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Air Quality, Regeneration & Health

IMPACT ON HEALTH IN UK & THURROCK

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Presentation Plan

- National Air quality Strategy
- Health impact of air pollution on health, with particular reference to PM
- Quantification of impact of air pollution
- Is this a priority for Thurrock?
- Opportunities to develop integrated and joined up response to lower exposure

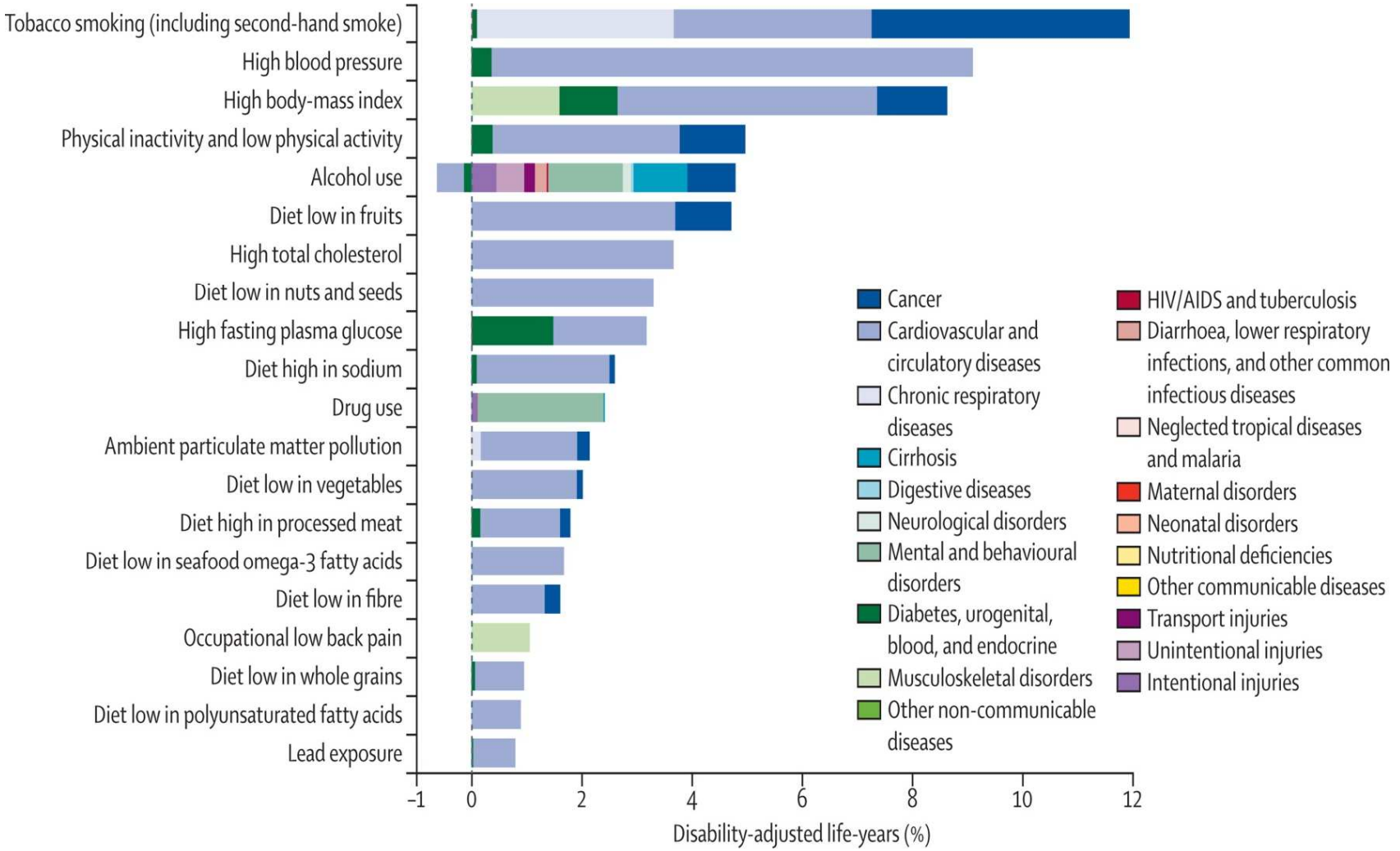
National Air Quality Strategy

- Sets national air quality standards
- Policy options to improve air quality in UK

- Regulated Pollutants
  - Benzene
  - 1,3-Butadiene
  - Ozone
  - Sulphur dioxide
  - Carbon monoxide
  - Lead
  - **Particulates (PM10 & PM2.5)**
  - **Nitrogen dioxide**

Health Impacts of air pollution

Burden of disease attributable to 20 leading risk factors for both sexes in 2010, expressed as a percentage of UK disability-adjusted life-years, *The Lancet* 2013



What is Particulate matter (PM2.5)?

- **Solid particles and droplets**
  - Composition:
  - Biological (spores, viruses, pollen)
  - Non-biological (soot, soil, salt, minerals, metals, fibres etc)

- **Classification by size fraction:**
  - PM10: <10µm in diameter (example: mineral dusts)
  - PM2.5: <2.5µm (example: car exhausts)
  - Ultrafine: <0.1µm
  - **NB. Smaller: more health damaging**

- **Main Sources**: **Fuel combustion - traffic emissions, stationary combustion and industrial processes**

PM2.5: How does it affect individuals and our communities?

- **Short term**
  - Worsening of frequency & severity of symptoms for those with respiratory disease (including asthma)
  - Increased hospital admissions for cardiopulmonary related conditions
  - Higher impact on susceptible individuals – those with existing cardiopulmonary disease, diabetes, vulnerable groups
- **Long term**
  - Premature death from cardiovascular and respiratory diseases, including lung cancer.
  - High levels in childhood may permanently impair lung function.

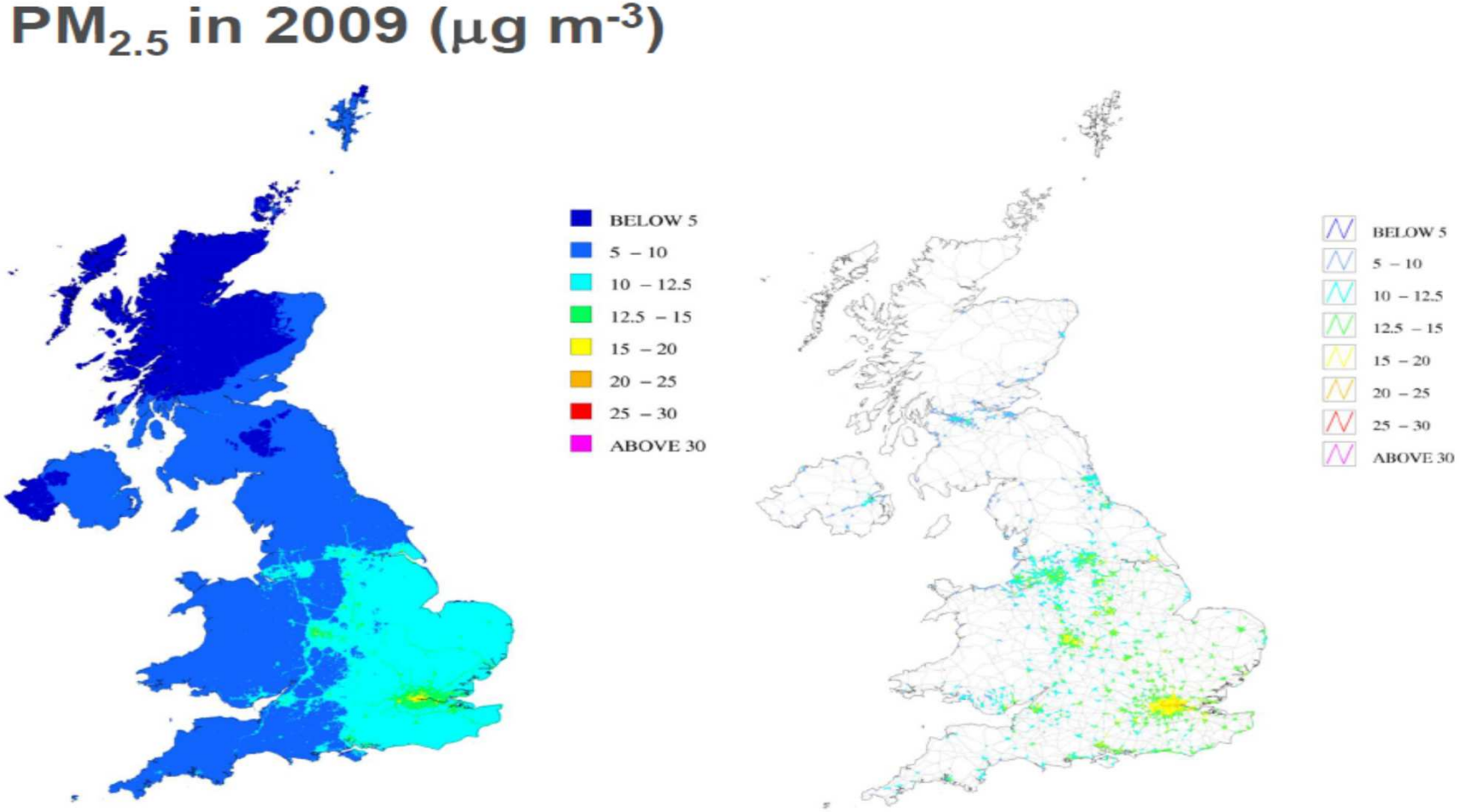
Who's affected?

Greatest burden falls on most vulnerable groups - children, older people, deprived communities.

Those who live or work near roads, car occupants.

There is no safe limit for exposure for PM2.5

PM2.5 levels over UK

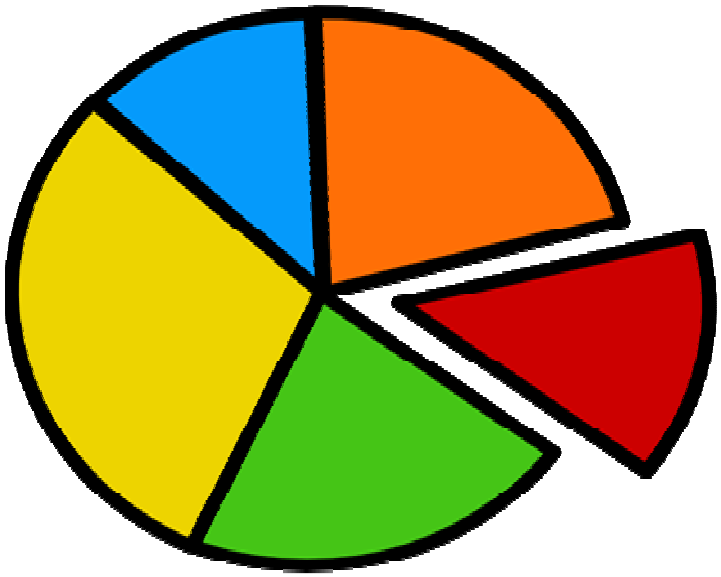


Air Pollution

Quantifying health impacts

Ways of thinking about health impacts of air pollution

- Number
- Proportion
- Years of life lost



- **Attributable fraction** - proportion of local deaths attributable to exposure
- **Attributable deaths** - number of deaths attributable to exposure
- **Years of life lost** – using numbers of attributable deaths and the age at which these occur to determine the total loss of life associated with exposure in community

Estimates UK – COMEAP (2010) & PHE Report (2014)

- **COMEAP - Burden of human–made particulate pollution in 2008**
  - An effect equivalent to 29,000 deaths
  - A loss of 340,000 years of life
  - Loss of 6 months of life expectancy from birth
- **PHE Report suggested**
  - PM2.5 contributes to 8.3% of deaths in London & 5.3% nationally (28,969 deaths/annum)
- **Impact of changing levels of pollution**
  - Estimate that long term exposure to a 10µg per m^3 increase in $PM_{2.5}$ concentrations leads to a 6% increase in 'all cause mortality', or total deaths
  - Increase in LE from birth of about 20 days (by 1µm/m3 PM2.5)

Table 2.1: Adjusted mortality relative risk [a] (with 95% CI) associated with a 10 µg/m³ increase in fine particles measuring less than 2.5 µm in diameter

Cause of mortality	1979–1983 [b]	1999–2000 [b]	Average
All-cause	1.04 (1.01–1.08)	1.06 (1.02–1.10)	1.06 (1.02–1.11)
Cardiopulmonary	1.06 (1.02–1.10)	1.08 (1.02–1.14)	1.09 (1.03–1.16)
Lung cancer	1.08 (1.01–1.16)	1.13 (1.04–1.22)	1.14 (1.04–1.23)
All other cause	1.01 (0.97–1.05)	1.01 (0.97–1.06)	1.01 (0.95–1.06)

(a) Estimated and adjusted based on the baseline random-effects Cox proportional hazards model, controlling for age, sex, race, smoking, education, marital status, body mass, alcohol consumption, occupational exposure and diet.

(b) The time periods (i.e. 1979–1983 and 1999–2000) given in the table refer to the time during which concentrations of fine particles were measured.

CI, confidence interval.

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Air Pollution Outcome Indicator

- Because of the significant impact on health, the Public Health Outcomes Framework includes an air pollution indicator, which relates to the mortality effect of man-made particulate matter expressed as the percentage mortality fraction attributable to PM2.5 for a upper tier local authority.

Public Health Outcomes Framework

Indicat

Health protection

Area type: District & UA | Areas grouped by: PHE Centre | Benchm

Area: Thurrock | PHE Centre: Anglia and Essex | Bench

Search for an area

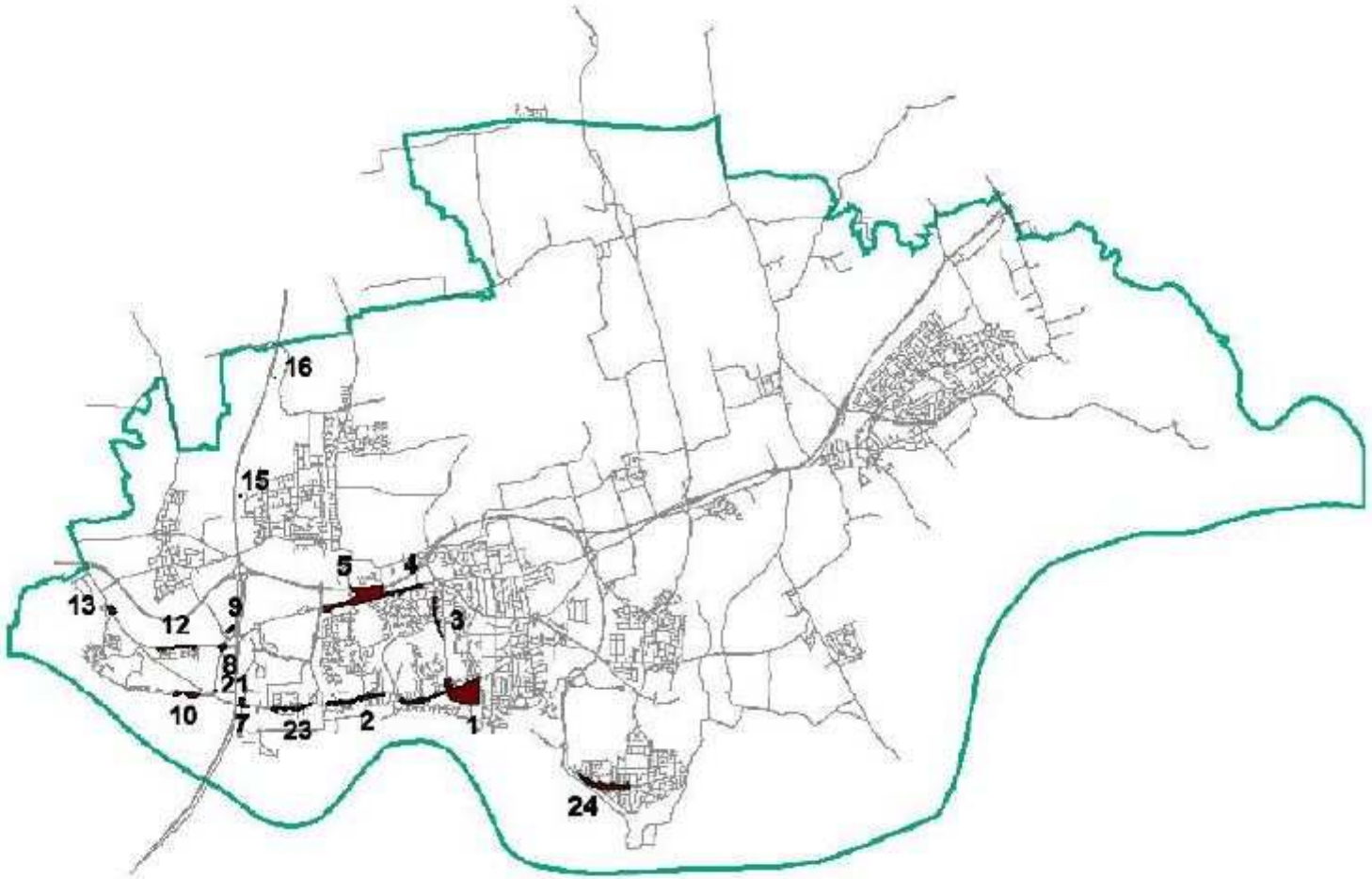
Indicator: 3.01 – Fraction of mortality attributable to particulate air pollution

Compared with benchmark: Better | Similar | Worse | Lower | Similar | Higher | Not compared

3.01 - Fraction of mortality attributable to particulate air pollution 2012

Area	Count	Value		Lower
England	-	5.1		-
Anglia and Essex	-	-		-
Babergh	-	5.2		-
Basildon	-	5.5		-
Braintree	-	5.3		-
Breckland	-	4.8		-
Brentwood	-	5.6		-
Broadland	-	4.8		-
Cambridge	-	5.4		-
Castle Point	-	5.2		-
Chelmsford	-	5.4		-
Colchester	-	5.2		-
East Cambridgeshire	-	5.1		-
Epping Forest	-	5.7		-
Fenland	-	5.2		-
Forest Heath	-	5.0		-
Great Yarmouth	-	4.7		-
Harlow	-	5.6		-
Huntingdonshire	-	5.3		-
Ipswich	-	5.2		-
King's Lynn and West Norf...	-	4.9		-
Maldon	-	5.1		-
Mid Suffolk	-	5.2		-
North Norfolk	-	4.6		-
Norwich	-	5.0		-
Peterborough	-	5.4		-
Rochford	-	5.2		-
South Cambridgeshire	-	5.3		-
South Norfolk	-	4.9		-
Southend-on-Sea	-	5.3		-
St. Edmundsbury	-	5.2		-
Suffolk Coastal	-	4.9		-
Tendring	-	4.8		-
Thurrock	-	5.9		-
Uttlesford	-	5.3		-
Waveney	-	4.5		-

AQMAs in Thurrock in 2015



Should Air Quality be a key priority for Thurrock?

- Major issue as is both a major transport hub for HGVs and regeneration area
- PHE report suggests Thurrock has equivalent of:
  - 6.5% of deaths due to long term exposure (PHOF 5.9%)
  - 73 deaths in those over 25 years
  - 821 years of life lost from population
- Tackling air pollution would not only (1) increase healthy life expectancy and reduce early death from cardio-pulmonary disease, but (2) impact on number of other PHOF indicators.
- Transport measures are an excellent opportunity to deliver further public health benefits across the life course.
- But should we be linking action across the Council to have more health impact by lowering exposure, improving air quality and encouraging behavioural change?

Opportunities to increase impact for health?

- Transfer of public health responsibilities offers opportunities for **joined up approaches to health and wellbeing**. This is why the integrated air quality officer group should report progress into HWBB as HWBBs can prioritise environmental issues that impact on health & wellbeing.
- More emphasis on **"greening"** of the planning process to ensure PM2.5 levels are taken into account in new developments e.g. could include "special particulate reducing plants, green walls & roofs, and dust mitigation measures.
- **Reducing car usage**: encouraging active travel; i.e. walking or cycling, lowering car travel, encouraging park & ride schemes
- **Encouraging "living streets"** by prioritising pedestrian access and use, traffic management, public transport interventions, relocation of road space, greener" buses, anti-idling measures.
- **Lowering exposure and supporting individual action:** Working with schools and more vulnerable communities, raising awareness, pollution alerts, anti-idling initiatives
- Developing **urban green spaces** that help to improve air quality and have secondary health benefits e.g. mental health, physical activity

What should Thurrock be doing?

- **Thurrock is already taking this seriously. But we want to link up health, planning, and transport to have a bigger impact on people's lives and reduce inequalities. We already have 16 AQMAs, active and improved travel, but we have been considering other ideas:**

- **Reducing pollution from idling vehicles –** 2 ideas: outside schools, targeting idling vehicles within a new LEZ area with known poor air quality.
- Encouraging **smarter travel behaviour**
- **Promoting Living streets** - action on congested roads, traffic management, prioritising pedestrian access – links to smarter travel
- **"Planning for health"** – "greening" development, reducing non-road emissions, greener urban spaces/encouraging biodiversity, use of HIA and checklists
- **Action for vulnerable individuals** – cleaner air for schools, alerts, AirText systems.

Going forward……

- Strong evidence around health impact on health of air pollution
- Officer Working Group established to look at all approaches that could limit exposure of communities to air pollution to protect health and wellbeing
- HWBB to consider integrated plan in order to identify and prioritise actions and approaches within document.