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Scottish Transport Statistics 2025

Transport Environment

Contents

Introduction

This chapter provides information about the impact of transport on certain aspects of the environment with a focus on greenhouse gas emissions and air quality. Statistics include atmospheric pollutants and emissions of greenhouse gases by types of transport as well as details of emissions levels of road vehicles. Data from other chapters within Scottish Transport Statistics are referred to in the analysis.

Key points

- **In 2023 (the most recent year available), transport (including international shipping and aviation) accounted for 33% of Scotland's greenhouse gas emissions under the definition set out in the Climate Change Scotland Act.**
- **Road transport made up 68% of transport greenhouse gas emissions.**
- **In 2024 there were 31,141 Ultra Low Emission Vehicles registered in Scotland for the first time – 18% up on 2023.**
- **In 2023, transport accounted for 68% of emissions of oxides of nitrogen, 24% of particulate matter PM_{10} and 29% of particulate matter $PM_{2.5}$. As at 13 November 2025, there were 20 active Air Quality Management Areas related to these pollutants.**

Main Points

Air pollutant emissions

The main pollutants of current concern in Scotland are:

- Nitrogen oxides (NO_x);
- Particulate matter (PM10 and PM2.5);
- Sulphur dioxide (SO2);
- Non-methane volatile organic compounds (NMVOCs);
- Ground-level ozone (O3); and
- Ammonia (NH3).

Of these pollutants, transport is a significant contributor to emissions of oxides of nitrogen and particulate matter. Transport is also linked to ground level ozone, which is a secondary pollutant produced by chemical reactions involving oxides of nitrogen.

Historically, transport was also a major contributor to emissions of lead and non-methane volatile organic compounds (NMVOCs). The significant decline in lead emissions (97% since 1990) has been mainly driven by the progressive phasing out of leaded petrol. The lead content of petrol was reduced from around 0.34 g/l to 0.143 g/l in 1986. From 1987, sales of unleaded petrol increased, particularly as a result of the increased use of cars fitted with three-way catalysts. Leaded petrol was phased out from general sale at the end of 1999. For NMVOCs, transport sector emissions declined significantly during the 1990s due to the increased use of catalytic converters and fuel switching from petrol to diesel cars. (Chart 13.1a – note that the jump observed in 2005 is due to a revision of the figures for 2005 onwards, as detailed in the notes and definitions section 13.3.6).

Emissions of nitrogen oxides (NOx) were estimated to be 68kt in 2023 of which transport accounted for 65%. Since 1990, transport emissions have declined by 71%. Transport emissions have declined due to a number of reasons including the requirement for new petrol cars to be fitted with three-way catalysts since 1989 and, in more recent years, “Euro standards” for new cars have driven a reduction in emissions, although studies show that the diesel Euro 5 cars have not performed as well as expected. Since 2008, there has been a general reduction in the emissions from passenger cars, mainly driven by improvement in catalyst repair rates. In 2023, diesel cars and light goods vehicles (LGVs) accounted for 30% of NOx emissions from transport compared with less than 2% in 1990 (Table 13.1a).

Emissions of PM10 were estimated to be 10kt in 2023, of which transport accounted for 24%. Since 1990, transport emissions have declined by 66%. For particulate matter, the main source of transport emissions is non-exhaust emissions from tyre and brake wear and road abrasion. In 2023, these accounted for 69% of PM10 emissions from transport compared with 14% in 1990. Since 1990, exhaust emissions from road transport have decreased by 91% due to the penetration of new vehicles meeting tighter PM10 emission regulations ("Euro standards" for diesel vehicles were first introduced in 1992). Over the same period emissions from shipping fell by 87% (Table 13.1a).

Emissions of PM2.5 were estimated to be 5kt in 2023 of which transport accounted for 29%. Trends in emissions of PM2.5 from transport follow a similar pattern to those for PM10. PM2.5 accounts for all road transport exhaust emissions and most of such emissions from shipping but only around 55% of PM2.5 emissions are due to road abrasion and tyre and brake wear.

There has been a notable difference in the changes observed for NO2, PM10 and PM2.5 for 2019 to 2020 compared to the earlier year-to-year changes. From 2012-2019 the annual decreases for all three pollutants have been up to 8 percent. By contrast the decreases from 2019 to 2020 were 19 percent for NO2, 24 percent for PM10 and 25 percent for PM2.5. This is likely to have been strongly influenced by the reduction in vehicle use during the restrictions which were in place during 2020 due to the Covid-19 pandemic. However, between 2020 and 2021 there was a decrease of 3 percent for NO2 and increases of 9 percent for PM10 and 7 percent for PM2.5.

Air quality

Concentrations of air pollutants are sampled at automatic monitoring sites and the information is held in the "Scottish Air Quality Database" on the "Air Quality in Scotland" website (http://www.scottishairquality.co.uk/), The data section of the "Air Quality in Scotland" website provides detailed information on all sites while the publication section of the website includes reports showing trends. Table 13.b in this publication shows concentrations of nitrogen dioxide, ozone and PM10 at a mixture of urban and rural monitoring sites with long time series. Air quality is monitored against standards set as air quality objectives (see environment section of the user guide).

Nitrogen dioxide (NO_2)

For many of the selected monitoring sites, nitrogen dioxide concentrations show a downward trend. In 2024 eight of the 10 selected operational sites that recorded nitrogen dioxide concentrations with a data capture rate of over 75% had the lowest concentrations recorded over the period 2013-2024. In 2024, 70 sites in Scotland recorded nitrogen dioxide concentrations with a data capture rate of over 75%, of which 58 were roadside or kerbside locations. None of these 70 sites had concentrations in excess of the air quality strategy objective of 40 µg/m3 as an annual mean (Table 13.1b).

Ozone (O_3)

Though transport emissions contribute to ozone formation, levels of ozone are generally higher in rural areas due to the long-range transportation of primary pollutants from urban sources. In addition, ozone reacts with nitric oxide, which is more abundant in urban areas due to traffic emissions, to form nitrogen dioxide; therefore ozone levels are usually lower in urban areas. While at the selected monitoring sites there has been some indication of a downward trend in the number of occurrences of maximum daily concentrations exceeding 100 µg/m3, this has since levelled off. There appears to be no clear trend in average annual concentrations. In 2024, all of the 10 sites in Scotland recording ozone with a data capture rate of over 75% met the air quality objective of no more than 10 occurrences of the maximum daily concentrations exceeding 100 µg/m3 (Table 13.1b)

Particulate matter (PM_{10})

PM_{10} concentrations show a general downward trend at the selected sites. In 2024, of the 75 sites in Scotland recording PM_{10} with a data capture rate over 75%, no sites had concentrations greater than the air quality objective of 18 $\mu g/m^3$ as an annual mean. (Table 13.1b)

Air Quality Management Areas

Whenever it appears that one or more of the air quality objectives is unlikely to be met by the required date, the local authority concerned must declare an Air Quality Management Area (AQMA) covering the area of concern. The authority must then prepare and implement an action plan outlining how it intends to tackle the issues identified. Table 13.1c summarises active AQMAs and the pollutants of concern. As at 13 November 2025, there were 20 active AQMAs, all but one of which related to either NO2 or PM10, or both. (Table 13.1c)

Greenhouse gases

In 2023, Transport (*including* international aviation and shipping) accounted for 13 million tonnes of carbon dioxide equivalent ($MtCO_2e$). This represents 33.2% of total net greenhouse gas emissions allocated to Scotland in the *Greenhouse Gas Inventories*, 3.1% higher than 2022. Total net emissions from *all* sources decreased by 1.9% between 2022 and 2023 falling from 40.35 $MtCO_2e$ to 39.57 $MtCO_2e$, with transport total emissions having increasing from 13.0 MtCO2e to 13.1 MtCO2e, an increase of 1%. Within Transport emissions, Road Transportation accounted for approximately 67.7% of the transport total. Heavy Goods Vehicles and Light Goods Vehicles were the other significant contributors to transport emissions accounting for 12.0% and 13.8%, respectively. International Aviation and Shipping contributed roughly 13.4% and domestic aviation 2.8% of transport's total emissions. The contribution from domestic shipping, 11.9%. It should be noted that these estimates use a methodology designed to produce internationally-comparable figures so apparent year-to-year fluctuations could be due in part to limitations in or changes to the underlying data or calculations. See *Table 13.2* for more detail and emissions from earlier years and the user guide for more detail on the methodology used.

Figure 13.2 shows transport emissions over time, by mode. Estimated car emissions have fallen by 13% since 2006. Traffic levels (vehicle km) have increased slightly over the last few years so the reduction in emissions seen will be due to the introduction of more fuel efficient vehicles as well as other more fuel efficient driving, particularly in the business fleet. More detail on car emissions is set out in the car emissions chapter below while more details on traffic volumes by mode can be found in chapter 5 of STS. Details of personal modal choice can be found in chapter 11.

The *Greenhouse Gas Inventories* report the emissions of the six gases that are listed under the Kyoto Protocol. In the case of transport, the quantities of gases involved are relatively small except for carbon dioxide, which accounts for about 99 per cent of transport's total. *(Table 13.3)*.

Table 13.4 presents some comparisons between the UK as a whole and Scotland. Overall, Scotland's transport emissions account for 9% of the UK total. At 15% Scottish bus emissions are above a proportionate share of the UK total, while domestic aviation, at 32%, is also above that benchmark.

Estimates of carbon dioxide emissions per passenger-km for different modes of transport are available only for GB/UK as a whole. The lowest emitting modes of land transport per passenger-km are coaches at 28 gCO_2e; and light rail and tram at 29 gCO_2e. Both diesel and petrol cars are the highest emitters per passenger-kilometre and account for 163-173 grams of CO_2 per passenger kilometre (*Table 13.5*). The basis of these estimates is described in the environment section of the user guide.

Car emissions

Newly registered cars are becoming more fuel efficient and thus generally emit fewer emissions per kilometre. Figure 13.3 shows the steady downward trend in average CO_2 emissions for newly registered cars in Scotland. Average CO_2 emissions in Scotland for new car registrations has fallen by 8 per cent over the last ten years. However, since a low of 120 for CO_2 in 2016 there has been a steady rise to 128.9 in 2020 before falling back to 114.8 in 2024. (*Table 13.6a*)

The proportion of newly registered cars with emissions of 150g/km or lower has decreased from 87 per cent in 2014 to 82 per cent in 2024. Cars with emissions of over 191g/km have increased from 2.7 per cent of new cars in 2014 to 4.8 per cent. These changes are at least in part the result of changes to vehicle excise duty bandings made by the UK Government in recent years.

Ultra low emission vehicles (ULEV)

The number of ultra-low emission vehicles registered in Scotland for the first time in 2024 was 31,141, 18% up on the corresponding figure for 2023 (26,417). At the end of 2024 there were 121,622 ULEVs registered in Scotland (*Table 13.7 and 13.8*)

Registrations by type of vehicle

The overwhelming majority (90 per cent) of vehicles licensed for use on the roads in Scotland are still powered by either petrol or diesel. Historically petrol powered vehicles have been outsold by diesel vehicles although in recent years petrol vehicles have been outselling diesel. Overall though there are more petrol vehicles on the road than diesel ones. While 37 per cent of all diesel vehicles are body types other than cars only 6 per cent of petrol vehicles were not cars. (*Table 13.9 and 13.10*)

Electric Vehicle (EV) charge points

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Scotland now has over 7,400 public EV charge points, achieving a target of 6,000 charge points 2 years ahead of the target set by Scottish Ministers. Thanks to over £65 million invested by the Scottish Government, over 2,500 of those public charge points are part of the ChargePlace Scotland (CPS) network, with the rest belonging to commercial charging networks.

At the start of 2026, Scotland has the UK's fourth highest number of electric vehicle public charge per head of population, and the fourth highest number of rapid charge points among UK regions. EV charging statistics 2026 - Zapmap

In 2023, the publication of Scotland's vision for public EV charging was announced, highlighting the need for a transition towards a network that is largely financed and delivered by the private sector, signalling a shift away from publicly funded ChargePlace Scotland approach.

The Scottish Government's vision sets out what an ideal public charging offer for cars and vans in Scotland should look like. It is intended to help guide public, private and third sector partners who will be central to developing Scotland's future public charging network. The vision states that Scotland's public EV charging network should be comprehensive and convenient, be grown with private investment, be powered by clean, green energy and support the wider sustainable transport system.

In late 2024 the Scottish Government published a draft vision Implementation Plan identifying the key actions be taken to deliver the vision. The Implementation Plan is a 2024 PfG commitment and outlines an agreed set of actions to meet Scotland's needs and also provided a route map for delivering approximately 24,000 additional charge points by 2030 largely financed and delivered by the private sector.

A map showing the locations of the charging points in Scotland is available here https://chargeplacescotland.org/cpmap/ (*Table 13.11)*

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Published by Transport Scotland, March 2026

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