3.2 SUAQ work to date

SUAQ core activities involve providing a strategic direction to air policy work in Scotland. In addition to regular SUAQ steering group business at monthly meetings the following Key SUAQ activities, shown in Table 7, have been held.

Date and Event		Key "Harm" outputs
2013	March Edinburgh Science Festival Event	<ul style="list-style-type: none"> Morning session with key stakeholders to share detail on air quality and health impacts. Evening session to engage directly with the public on air quality and transport.
	May Meeting with official from Bremen	<ul style="list-style-type: none"> Shared detailed views on the process of establishing an LEZ in a European City.
2014	July Lucy Sadler Low Emission Zone Website	<ul style="list-style-type: none"> Joint discussion on Low Emission Zones across Europe, their application, effectiveness, and contact details of organisations who have implemented these.

Date and Event		Key "Harm" outputs
	Transport for London presentation	<ul style="list-style-type: none"> Group discussion with TfL on their journey to date on the Low Emission Zones in London. Developed opportunities for working together and sharing of data and experience.
	December Monitoring and Modelling Workshop	<ul style="list-style-type: none"> Netherlands Officials presentation Detailed discussion of the monitoring and modelling framework developed in the Netherlands and an appraisal of how this could be developed for Scotland.
2015	April Denmark cycling discussion	<ul style="list-style-type: none"> Detailed discussion with Director of the Danish Cyclists' Federation on applied cycling policy and application to Scotland.

Table 7 – Key SUAQ Activities

Through the range of activities noted in table 6 and table 7 both STEP and the SUAQ steering group have engage a wide range of stakeholder in addressing the "Harms" involved in air quality management. This work has led to the collaborative community focussing on developing a Low Emission Strategy for Scotland.

3.3 STEP and SUAQ steering group work on the Low Emission Strategy for Scotland

Following the joint work noted in tables 6 and 7, during 2013 both STEP and SUAQ recognised the need for a Low Emission Strategy (LES) for Scotland to provide a cohesive framework within which Scottish stakeholders can work together towards a common vision of ensuring that Scotland's air quality is amongst the best in Europe. To ensure the LES reflects the collaborative "harms" approach, the SUAQ steering group, with support from STEP, has sought to ensure the LES consultation has been wide-ranging and proactive. SUAQ has sought to actively engage a broad range of stakeholders through multiple opportunities to gather feedback on the LES draft, and to prepare for the delivery of the LES 'on the ground'. Key elements of this approach are as follows.

- Creating six open and collaborative working groups on the topics of Transport, LEZ Framework, Modelling and Monitoring, Health, Planning and Sustainability, with the goal of reviewing actions identified in the draft LES, and to provide feedback on how these should be delivered.
- Encouraging inclusion in the working group process by calls at the STEP 2014 Conference, the STEP Twitter feed, and website, with promotion through key networks such as Scotland's Sustainability Network and the Society for Motor Manufacturers and Traders.
- Developing a wider approach to the 'traditional' Scottish Government consultation, with a series of telephone and semi-structured face-to-face interviews, facilitated by the environmental knowledge broker Sniffer

The above approach underpins the collaborative ethos of the "Harms" approach. The current STEP and SUAQ steering group operational relationship is defined in Figure 4.

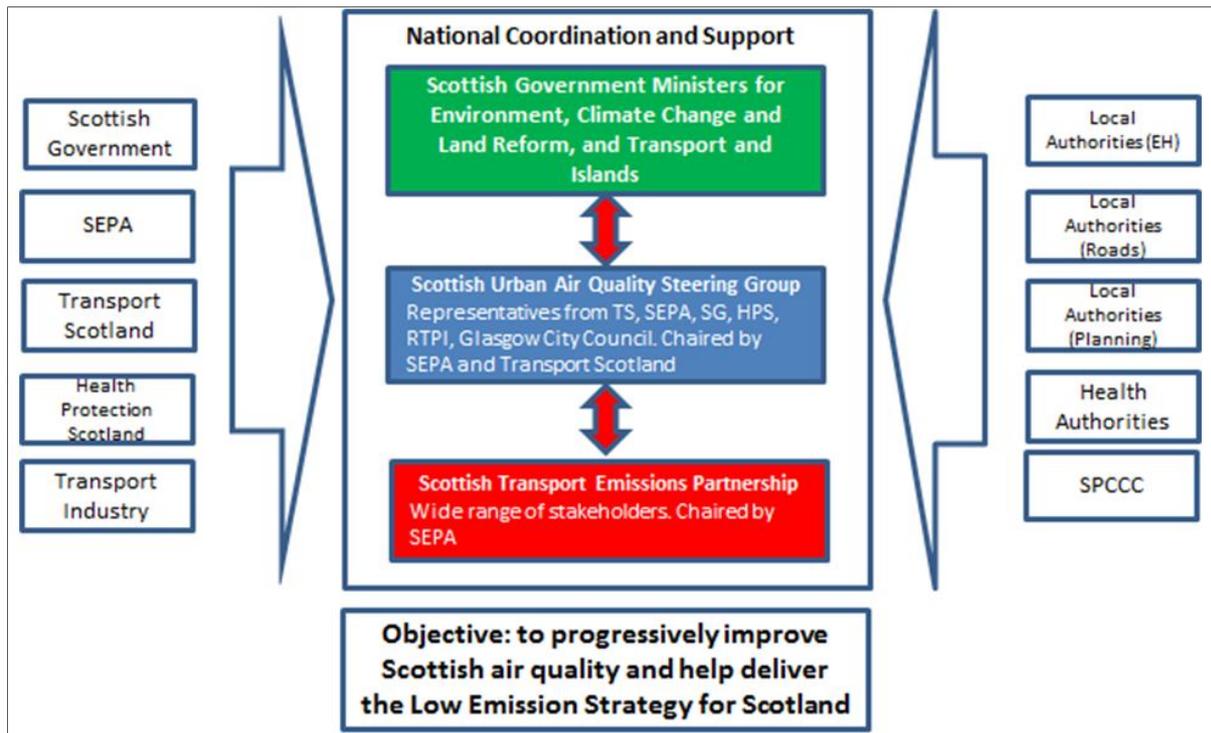


Figure 4 – STEP SUAQ steering group operational relationship

4 Conclusion

4.1 Review of Progress to Date

Progress to date addresses the challenge from recommendation 1 of the UK Environment Committee's Sixth Report of Session 2014-15, and the UK Governments response, UK Government (2015). Recommendation 1 noted the following.

“The UK Government should without any further delay introduce a national framework for Low Emission Zones, with common metrics and a national certification scheme for vehicles meeting particular air quality standards, to facilitate their widespread adoption”.

The UK Government, UK Government (2015), noted decisions on the introduction of low emissions zones are made at a local level by local authorities to suit their specific circumstances, and the Government published 'Low Emission Strategies Good Practice Guidance' to establish ways in which the planning system may be used to reduce emissions from transport, in order to improve local air quality.

From the evidence provided in section 3, the addition of a “Harms “ based approach, such as STEP and the SUAQ steering group, has added significant value and direction to a robust approach of the type noted above.

An example of this added value is the depth and quality of the responses to the Low Emission Strategy consultation, which are believed to be due, in part, to the level of engagement the SUAQ STEP collaborative community embraced.

4.2 Next Steps for Scotland

In the year ahead, the focus of the SUAQ steering group and STEP will be on supporting the Scottish Government in the finalisation and delivery of the Low Emission Strategy for Scotland for the STEP conference in November. The collaborative process described in section 3 has been key to ensuring the development of the LES reflects the fact that no one organisation can solve Scotland's air quality issues.

Delivery of the strategy will continue to focus on this approach, with particular support being provided to local authorities with Air Quality Management Areas and to providing evidence to support relevant actions and required funding.

Key aims are as follows:

- Facilitate knowledge sharing between organisations and geographical areas, in particular identifying examples of best practice globally, and sharing our own.
- Increasing the ease with which organisations and individuals can find opportunities for engagement and contribution.
- Continuously improving communications through the existing medium of website, Twitter, and other, unexplored methods such as YouTube and Soundcloud.
- Continuous engagement on the subject of poor air quality and its effects on health, the environment and the economy (both general public awareness, and targeted at influencers, and deliverers).
- Developing tools to aid collaboration and delivery of the LES (LEZ Framework, Modelling methodology, traffic data collection project, database of funding opportunities).
- Measure and capture successes more effectively in order to communicate to others.

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