



5 September
2022

Auckland Air Quality Report

Monthly update

Research and
Evaluation Unit

RIMU



Introduction

Auckland Council continuously collects air quality data to assess compliance with national standards and provide information to aid policy development and evaluation. The data the council collects enables us to quantify ambient air quality in the region and note spatial and temporal variations. This report presents a monthly update on air quality in Auckland. It has four sections: sections A and B present tables and graphics illustrating air quality status in the Auckland region based on the data collected from continuous monitoring sites across the region. For this edition, section C focuses on one monitoring site – Takapuna. Section D provides the monthly 1-hour averages for 2022 and the past five years pollutant concentrations. The monthly update is prepared using validated data which is generally available one month after raw data is collected. This update covers data to July 2022.

Summary

- In July 2022, there was no exceedance of the National Environmental Standard for Air Quality (NESAQ). Customs Street site recorded 94 exceedances of NESAQ for Nitrogen Dioxide (NO₂) (1-hour average) between 09/06/2022 and 17/06/2022. An investigation found that a mobile diesel power generator had been located next to the monitoring station whilst some repair work in the area was being carried out.
- The majority of the monitoring sites recorded NO₂ concentrations lower than the same period of the previous year (January to July).
- As expected, the highest NO₂ concentrations were measured at the city centre sites, although the concentrations are lower than the same period of the previous year.
- Most monitoring sites recorded particulate matter (PM₁₀) concentrations higher than the same period of the previous year (January to July).
- Compared to the same period of the previous year, there has been a 38% decrease in carbon monoxide (CO) average concentration measured at the Khyber Pass Road monitoring site.
- Air quality of a monitoring site can vary from year to year due to weather and other influences and for trend analysis of change see Table 2 and [this report](#).

Glossary of terms

Term	Meaning
Aerodynamic diameter	Used to describe the behaviour of a particle as it moves around in the air; it compares the behaviour with that of a spherical particle of unit density.
Air pollutant/contaminant	Any substance in the air that could harm humans, animals, vegetation, or other parts of the environment when present in high enough concentrations.
Air pollution	The presence of one or more air pollutants in high enough concentrations to cause harm.
Air quality	Is the degree to which air is suitable or clean enough for humans, animals, or plants to remain healthy.
Air quality index (AQI)	Score out of 100, based on dividing a pollutant concentration by a relevant standard. It can be used to approximate relative impact of different pollutants.
Ambient air	The external air environment (does not include the air environment inside buildings or structures)
Black carbon (BC)	Is an air pollutant made up of tiny soot-like particles discharged into the atmosphere from combustion processes.
CO	Carbon monoxide, a type of air pollutant.
Exceedance	An exceedance defines a period of time during which the concentration of a pollutant is greater than the appropriate air quality criteria.
Ground-level ozone (O ₃)	At ground level, ozone is considered an air pollutant that can seriously affect the human respiratory system. It is a major component of photochemical smog.
Monitoring site	A facility for measuring the concentration of one or more pollutants in the ambient air; also referred to as 'monitoring station'
NESAQ	National Environmental Standard for Air Quality.
NO ₂	Nitrogen dioxide, a type of air pollutant
PM	Particulate matter is made up of a mixture of various sizes of solid and liquid particles suspended in air.
PM ₁₀	Particulate matter with an aerodynamic diameter of 10 micrometres or less; a type of air pollutant.
PM _{2.5}	Particulate matter with an aerodynamic diameter of 2.5 micrometres or less; a type of air pollutant.
SO ₂	Sulphur dioxide, a type of air pollutant
µg/m ³	Microgram of pollutant (1 millionth of a gram) per cubic metre of air, referenced to temperature of 0°C (273.15 K) and absolute pressure of 101.325 kilopascals (kPa)
n/a	Not applicable

Data can be viewed on the [environmental data portal](#) , [LAWA](#) or requested from environmentaldata@aucklandcouncil.govt.nz. Full state and trends analyses and reports are prepared every few years (last report; [Trends in Auckland's air quality 2006-2018](#)).

See the [frequently asked questions](#) about the Auckland air quality monitoring programme.

What we monitor		Why we monitor
Air	Particulate matter (PM) - PM ₁₀ and PM _{2.5}	Tiny particles (particulate matter) from polluting sources such as vehicles and smoke get into the air. Breathing them may cause health problems.
	Nitrogen dioxide (NO ₂)	Vehicles are the main source of NO ₂ in Auckland. It can irritate the lungs, increasing susceptibility to asthma and lowering resistance to respiratory
	Other Pollutants	Air pollutants ozone, sulphur dioxide, carbon monoxide, black carbon and volatile organic compounds (VOCs) like benzene cause adverse health effects at elevated concentrations.
Greenhouse gas emissions	Carbon dioxide equivalent (CO ₂ e)	The climate is warming due to increased greenhouse gas (GHG) levels in the atmosphere caused by human activities. Reducing GHG emissions will limit temperature rise.

Section A – Data tables

Table 1. Summary information about Auckland air quality monitoring programme 1 January 2022 to 31 July 2022

Number of exceedances of NESAQ In 2022	94 (NO ₂ 1-hour average at Customs Street – June 9 – 17)	
Number of exceedances of Auckland ambient air quality targets in 2022	10 (NO ₂ 24-hour average at Customs Street – June 9 – 17)	
Maximum PM₁₀ 24-hours mean (Jan – July 2022)	42.5 µg/m ³ (85.0% of NESAQ)	<i>Recorded at Queen Street on 9 July 2022</i>
Maximum PM_{2.5} 24-hour mean (Jan – July 2022)	19.3 µg/m ³ (77.2% of Auckland target)	<i>Recorded at Patumahoe on 13 June 2022</i>
Maximum NO₂ 1-hour mean (Jan – July 2022)	399.0 µg/m ³ (199.5% of NESAQ)	<i>Recorded at Customs Street on 9 June 2022</i>
Maximum SO₂ 1-hour mean (Jan – July 2022)	51.0 µg/m ³ (14.6% of NESAQ)	<i>Recorded at Customs Street on 10 June 2022</i>
Maximum O₃ 1-hour mean (Jan – July 2022)	72.0 µg/m ³ (48.0% of NESAQ)	<i>Recorded at Patumahoe on 21 July 2022</i>
Maximum CO running 8-hour mean (Jan – July 2022)	2.05 mg/m ³ (20.5% of NESAQ)	<i>Recorded at Khyber Pass Rd on 13 May 2022</i>
Number of continuous monitoring sites	10	
Location of monitoring sites	Queen Street, Customs Street, Khyber Pass Road, Penrose, Henderson, Takapuna, Glen Eden, Pakuranga, Papatoetoe, and Patumahoe	

Table 2. General changes in concentration of key contaminants monitored for the last 19, 31 and 43 months.

↑ indicates an increase ↓ indicates a decrease ↗ Increase but not significant ↘ Decrease but not significant

	PM ₁₀			PM _{2.5}			NO ₂			Black carbon			Ozone			CO			SO ₂			Air Quality Index(AQI)			
Site	Last 19 months	Last 31 months	Last 43 months	Last 19 months	Last 31 months	Last 43 months	Last 19 months	Last 31 months	Last 43 months	Last 19 months	Last 31 months	Last 43 months	Last 19 months	Last 31 months	Last 43 months	Last 19 months	Last 31 months	Last 43 months	Last 19 months	Last 31 months	Last 43 months	Last 19 months	Last 31 months	Last 43 months	Site
Customs Street*	n/a	n/a	n/a	↗	↘	n/a	↘	↓	n/a	↘	↘	n/a	n/a	n/a	n/a	n/a	n/a	n/a	↑	↑	n/a	n/a	n/a	n/a	Customs Street*
Glen Eden*	↗	↘	↘	↗	↗	↘	↗	↗	↗	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	↗	↘	↘	Glen Eden*
Henderson	↑	↑	↘	n/a	n/a	n/a	↗	↗	↘	↗	↗	↘	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	↗	↗	↗	Henderson
Khyber Pass Road	↑	↗	↗	n/a	n/a	n/a	↘	↘	↘	n/a	n/a	n/a	n/a	n/a	n/a	↘	↘	↘	n/a	n/a	n/a	n/a	n/a	n/a	Khyber Pass Road
Pakuranga*	↑	↑	↘	↑	↗	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Pakuranga*
Papatoetoe	↘	↗	↘	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Papatoetoe
Patumahoe	↘	↘	↓	↗	↗	↘	↑	↗	↘	n/a	n/a	n/a	↗	↘	↘	n/a	n/a	n/a	n/a	n/a	n/a	↗	↗	↘	Patumahoe
Penrose	↗	↗	↓	↗	↘	↓	↗	↘	↘	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	↑	↑	↗	↗	↗	↓	Penrose
Queen Street	↗	↑	↑	↗	↑	↑	↓	↓	↓	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	↘	↗	↘	Queen Street
Takapuna	↗	↗	↘	↗	↗	↘	↗	↗	↘	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	↗	↗	↘	Takapuna
	PM ₁₀			PM _{2.5}			NO ₂			Black carbon			Ozone			CO			SO ₂			Air Quality Index(AQI)			

Notes

Effective dates: 19 months (1 Jan 2021 to 31 July 2022), 31 months (1 Jan 2020 to 31 July 2022), and 43 months (1 Jan 2019 to 31 July 2022)

PM₁₀ is monitored at Glen Eden, Henderson, Khyber Pass Rd, Pakuranga, Papatoetoe, Patumahoe, Penrose, Takapuna, and Queen St.

PM_{2.5} is monitored at Customs St, Glen Eden, Pakuranga, Patumahoe, Penrose, Takapuna, and Queen St.

NO₂ is monitored at Customs St, Glen Eden, Henderson, Khyber Pass Rd, Patumahoe, Penrose, Takapuna, and Queen St.

Black carbon is monitored at Customs St, and Henderson.

CO is monitored at Khyber Pass Rd.

Ozone is monitored at Patumahoe.

SO₂ is monitored at Customs St, and Penrose.

*PM_{2.5} data coverage for Glen Eden, Customs Street and Pakuranga is less than 75% due to instrument failure between Sep 2021 and Jan 2022.
Weather changes significantly affect concentrations of air contaminants ([see this report](#))

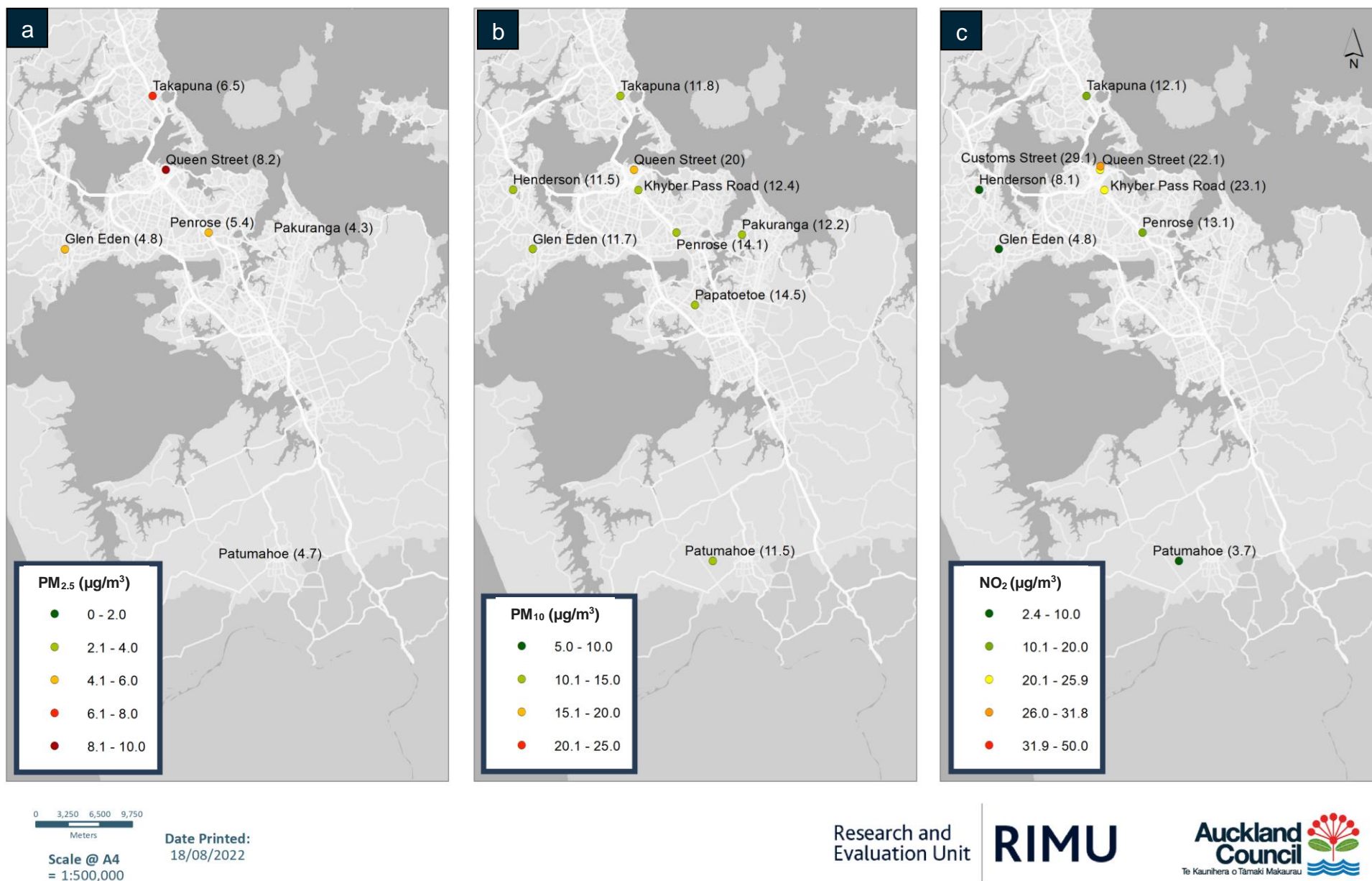


Figure 1. Maps a, b and c show the air quality monitoring sites and their last 12- months (1 August 2021 to 31 July 2022) average PM and NO₂ concentrations in brackets. Auckland city centre monitoring sites recorded the highest PM and NO₂ concentrations.

Section B. Key air contaminants across the 10 air quality monitoring sites (1 January 2022 to 31 July 2022)

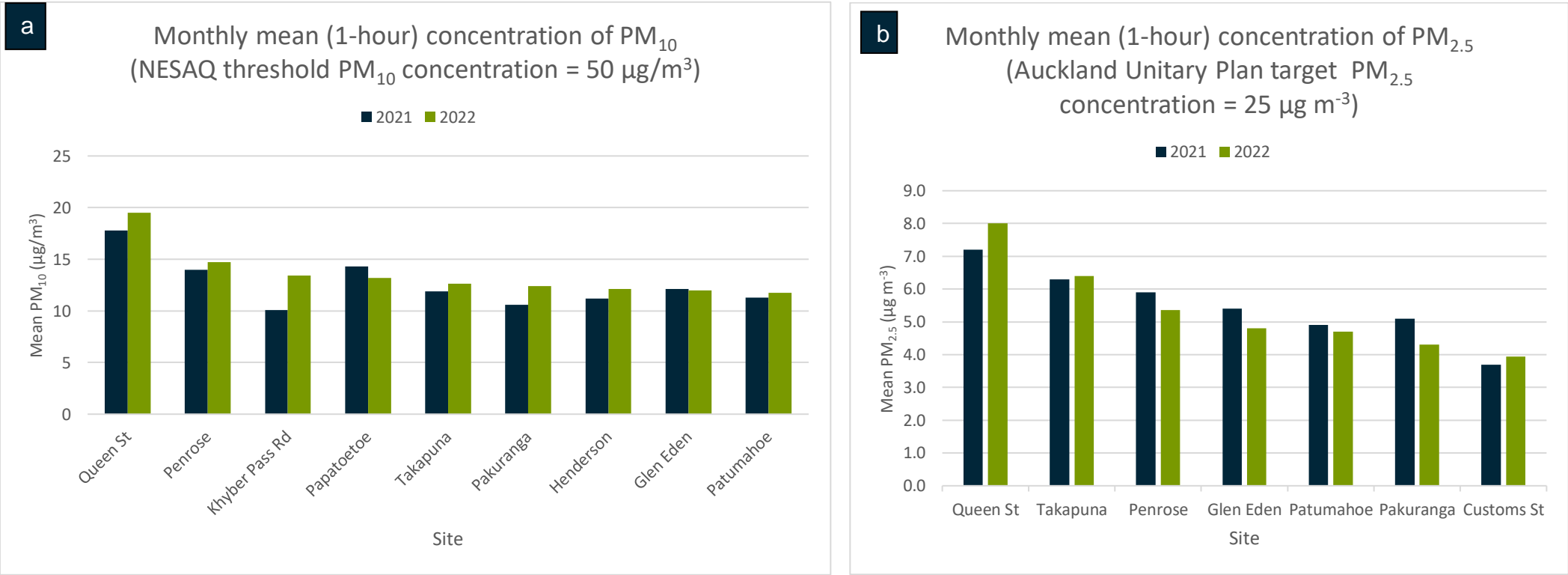


Figure 2. Monthly mean concentration of particulate matter. As in the previous year, the highest concentrations of both PM₁₀ and PM_{2.5} were recorded at Queen St. Plots a and b represent PM₁₀ and PM_{2.5}, respectively. The average PM₁₀ concentration in all the monitoring sites is higher than the same period of the previous year. PM₁₀ and PM_{2.5} have multiple sources including motor vehicles, home heating, sea salt, marine diesel, and soils (windblown soil, road dust, and dust generated by earthworks, construction, and road works).

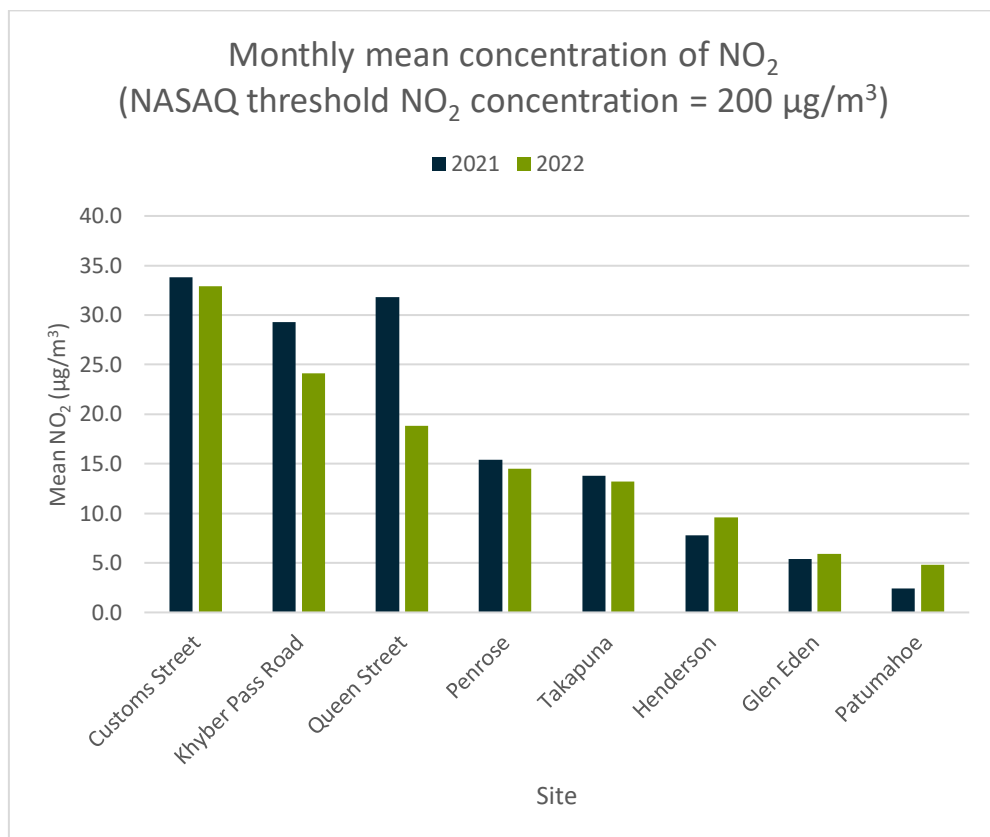


Figure 3. Monthly mean concentration of NO₂ across monitoring sites. Auckland city centre monitoring sites recorded the highest concentrations. All monitoring sites, except Queen St, Customs St, and Khyber Pass Rd, recorded higher average NO₂ concentrations compared to 2021. The main source of NO₂ is motor vehicles.

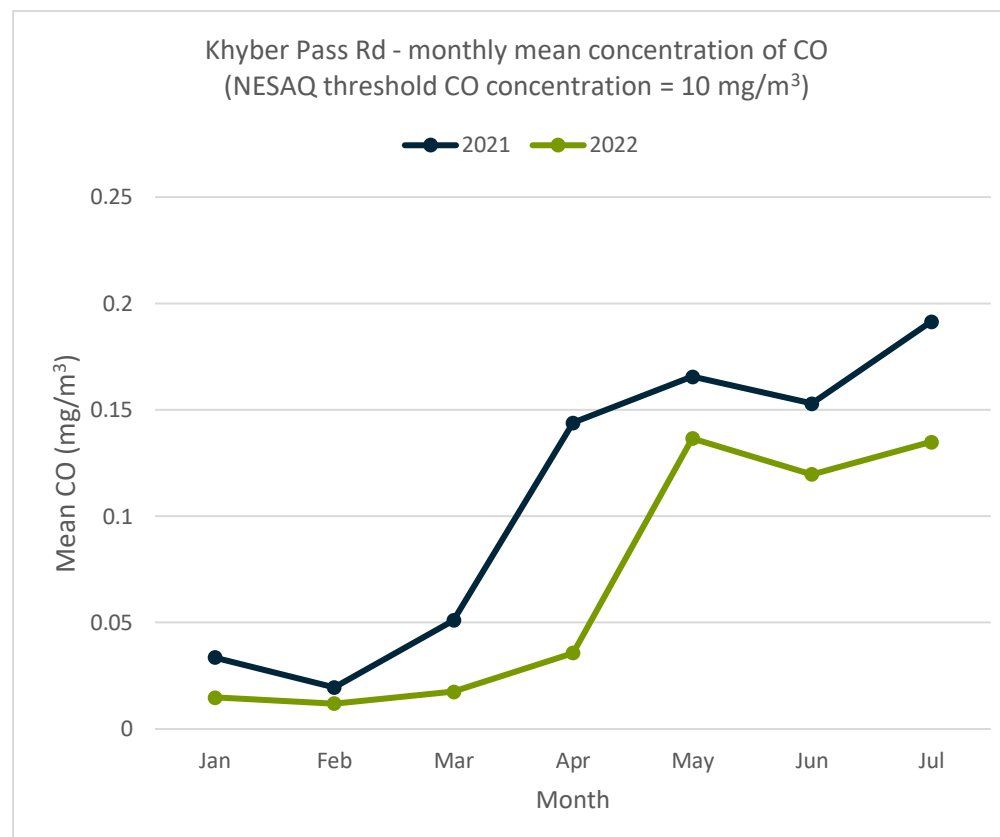


Figure 4. Monthly mean concentration of CO. The mean CO concentration for each month is less than the previous year. The main source of CO is motor vehicles. Note: currently, CO is only monitored at Khyber Pass Road. There is 38% decrease in CO average concentration (from 0.108 mg/m³ to 0.067 mg/m³)

Section C. Focus on a monitoring site: Takapuna

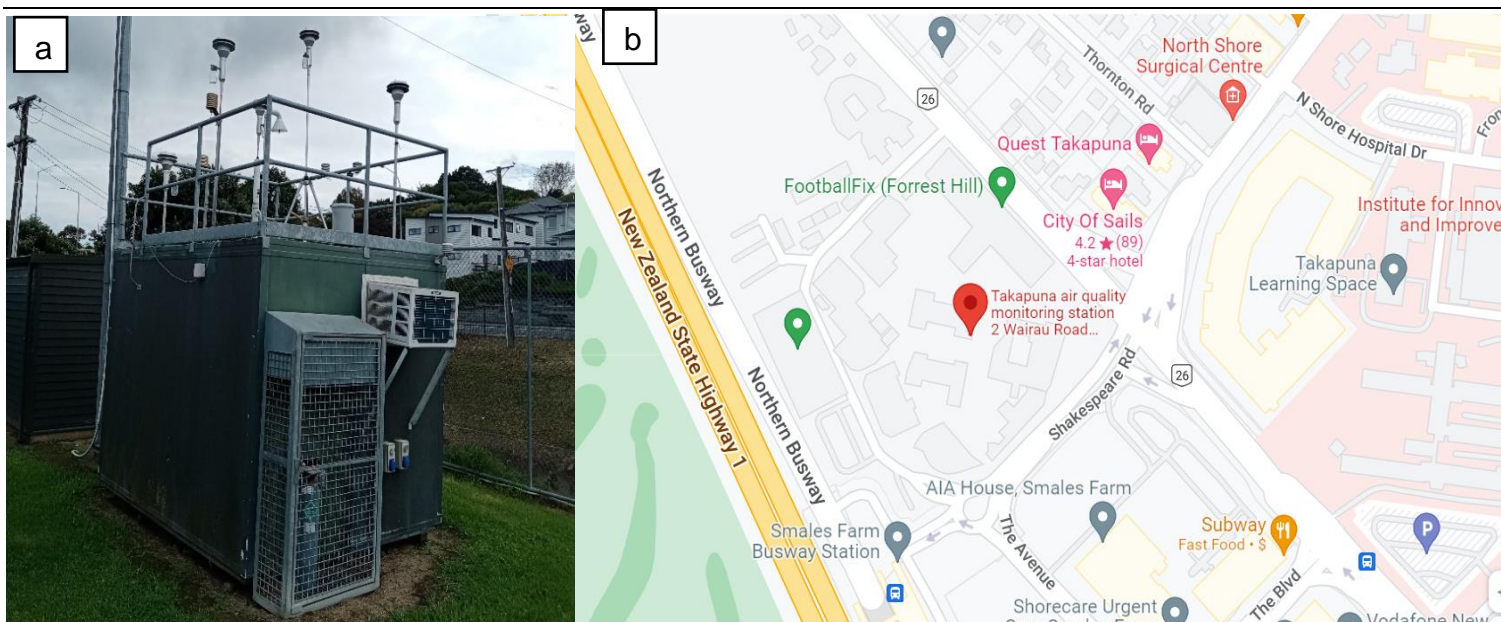


Figure 5. The Takapuna air quality monitoring site is located at Westlake Girls High School (2 Wairau Road). Image a shows the air quality monitoring shed. Image b is an aerial view of the monitoring site and surroundings taken in August 2022 (Source: Google Maps). Air quality monitoring at this site commenced on 31st May 1995. PM₁₀, PM_{2.5}, NO₂, and ambient meteorological parameters are monitored at this site. The main sources of air contaminants are motor vehicles, home heating (during winter) and soils.

Key findings:

- Overall, Takapuna site average PM_{2.5} concentration is 17.9 % higher than Auckland's average and 37.2 % more than Patumahoe site (rural site).
- In general, Takapuna site average PM₁₀ concentration is 0.3 % higher than Auckland's average and 20.7 % more than Patumahoe site.
- This monitoring site is classified as residential 'peak' for particulate matter (PM₁₀ and PM_{2.5}) exposure. Therefore, it is expected that the average concentrations will be above Auckland's average and rural site.
- Overall, Takapuna site average NO₂ concentration is 27.9 % lower than Auckland's average and 6-fold higher than Patumahoe site. This site is an urban 'representative' site with average NO₂ concentrations typically 50% less than peak monitoring sites.
- Deseasonalised long-term trend analysis results at the Takapuna site show there is a downward trend in PM₁₀, PM_{2.5}, and NO₂ average concentrations.

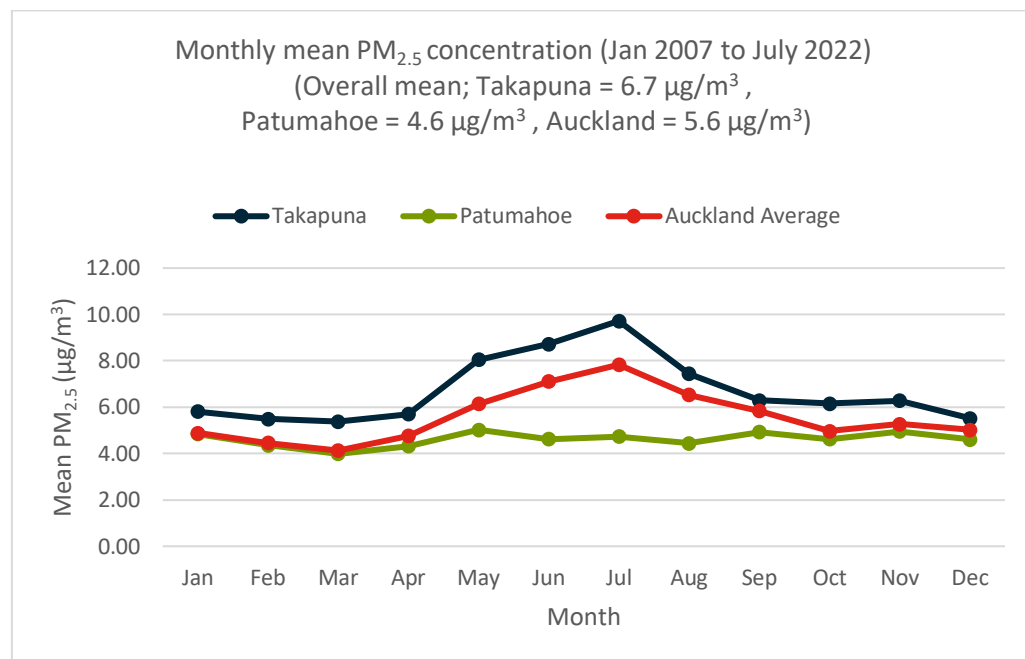


Figure 6. Temporal variation in monthly PM_{2.5} concentrations – Takapuna site compared to Patumahoe (rural site) and Auckland average. Overall, Takapuna site average PM_{2.5} concentration is 17.9 % higher than Auckland’s average and 37.2 % more than Patumahoe site. The Takapuna site is located at an urban residential peak exposure to PM_{2.5}. Therefore, PM_{2.5} average concentration is expected to be above Auckland’s average and the rural/background site.

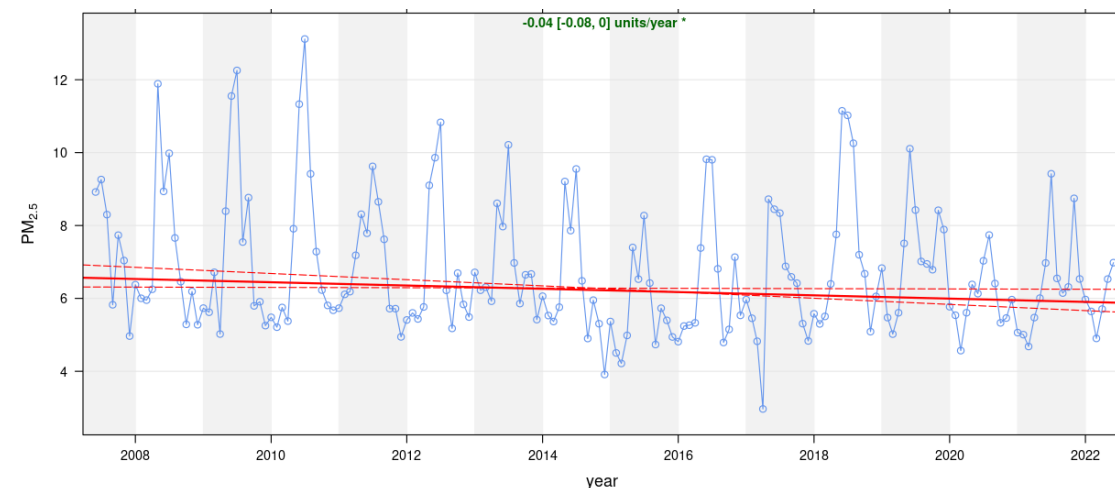


Figure 7. Long-term trends in PM_{2.5} at Takapuna site. The plot shows the deseasonalised monthly mean concentrations of PM_{2.5}. The solid red line shows the trend estimate and the dashed red lines show the 95% confidence intervals for the trend based on resampling methods. The overall trend is shown at the top-left as -0.04 (µg/m³) per year and the 95% confidence intervals in the slope from -0.08 – 0.00 µg/m³/year. The ‘*’ shows that the trend is significant to the 0.05 level.

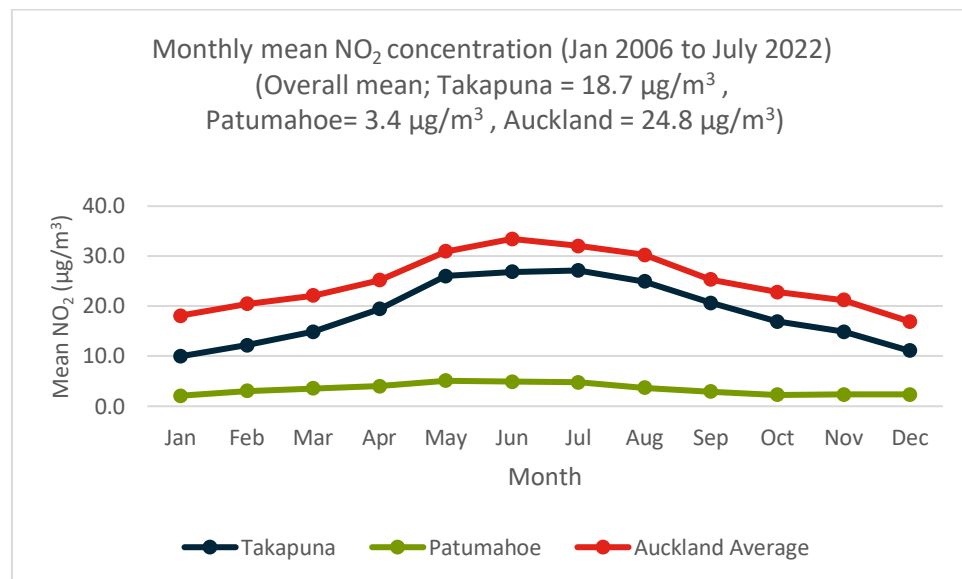


Figure 8. Temporal variation in monthly NO₂ concentrations – Takapuna site compared to Patumahoe (rural site) and Auckland average. Overall, Takapuna average NO₂ concentration is 27.9 % lower than Auckland’s average and approximately 6-fold higher than Patumahoe site. The Takapuna site is located at an urban residential peak exposure to PM₁₀. Therefore, PM₁₀ average concentration is expected to be above Auckland’s average and the rural/background site.

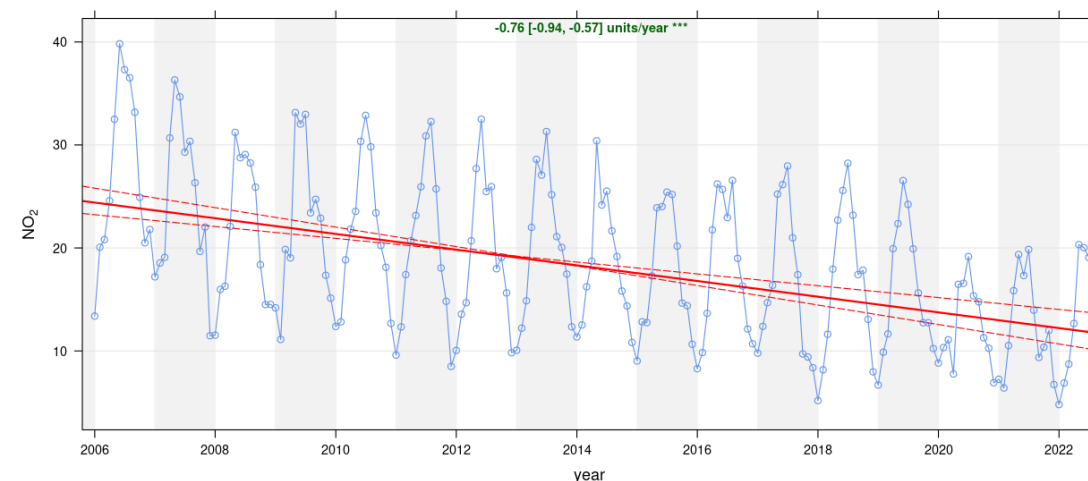


Figure 9. Long-term trends in NO₂ at Takapuna site. The plot shows the deseasonalised monthly mean concentrations of NO₂. The solid red line shows the trend estimate and the dashed red lines show the 95% confidence intervals for the trend based on resampling methods. The overall trend is shown at the top-left as – 0.76 (µg/m³) per year and the 95% confidence intervals in the slope from -0.94 – (- 0.57) µg/m³/year. The ‘***’ show that the trend is significant to the 0.001 level.

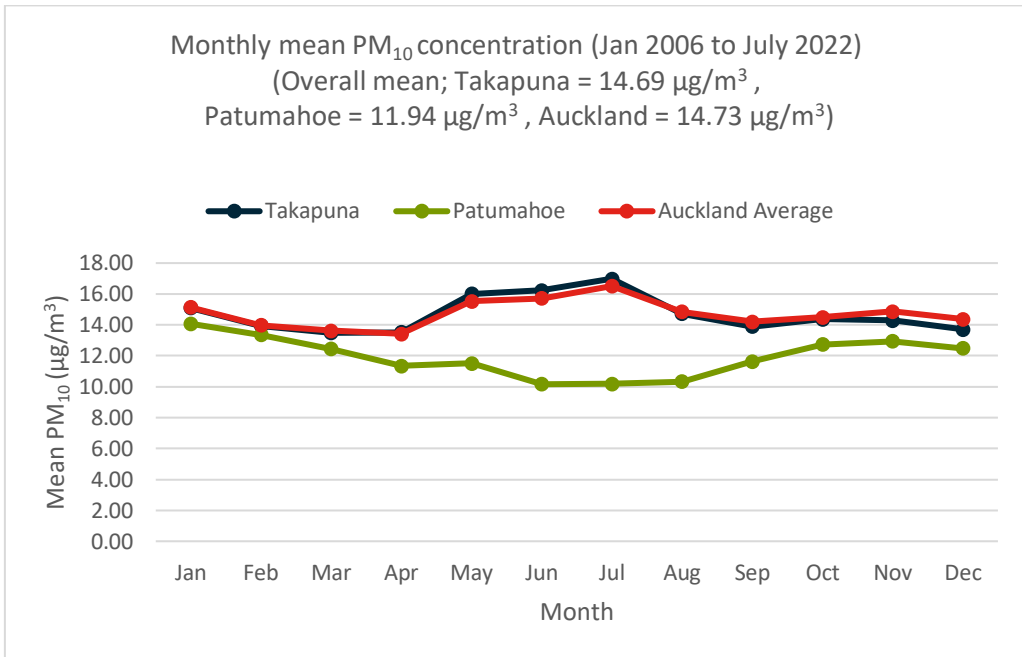


Figure 10. Temporal variation in monthly PM₁₀ concentrations – Takapuna site compared to Patumahoe (rural site) and Auckland average. Overall, Takapuna site average PM₁₀ concentration is 0.3 % higher than Auckland’s average and 20.7 % more than Patumahoe site. The Takapuna site is located at an urban representative exposure to NO₂. Therefore, NO₂ average concentration at Takapuna site is expected to be less than Auckland’s average but more than the rural/background site. Typically, urban ‘representative’ NO₂ exposure sites have average concentrations 50% less than the urban ‘peak’ sites.

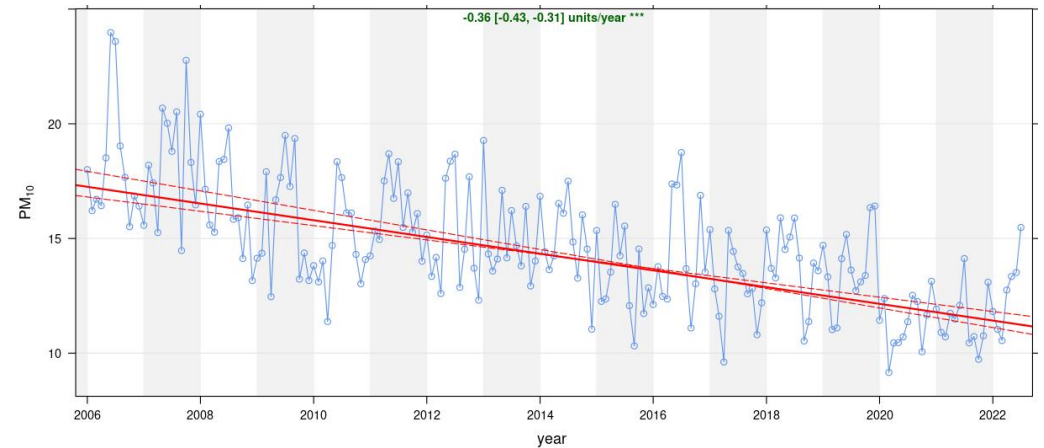


Figure 11. Long-term trends in PM₁₀ at Takapuna site. The plot shows the deseasonalised monthly mean concentrations of PM₁₀. The solid red line shows the trend estimate and the dashed red lines show the 95% confidence intervals for the trend based on resampling methods. The overall trend is shown at the top-left as – 0.36 (µg/m³) per year and the 95% confidence intervals in the slope from -0.43 – (- 0.31) µg/m³/year. The ‘***’ show that the trend is significant to the 0.001 level.

Section D. Table 3. Monthly averages: 2022 and past 5 years; ND = No data measured due to faulty sensor

Pollutant	Site	Period	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
PM ₁₀ (µg/m ³)	Glen Eden	2022	11.7	10.5	9.6	10.6	12.3	15.0	14.6	-	-	-	-	-
		Past 5 years	12.6	11.1	9.4	11.0	13.5	15.4	15.8	13.8	11.8	10.6	11.7	13.2
	Henderson	2022	12.2	11.7	13.8	11.1	11.7	11.9	12.3	-	-	-	-	-
		Past 5 years	12.7	11.4	10.4	11.6	12.8	13.3	13.2	12.5	11.6	11.1	12.2	13.2
	Khyber Pass Road	2022	13.0	12.3	13.4	13.7	13.1	13.7	14.6	-	-	-	-	-
		Past 5 years	16.2	14.5	13.5	13.6	14.2	13.2	13.7	13.1	13.1	12.9	14.5	14.4
	Pakuranga	2022	12.2	10.6	11.8	11.9	13.0	12.8	14.7	-	-	-	-	-
		Past 5 years	13.2	11.8	9.9	10.5	12.7	14.0	14.0	12.6	11.4	11.1	12.4	13.1
	Papatoetoe	2022	15.1	12.8	12.3	12.3	13.6	13.1	13.5	-	-	-	-	-
		Past 5 years	15.1	13.8	12.4	13.4	14.1	14.3	16.2	14.4	13.9	13.2	15.1	15.8
	Patumahoe	2022	13.9	10.1	14.6	11.1	11.9	10.3	10.3	-	-	-	-	-
		Past 5 years	15.0	13.7	11.5	11.9	11.3	9.7	10.0	11.0	11.7	11.7	13.3	15.4
	Penrose	2022	15.5	13.7	15.5	14.3	16.0	13.0	14.6	-	-	-	-	-
		Past 5 years	15.9	15.1	13.4	14.2	15.4	14.9	14.6	13.9	13.7	13.1	15.0	16.2
	Queen Street	2022	21.4	19.4	18.4	17.9	18.4	19.2	21.7	-	-	-	-	-
		Past 5 years	16.5	16.0	15.1	15.8	16.7	16.1	17.0	17.3	17.3	17.4	18.1	19.0
PM _{2.5} (µg/m ³)	Customs Street	2022	ND	2.9	2.6	3.8	3.8	5.7	4.9	-	-	-	-	-
		Past 5 years	4.4	4.1	3.6	3.9	4.1	4.1	4.7	6.5	6.8	4.0	3.7	4.0
	Glen Eden	2022	ND	ND	2.0	2.8	5.0	6.9	7.4	-	-	-	-	-
		Past 5 years	2.7	2.5	2.0	3.2	6.0	10.8	10.6	7.8	5.1	3.4	3.8	3.8
	Pakuranga	2022	2.7	2.8	2.4		4.8	5.3	6.3	-	-	-	-	-
		Past 5 years	3.1	2.9	2.5	3.5	5.5	6.7	10.2	5.4	4.4	3.2	4.4	4.0
	Patumahoe	2022	5.1	3.3	4.6	4.9	5.4	5.8	4.5	-	-	-	-	-
		Past 5 years	5.5	4.7	4.2	4.9	5.6	5.0	5.0	4.8	5.0	4.7	5.7	5.9
	Penrose	2022	5.5	4.6	4.5	5.0	6.1	5.8	6.1	-	-	-	-	-
		Past 5 years	7.0	5.6	5.0	5.7	6.8	8.0	7.5	6.5	5.9	6.1	7.0	6.5
	Queen Street	2022	8.8	7.8	7.1	7.4	8.0	8.4	9.4	-	-	-	-	-
		Past 5 years	6.7	6.1	5.8	6.6	7.0	7.2	7.5	7.3	7.1	7.2	7.3	7.6
	Takapuna	2022	6.0	5.7	4.9	5.7	6.5	7.0	8.6	-	-	-	-	-
		Past 5 years	5.9	5.4	4.9	5.6	6.9	8.5	8.8	7.4	6.7	6.3	6.7	6.3
NO ₂ (µg/m ³)	Customs Street	2022	20.0	18.8	26.7	26.3	26.5	80.4	31.5	-	-	-	-	-
		Past 5 years	42.1	45.7	45.1	33.1	42.4	39.0	40.5	36.4	29.4	31.9	25.6	27.2
	Glen Eden	2022	2.3	2.7	2.6	5.3	8.9	9.2	9.9	-	-	-	-	-
		Past 5 years	2.0	3.4	4.4	4.6	7.3	8.1	7.6	5.8	3.5	3.4	3.0	2.2
	Henderson	2022	4.4	8.9	9.4	11.2	12.5	10.9	9.9	-	-	-	-	-
		Past 5 years	3.6	7.3	8.2	9.0	12.7	14.1	12.8	8.1	6.1	5.9	6.1	4.4
	Khyber Pass Road	2022	15.5	16.0	17.3	22.8	33.2	35.0	29.3	-	-	-	-	-
		Past 5 years	24.1	21.6	27.8	28.3	37.4	36.1	40.5	34.7	32.0	28.5	33.5	22.0
	Patumahoe	2022	ND	ND	3.9	4.2	5.3	5.6	5.4	-	-	-	-	-
		Past 5 years	1.5	2.3	3.3	2.8	3.8	4.2	4.2	3.0	1.9	1.9	2.2	1.9
	Penrose	2022	7.7	7.5	11.4	15.7	21.8	19.1	18.3	-	-	-	-	-
		Past 5 years	9.5	11.9	14.5	17.2	23.1	24.6	25.4	19.2	17.0	13.4	13.2	9.1
	Queen Street	2022	18.5	18.5	18.5	15.0	17.4	21.9	21.8	-	-	-	-	-
		Past 5 years	31.4	32.3	34.7	37.6	43.0	43.3	49.4	48.8	45.0	42.0	36.8	32.2
	Takapuna	2022	4.8	6.9	8.7	12.7	20.3	20.0	19.1	-	-	-	-	-
		Past 5 years	7.6	9.5	11.9	15.4	21.2	22.4	23.9	18.7	14.9	12.5	11.5	8.1
SO ₂ (µg/m ³)	Customs Street	2022	2.1	1.7	2.6	2.3	2.0	10.3	3.3	-	-	-	-	-
		Past 5 years	1.4	1.6	2.2	1.1	1.6	1.5	2.2	2.6	1.7	1.7	1.3	1.4
	Penrose	2022	1.0	1.0	1.2	1.2	1.4	1.3	1.1	-	-	-	-	-
		Past 5 years	0.4	0.9	1.1	0.9	1.3	1.4	1.1	0.8	0.9	0.8	1.0	0.5
O ₃ (µg/m ³)	Patumahoe	2022	24.4	26.1	31.0	33.4	37.4	41.2	47.6	-	-	-	-	-
		Past 5 years	27.4	28.9	32.9	38.9	41.6	42.2	46.3	52.1	51.3	46.2	40.1	32.2
CO (mg/m ³)	Khyber Pass Road	2022	0.015	0.012	0.018	0.036	0.137	0.120	0.135	-	-	-	-	-
		Past 5 years	0.199	0.262	0.281	0.357	0.509	0.425	0.540	0.336	0.229	0.226	0.232	0.160
Black carbon (ng/m ³)	Customs Street	2022	1001	1005	1055	1265	1322	7818	1303	-	-	-	-	-
		Past 5 years	1675	1740	1456	1009	1375	1357	1372	1076	818	945	1061	992
	Henderson	2022	254	452	502	530	825	802	699	-	-	-	-	-
		Past 5 years	236	444	577	603	1105	1337	1272	890	476	391	413	302

*All Customs Street 'Past 5 years' values are the averages for the past 2 years (2020 and 2021); **All Papatoetoe 'Past 5 years' values are the averages for the previous 4 years (2018 - 2021); ***Glen Eden and Pakuranga 'Past 5 years' PM_{2.5} values are for the previous 3 years averages (2019 - 2021).

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