ASTHMA+ LUNG UK
SCOTLAND

CLEARING THE AIR:

Transport + Lung Health

September 2024

Contents

Executive summary

Air pollution is the greatest environmental threat to public health. This report outlines why Asthma + Lung UK Scotland fights for the right to breathe clean air.

The evidence is clear that air pollution causes new lung conditions and exacerbates existing conditions, like asthma and chronic obstructive pulmonary disease (COPD). Further evidence attributes air pollution to a wider range of health issues, such as cardiovascular disease, dementia, Parkinson's disease, diabetes and cognitive decline.

Clearing the Air: Transport + Lung Health looks at how air pollution impacts our lungs, the lung health of our children and the associated health inequalities, while discussing air pollution levels in Scotland and how the quality of our air is monitored. The report also analyses public transport's role in polluting the air we breathe, and the policies of the Scottish Government and local councils, which play a part in reducing emissions from transport, including ultra-low emissions vehicles (ULEVs) and infrastructure, low emission zones (LEZs) and vehicle idling.

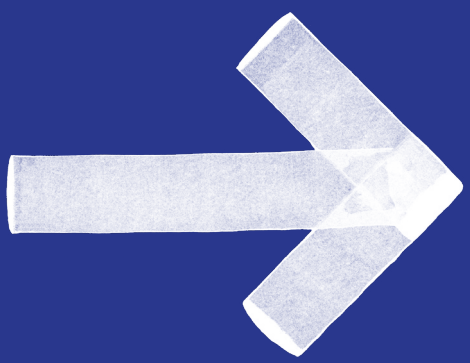
Key findings in the report:

- All automatic air quality monitoring stations were within the current legal limits for nitrogen dioxide (NO_2) and fine particulate matter ($PM_{2.5}$) in 2023.
- Less than half of monitoring sites would meet the World Health Organisation (WHO) 2021 air quality guidelines for $PM_{2.5}$ and just over two-thirds would meet these new guidelines for NO_2.
- 41% of ScotRail's train fleet is diesel trains and the percentage of services using diesel trains is increasing at a greater rate than that of electric trains.
- Bus travel is the most popular method of public transport with 301 million passenger journeys taken in 2023.
- Ultra-low emissions vehicle (ULEV) sales are increasing year-on-year, but demand for public charge points fell by 37% between July 2023 and June 2024.
- Only one fine has been issued to a driver for vehicle idling in the last three and a half years, with over 1,158 complaints made to 20 councils over the same period.

Active travel, i.e. walking, wheeling, and cycling, is by far the cleanest and greenest form of transport. However, it must be said that for people with lung conditions, active travel is not always a viable option due to the severity of their condition, factors like the Scottish weather and where they live. While this report does not discuss active travel, we share the concerns of other organisations that the Scottish Government will no longer meet its target to spend 10% of the transport budget on active travel by the end of this parliament, and we encourage government at all levels to go further to support people to walk, wheel and cycle.

In this report, Asthma + Lung UK Scotland sets out a series of recommendations for the Scottish Government and key policymakers to adopt to meet its ambition of having the best air quality in Europe. With the next Scottish Parliament elections and Cleaner Air for Scotland 3 both expected in 2026, we hope that the insights from people with lung conditions, along with the wide range of evidence in this report, demonstrate the case for further action on air pollution and that this is considered and actioned by policymakers.

We propose the following recommendations for Scottish Government, opposition parties, local authorities, and other policymakers:



Recommendation

Legislate to adopt the 2021 World Health Organisation (WHO) air quality guidelines as legal targets.

Recommendation

Increase the automatic monitoring network across Scotland so that every local authority is accounted for, prioritising areas around schools, hospitals, maternity units and care homes.

Recommendation

Improve the alert system using greater monitoring under recommendation 2 so that people with respiratory conditions and other existing health conditions can take action to protect their health during periods of higher air pollution, and GPs, hospitals, schools and care homes are alerted to prepare for exacerbations of people with lung conditions.

Recommendation

Scrap peak rail fares beyond the trial ending on 27 September 2024, creating the conditions for more affordable rail travel.

Recommendation

Accelerate the roll out of electric trains and buses and reduce the proportion of routes using diesel vehicles.

Recommendation

Utilise the powers of the Transport (Scotland) Act 2019 to support bus travel in underserved communities, create council-run services that are more affordable and accessible.

Recommendation

Offer greater incentives of £5,000 or more to purchase new ultra-low emissions vehicles to encourage the phasing out of petrol and diesel vehicle sales.

Recommendation

Audit the electric vehicle charging network annually to find gaps in supply and demand, reporting when and where anomalies are found in charging point data.

Recommendation

Implement Low Emission Zones (LEZ) in further cities and large towns in Scotland and expand the existing LEZ boundaries in Glasgow, Edinburgh, Aberdeen and Dundee by 2030.

Recommendation

Implement and enforce the ban on vehicle idling across Scotland and increase the fixed penalty notice to act as a greater deterrent.

Your Health + Air Pollution

Air pollution is the greatest environmental threat to public health

The causes of air pollution are complex with numerous sources, but one of the most common culprits in towns and cities is transport emissions.

Everyone is exposed to air pollution, short-term or long-term, and at all stages of life, no matter where they live, work and play. It is a cause of ill-health and mortality for people across Scotland, especially for those living with a lung condition such as asthma or chronic obstructive pulmonary disease (COPD).

There is no safe level of air pollution. Toxic air is a health emergency, causing new lung conditions and worsening existing ones. It can stunt the growth of children's lungs and travel deep into the lungs and brains of unborn babies[1].

The evidence on the damage to public health by air pollution is well-documented. Depending on the source, between 1,800 and 2,700 people die prematurely each year in Scotland[2] as a result of toxic air. There is a clear link between air pollution and respiratory disease, lung cancer and cardiovascular disease and there is growing research and evidence linking air pollution to brain health issues, mental health problems, neurological conditions and diabetes. Air pollution has been shown to cause cancers, with research showing that for every 10 $\mu g/m^3$ of increased exposure to fine particulate matter ($PM_{2.5}$), the risk of dying from any cancer rose by 22%[3].

As an action for Cleaner Air for Scotland 2 (CAFS2), the Scottish Government commissioned a review of the evidence on health impacts of low-level air pollution in countries with levels of ambient air concentrations comparable to Scotland. A Summary Report[4] on this review was published in October 2023 and referenced 46 studies from countries like Canada, Sweden, Denmark, the Netherlands, and the UK. Some studies identified the levels of exposure and the potential health harms.

- The ELAPSE study [5] (six European nations) "found significant associations between $PM_{2.5}$, Black Carbon (BC), and NO_2 exposure and natural-cause, cardiovascular, respiratory, and lung cancer mortality, as well as stroke, asthma and COPD hospital admissions at concentrations below the European Union limit values for $PM_{2.5}$ (25 $\mu g/m^3$) and NO_2 (40 $\mu g/m^3$)".

- The MAPLE study (Canada) " found long-term outdoor $PM_{2.5}$ exposures as low as 2.5 $\mu g/m^3$ were linked to an increased risk of death in a large representative sample of Canadian adults, with variation across different geographical regions and with smaller effects when adjusted for O_3 concentrations."

As well as the serious impacts on public health, there are economic consequences on individuals, communities and society as a whole. Air pollution is estimated to cost the Scottish economy over £1.1 billion each year in days lost at work and costs to the NHS[6]. As air quality improves and the effects on people with respiratory and other health conditions ease, the financial burden on the NHS and employers will be significantly reduced. However, given the growing evidence associating air pollution with various conditions, the estimated cost to the economy and NHS is likely to rise as research progresses. This is also true for the numbers of estimated early deaths attributable to air pollution.

Lung Health + Air Pollution

Air pollution harms us all, but it is more harmful for people living with a lung condition. Pollutants can irritate the airways and exacerbate lung condition symptoms like breathlessness, wheezing and coughing. Triggers, like air pollution, can result in more hospital admissions for people with conditions like asthma and COPD, and there is also some evidence to suggest that air pollution could increase the risk of severe illness from COVID-19[7].

All sources of air pollution can cause new lung conditions with exposure over a long period and, as discussed previously, it has been highly associated with the development of lung cancer.

For people with lung conditions, air pollution impacts their daily quality of life. Short-term exposure to air pollutants can result in inflammation of the airways, causing coughing and breathlessness, and can also result in life-threatening flare-ups of conditions[8]. In the Asthma + Lung UK Life with a Lung Condition Survey 2024, 49% of all respondents with a lung condition told us that road transport is the source of air pollution that concerns them most. When it comes to the impact of air pollution on their daily life, people with lung conditions told us that:

they have difficulty breathing when air pollution levels are high (43%)

they avoid going to places where they know air pollution is higher (34%)

they avoid exercise outdoors when air pollution is worse (24%)

being exposed to air pollution makes them feel low or depressed (10%)

Source: Asthma + Lung UK Scotland, 2024

We believe that with better and more accurate air pollution monitoring, reported in an easy-to-understand way, we can alert people with lung conditions when pollution is high and drive the behaviour change that we all need to see to reduce our reliance on cars. The Scottish Air Quality website[9] offers a free alert system, 'Know & Respond Scotland', that communicate alerts by email, SMS text or voicemail around 2pm for the following day. The alerts are graded by 'moderate', 'high' and 'very high', providing health guidance for recipients and action to take if needed. However, the Life with a Lung Condition Survey 2024 found that fewer than 1 in 10 (9%) respondents receive alerts for air pollution levels, so a lot more needs to be done to raise awareness about this system.

Air Pollution + Inequalities

Air pollution is more than a public health crisis - it's a social justice issue. People living on lower incomes[10] or living with existing health conditions, children and the elderly are disproportionately impacted by, and exposed to, toxic air[11]. Those who can't afford to drive are often those most impacted by the toxic air from transport emissions. The poorest communities are more likely to be living near busy roads, in more condensed housing designs and in areas with less green space than more affluent areas.

Information from the Scottish Transport Statistics 2020 reveals that 19% of households with a net income of less than £10,000 use a car daily, whereas 62% with a household net income over £50,000 use a car daily. There is a similar pattern in car ownership, with 40% of lower earners (less than £10,000 net household income) having one or more car, compared to 97% of households earning over £50,000.[12]

There is also growing evidence showing that ethnic minority groups are more at risk from air pollution. A study by researchers at St Andrews University[13] found that ethnic minorities and those born outside of the UK are more affected by higher exposure to air pollution than the rest of the population. The research found that where people lived placed them at a greater risk and found that "people from Indian, Pakistani, Bangladeshi, and Black/African/Caribbean backgrounds tended to report worse health if they were exposed to more air pollution compared to those who were born in the UK."[14]

A quantitative study on public perceptions of air quality in Scotland[15], commissioned by the Scottish Government as part of CAFS 2, found that understanding of air pollution is higher among ethnic minority respondents than white respondents, potentially as a result of ethnic minority groups being more exposed to and harmed by air pollution than white people. Furthermore, households from ethnic minority groups are more likely to have no access to a car, evidencing that they are creating less pollution yet more aware of and exposed to vehicle emissions.

Children + Air Pollution

Children and young people are more vulnerable to air pollution than adults, primarily because their lungs and airways are not fully grown, they breathe faster, and they are closer in proximity to vehicle emissions due to their size. There are other reasons why many children are most exposed, with research pointing to in-utero exposure and air pollution levels around maternity units, hospitals, primary schools and nurseries [16].

Exposure to air pollution as a child increases the risk of developing asthma in childhood and later life, as well as chronic obstructive pulmonary disease (COPD) as an adult. If an unborn baby is exposed to high

levels of air pollution, this can also lead to premature birth, low birth weight and decreased brain growth in infancy.

A study in 2023 from researchers at the University of Edinburgh[17] found that exposure to air pollution at a young age increases the risk of early death. Researchers at the University of Dundee also found that children and young people may be more vulnerable to much lower levels of air pollution than adults, with data showing increased respiratory hospital admissions for under 16's due to nitrous oxides (NO and NO_2).

Asthma + Lung UK Scotland's polling of 1,000 adults in Scotland, performed independently by Opinion Matters, reveals that people are more concerned about air quality at schools (66.8%) than in the streets they live (53.5%). However, both results show a majority of people are concerned about air pollution than not.

The Key Players in Pollution – Emission Targets for Scotland

There are two key pollutants when considering the impact of road transport on health – nitrogen dioxide (NO_2) and fine particulate matter ($PM_{2.5}$).

Nitrogen dioxide (NO_2)	Fine particulate matter ($PM_{2.5}$)
What is it? A gas.	**What is it?** A mixture of solid particles and liquid droplets.
Where does it come from? It is produced by combustion processes, for example in an internal combustion engine. It can also be formed when nitric oxide reacts with certain gases in the atmosphere.	**Where does it come from?** A variety of causes – particles from combustion products, engine abrasion, brake pads, tyres. These can comprise of materials including soot, heavy metals, silica and rubber.
How bad is it? Exposure to NO_2 can, in the short term, cause inflammation of the airways and increase susceptibility to infection. It can exacerbate the symptoms of those already suffering from lung and heart conditions.	**How bad is it?** $PM_{2.5}$ is the air pollutant most harmful to human health. At this size, the particles can be inhaled deep into the lungs and can enter the bloodstream which then transports to other organs and parts of the body.

Current legal limits in Scotland are set by the Air Quality (Scotland) Regulations 2000, the Air Quality (Scotland) Amendment Regulations 2002 and the Air Quality (Scotland) Amendment Regulations 2016. Similar targets are set at EU level and are laid out in the European 2008 Ambient Air Quality Directive (2008/50/EC) and transposed into Scottish legislation by the Air Quality Standards (Scotland) Regulations 2010 .

Air Quality Standards for Scotland:

Pollutant	Concentration (Current legal limits)	Concentration (2021 WHO guidelines)	Measured as
Nitrogen Dioxide NO_2	40 μg/m^3	20 μg/m^3	Annual mean
Particulate Matter $PM_{2.5}$	10 μg/m^3	5 μg/m^3	Annual mean

The legal limits set out above follow the World Health Organisation (WHO) air quality guidelines set in 2005. These guidelines were updated by the WHO in September 2021[18] and halve the previous guidelines; however, they are not legally enforceable in Scotland. Scotland was the first part of the UK to set a legal target for fine particulate matter of 10 μg $m^{3.}$

A parliamentary question submitted by Mark Ruskell MSP (Scottish Greens) to the Scottish Government following the publication of the updated in September 2021 guidelines asked what its response was to the new air quality guidelines and what new targets were planned to meet the new WHO guidelines accordingly[19]. Responding for the Scottish Government, then Minister for Environment, Biodiversity and Land Reform, Màiri McAllan said that the Scottish Government welcomed, and was "carefully considering" the recommendations, adding that the "case for making any changes to air quality targets in Scotland to reflect the new guidelines will be assessed and taken forward during implementation of the Cleaner Air for Scotland 2 strategy."

In June 2023, then Cabinet Secretary for Transport, Net Zero and Just Transition, Màiri McAllan responded to the Scottish Parliament's Net Zero, Energy and Transport Committee's inquiry 'Air pollution in Scotland' to state that the Scottish Government was "currently considering the ambitious targets" in the new WHO guidelines "in the context of both CAFS2 and development of the next air quality strategy"[20].

The 2024 'Cleaner Air for Scotland 2 strategy: progress report' confirmed that the updated WHO guidelines will be considered as part of the review of CAFS2, however made it clear that adopting the 2021 guidelines will "have implications for the current system of LAQM [Local Air Quality Management]."

Asthma + Lung UK Scotland strongly encourages the Scottish Government to align its air quality ambitions with the 2021 World Health Organisation air quality guidelines. Meeting the new targets may prove challenging for the Scottish Government, local authorities and other public bodies. However, with no safe levels of air pollution, lower limits will better protect human health, particularly those living with lung conditions and those at risk from developing lung conditions.

Air pollution is the greatest environmental threat to public health.

2023 Performance of Local Authorities for $PM_{2.5}$ and NO_2

	PM2.5 Automatic monitoring sites meeting:		NO2 Automatic monitoring sites meeting:	
Local Authority	Scottish annual mean target	WHO 2021 guideline	Scottish annual mean target	WHO 2021 guideline
Aberdeen City[21]	6/6	0/6	6/6	3/6
Angus[22]	1/1	1/1	nil	nil
City of Edinburgh[23]	8/8	3/8	7/7	4/7
City of Glasgow[24]	9/9	2/9	9/9	4/9
Clackmannanshire[25]	1/1	0/1	1/1	1/1
Dumfries and Galloway[26]	nil	nil	1/1[i]	0/1[i]
Dundee City[27]	6/6	2/6	6/6	2/6
East Ayrshire[28]	1/1	0/1	1/1	1/1
East Dunbarton-shire[29]	4/4	1/4	4/4	4/4
East Lothian[30]	1/1	0/1	4/4	1/1
East Renfrewshire[31]	1/1	1/1	4/4	1/1
Falkirk[32]	7/7	3/7	7/7	6/7

Fife[33]	4/4	2/4	4/4	4/4
Highland[34]	1/1[ii]	1/1[ii]	4/4	2/4
Inverclyde[35]	1/1	1/1	1/1	1/1
Midlothian[36]	1/1	1/1	1/1	1/1
North Ayrshire[37]	1/1	0/1	1/1	1/1
North Lanarkshire[38]	9/9	9/9	9/9	9/9
Perth and Kinross[39]	4/4[iii]	2/4[iii]	3/3	2/3
Renfrewshire[40]	1/1	0/1	1/1[iv]	0/1[iv]
Scottish Borders[41]	nil	nil	1/1	1/1
Shetland Islands[42]	nil	nil	1/1	1/1
South Ayrshire[43]	2/2	0/2	2/2	2/2
South Lanarkshire[44]	8/8	5/8	7/7[v]	5/7[v]
Stirling[45]	1/1	0/1	1/1	1/1
West Dunbartonshire[46]	1/1	0/1	2/2	2/2
West Lothian[47]	3/3	2/3	3/3	1/3
Scotland total	82/82	35/82	85/85	60/85

N.B. No information for Aberdeenshire, Argyll and Bute, Moray, Nan Eilean Siar and Orkney Islands. The following sites have been excluded from the above data:

[i] The Eskdalemuir site had <50% data capture.

[ii] The Strath Viach site had <50% data capture.

[iii] The Perth Glasgow Road site has <50% data capture.

[iv] The Renfrew Cockels Loan site had <50% data capture.

[v] The Hamilton site had <50% data capture.

There are 100 automatic monitoring sites across Scotland, yet not all are recording emission levels for NO_2 and $PM_{2.5}$. It should be noted that emissions recorded at these sites come from sources not wholly attributable to transport.

With the exception of the years impacted by COVID-19 lockdowns, 2022 was the first year that the monitoring sites showed Scotland did not breach its legal air quality limits. It is encouraging that the data in the previous table shows this continued into 2023. However, using the 2021 WHO guidelines for $PM_{2.5}$ and NO_2, only four local authorities would meet these tougher limits – East Renfrewshire, Inverclyde, Midlothian, and North Lanarkshire. For 2023, 35 of the 82 monitoring sites would meet the 2021 limits for $PM_{2.5}$, and 60 of the 85 would meet the NO_2 limits.

Environmental Standards Scotland (ESS), the environmental watchdog created to fulfil governance gaps in environmental law after the UK left the EU, issued an Air Quality Improvement Report[48] to the Scottish Government in 2022 relating to nitrogen dioxide levels. Although there has been progress over the lifetime of the Scottish Parliament, the Improvement Report said there was a "slow, incremental, improvement in air quality".

Of the six recommendations for the Scottish Government, one of these recommendations focused on air quality monitoring sites and their locations:

That the Scottish Government ensures that its ongoing review of data provision scrutinises the protocols for the siting of monitoring sites, with a view to establishing whether they provide a sufficiently comprehensive picture of the state of air quality, particularly in and around our major cities. Specific focus should be placed on areas where vulnerable groups are

The Net Zero, Energy and Transport Committee, in its 'Air Quality in Scotland'[49] inquiry, heard from stakeholders that a more robust system of monitoring was required, with additional calls for monitoring sites to be placed near vulnerable groups, such as schools and hospitals, backing ESS calls in the recommendations. ESS also questioned if the existing network of monitoring sites was "comprehensive enough to detect poor air quality" in Scotland.

Asthma + Lung UK Scotland believes there should be more automatic monitoring sites across Scotland, especially at schools, maternity units, hospitals and care homes. Live data and reporting should then be used to alert GP surgeries, hospitals and schools of periods of higher air pollution to protect the lungs and health of vulnerable people, including those with existing lung conditions. These alerts should also be communicated to people with existing conditions so that they can take action to limit their own vehicle use within close proximity to these locations and prepare for any exacerbations of lung conditions, like asthma and COPD.

Public Transport - Rail

The public rail network in Scotland is run by ScotRail Trains Limited, with cross-border services operated by other companies. On 1 April 2022, ScotRail services were transferred to the new public body ScotRail Trains Limited, which is a publicly owned company controlled by the Scottish Government[50].

The renationalisation of ScotRail followed more than 25 years of private control. During the quarter-century of privatisation, many argued that the quality of services was poor and that costs were pricing people away from public transport.

It is widely accepted that rail is a more environmentally friendly way to travel, but whether it is a healthier way to travel depends on the route and the train. Diesel trains emit a number of pollutants that are harmful to human health and are the least energy efficient method of rail use.

By 2035, the Scottish Government aims to decarbonise the rail network by electrifying more of Scotland railway and using other sources of green technology, such as battery power and hydrogen[51]. One of the identified benefits of this is to improve air quality. Rail electrification is more energy efficient and reduces emissions, like carbon dioxide, nitrogen dioxide and particulate matter.

A Freedom of Information request to ScotRail found that diesel trains account for a third of all rail services run by the operator and diesel trains account for 41% of the total train fleet in Scotland. Between 2021/22 and 2023/24, the total number of services increased by 14% but the number of diesel services increased by 15%, with 202,634 services in 2021/22 and 234,040 services in 2023/24. This could be because of rail services continuing to recover from the coronavirus pandemic but illustrates that more polluting services are in operation, despite the Scottish Government's ambition to decarbonise Scotland's railways.

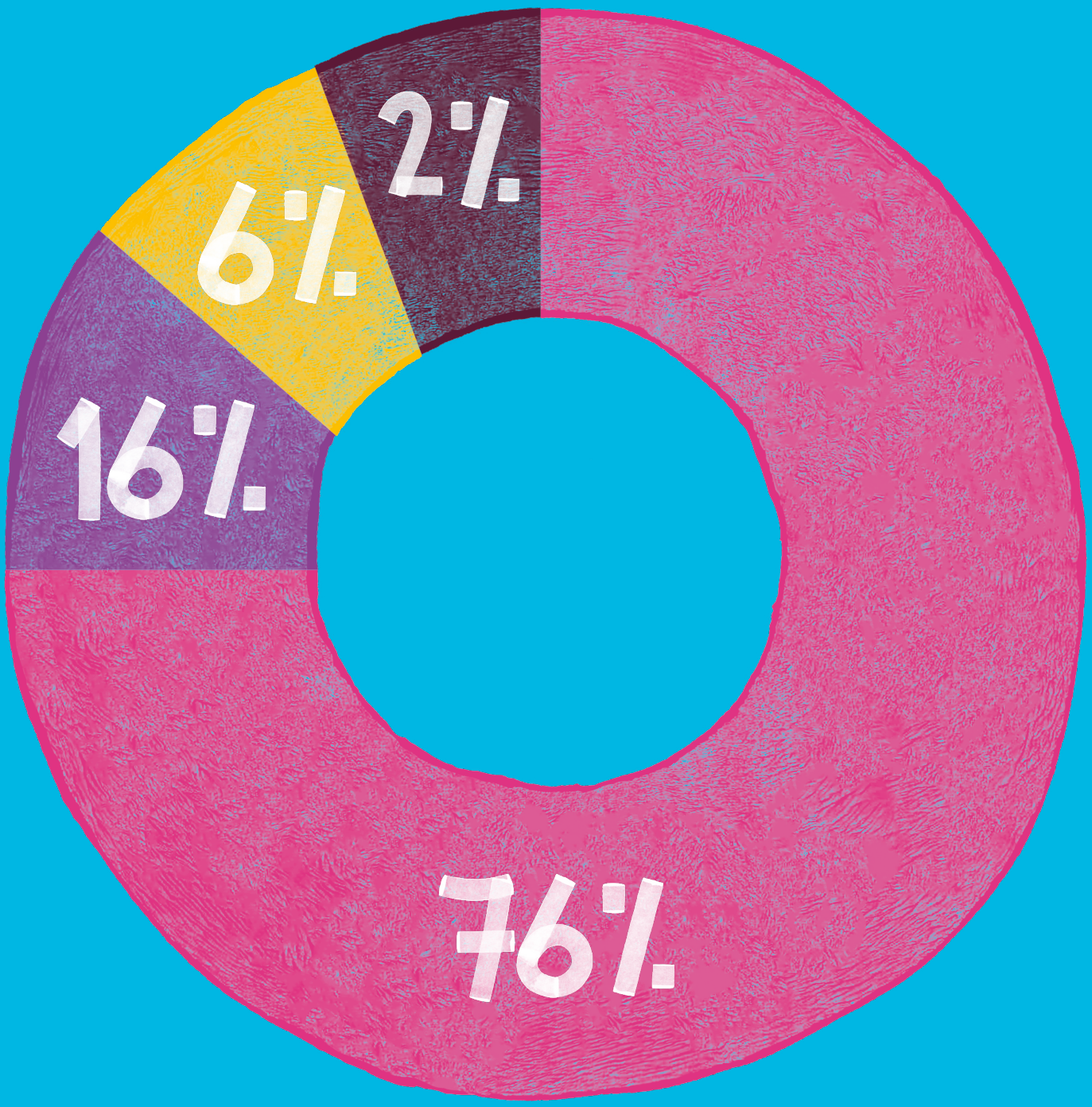
Passenger numbers on rail are smaller than those using bus as their main method of passenger transport. This has been a constant in Scottish public transport passenger statistics. The latest publication of the Scottish Transport Passenger Statistics[52] shows that in 2022/23, there were 63.7 million journeys on ScotRail. Although the number of journeys is up 36% on 2021/22 at 46.7 million, they are still 34% lower than pre-pandemic journeys of 96.7 million. All forms of passenger transport show a decrease between 2019 and 2023, with the exception of cycling.

Asthma + Lung UK Scotland polling in early 2024, conducted by Opinion Matters, shows that 57% of people are concerned about being able to afford public transport with the rising costs of living. The polling also revealed that 50% said they are more likely to use their own transport for journeys into city centres than public transport, with 30% more likely to use public transport and 20% undecided.

It is imperative that the Scottish Government finds solutions within its powers to make public transport more affordable and scrapping peak fares on ScotRail can support the modal shift required to reduce emissions that harm public health and the environment. The scrapping of the peak fares trial is due to end on 27 September 2024. On 20 August 2024, the Scottish Government announced the trial will end with peak fares returning and the cost of a peak fare set to increase[53]. This move will do little to encourage the modal shift from car to rail and may result in some people returning to using their cars while commuting. Some new financial incentives will be offered, such as a discount on annual season tickets and two free journeys on a ten-journey flexipass. However, the news was met with criticism across Scotland, with the Scottish Trade Union Congress (STUC) labelling the decision as "a short-sighted, regressive decision...which makes a mockery of [Scottish Government] sustainable travel and net-zero targets"[54].

Asthma + Lung UK Scotland welcomed the trial to remove peak fares, and we want peak fares to be axed completely beyond the trial. The re-introduction of peak fares on ScotRail goes against the ambitions of the Scottish Government to have the cleanest air and reduce car kilometres by 20% by 2030.

Passenger journeys 2022-2023



Bus travel

ScotRail

Air travel

Ferry travel

Public Transport – Bus

Bus services remain the primary method of public transport in Scotland, with 301 million passenger journeys in 2022/23, totalling 76% of all public transport journeys in Scotland. Travelling by bus is often more affordable than other forms of public transport, more accessible and more connected to local communities. Bus patronage is much lower than pre-pandemic levels with 120 million fewer journeys than in 2013/14[55].

During the pandemic, Asthma + Lung UK Scotland commissioned Opinion Matters for views on public transport. Respondents were asked if they felt safer using their own car than public transport due to COVID-19, and approximately two-thirds (62.3%) responded that they felt safer in their own car. Thankfully, those numbers decreased year-on-year as restrictions eased, transport options increased and ultimately, the World Health Organisation declared an end to the pandemic [56]. For people with lung conditions, using public transport was a risk due to COVID-19, but it can be dangerous for some due to emission levels near bus stops and train stations.

Bus travel has become a greener form of travelling in recent years due to investment for the Low Emissions Zones in Aberdeen, Dundee, Edinburgh, and Glasgow . Yet there are anecdotal reports that older, more polluting buses are being removed from city routes and used more in other towns and less urban routes. Asthma + Lung UK Scotland believes that this is something the Scottish Government, through Transport Scotland, should be monitoring so that air pollution is not being displaced from one busy urban area to smaller urban and rural areas.

Around 84% of all bus journeys in 2022/23 were in urban areas and the reality for many in rural areas is that bus travel is far less accessible than private car use. Asthma + Lung UK Scotland questioned 110 of our supporters in summer 2024, the vast majority living with a lung condition like asthma and/or COPD, on a series of topics around public transport, private car use and electric vehicle options. When asked how often they use a bus, most said that they do so less than once a week (38%), with a further 36% saying less than once a month. The main reasons for this limited bus use revolve around infrequent services, length of journeys required and crucially because of their lung condition or other health concerns. Actions must be taken to make bus travel more accessible for people with lung conditions, and we note that many with lung conditions like COPD, bronchiectasis, or idiopathic pulmonary fibrosis (IPF) will have concessionary cards either due to age or disability linked to the severity of their conditions.

Local authorities have had the power to run their own local bus services since 2022, after 37 years of being prohibited from doing so under the Transport Act 1985. The Transport (Scotland) Act 2019 has created more opportunities for better public transport, and it is time that local authorities rose to this challenge to create better services for underserved communities by fully utilising this power, alongside the new franchising model and working with transport authorities to develop purposeful Bus Services Improvement Partnerships. Despite the financial challenges, Asthma + Lung UK Scotland believes that any delays to improve the bus network would be an opportunity missed. A third of Scottish respondents (32%) to the *Life with a Lung Condition 2024* survey would like a more reliable public transport system as a way of reducing air pollution.

Tailpipe emissions from bus travel are decreasing, which can be accredited to advancements in greener technologies and investment by bus operators and national and local government. The most recent example being a £41 million grant to deliver 252 new zero-emission buses and coaches for eight operators across Scotland, along with charging infrastructure, invested by the Scottish Zero Emissions Bus Challenge Fund (ScotZEB2)[57].

The National Atmospheric Emissions Inventory shows lower levels of nitrous oxides and particulate matter from exhausts emissions in 2021 than in 2011, yet the statistics do not show a similar decrease in emissions from road abrasion and tyre and brake wear[58]. There have been vast improvements in public transport emissions since 1990 and the Scottish Government and local authorities must continue to work to reduce emissions levels from buses further.

Ultra-Low Emissions Vehicles (ULEV) and the Charging Network

Private car use has long been the largest contributor of NO_2 emissions in Scotland and statistics from March 2023 show that petrol and diesel vehicles make up 94% of all vehicles driven, with hybrid and fully electric vehicles at 5.6%[59,60].

Ultra-low emissions vehicles (ULEV) is the term used to describe any vehicle that uses low carbon technologies and emits less than 75g of CO2/km from the tailpipe. ULEVs range from pure electric vehicles and fuel cell electric vehicles, to plug-in hybrids and extended range electric vehicles.

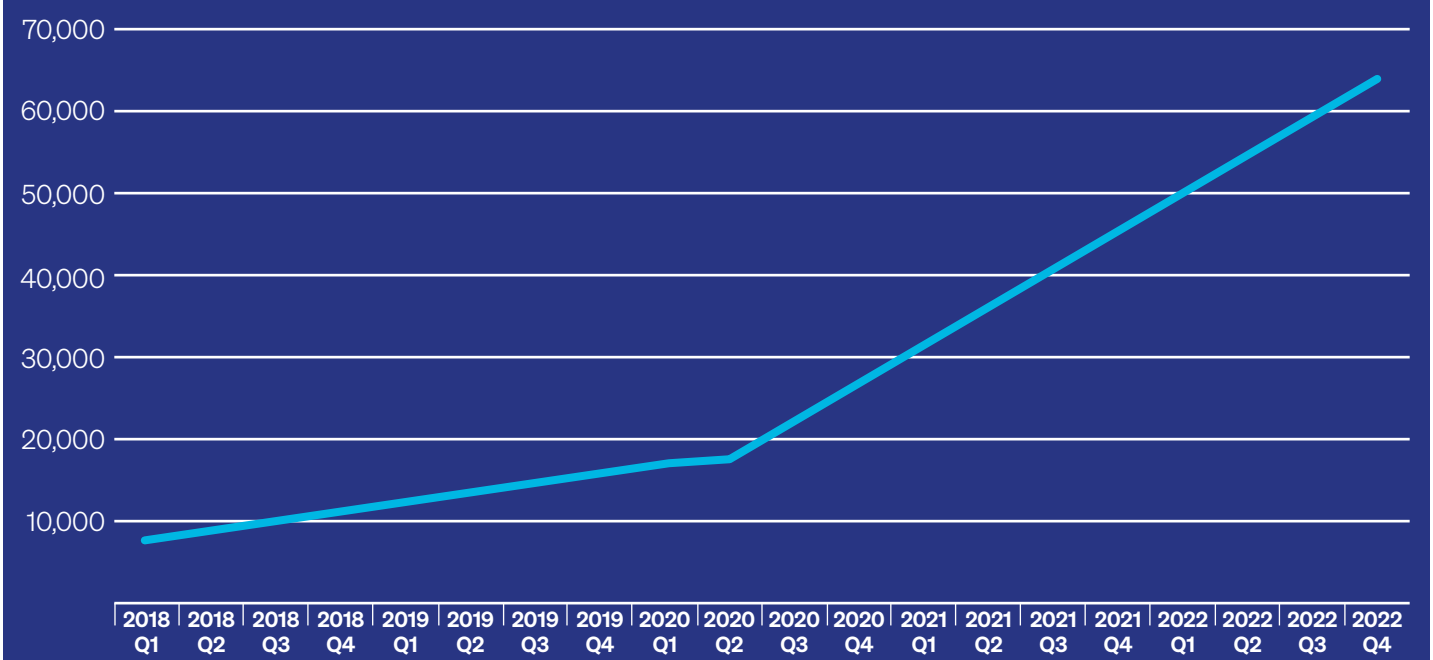
At the end of 2022, 2.1% of vehicles licensed in Scotland were ULEV (64,447), which was up from 1.4% at the end of 2021 (43,493). ULEV new registrations in 2022 accounted for over a third of all ULEV's licensed in Scotland, 21,980 of 64,447.

The sale of ultra-low emissions vehicles has been increasing year-on-year in Scotland and across the UK. However, manufacturers and traders reported slowing sales for electric vehicles in Spring 2024, calling on government to do more to incentivise the purchase of ultra-low emissions vehicles.

Purchasing a ULEV is not an easy option for many. The average cost for purchasing a new electric vehicle is £59,865, with the cheapest being just under £15,000 and the most expensive models costing as much as £200,000[61]. The average earnings for a full-time worker in Scotland in 2023 was around £35,500[62]. Although the costs of running electric vehicles are greatly reduced compared to petrol and diesel cars, far too many people are priced out of the new electric vehicle market. The market for second-hand vehicles is too small, creating another barrier for hard-pressed families and drivers looking to switch to an ULEVs.

Electric vehicles improve local air quality and reduce point-of-use emissions. However, they still produce $PM_{2.5}$ due to road, brake and tyre wear, and when considering the whole life cycle of an electric

Ultra low emission vehicles licenced in Scotland - growth from 2018 Q1 to 2022 Q4



Source: Scottish Transport Statistics 2023

vehicle and its parts, they are not wholly a net-zero product. Secondary particulate matter will remain an undesirable consequence of road transport for years to come, even when countries meet their net zero and decarbonisation targets. This is one of the many reasons why it is important for the Scottish Government to meet its ambition to reduce car kilometres by 20% by 2030. Efforts towards greener transport and a reduction in overall car use must be made in tandem.

The current Scottish Government grants and funding for encouraging the uptake of electric vehicle ownership is inadequate. The funding available is:

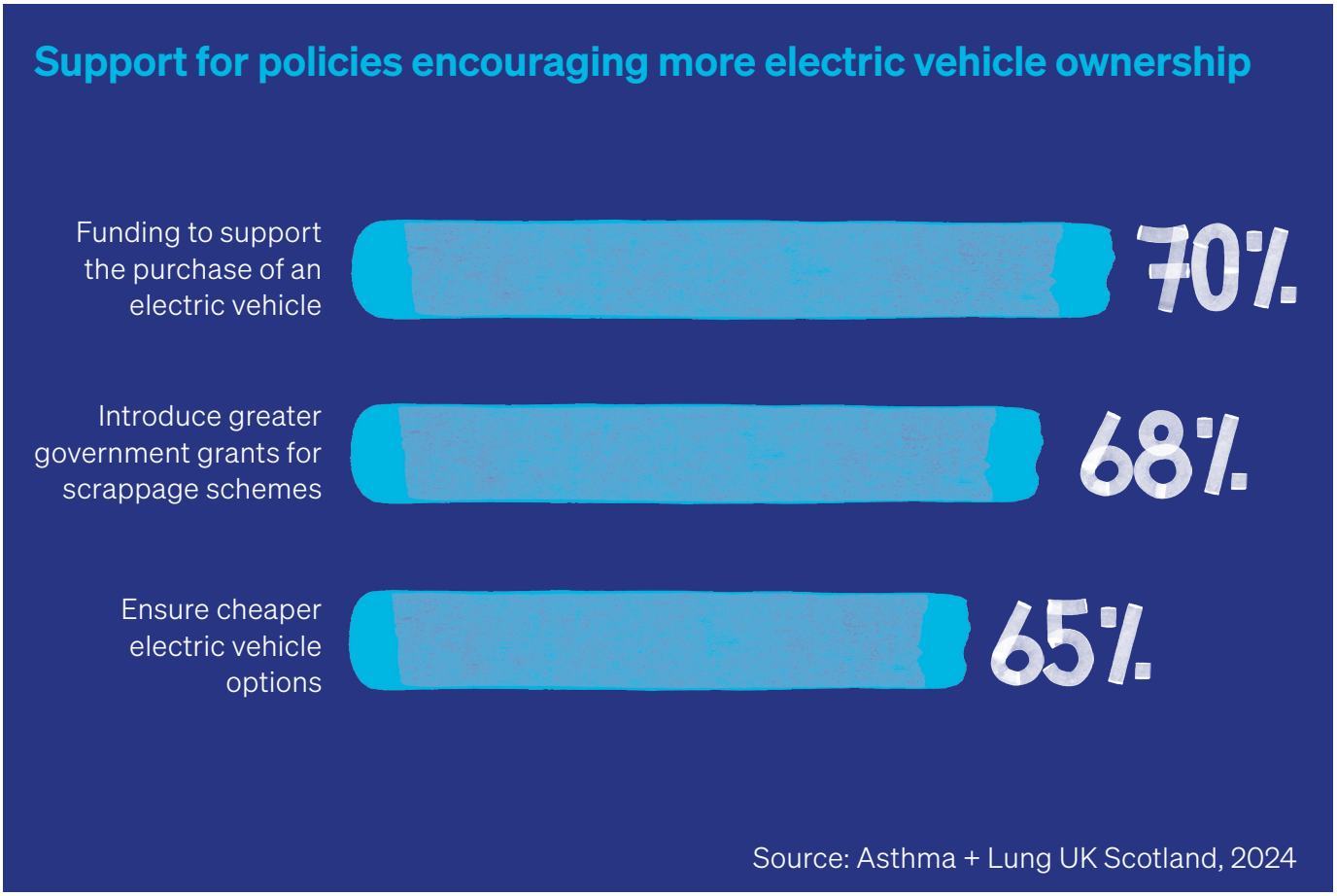
- The **Used Electric Vehicle Loan** can help purchase a used vehicle with maximum loan value of £30,000. This is an interest-free loan to be paid back over five years, covering electric moped, motorcycles, cars, and vans.

- The **Domestic ChargePoint Funding** offers up to £400 towards buying and installing home chargepoints if the applicant is either a rural and remote owner or a used electric vehicle owner.

As discussed previously, the costs of purchasing new electric vehicles price many out of the market and the used electric vehicle market is relatively small compared to the used petrol and diesel market. If the Scottish Government seeks to phase out the need for new petrol and diesel cars by 2030[63], more support is needed for drivers to purchase ULEVs.

It is worth noting that the Scottish government target to phase out new diesel and vehicle sales is unsettled due to former UK government delaying the UK phase-out until 2035. This announcement has created concern that the Scottish Government does not have the power to ban the sale of diesel and electric cars. The phrasing of the ambition to phase out the "need for" new petrol and diesel cars adds additional uncertainty as to what the Scottish Government will do if the target for 2030 is not met.

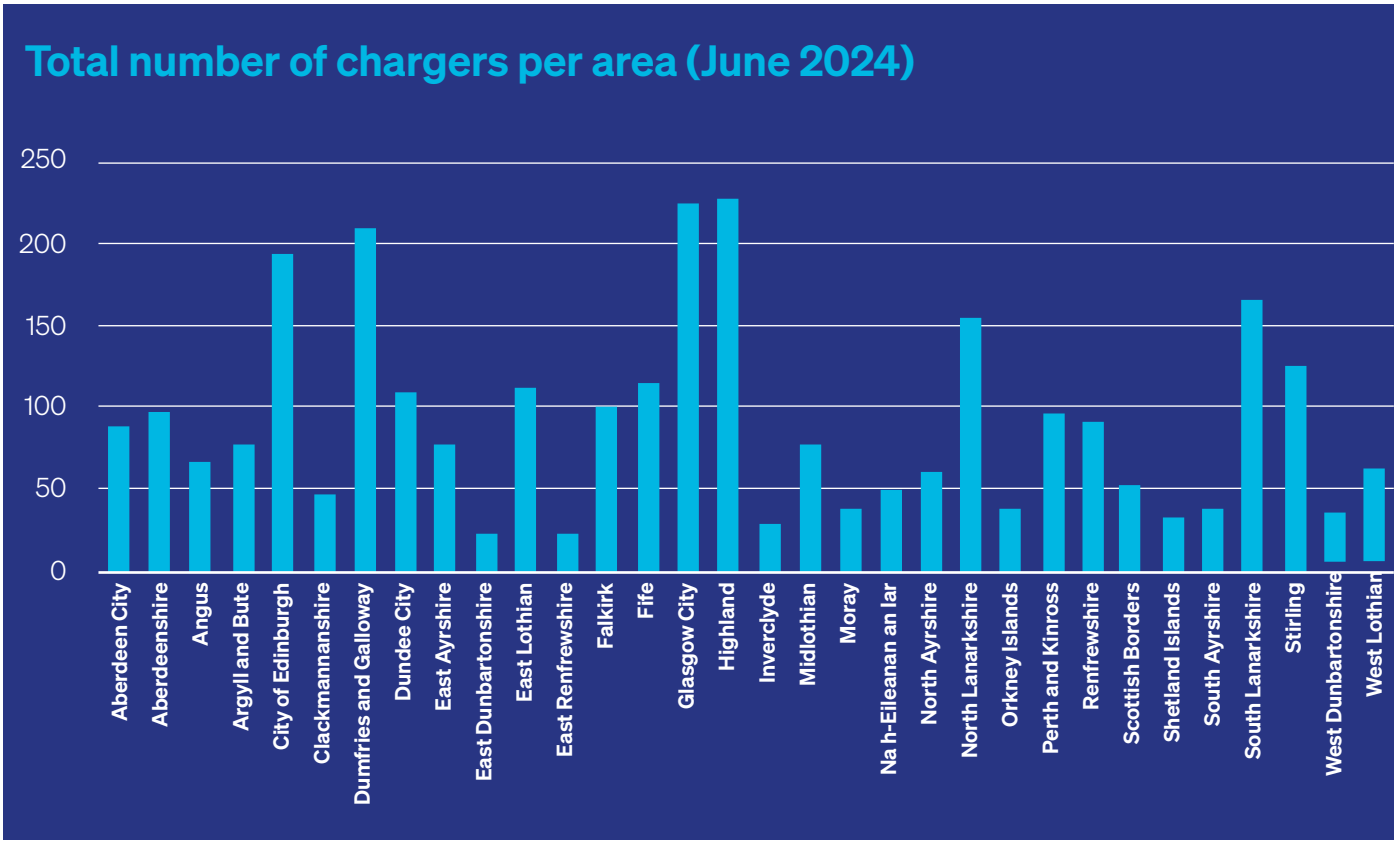
Asthma + Lung UK Scotland would like to see greater financial incentives for switching to ultra-low emissions vehicles. We asked 110 people with lung conditions what levels of incentive they would require

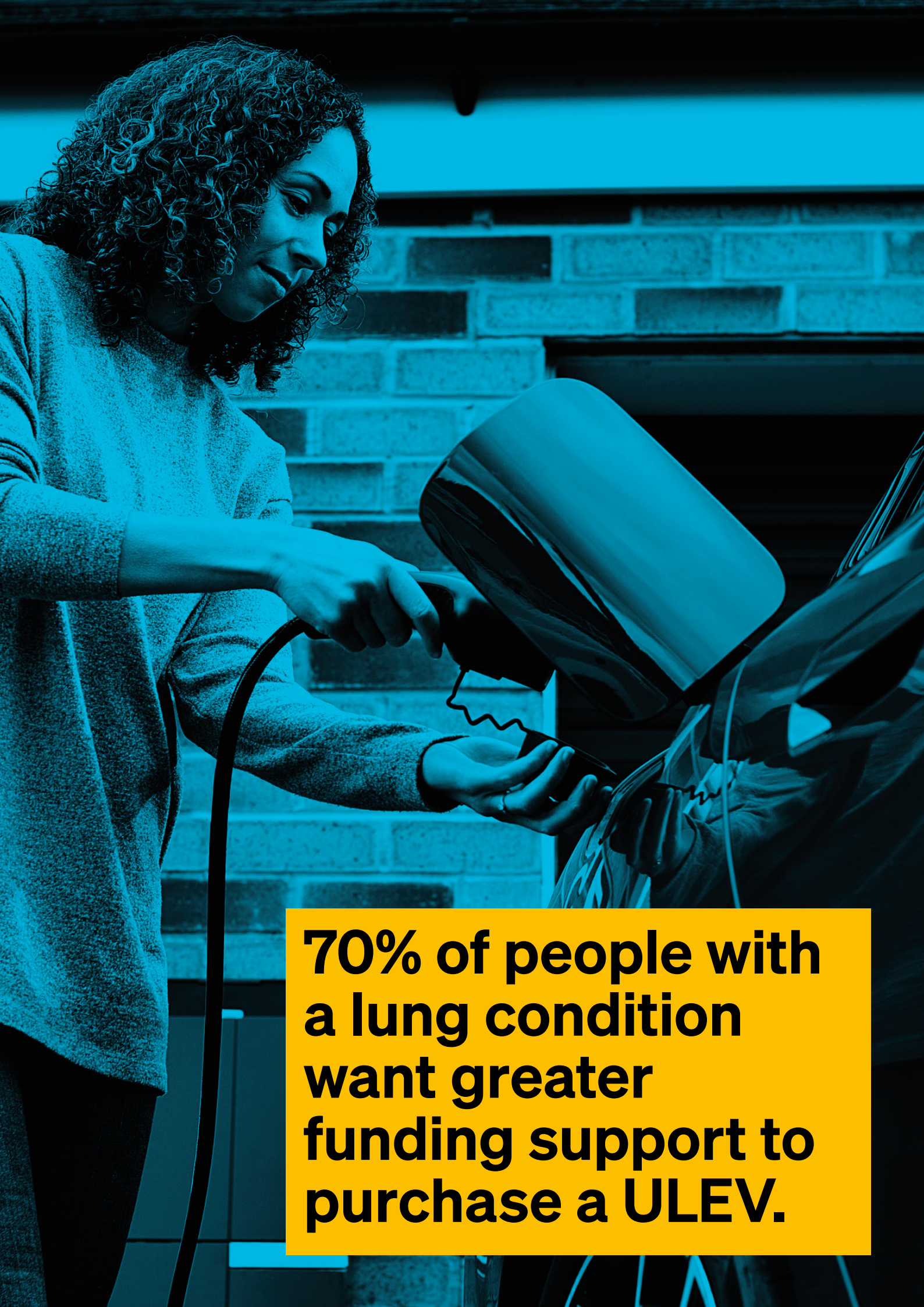


to consider scrapping their current petrol or diesel car and switching to an electric vehicle. Of those who responded, 57% said it would take over £5,000 of funding to switch, with 14% saying up to £5,000, 4% saying up to £3,000 and 7% saying up to £2,000 of incentives needed.

Creating the infrastructure for electric vehicle charging is as crucial as encouraging the uptake of electric vehicle ownership. The Scottish Government and local authorities have invested millions of pounds in public charging points across Scotland and the most recent data from ChargePlace Scotland shows that in June 2024, there were 2,876 public charging access points, up from 2,487 in July 2023 (N.B. June 2023 figures exclude Midlothian).

Using this data, we can also see that the number of charging sessions falls by 36.7% in less than 12 months, from 174,033 sessions in July 2023 to 109,989 in June 2024. This is an unexpected drop given the 15% increase in the total number of charging points. On average there were thirty-eight charging sessions per charger in June 2024, down from seventy sessions per charger in July 2023. Asthma + Lung UK Scotland calls on Transport Scotland and the Scottish Government to audit public charger access points and find reasons why there has been a drop while ULEV ownership increases.



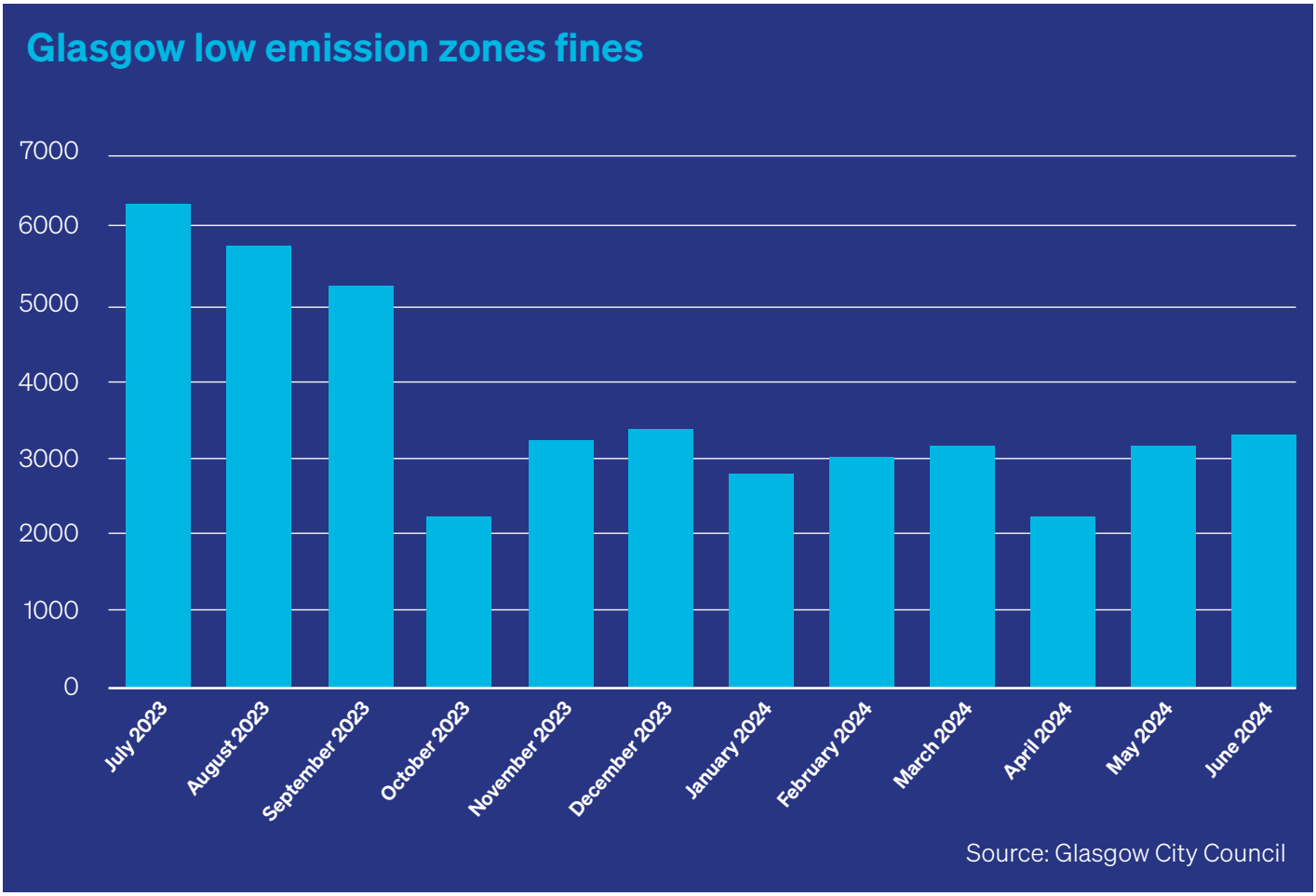

70% of people with a lung condition want greater funding support to purchase a ULEV.

Low Emission Zones

In 2022, the city councils of Aberdeen, Dundee, Edinburgh and Glasgow created Low Emission Zones (LEZ) for all vehicles to reduce the levels of harmful emissions in the city centres. Each council consulted on their proposals in the summer/autumn of 2021, with Asthma + Lung UK Scotland responding to each, calling for the shortest grace period of one year and the largest possible boundaries for each zone. To its credit, only Glasgow City Council opted for the one-year grace period before enforcement began in June 2023. The introduction brought legal challenges and widespread misinformation online. Enforcement for Aberdeen, Dundee and Edinburgh began in May and June 2024 with these councils utilising the powers of the Transport (Scotland) Act 2019 and subsequent Low Emission Zones (Emissions Standards, Exemptions and Enforcement) (Scotland) Regulations 2021[64] to have the longest grace period.

It is estimated that only 10% of all vehicles in Scotland fail to meet the criteria for entering Low Emission Zones. All zero emissions vehicles that meet the LEZ emissions standards are exempt. The minimum criteria are:

- Euro 4 for petrol cars and vans
- Euro 6 for diesel cars and vans
- Euro 6 for petrol and diesel taxis and private hire vehicles
- Euro VI for buses, coaches, and HGVs.



Glasgow has well-documented success for the LEZ, as bus and coach travel restrictions were introduced on 31 December 2018. This initial phase of the LEZ saw reductions in emissions from bus transport that brought Glasgow to under legal air pollution limits. It is the desire of Asthma + Lung UK Scotland to see further progress now that enforcement in Glasgow has extended to all vehicles over the last year and in all LEZs in Scotland.

Low Emissions Zones are one of a number of methods to tackle toxic air and will not work in isolation. They can reduce hospital admissions for respiratory conditions like asthma and COPD, while making city centres a cleaner and healthier place for those living, working and visiting. Whilst we await analysis of the emission reduction from LEZs in Scotland, initial evidence shows increasing compliance in Glasgow with the number of fines issued between July 2023 and June 2024 almost halving. However, the figures also show that the level of fines remained consistent between November 2023 and June 2024[65].

The Ultra Low Emission Zone (ULEZ) in London has shown that bold ambitions produce positive results. Academics at the University of Bath[66] found significant reductions in pollution and improvements in public health as a result of the ULEZ. The expansion of the ULEZ has been controversial but again shows that being ambitious can have net gains for public health and the environment, with time yet to tell what further improvements will be witnessed in Greater London.

Asthma + Lung UK Scotland would like the existing Low Emission Zones to be expanded in due course, and new boundaries created in other cities and large towns in Scotland, for the benefit of those working, living, and visiting popular destinations in Scotland. Whilst most cities and urban areas are meeting current air quality limits, many are breaching the WHO 2021 guidelines. We therefore call on the Scottish Government to create new Low Emission Zones and expand the existing boundaries in Aberdeen, Dundee, Edinburgh and Glasgow by 2030.

Vehicle Idling

Running a vehicle engine unnecessarily whilst stationary is a nuisance, harming the lungs and health of children and other vulnerable groups and adding to pollution on streets across Scotland. Vehicle idling is an offence against the Road Traffic (Vehicle Emissions) (Fixed Penalty) (Scotland) Regulation 2003 and carries with it a £20 fixed penalty notice.

The Scottish Government's guidance to local authorities is that drivers should only be issued with a fixed penalty notice as a last resort, i.e. where a driver refuses to switch off their engine after being advised to do so. This soft touch approach focuses on offering guidance and warnings. Some councils have opted not to adopt the enforcement power, while some have created a partnership to campaign on education and awareness[67].

It has been claimed that one minute of idling fills up to 150 balloons containing harmful pollutants such as nitrous oxides, $PM_{2.5}$ and cyanide[68]. There can be no doubt that an idling vehicle emits harmful toxins just as driving does, and there is a common misconception that turning the engine off and on again uses more fuel than idling, thus wasting fuel at a time of high fuel costs. In reality, idling for ten seconds uses more fuel than switching the engine off and on.

Most concerningly, schools are idling hotspots. Supporters of Asthma + Lung UK Scotland tell us that congested school gates and surrounding streets are often areas where parents leave engines running while waiting for their children, regardless of the summer or winter weather. It is these children that idling poses a greater risk to. Adding to the fact that children are closer to tailpipe emissions given their height, they also take more breaths than adults and their lungs are still developing, putting them at greater exposure.

Although idling is an offence, it is not fully enforced. Our 2024 polling through Opinion Matters shows resounding support for greater enforcement, with 73% of respondents backing vehicle idling bans at schools, despite the laws already in place. For this report, 87% of people with a lung condition told us that they are concerned about how often other drivers leave their engine running when parked and 78% are concerned about the level of enforcement of vehicle idling where they live.

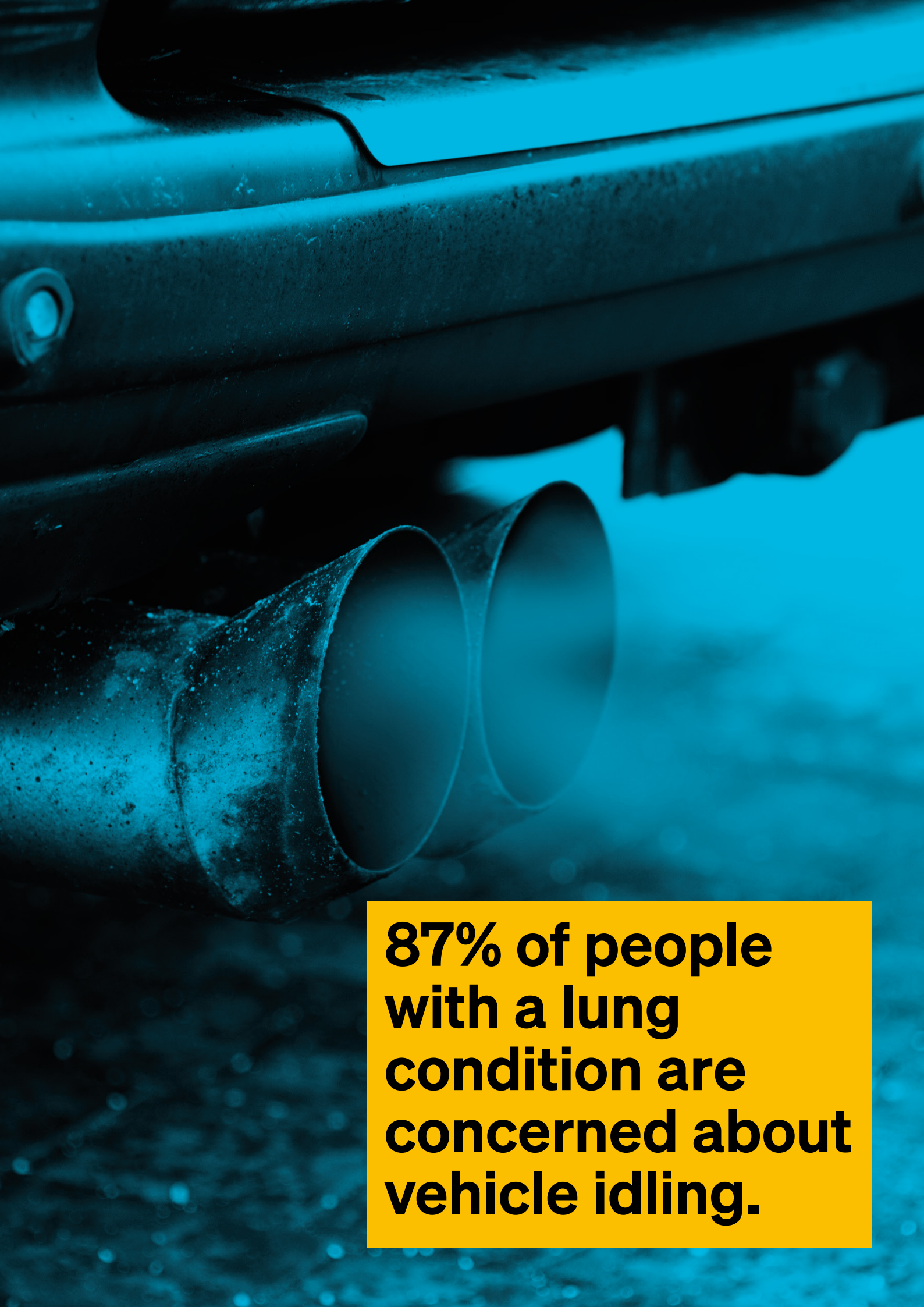
Asthma + Lung UK Scotland submitted Freedom of Information/Environmental Information Regulations requests to all local authorities in Scotland asking how many complaints were received regarding idling, how many fixed penalty notices were issued and what other enforcement was carried out between January 2021 and May 2024. The responses show that during this period:

- twenty councils across Scotland received 1,158 complaints about vehicle idling, with the number of complaints increasing each year
- only one fixed penalty notice was issued by South Lanarkshire Council in 2022
- other forms of enforcement, such as proactive checks, warnings, advice and guidance amounted to 3,958 cases where information was recorded.

Several councils responded that they either do not enforce the powers they have, or that they did not adopt the powers. One council did not reply, and another requested a fee for this information.

West Lothian, East Lothian, Midlothian, Falkirk, and Stirling Councils formed the East Central Scotland Vehicle Emissions Partnership (VEP) in 2004 with Scottish Government funding. The VEP confirmed that none of the members issued fixed penalties for idling, instead choosing to focus on campaigning for education and awareness.

Asthma + Lung UK Scotland believes that vehicle idling should be banned nationwide and fully enforceable across Scotland, especially at schools, care homes, hospitals and locations where vulnerable groups are exposed. We would like to see the Scottish Government update its guidance to reflect public opinion that vehicle idling is a nuisance, harmful to public health and the environment by ensuring that all councils enforce idling bans. We believe that the £20 fixed penalty notice is not a strong deterrent. This should be increased in line with other fixed penalty notices for motoring and environmental offences.



87% of people with a lung condition are concerned about vehicle idling.

Conclusions + Recommendations

Air pollution is the greatest environmental threat to public health. There is no safe level of air pollution, no matter the source.

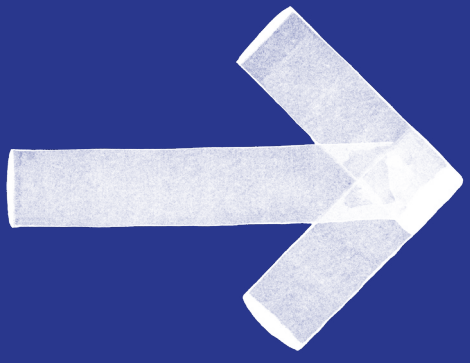
Transport is crucial to the economy and the daily lives of people, no matter where they live. Unfortunately, it is also a key source of emissions that harms public health and the environment. Up to 2,700 early deaths can be attributed to poor air quality in Scotland, and hundreds of thousands more across the nation face lifelong, chronic conditions caused and exacerbated by toxic air.

Through the use of surveys, polling and questionnaires, Asthma + Lung UK Scotland asked people with lung conditions, like asthma and COPD, and those without for their thoughts and ideas for improving Scotland's air quality and transport network. These views have supported the research carried out showing that Scotland can do so much more to reduce emissions from transport, even though great achievements have been made in recent years, like meeting legal limits for nitrogen dioxide and particulate matter in 2022 for the first time and implementing low emission zones.

Achieving legal air pollution limits in 2022, the first year doing so outside of the pandemic years, backs up the argument that improvements have been made for all sources of emissions. Yet the air quality monitoring network is limited to only 100 automatic monitoring sites, although complemented with other means of monitoring. We have found in this report that the legal limits need updating to align with the World Health Organisation 2021 guidelines. However, using the data from 2023, we found that these new limits would be breached.

Public transport has a vital role to play in emissions reductions and the modal shift from private car use but needs greater support and investment from national and local government. Electric vehicles and associated infrastructure also support the shift away from polluting fuels like diesel and petrol yet remain so costly and unaffordable for many. Greater incentives are required to increase the share of electric vehicles on our streets to phase out the need for new petrol and diesel and reduce car kilometres by 20% by 2030.

Using the views of people with lung conditions and evidence and statistics from a wide range of sources, Asthma + Lung UK Scotland sets out the following recommendations for the Scottish Government and civil servants, political parties, local authorities and other policymakers.



Recommendation 1

Legislate to adopt the 2021 World Health Organisation (WHO) air quality guidelines as legal targets.

Recommendation 2

Increase the automatic monitoring network across Scotland so that every local authority is accounted for, prioritising areas around schools, hospitals, maternity units and care homes.

Recommendation 3

Improve the alert system using greater monitoring under recommendation 2 so that people with respiratory conditions and other existing health conditions can take action to protect their health during periods of higher air pollution, and GPs, hospitals, schools and care homes are alerted to prepare for exacerbations of people with lung conditions.

Recommendation 4

Scrap peak rail fares beyond the trial ending on 27 September 2024, creating the conditions for more affordable rail travel.

Recommendation 5

Accelerate the roll out of electric trains and buses and reduce the proportion of routes using diesel vehicles.

Recommendation

Utilise the powers of the Transport (Scotland) Act 2019 to support bus travel in underserved communities and create council-run services that are more affordable and accessible.

Recommendation

Offer greater incentives of £5,000 or more to purchase new ultra-low emissions vehicles to encourage the phasing out of petrol and diesel vehicle sales.

Recommendation

Audit the electric vehicle charging network annually to find gaps in supply and demand, reporting when and where anomalies are found in charging point data.

Recommendation

Implement Low Emission Zones (LEZ) in further cities and large towns in Scotland and expand the existing LEZ boundaries in Glasgow, Edinburgh, Aberdeen and Dundee by 2030.

Recommendation

Implement and enforce the ban on vehicle idling across Scotland and increase the fixed penalty notice to act as a greater deterrent.

Methodology

Asthma + Lung UK Scotland used the references below to collect evidence for this report. We used the following surveys and polls of people living with and without lung conditions across Scotland:

1. Life with a Lung Condition Survey 2024, conducted by Asthma + Lung UK between January and March 2024. Sample: 1,231 responses in Scotland.
2. The research was conducted by Opinion Matters, among a sample of 1,000 Adults aged 16+ in Scotland. The data was collected between 05.03.24 - 14.03.24. Opinion Matters abides by and employs members of the Market Research Society and follows the MRS code of conduct and ESOMAR principles. Opinion Matters is also a member of the British Polling Council.
3. Scotland Transport Survey and Questionnaire, conducted by Asthma + Lung UK in June and July 2024. Sample: 110 responses in Scotland.

Report authored by Gareth Brown, Policy and Public Affairs Officer for Asthma + Lung UK Scotland.

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