

**MIDDLESBROUGH COUNCIL
OVERVIEW AND SCRUTINY BOARD**

5 MARCH 2019

**FINAL REPORT OF THE ECONOMIC
DEVELOPMENT, ENVIRONMENT AND
INFRASTRUCTURE SCRUTINY PANEL
– AIR POLLUTION**

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AIM OF THE INVESTIGATION

1. The aim of the investigation was to identify the causes and impacts of air pollution and suggest measures that can be put in place locally, and as part of national strategies, to reduce those levels and improve air quality.
2. Early on in its investigation, the Panel acknowledged that the topic of air pollution is vast and the numerous effects of poor air quality were too many to explore in detail. The Panel therefore addressed the terms of reference by focussing on the areas most pertinent to its remit: economic development, environment, infrastructure and transport.

MAYOR'S VISION

3. The scrutiny of this topic fits within the following priority of the Mayor's Vision 2025¹:
 - Safer – Safer environment ensuring our town is cleaner and more resilient to a changing climate.

COUNCIL'S CORE OBJECTIVES

4. The scrutiny of this topic also aligns with the following core objective as detailed in the Strategic Plan 2017-2021²:
 - Social Regeneration – Working with our communities and other public service organisations to improve the lives of Middlesbrough's residents.

TERMS OF REFERENCE

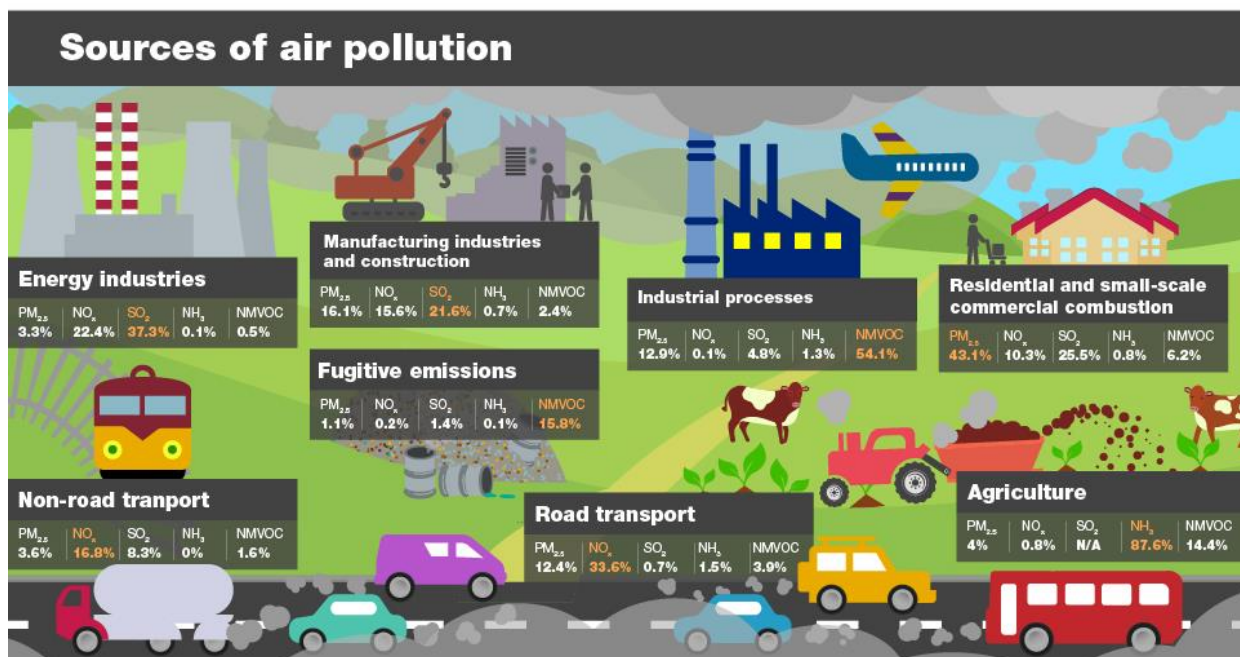
5. The terms of reference for the scrutiny panel's investigation were as follows:
 - A) To investigate air pollution in Middlesbrough: how it is monitored and how it compares regionally/nationally and in relation to EU Standards.
 - B) To identify and explore what measures Middlesbrough Council has implemented to improve air quality and any future initiatives that are planned.
 - C) To investigate examples of good practice in other local authority areas which could be adopted in Middlesbrough.
 - D) To investigate the impacts of air quality on the local social and physical environment and how this can be mitigated.

¹ Middlesbrough 2025 – The Mayor's Vision

² Middlesbrough Council's Strategic Plan 2017-2021

BACKGROUND INFORMATION

6. *“A variety of air pollutants have known or suspected harmful effects on human health and the environment. In most areas of Europe, these pollutants are principally the products of combustion from space heating, power generation or from motor vehicle traffic. Pollutants from these sources may not only prove a problem in the immediate vicinity of these sources but can travel long distances.”³*
7. *“Air pollution affects the environment by causing acid rain, reducing visibility, damaging plants and animals, and contributing to climate change. It has a negative effect on biodiversity and the survival of species”.⁴*
8. *“Poor air quality is the largest environmental risk to public health in the UK, as long-term exposure to air pollution can cause chronic conditions such as cardiovascular and respiratory diseases as well as lung cancer, leading to reduced life expectancy.”⁵*



9. Air quality and pollution has changed over time. In the 1940s and 1950s the main pollutant was sulphur dioxide, which was present in the soot from heavy industry. From the 1960s to the 1980s there were different pollutants linked to different types of industry, including carbon monoxide. Since the 1980s, nitrogen dioxide has become an issue, in the form of particulates which are very small and can enter the bloodstream. This increase is linked

³ DEFRA – UK Air – Air Information Resource Website

⁴ www.reference.com

⁵ Health Matters: Air Pollution – Public Health England

with transport, with ten times more journeys being made by vehicles, combined with a 30% decrease in people walking. Since the 1980s, lead has been removed from petrol and diesel and now electric and other forms of low emission vehicles are being developed.

10. Air quality impacts on health and often the most deprived populations are affected the most by poor air quality. Standards are in place to protect health and Local Authorities have a legal duty to monitor air quality. Air quality is measured against the European Standards. The World Health Organisation (WHO) states that there is no safe level of air pollution because even at very low levels it can affect those who are vulnerable, such as people with respiratory illnesses, asthma and the elderly. Another factor is indoor air quality and what people breathe in their own homes.
11. Local Authorities have a legal duty to monitor air quality standards and to protect the health of the population. Air quality has to be monitored to ensure that standards are being met and the limits are not exceeded. An Annual Status Report (ASR) is produced for the Department for Environment, Food and Rural Affairs (DEFRA) on the measurements taken throughout the year and whether limits have been exceeded. To date, Middlesbrough has never had to declare an Air Quality Management Area.
12. Common pollutants in Middlesbrough include Nitrogen Dioxide (NO₂), Particulate Matter (PM₁₀ PM_{2.5}) and Sulphur Dioxide. NO₂ comes from road transport, energy generation, domestic and industrial combustion and other transport, and can exacerbate the symptoms of those already suffering from lung or heart conditions. High levels of NO₂ can also change soil chemistry and affect biodiversity in sensitive habitats, although Middlesbrough is not markedly affected in this way.
13. Particulate Matter (PM₁₀ PM_{2.5}) is an emerging pollutant consisting of microscopic particles that can enter the bloodstream through inhalation and can cause respiratory illnesses, cancers, dementia and low birthweight in babies. Particulates come from domestic wood and coal burning, industrial combustion, road transport and industrial processes. Many sources of PM_{2.5} travel from further afield and since this cannot be controlled it is quite a hard task to reduce it.
14. Sulphur Dioxide contributes to the formation of acid rain and comes from energy generation, industrial combustion and the manufacture and use of domestic solid fuel. Sulphur Dioxide is a respiratory irritant and people with asthma are particularly susceptible.

AIR QUALITY MONITORING IN MIDDLESBROUGH

15. There are currently two Air Quality Monitoring Stations in Middlesbrough: one at Macmillan College and another at Breckon Hill School. The station at Breckon Hill School is attached to the national recording network and provides continuous updates to the national report network at DEFRA. The Air Quality Monitoring Station is a sophisticated piece of equipment for reporting air quality and the standards are published on the DEFRA website.
16. The Breckon Hill site is an urban site within a school, which references similar types of environment in Middlesbrough. Also, children are more susceptible to pollution than adults. The Macmillan site is also a school and is close to the A66 and A19 roads. Both

stations are static and monitor the air quality only at those locations.

17. Diffusion Tubes can also be used to monitor air quality. There are 27 Diffusion Tubes located at 23 sites across Middlesbrough which have been in place since 2015. These Tubes measure NO₂ only. The tubes are made of acrylic plastic and contain a chemical soaked gauze which absorbs NO₂. The tubes are replaced every month and sent to a laboratory for testing. The results provided by the tubes are not as accurate as those from the monitoring stations but they do allow for monitoring to be carried out at different locations.
18. Since 1995 at Breckon Hill, and the year 2000 at Macmillan, the NO₂ levels recorded have reduced. The Diffusion Tube results show some high levels, the highest being recorded next to the A66. Twelve measurements are taken over the year and then averaged out. The Diffusion Tubes have been in place for three years and consideration is being given to moving some, but not all, to other locations. The PM₁₀ PM_{2.5} and Sulphur Dioxide results are all at a low level and there have not been any exceedances of the limits.
19. One of the main contributors to PM_{2.5} is burning and this is evidenced by a large increase in levels of concentration recorded in Middlesbrough on Bonfire Night. The Government's recently produced Clean Air Strategy 2019 includes a pledge to improve awareness of the environmental and public health impacts of burning. Whilst this is not currently a huge issue in Middlesbrough some advice will be made available on the Council website in the near future. A new standard for wood burning stoves will be issued by the Government to ensure cleaner burning.
20. The Clean Air Strategy 2019 produced by DEFRA identifies national measures to reduce emissions from residential housing, farming and industry. The Strategy also contributes to the Government's action on Clean Growth and seeks ways to support investment in technologies and solutions that tackle emissions. The Road to Zero Strategy produced by the Department for Transport (DfT) identifies national measures to reduce emissions from vehicles already on the roads and to drive up the uptake of the cleanest new vehicles. The Strategy also promotes, amongst other things, the Government's policy to develop one of the best electric vehicle infrastructures in the world.
21. The UK has been challenged by the EU in terms of progress to reduce NO₂ and at the end of 2017 produced a list of Local Authorities exceeding levels, as identified using their own model. The EU require Member States that are in breach of the maximum levels to be compliant by 2020 at the latest.
22. Middlesbrough is on the list for two locations in the town centre, both on the A66. Middlesbrough has been tasked with using its local model and local data to compare whether the same data was identified through the national model imposed by the EU. The aim is for Middlesbrough to achieve compliance in the shortest time. Work is in progress and modelling has been carried out. The two areas being monitored are next to Crown House on the A66 as it passes through the town centre and a stretch where the A66 joins the A19. The results will be fed back to DEFRA and will be reviewed by an independent panel. It is anticipated that the findings will be reported to Middlesbrough Council's Executive in February 2019.

AIR QUALITY IMPROVEMENT IN MIDDLESBROUGH

23. Improving air quality links with a wide range of strategies including:

- Transport Plans: public transport, cycle routes, infrastructure, reducing congestion.
- Public Health: improving physical activity.
- Planning and Development control.
- Modal shift: moving away from car use or to low emission vehicles.
- Promoting active travel including walking and cycling.

24. In March 2018 the Joint Air Quality Unit (JAQU), established between the Department for the Environment, Food and Rural Affairs (DEFRA) and the Department for Transport (DfT), awarded Middlesbrough Council £1.813 million Early Measures funding. The funding has been awarded to assist the Council to improve air quality along the A66 through implementing the various schemes, while further modelling works detailed at paragraph 22 of this report are undertaken. The following schemes were approved by the Executive Member for Economic Development and Infrastructure on 27 November 2018:

Table 2. Approved schemes⁶

Ref	Scheme	Cost (£)	impact
2	Smart technology; Variable Messaging System (VMS)	354,280	Allows traffic control, advising drivers of alternate routes when congestion increases.
5a	Creation of a new carriageway connecting Cleveland Street with Windward Way	965,553	Provides alternate routes into area of economic expansion
5b	Signalisation of the junction of North Road and Snowdon Road	161,614	Provides alternate routes into area of economic expansion
5c	junction improvements at Vulcan street and Ferry Road (signalisation)	209,830	Provides alternate routes into area of economic expansion
5d	Creation of off carriage cycle way along Vulcan Street	122,062	Provides safe route connecting area of economic expansion, encouraging alternate mode of travel
Total		£1,813,339	

25. The Council is currently progressing the design works for the associated projects prior to agreeing a construction programme. In addition to reducing NO₂ levels, it is anticipated that the measures will assist in ensuring journey time reliability, improving physical activity levels amongst the general public and reducing CO₂ and noise levels.⁷

26. The TVCA has been awarded £59 million from the Transforming Cities Fund over a four-year period, with a further £16 million for a fifth year also announced. The five Local Authorities in Tees Valley can bid for funding from the TVCA for transport schemes. Middlesbrough is looking at Urban Traffic Management Control (UTMC) to improve congestion through traffic management signals and also variable message signs.

27. As part of the NO₂ work in Middlesbrough, a traffic study has been carried out to gather information about older vehicles on the road and their efficiency. The study also examines the routes that people are taking around the town. The development of the Rail Station is

^{6,7}Joint Air Quality Unit Early Measures programme approval – Kevin Parkes, Executive Director of Growth & Place/Councillor L Young, Executive Member for Economic Development and Infrastructure – 27 November 2018

also included in road infrastructure plans to try and divert people from using the cars, as well as electrification of the line.

28. The Principal Public Protection Officer has provided 2017 data to a health consultant who is examining the information to check whether there is any correlation to raised pollution levels and the numbers of people presenting at GPs and/or Hospital with asthma. This work is ongoing and most of the data provided shows low levels of air pollution.
29. As part of Middlesbrough's Local Improvement Plan (LIP), which underpins the Tees Valley Combined Authority's (TVCA) Strategic Transport Plan, Middlesbrough's Cycling and Walking Policy is being refreshed, with air quality issues embedded in the Policy. Local Growth Funding (LGF) has also enabled more cycle routes to be put in place encourage cycling into town centre areas. The Council has an active travel policy to engage people to walk and cycle more, thus reducing vehicle emissions and also increasing physical activity, with associated health benefits.
30. Sustainable Transport involves low carbon modes of transport, reducing carbon emissions and need to travel. This involves lower reliance on the private car, or single occupancy vehicles, and the promotion of public transport (Bus and Trains), walking, cycling and car sharing.⁸
31. Middlesbrough Council has a range of initiatives for employees, designed to promote sustainable travel including:
 - Annual Public Transport Tickets – annual passes available from Arriva, Stagecoach and Northern Rail services. Payments are taken from salary over 12 months, making accessing public transport easy and affordable.
 - Bike to Work Scheme – Up to 42% savings on the purchase of a bike and equipment with payments taken from salary over 12 months.
 - Half Price Cycle Ride Insurance – British Cycling ride insurance provides liability cover, access to legal support and advice and other savings for £14 per year.
 - Pool Bikes – located at Middlesbrough Cycle Centre and free for employees to use during the working day for travel around Middlesbrough.
 - Car Sharing – Lift Share – a service dedicated to pairing up journeys to reduce single occupancy cars. Employees can register their details on the website.
 - Journey Planner - <http://www.connectteesvalley.com>. Updated with real time information, the journey planner provides you with all of your transport needs across Teesside.

⁸ Middlesbrough Council Intranet – Sustainable Transport

LEICESTER CITY COUNCIL – AIR QUALITY ACTION PLAN

32. The Panel heard evidence from Leicester City Council which currently fails to meet the EU air quality standards in Nitrogen Dioxide (NO₂) levels in and around the city. In the most polluted areas the levels are significantly above the target of 40µ/m³, at around 55µ/m³. The Department for Environment, Food and Rural Affairs (DEFRA) is currently consulting on a new Environment Bill and is considering introducing the World Health Organisation (WHO) limits. If the WHO limits are applied Leicester would also breach the limits in PM₁₀ and PM_{2.5}.
33. The main source of NO₂, in Leicester, (80%), is from the road traffic emissions. The City Council has moved its air quality section from the Environmental Health Department into Transport to help address air pollution. One of the key reasons for this is that the Transport Department is able to bid for funding from several sources including DEFRA and the Department for Transport (DfT).
34. Leicester has an Air Quality Management Area, which includes the inner and outer ring roads. NO₂ levels are exceeded on the inner ring road in its entirety and also on radial routes and part of the outer ring road. There are five automatic monitoring stations and a modelling system. A bid for funding has recently been made to the Joint Air Quality Unit (JAQU) to purchase some portable monitors. There has also been a pilot exercise with Leicester University where portable monitors were attached to electric vehicles to monitor pollution hotspot levels around the City. NO₂ levels are trending downwards in the City.
35. The Air Quality Action Plan - Healthier Air For Leicester⁹ - was introduced by the City Mayor in 2015 and runs until 2026. The Plan is a top priority for the Mayor and as well as achieving EU targets, will mean better health for Leicester residents. The Air Quality Action Plan also links in with Leicester's Economic Action Plan (2012-20). The Air Quality Action Plan sets out seven ambitions and sixteen actions presented under four themes:
- Reducing Transport Emissions.
 - Promoting Sustainable Transport.
 - Improving Traffic Management.
 - Enhancing Planning and the Environment.
36. The seven ambitions include:
- Substantially improve people's health and reducing premature deaths by improving air quality.
 - Introducing a Low Emission Zone for the most polluting vehicles in the City Centre.
 - Delivering Phase II of the Connecting Leicester initiative by 2019 to increase pedestrianisation and remove vehicles from where they are not required.
 - To increase number of people cycling daily to 52,000 by 2023.
 - For bus, taxi and freight operators to use the cleanest lowest emission vehicles as their first choice for fleet replacement.
 - To reduce Council fleet emissions by 50% by 2025.
 - For all land use planning decisions to minimise the need for travel by polluting

⁹ Healthier Air for Leicester – Leicester's Air Quality Action Plan (2015-2016) – City Mayor

vehicles.

Progress has been made on many of the actions to date. A low emission zone, now called 'Clean Air Zone' has been introduced. Over the last eight years, most of the inner ring road has been pedestrianised.

37. The whole of Leicester is now a shared space for cycling and walking, and cycling was encouraged in pedestrian areas. There are currently approximately 23,000 cyclists and it is anticipated that the 2023 target of 52,000 people cycling daily will be achieved. Two strategic cycle parks have been introduced and a third one is planned. Local businesses can apply for grants of up to £3,000 to provide changing areas for those cycling to work.
38. There are also three Park and Ride facilities, which are joint funded by the City Council and the County Council. The City Council has been shortlisted for the DfT's Transport for Cities Bid and is planning to establish a parking hub as well as a sky link to connect the City to Nottingham and East Midlands Airport.
39. The City Council has a fleet of over 800 vehicles, which it aims to reduce by 50% by 2025. Having already reduced to under 700, this aim is currently on target. A low emission zone focussing initially on buses and taxis has been established and there is an ambition to eventually have an Ultra-Low Emission Zone for all vehicles.
40. Bus Companies have invested £25 million in their fleets during the last six years and moved from Euro 3.8 to 4.8 standard. Over £2.7 million has been spent on retro-fitting 109 older buses. Local bus companies have signed an agreement to have at least Euro 6 standard across their whole fleets by 2020.
41. A Leicester Low Carbon Transport Accelerator Grant has been established and £6.5 million has recently been secured from the European Regional Development Fund for low carbon. £2.2 million of the funding is available to any organisation that does significant mileage within Leicester or Leicestershire to provide a grant of up to 40% in the difference between buying a new diesel and a low emission vehicle. An on-street charger trial is also in place for electric vehicles where there is no off-street parking. Using funding from EDRF, solar panels will be installed in car parks with charging points.
42. The City Council has purchased an electric taxi, which can accommodate wheelchairs and is currently used for social services transport. It is primarily an electric car with a very small engine, which can be charged overnight like a conventional electrical vehicle. The range is claims to be 160 miles, although this has not yet been tested by the City Council. Plans are in place for the taxi to be loaned out from January 2019 for people to try before they buy.
43. A test was in place for all new fleet purchases, so that if the City Council decided to purchase a new vehicle, checks were made to see whether there was a low emission alternative and funding was set aside in the budget to make up the difference in cost. Unfortunately, there are currently no electric or low emission transit sized vehicles available and there are approximately 550 of these in the fleet.
44. In relation to promoting sustainable transport, Connecting Leicester is establishing more shared spaces, including a 'Cycle Super Highway' - a £3.9 million scheme to bring cyclists

into the heart of the City. A significant amount of funding is also being spent upgrading cycling routes.

45. 'Choose How You Move' is a one stop website that provides travel information for Leicester and Leicestershire, with a journey planner which allows residents and visitors to consider the different travel options available to them. The journey planner offers a variety of travel methods starting with the most active or sustainable travel options. This includes a car share matching service which offers a monetary reward of £5 for each journey.
46. Leicester's Cycle City Action Plan has 107 actions in it and Cycling England has provided good support and approximately £100,000 per annum in funding into various events. Originally the City had hosted the Sky Ride and this has now been replaced by Leicester City Ride. There is also a schools' ride involving ten schools per year.
47. As part of the Parking Improvement Action Plan, £2.2 million has been spent on parking improvements, with campaigns in relation to anti-idling and school parking. As part of a Clean Air Day, a road in front of a school was closed for the day and used as a school facility. No Parking and No Alighting areas have been extended outside of schools, cameras have been installed and the number of Enforcement Officers increased. There is also an Eco Schools model on air quality which is in place to educate pupils as well as teachers and parents. Schools are in competition with each other and there is an annual Awards Ceremony.
48. Air quality is also prominent in Leicester's Local Plan for 2019 and is also likely to feature in the Land Use Planning Guidance for 2019. Previously transport and air quality modelling for land use planning would have been carried out separately but are now coming together. Much of this type of planning is done by modelling to add capacity to new roads and take traffic pollution away from heavily residential areas and town centres.
49. There does, however, need to be a balance between sustaining the town centre economy, whilst discouraging people from travelling in to the centre by car. Leicester City Council has been monitoring the profitability of the City Centre through its Business Improvement District. City Centre living is also increasing with the re-development of old factories and office blocks.

H21 NORTH OF ENGLAND PROJECT

50. The Panel heard evidence from the H21 Commercial Manager at Northern Gas Networks (NGN) about the H21 Project. The Leeds City Gate Project in 2016 confirmed that it was technically possible to convert the existing gas network in the UK to hydrogen. In 2018, OFGEM (Office of Gas and Electricity Markets) awarded £9 million to four gas networks: Cadent, Northern Gas Networks, SGN and Wales and West Utilities, to work together on how the UK network could be converted.
51. The Climate Change Act 2008 placed a duty on the Secretary of State to ensure that the net UK carbon account for all six Kyoto ¹⁰ greenhouse gases for the year 2050 is at

¹⁰ The Kyoto Protocol is an international agreement linked to the United Nations Framework Convention on Climate Change, which commits its Parties by setting internationally binding emission reduction targets.

least 80% lower than the 1990 baseline by 2050. Currently that target is a long way off and the heat market provides a good opportunity to decarbonise through converting to hydrogen. The Government's Clean Growth Strategy recognises that hydrogen is a feasible option that will help decarbonise the network.

52. Hydrogen is carbon free and can be extracted from natural gas, whereas natural gas (methane) emits carbon when lit. In the 1960s/1970s the UK successfully converted from coal gas to town gas. It is proposed to utilise the existing gas infrastructure which will minimise the environmental impact. A transformation system will be needed to link into existing infrastructure and gas powered appliances will also need to be converted.
53. By 2032 the current programme to replace gas mains will be completed and it is possible that funding currently awarded to Suppliers for that purpose could be used to replace infrastructure. There will also be a cost to replace appliances. The Government has awarded £25 million to a project called Hy4Heat, to consider everything inside domestic, commercial and industrial properties, that will need converting. The conversion of both the network and appliances will have to take place incrementally.
54. The strategic evidence compiled for the North of England conversion calculates that over 17 million tonnes of carbon will be removed per annum. The conversion will take from 2028 to 2035, and cover 12.5% of the UK population in Middlesbrough, Newcastle, York, Hull, Leeds, Bradford, Wakefield, Halifax, Manchester and Liverpool. It could support decarbonisation of transport with hydrogen fuelling stations and electric with decentralised and centralised generation. The total cost of implementation would be less than building a nuclear power station (over £20 billion) but decarbonise over five times the energy.
55. The H21 Project has identified what could potentially be implemented, but the UK Government will need to make a policy decision by the end of 2023 to meet the proposed timescales and indeed, the Climate Change Act targets.

OPPORTUNITIES FOR HYDROGEN IN THE TEES VALLEY

56. The TVCA (Tees Valley Combined Authority) has been working with the Teesside Collective Cluster to get industrial carbon capture and storage in place, as well as the Clean Gas project. This will enable the Tees Valley to make a significant contribution to the H21 Project. The Tees Valley already has the UK's largest existing industrial hydrogen network. Hydrogen is used to make fertilisers and polyurethane intermediates in Teesside. The Tees Valley also has the largest merchant hydrogen producer: BOC Linde, as well as extensive hydrogen storage capacity.
57. There are also many opportunities for 'green' hydrogen including: Dogger Bank wind farms, Hartlepool Nuclear Power, Biomass Power and large scale waste processing which provides opportunity for gasification. Hydrogen can also be produced from water using electricity, and as a raw material and energy source in industrial settings. Teesside is a compact area with adjacent port, rail, road and industrial opportunities and ideal for the demonstration of hydrogen for heat and transport.
58. The challenge of emissions from heavy goods transport can be addressed with hydrogen, as well as fully electric, and hybrid vehicles. Vehicles can travel much further on hydrogen

than using electric. When hydrogen is used to power vehicles, only water is produced and not particulates. The TVCA has bid for funding from the OLEV (Office of Low Emission Vehicles) to install two hydrogen refuelling stations in the Tees Valley. Two possible sites have been identified in Middlesbrough and Redcar.

59. Buses are already running on hydrogen in other cities in the UK and opportunities exist to use the franchise system to encourage low carbon transport. A business case is currently being developed by a consortium including Northern Rail, Network Rail and the TVCA to establish the cost of running a hydrogen rail system. Germany has already developed its first hydrogen train. The Tees Valley, with its railway heritage, will be an ideal location for the first UK hydrogen rail system.

AIR QUALITY AND THE SOCIAL AND PHYSICAL ENVIRONMENT

60. In terms of air pollution and the planning service there are two ways in which interaction takes place. When an application is made for development, the location to source of air pollution has to be taken into consideration. For example, when building office or residential accommodation next to a main road, applicants need to demonstrate that a scheme can be accommodated without detriment to the inhabitants of those premises and air quality surveys are part of the process. With regard to the developments themselves, some will lead to increased traffic movements, and other recognised sources of air pollution to different degrees including heat and light sources, which need to be mitigated.
61. One way of mitigating potential air pollution is through design and development so that good access to open spaces, recreation facilities and public transport are included to minimise the use of private cars. Particularly in larger developments, significant landscaped areas and woodland planting can be incorporated.
62. Middlesbrough Council is currently in the process of developing a new Local Plan which will include a number of policies to mitigate air pollution. Following direction from Central Government, for the first time reference is made to the inclusion of electric car charging points in homes. As more and more people buy electric cars it is anticipated that Developers will provide them in residential homes as well as town centre office developments.
63. Trees have a role to play in capturing carbon as well as assisting with landscaping. When trees are removed as part of a new development they are not necessarily replaced like for like but more planting might be required to make the development more attractive. Usually if a tree dies within five years it will be re-planted but unless there is a Tree Preservation Order (TPO) on it, replacement cannot be enforced. Future developments are more likely to contain clumps of trees or an area of woodland rather than planting close to houses.
64. It is also important to specify native species that will not dominate. Previously trees were often planted within the curtilage of properties within new developments, so that the Council did not have to maintain them. However, house owners are then free to remove them if they wish.
65. In terms of woodland planting, there is a better mortality rate rather than planting on verges. Native species always survive better than foreign ones although they also play an important role in planning. They can be hybridised more easily to avoid potential issues

such as sticky deposits.

66. There are an estimated 100,000 trees in Middlesbrough which include: 14,000 verge planted, 10,000 in parks in cemeteries, 10,000 in open spaces and 65,000 in woods and copses. Approximately 26% of Middlesbrough's tree stock are species highly recommended by the Woodland Trust for absorbing pollutants including carbon dioxide, nitrogen dioxide, sulphur dioxide and particulates. Recommended species include: Elm (Ulmus), Common Ash (Fraxinus), Limes (Tilias), Maples (Acer), T Oaks (Quercus) and Ginkgo (Ginkgo).

Middlesbrough Council has the following highway trees planted:

Maples	1507	10.7%
Limes	1357	9.6%
Ash	784	5.6%
Elm	38	0.2%
Turkey Oak	10	0.07%
Ginkgo	0	0%

67. A standard tree can absorb 13 pounds of CO₂ per year and becomes most productive at carbon absorption at around ten years old. A standard large tree can supply enough oxygen for four people each day. About 28% of all oxygen is produced from plants, including rain forests. The greatest percentage of oxygen is actually supplied by marine life.
68. Trees can also help pollution by other means. London Plane has microscopic Velcro-like hooks on the underside of the leaves that capture airborne pollutants. Others such as Maples and Limes secrete a sticky mildew substance that can also help trap airborne pollutants.
69. Due to historical austerity measures, Middlesbrough Council does not currently have a policy of planting trees. However, when requests are made to plant on Council land, this is generally facilitated. A standard tree from a local supplier costs between £120 and £160 to purchase and up to £250 to cover planting and maintenance costs.
70. The Woodland Trust provide grants to anyone to plant up to 100 trees. Middlesbrough Council actively encourages more tree planting and works with groups including the Green Space Forum headed by Natural England, Fairy Dell and the Friends of Bluebell Beck.
71. Middlesbrough is a compact area with about 1% tree cover overall. The aim is to increase that figure through future developments not only for improved air quality but also ecological benefits. Where sites are earmarked for development in the Local Plan, it might not necessarily be a good idea to plant there in the interim, since established woodland can become a barrier to future development.

CONCLUSIONS

The scrutiny panel reached the following conclusions in respect of its investigation:

72. TERM OF REFERENCE A - To investigate air pollution in Middlesbrough: how it is monitored and how it compares regionally/nationally and in relation to EU Standards.

Despite pre-conceptions, Middlesbrough has a very good record in terms of air quality, particularly in the most heavily populated areas of the town. The measures that the Council take to monitor air quality and particulates are detailed, wide-ranging, and provide comprehensive coverage of the town to ensure the Council is aware of any issues. Middlesbrough's latest Air Quality Annual Status Report (ASR) dated June 2018, confirms that Middlesbrough air quality is consistently good when compared with Government objectives and no Air Quality Management Areas have been declared.¹¹

Middlesbrough has two fixed Air Quality Monitoring Stations and 27 Diffusion Tubes located at 23 sites across Middlesbrough. Common pollutants in Middlesbrough include Nitrogen Dioxide (NO₂), Particulate Matter (PM₁₀ PM_{2.5}) and Sulphur Dioxide. The Daily Air Quality Index (DAQI) on DEFRA's website: UK Air – Air Information Resource, provides daily updates on pollution levels by region across the UK.

Since 2010, the UK has been in breach of the European Union's (EU) NO₂ limit. Two locations in Middlesbrough, both on the A66, have been identified as exceeding these levels. However, work is ongoing using local modelling and data to establish whether the data is the same as that identified through the national model imposed by EU and the results will be reported to the Executive in due course.

73. TERM OF REFERENCE B – To identify and explore what measures Middlesbrough Council has implemented to improve air quality and any future initiatives that are planned.

The latest Air Quality Annual Status Report (ASR) (June 2018), lists 38 initiatives that are being planned, or are in the process of being implemented to reduce vehicle use, emissions and congestion.

Middlesbrough Council is currently progressing the design works for five projects to improve air quality along the A66 and has been awarded £1.813m Early Measures funding from the Joint Air Quality Unit (JAQU) to implement these schemes.

As part of Middlesbrough's Local Improvement Plan (LIP), the Cycling and Walking Policy is being refreshed. The Council has an Active Travel Policy encouraging people to walk and cycle more frequently. A range of opportunities exist for Council employees designed to promote sustainable travel and they are promoted on the staff intranet.

¹¹ Air Quality Annual Status Report (ASR) – June 2018 – Middlesbrough Council

The Council is in the process of developing a new Local Plan, which will include a number of policies to mitigate air pollution.

Middlesbrough currently has no tree planting policy. However, when opportunities arise, every effort is made to facilitate planting on Council owned land.

74. TERM OF REFERENCE C – To investigate examples of good practice in other local authority areas which could be adopted in Middlesbrough.

The Panel received a presentation from Leicester City Council, who have implemented an Air Quality Action Plan due to breaching EU air quality standards in NO₂. The Plan focusses on reducing transport emissions, promoting sustainable transport, improving traffic management and enhancing planning and the environment. From the evidence provided by Officers, it is clear that Middlesbrough is already implementing similar measures to address air quality.

The Panel also received information about in relation to opportunities for hydrogen in the Tees Valley. The Tees Valley is well-placed to be a national hub for hydrogen power and the development of hydrogen as a fuel source both domestically, industrially and in the transport sector. This is an exciting opportunity and TVCA are leading the drive to deliver this in Middlesbrough and the wider Tees Valley.

75. TERM OF REFERENCE D – To investigate the impacts of air quality on the local social and physical environment and how this can be mitigated.

Poor air quality has a negative impact on both human health and biodiversity. Chronic conditions such as cardiovascular and respiratory diseases can be caused by long-term exposure to air pollution. Air pollution can cause acid rain, damage animals and plants, and contribute to climate change.

Air quality can be improved by reducing emissions from road transport, energy generation and domestic and industrial combustion. Potential air pollution can also be mitigated through design and development: providing good access to open spaces, recreation facilities, landscaped areas and woodland planting. A standard tree absorbs 13 pounds of CO₂ per year and can supply enough oxygen for four people each day and some species can also trap airborne pollutants. The more trees that are planted, the greater the mitigating effect on carbon in the atmosphere.

Middlesbrough Council takes environmental concerns into account through the planning process. Green spaces and environmental issues are a key part of the Council's deliberations when considering new developments, whether in terms of housing, infrastructure or business. When designing new developments, easy access to public transport will help to minimise the use of private cars. The incorporation of design features such as car charging points in new developments could help promote the use of electric cars.

RECOMMENDATIONS

76. Following the submitted evidence, and based on the conclusions above, the Economic Development, Environment and Infrastructure Scrutiny Panel's recommendations for consideration by the Executive are as follows:

- a) The Council revert back to replacing all trees on a '1 for 1' basis. The environmental impacts in terms of carbon footprint of planting one tree are massive and where trees have to be removed they should be replaced as a matter of course.
- b) The Council should actively encourage local Community Groups, Elected Members and others to access the funding that is available through the Woodland Trust for trees for their local areas and facilitate planting of those trees across the town.
- c) Middlesbrough Council's recently established Housing Delivery Vehicle (HDV) should seek to mitigate potential air pollution through design and development in all its projects, ensuring that electric charging points are included as standard in any new builds.
- d) Linked to the Panel's 2017 report on Bus Services¹² - Middlesbrough Council, through its seat on the TVCA - should lobby private bus companies to deliver hydrogen-powered buses in Tees Valley. Any future voluntary/enhanced partnership/franchising scheme should include provisions for hydrogen buses, with the Tees Valley applying for funding from the Government's Low Emission Bus Scheme (DfT/OLEV) for the purchase of low emission buses and associated infrastructure.
- e) The Council should set as an aspiration that by 2023 at least half its vehicles will be powered by hydrogen. This aspiration should be set with a view to continuing joint-working with TVCA and supporting projects such as H21, to deliver research and development into hydrogen power and subsequent large-scale infrastructure investment. Where opportunities arise, the Council should promote making hydrogen a viable alternative fuel source as the move towards increased domestic and industrial use continues apace, recognising both the environmental and economic benefits of decarbonisation.
- f) A survey is undertaken to ascertain the current use of electric/hybrid/hydrogen vehicles by Middlesbrough residents.
- g) The Council should explore all available opportunities to promote car sharing schemes not only to its own employees but also the wider community and in collaboration with local businesses and other stakeholders.

¹² Tees Valley Strategic Transport Plan Including Bus Franchising – Middlesbrough Council - Economic Development and Infrastructure Scrutiny Panel – November 2017

- h) In order to encourage the take-up of low emission vehicles in Middlesbrough, consideration is given to Council Tax reductions for people using electric or hydrogen vehicles.

ACKNOWLEDGEMENTS

77. The Economic Development, Environment and Infrastructure Scrutiny Panel would like to thank the following for their assistance with its work:

David Carter, Head of Transport and Infrastructure, Middlesbrough Council
Simon Chaffer, H21 Commercial Manager, Northern Gas Networks
Paul Clarke, Head of Planning, Middlesbrough Council
Judith Hedgley, Head of Public Protection, Middlesbrough Council
Mark Lewis, Technology and Innovation Manager, Tees Valley Combined Authority
Matthew Mace, Group Manager, Transport Strategy at Leicester City Council
Paul MacGregor, Principal Public Protection Officer, Middlesbrough Council
Chris Orr, Infrastructure Programme Manager, Middlesbrough Council
Richard Ward, Senior Area Care Manager, Middlesbrough Council

BACKGROUND PAPERS

78. The following sources were consulted or referred to in preparing this report:

- Minutes of meetings of the Economic Development and Infrastructure Scrutiny Panel held on 3 October, 7 November 2018
- Middlesbrough 2025 – The Mayor’s Vision – Middlesbrough Council
- Strategic Plan 2017-2021 – Middlesbrough Council
- Health Matters: Air Pollution – Public Health England – 14 November 2018
- Healthier Air for Leicester – Leicester’s Air Quality Action Plan (2015-2016) – City Mayor
- Joint Air Quality Unit Early Measures programme approval – Kevin Parkes, Executive Director of Growth & Place/Councillor L Young, Executive Member for Economic Development and Infrastructure – 27 November 2018

ACRONYMS

ASR - Annual Status Report
DEFRA - Department for Environment, Food and Rural Affairs
DfT – Department for Transport
JAQU – Joint Air Quality Unit
LIP – Local Improvement Plan
LGF – Local Growth Funding
NGN – Northern Gas Networks
NO₂ - Nitrogen Dioxide
OFGEM – Office of Gas and Electricity Markets
OLEV - Office of Low Emission Vehicles
PM₁₀ PM_{2.5} - Particulate Matter
TPO – Tree Preservation Order
TVCA – Tees Valley Combined Authority
UTMC – Urban Traffic Management Control

WHO - World Health Organisation

**COUNCILLOR M STOREY
- CHAIR OF ECONOMIC DEVELOPMENT, ENVIRONMENT AND INFRASTRUCTURE
SCRUTINY PANEL**

The membership of the scrutiny panel is as follows:

Economic Development, Environment and Infrastructure Scrutiny Panel 2018-2019

Councillors M Storey, (Chair), T Higgins, (Vice-Chair), R Arundale, D J Branson, B Hubbard, L Lewis, L McGloin, V Walkington and M Walters.

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