



Smoky Vehicle Reporting Program

2021-22 Annual report



CleanRun
Let's drive down emissions

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November 2022

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1 Smoky Vehicle Reporting Program

This report summarises the data and observations collected by the [Smoky Vehicle Reporting Program](#) between July 2021 and June 2022.

It is published to promote transparency in the program and provide feedback to people who submitted a smoky vehicle report during the year.

1.1 Program overview

The program is a joint initiative of the Department of Water and Environmental Regulation (DWER) and Department of Transport (DoT). It aims to:

- identify vehicles that are at risk of breaching vehicle emission legislation
- engage with vehicle owners to undertake any necessary vehicle maintenance.

The program is a key initiative of the National Environment Protection (Diesel Vehicle Emissions) Measure 2001 and the *Perth Air Quality Management Plan*.

When identifying whether a vehicle is breaching emission legislation and can be classified as 'smoky', the program follows regulation 354 of the Road Traffic (Vehicles) Regulations 2014, which relates to the visible emissions of certain motor vehicles:

- (1) This regulation applies to a motor vehicle that is propelled by an internal combustion engine and was built after 1930.
- (2) A motor vehicle mentioned in sub regulation (1) must not emit visible emissions for a continuous period of at least 10 seconds.
- (3) This regulation does not apply to emissions that are visible only because of heat or the condensation of water vapour.

In line with this, a smoky vehicle is one that emits visible emissions for at least 10 continuous seconds.

The program is a community engagement initiative to address public concerns about vehicle emissions and to encourage vehicle owners to take vehicle maintenance actions. It complements the regulatory effort of WA Police and authorised officers to identify excessively polluting vehicles and issue compliance notices.

1.2 How the program works

Members of the public who identify vehicles that smoke continuously for 10 seconds or more can submit reports to DWER. DWER and DoT then verify reported details and notify the vehicle owner, who is invited to respond. Those responses are collected and statistical data on reported vehicles is compiled for analysis.

Privacy

DWER does not have access to vehicle owner information and DoT does not have access to reporter information. This separation of data protects the privacy of reporters and vehicle owners, and the integrity of the program.

Making a report

DWER maintains an [online reporting portal](#) through which anyone can report a smoky vehicle's details. The data reported, which allows vehicle owners to be identified, includes:

- the vehicle body type, licence number, make, model and colour
- the location, date and time of sighting
- the reporter's name and contact details.

Photographic evidence can also be provided but is not essential. Reporters are sent a notification email to confirm their submission. If a report is incomplete or unclear, they may be contacted for further information.

Report verification

To mitigate against malicious and vexatious reporting, all reports are verified.

- Reports are checked for basic errors, such as mistyping of the vehicle licence number. Obvious mistakes are either queried or rejected.
- If the notification email sent to the reporter is rejected, a bounce-back email will be received and the report discarded.
- After the information identifying reporters is removed, batches of reports are sent to DoT every two months. DoT extracts vehicle owner, make, model and colour data from its database and sends DWER the vehicle make, model and colour for cross-checking against reports. Those with obvious mismatches are rejected.

Vehicle owner notification

After verification, reports are sent to a third party, which prints notification letters on behalf of DWER and DoT using the vehicle details from the reports. The letters are sent to vehicle owners, along with a reply-paid card to allow them to respond to the report.

Vehicle owners complete the reply-paid card with their licence number and fuel type, and provide a response to the report, which can include:

- vehicle repaired, or scheduled for service
- vehicle does not smoke for 10 continuous seconds
- cannot afford to repair vehicle
- vehicle has been sold or disposed of
- vehicle details incorrect
- other – please give details.

These responses are recorded against each report. Response data is analysed annually for observations and trends.

Vehicle owners can contact DWER to discuss the letter and reporting program.

1.3 Significant program changes

No significant program changes were made during 2021–2022.

1.4 Acknowledgements

This program exists and continues to operate thanks to the efforts of members of the public who care about the air they and others breathe.

For those reading this summary who have submitted a smoky vehicle report, know that you are making a difference. We hope you continue to make reports and would also encourage your acquaintances to report the smoky vehicles they see. Having a diverse range of people reporting to the program improves coverage and helps build a bigger picture of where vehicle emission issues are occurring.

If you have received a smoky vehicle letter and have taken action to repair, service or retire your vehicle, we hope you enjoy the reduced operating costs and the knowledge that you've reduced the impact of your vehicle on local air quality. Vehicle emissions are a significant source of air pollution in urban environments – any reduction makes a real difference to your community.

2 Program performance

2.1 Reporting data

Figure 1 shows the program’s recent reporting history. In 2021–2022, the program:

- received 796 valid reports
- verified 666 reports as valid and sent letters to identified vehicle owners
- received 317 responses from letters sent.

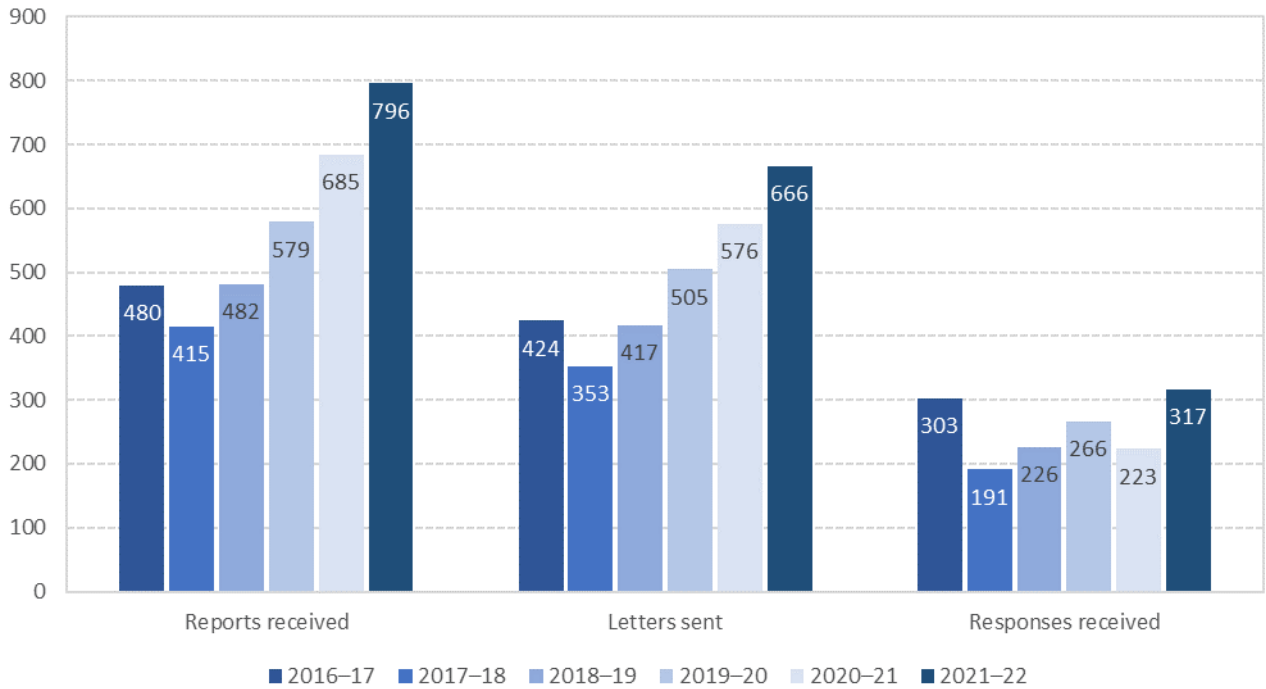


Figure 1: Annual reporting and response data

The number of reports received, and letters sent, in 2021–2022 continues an upward trend observed in recent years. The response rate for letters sent to vehicle owners during this period increased to a level consistent with recent years. There is no clear explanation for the drop in response rate observed in 2020-2021.

2.2 Reporting frequency

The monthly reporting rate for the recent years is presented in Figure 2.

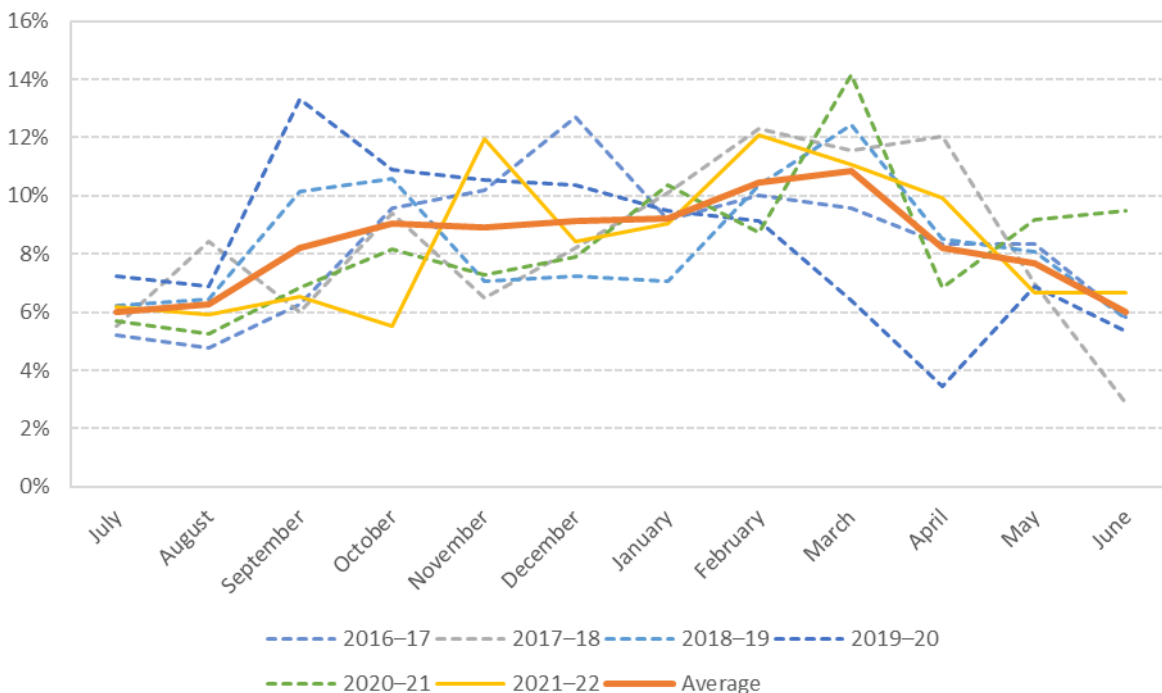


Figure 2: Reports received per month

The 2021–2022 period had a reporting frequency profile similar to the average of the past six years, with a notable spike in reports received in November following a lower than usual report rate in October.

Historic data shows spikes and dips occurring at various times of the year. It is unknown if any specific factors influence why reporting frequency varies over the year.

Considerations include:

- weather influencing visibility of exhaust fumes
- seasonal variance in driver activity or behaviours, such as air-conditioner use
- seasonal fuel quality variation, such as a change in Reid vapour pressure.

2.3 Repeat vehicle reports

In 2021–2022, 30 vehicles were reported more than once, and four of these were reported three times. Of the vehicles reported more than once, 14 vehicle owners responded to the advisory letters sent.

2.4 Response data

Responses received in recent years are summarised in Figure 3.

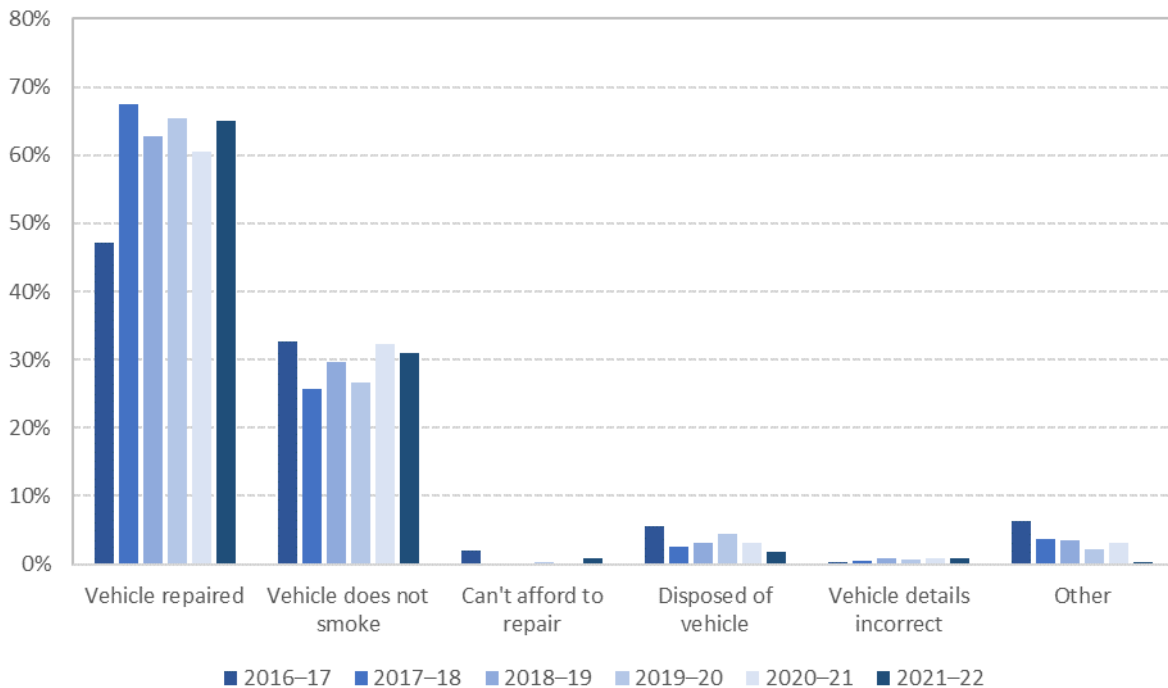


Figure 3: Distribution of responses received

Just under two-thirds of responses received in 2021–2022 indicated the vehicle owner had repaired their vehicle or scheduled it for servicing after being notified. This is consistent with responses from the previous four years.

The ‘vehicle does not smoke’ response was received in 32 per cent of cases, which was not significantly different from historic levels of this response.

Responses falling into other categories remain low with only 13 (4 per cent) of responses received in 2021–2022 falling outside the two main categories.

2.5 Reporter diversity

It is important to consider the diversity of the reporter base when assessing the significance of the dataset. A high percentage of unique reporters dilutes the risk of observational bias in the dataset. A very small number of heavy reporters can potentially impact the proportion of responses received if they do not properly observe the 10-second rule. An example of this is the reporting of vehicles that puff smoke on take-off but not for 10 continuous seconds.

An additional benefit of a wide reporter base is the likelihood of improved spatial coverage, though this is no guarantee and there is insufficient data collected for any meaningful spatial analysis of reports received. A wide reporter base can also be used as a proxy to measure community awareness of the program, though it is noted that several factors can influence reporter participation levels.

Reporter diversity, depicted in Figure 4, shows that the number of unique reporters has nearly doubled since 2016–2017. Relative diversity in 2021–2022 was lower compared with previous years, with report numbers increasing but the number of unique reporters starting to stabilise, shrinking for the first time this year from last year. More active

promotion of the program may be needed to avoid observational bias risk if unique reporter metrics do not follow the upward trend that reported vehicle metrics appear to be having.

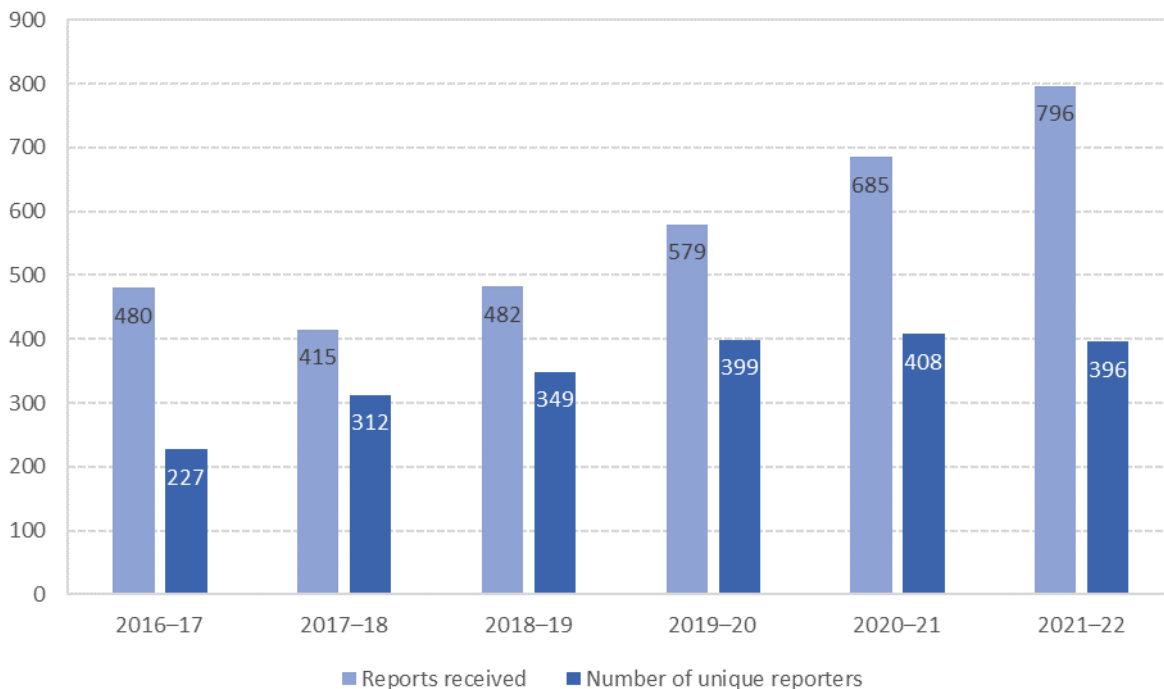


Figure 4: Number of unique reporters annually

A common feature of the reporter base is the dominance of a small number of ‘super reporters’ submitting 10 or more reports in a year. Analysis of the responses received from vehicles identified by super reporters historically has found the ‘vehicle does not smoke’ response was about 10 to 20 per cent higher than the average from the entire reporter base.

For 2021–2022, four reporters were responsible for 283 of the reports received. Thirty per cent of the responses received from these reporters indicated that the ‘vehicle does not smoke’, compared with 31 per cent for the whole reporter base. When the dataset was assessed without the reports received from these reporters, the ‘vehicle does not smoke’ response dropped to 25 per cent and the ‘vehicle repaired’ response rose to 70 per cent.

This reinforces the importance of a diverse reporter base to offset the potential impact of high-frequency reporters on report validity, but also the need to better emphasise the requirement that reports should only be submitted if the vehicle smokes for 10 seconds continuously.

2.6 Observations

Collection of detailed vehicle data started in November 2017. The only metric of note for 2021–2022 was the fuel type of reported vehicles, which is discussed further below. No noteworthy observations or trends were found for odometer data, vehicle weight or vehicle body type.

Fuel type

Eighty-six per cent of vehicles reported were diesel powered, increasing from the usual four out of five vehicles established since the 2016–2017 reporting period. [Roadside measurements taken in recent years by DWER](#) have established that diesel vehicles produce higher emissions of particulates compared with other fuels such as petrol. Particle emissions contribute to visible exhaust smoke.

Diesel engines can produce a short puff of smoke when accelerating until air intake is sufficient to combust more completely the volume of diesel being injected into the cylinders. This can be more noticeable when the vehicle is under heavy load. Given that the program uses the 10-second rule as defined by the Road Traffic (Vehicles) Regulations 2014, these smoke puffs do not necessarily make the vehicle 'smoky'.

Driver behaviour can also strongly influence smoke emissions. Vehicles that are accelerated heavily or towing overweight trailers are more likely to smoke. When driven smoothly with gentle acceleration, steady speed and the correct gear choice, emissions are reduced significantly and vehicles are less likely to smoke.

Only four LPG vehicles were reported to the program in 2021–2022. This is more reflective of the low popularity of the fuel in the Western Australian fleet than the emissions performance of engines operating on LPG.

2.7 Further information

For further information about the program and the data collected, contact DWER via email: smokyvehicles@dwer.wa.gov.au

