

Analysis of PM_{2.5} data collected by an air pollution monitoring sensor in Francis St & Williamstown Rd, Yarraville during 2020-2021

June 2021

Background

Maribyrnong Truck Action Group¹ deployed an air pollution sensor (KOALA)² to measure air pollution on the corner of Williamstown Road and Francis Street in Yarraville from May 2020. The PM_{2.5} air pollution data collected over a 12-month period during May 2020 and April 2021 was analysed by EPA Victoria.

The PM_{2.5} data collected was compared to the State Environment Protection Policy (Ambient air quality) objectives and the PM_{2.5} levels measured at EPA's background air monitoring station nearby at Footscray.

Key pollutant

The key pollutant in Francis Street is small airborne particles that are less than or equal to 2.5 µm in diameter (PM_{2.5}).

Sources of PM_{2.5} include motor vehicles, domestic wood heaters, bushfires and controlled burns and industrial facilities. Particles can also be formed from chemical reactions between other pollutants and the atmosphere.

Maribyrnong Truck Action Group used an air pollution sensor (borrowed from QUT) to monitor air pollution, the sensor data has been analysed by EPA Victoria as received. EPA Victoria uses an air pollution regulatory compliance monitor, which is an USEPA reference equivalent monitor, to measure PM_{2.5} in Footscray.

No correlation of the PM_{2.5} sensor data and EPA's PM_{2.5} data has been undertaken for this project. However, past correlation studies with this type of air pollution sensor in Melbourne and across Australia have shown the data is suitable for qualitative air pollution assessment and to understand the local PM_{2.5} impacts.

Was air pollution above air quality objectives in Francis Street & Williamstown Road, Yarraville?

Table 1 shows the air quality objectives for PM_{2.5} in the State Environment Protection Policy (Ambient air quality) and the number of days the objective was exceeded. The air monitoring data recorded 39 days exceeding the PM_{2.5} daily air quality pollution objective of 25 µg/m³. These poor air quality days are due to local urban air pollution and given the proximity to the road motor vehicle emissions are a likely major source of pollution.

The annual average PM_{2.5} concentration measured was 15 µg/m³, this is almost double the State Environment Protection Policy (ambient air quality) objective of 8 µg/m³.

1. <https://mtag.org.au/>
2. <https://research.qut.edu.au/ilqah/projects/koala-sensors/>

Analysis of PM_{2.5} data collected by an air pollution monitoring sensor in Francis St & Williamstown, Yarraville during 2020-2021

Table 1. State Environment Protection Policy (Ambient air quality) objectives for PM_{2.5} and results for Francis Street, Yarraville from May 2020 to April 2021.

Pollutant	Averaging interval	Objective	Yarraville results
PM _{2.5}	24-hour	25 µg/m ³	39 days exceeded the PM _{2.5} daily air quality objective of 25 µg/m ³ .
PM _{2.5}	Annual	8 µg/m ³	15 µg/m ³

How does the air quality in Francis Street, Yarraville compare to Footscray?

Footscray is a site that is generally representative of background concentrations in inner west Melbourne, without the influence of local air pollution sources.

Figure 1 displays the daily 24-hour averages measured in Yarraville compared to the 24-hour averages at the Footscray site. The results show the levels at Yarraville were significantly and consistently higher than the Footscray site.

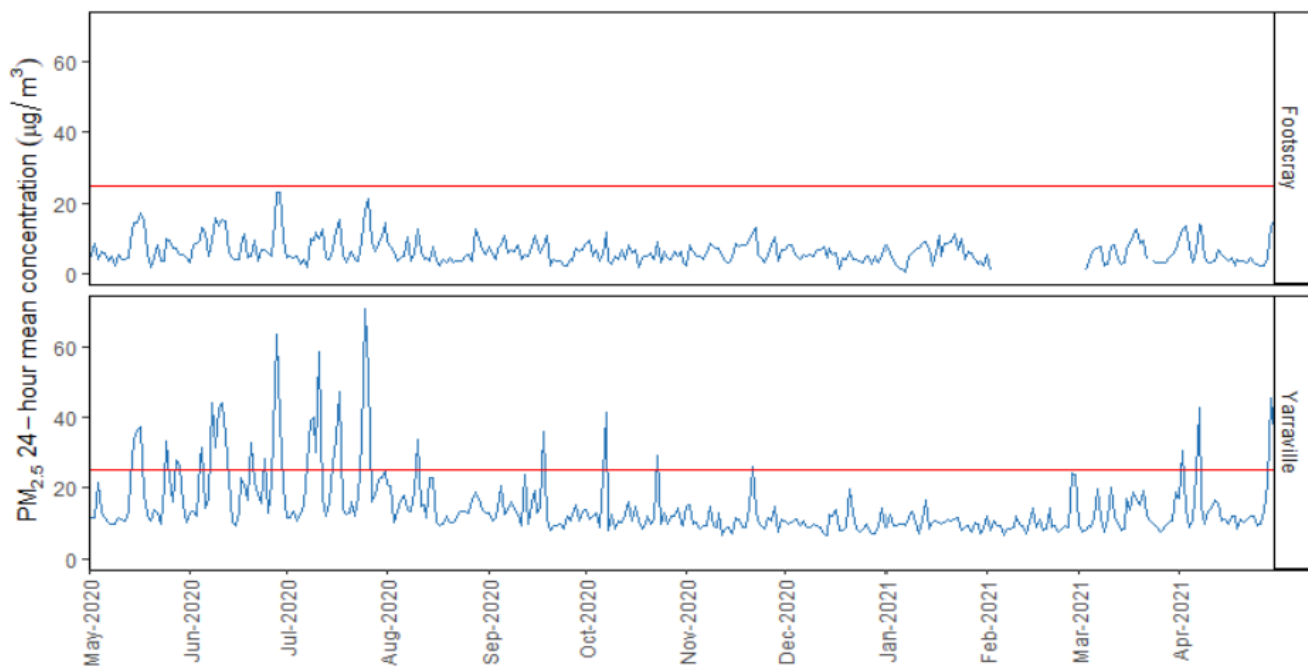


Figure 1. PM_{2.5} daily average concentrations recorded in Footscray and Yarraville. Red line is the PM_{2.5} daily air quality objective of 25 µg/m³.

A comparison of the Yarraville and Footscray results in relation to the PM_{2.5} air quality objective is presented in Table 2.

Table 2 shows that there were no days that exceeded the PM_{2.5} daily air quality objective of 25 µg/m³ in Footscray compared to 39 days at Yarraville.

Analysis of PM_{2.5} data collected by an air pollution monitoring sensor in Francis St & Williamstown, Yarraville during 2020-2021

The highest number of days per year exceeding the PM_{2.5} daily air quality objective measured at the Westgate Tunnel Project roadside Francis Street site during 2018 and 2019 was 8 days³.

The annual average PM_{2.5} concentration measured at Footscray was 6.6 µg/m³, lower than the State Environment Protection Policy (ambient air quality) objective of 8 µg/m³. Yarraville was much higher (15 µg/m³).

The local urban air pollution levels measured on the corner of Francis Street and Williamstown Road, Yarraville is substantially higher in Yarraville than measured at other sites in Yarraville and in Footscray. The PM_{2.5} air monitoring results and the proximity to the major roads are showing there are very high impacts of traffic related air pollution at the Yarraville site. Scientific evidence has shown that traffic-related air pollution is associated with exacerbation of asthma, the onset of childhood asthma and reduced lung function in children⁴.

Table 2. State Environment Protection Policy (Ambient air quality) objectives for PM_{2.5} and results for Francis Street, Yarraville versus Footscray from May 2020 to April 2021.

Pollutant	Averaging interval	Objective	Francis Street, Yarraville results	Footscray results
PM _{2.5}	24-hour	25 µg/m ³	39 days exceeded the PM _{2.5} daily air quality objective of 25 µg/m ³ .	0 days exceeded the PM _{2.5} daily air quality objective of 25 µg/m ³ .
PM _{2.5}	Annual	8 µg/m ³	15 µg/m ³	6.6 µg/m ³

- https://www.environment.vic.gov.au/_data/assets/pdf_file/0029/486506/IWAQCRGReportFINAL.pdf
- EPA Publication 1709: Air pollution in Victoria - a summary of the state of knowledge August 2018 <https://www.epa.vic.gov.au/about-epa/publications/1709>



EPA acknowledges Aboriginal people as the first peoples and Traditional custodians of the land and water on which we live, work and depend. We pay respect to Aboriginal Elders, past and present.

As Victoria's environmental regulator, we pay respect to how Country has been protected and cared for by Aboriginal people over many tens of thousands of years.

We acknowledge the unique spiritual and cultural significance of land, water and all that is in the environment to Traditional Owners, and recognise their continuing connection to, and aspirations for Country.



For languages other than English, please call **131 450**.

Visit epa.vic.gov.au/language-help for next steps.

If you need assistance because of a hearing or speech impairment, please visit relayservice.gov.au