

WestConnex air quality monitoring program and ventilation systems are designed to protect and improve the health of local communities and motorists using the tunnels.



New M4 Tunnels

WestConnex is delivering 33 kilometres of road network, including 22 kilometres of tunnels, linking Parramatta, Sydney CBD and the south west of Sydney.

Road tunnels can help reduce air pollution by moving traffic off local roads where people live and work, and putting vehicles underground. In a tunnel, compared to a local surface road, vehicle emissions can be controlled and dispersed more effectively and are monitored consistently to ensure standards are met.

Sydney's air quality

Sydney's air quality is good by world standards, according to international comparisons by the World Health Organisation who set the guidelines.

Even though traffic volumes have significantly increased over time, Sydney's air quality has improved and is now cleaner

than it was two decades ago. This is a result of big improvements in vehicle emissions mainly due to stricter fuel and vehicle emission standards.

WestConnex air quality

WestConnex is committed to effectively managing air quality during the construction and operation of the WestConnex road network. Tunnel infrastructure includes state-of-the-art technologies such as monitoring and ventilation facilities, which help keep air clean in our tunnels and local communities.

Air quality is considered and assessed during the proposal and design of WestConnex.

Contact us

Do you have a question about the project? If you need more information or would like to provide feedback, please get in touch.

- Westconnex.com.au
- info@westconnex.com
- 1800 660 248
- Find us on Facebook.

Find out more

For more information on air quality in NSW visit, NSW Department of Planning, Industry and Environment website at dpie.nsw.gov.au/air-quality for a daily update on Sydney's current and forecast air quality.

We speak your language



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The tunnels are designed to be wider, flatter and higher than other tunnels in Sydney, meaning a smoother journey with less stop-start driving, relieving surface congestion and fewer vehicle emissions.

Monitoring and reporting on air quality

In NSW air emissions are regulated by the NSW Environment Protection Authority (EPA), and compliance with ambient, or outdoor, air quality standards is an essential consideration during road project design and operation. To ensure requirements and standards are met, WestConnex must be built and operated according to conditions placed on the project, which control air quality limits, monitoring and reporting.

These conditions are developed in consultation with the NSW Advisory Committee on Tunnel Air Quality, chaired by the NSW Chief Scientist and Engineer and including

representatives from the NSW EPA, NSW Health, Roads and Maritime, and the Department of Planning and Environment as well as world-leading air quality experts.

Monitoring and reporting takes place to protect and work towards enhancing local community’s air quality and to ensure the in-tunnel ventilation system is operating effectively.

Air quality pollutants we’re monitoring

Air pollution in Australia is measured by six main air pollutants; carbon monoxide, nitrogen dioxide, photochemical oxidants, sulphur dioxide, lead and particulate matter. Of all the pollutants assessed, PM_{2.5} (tiny particles of matter, one-fortieth the width of a hair) is considered to present the greatest potential impact to our health. Accordingly, NSW standards for PM_{2.5} are the most stringent in the world.

The in-tunnel air quality monitoring shows data for:

- Carbon monoxide (CO)
- Nitrogen dioxide (NO₂)
- Visibility (K)

The external ambient air quality monitoring shows data for:

- Carbon monoxide (CO)
- Nitrogen dioxide (NO₂)
- Particles less than 2.5 micrometres in diameter (PM_{2.5})
- Particles less than 10 micrometres in diameter (PM₁₀)
- Standard deviation in wind direction (Sigma theta)
- Temperature at 2 metres (°C)
- Temperature at 10 metres (°C)
- Wind direction (degrees)
- Wind speed (m/s)

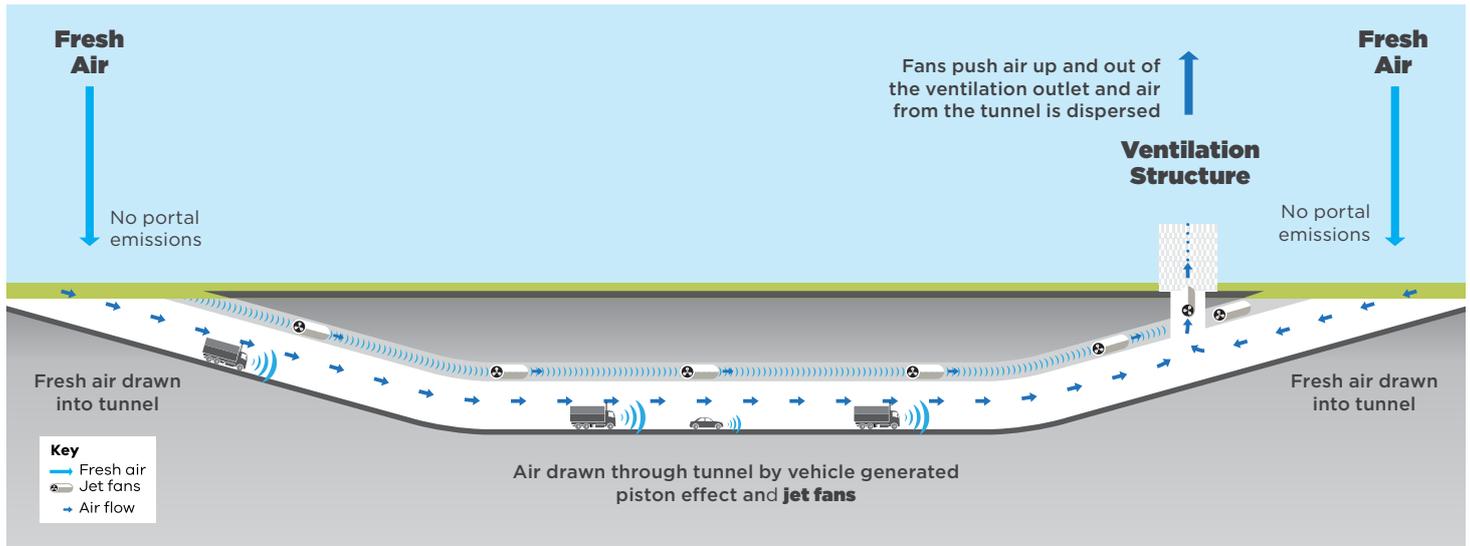
The ventilation outlet air quality monitoring shows data for:

- Carbon monoxide (CO)
- Nitrogen dioxide (NO₂)
- Oxides of nitrogen (NO_x)
- Solid particles
- Volatile organic compounds (VOC)

For a detailed description of each pollutant visit: <https://help.linkt.com.au/sydney/article/general/using-toll-roads/tunnel-air-quality/glossary-of-air-quality-terms>

Validating data

Data collected from all air quality monitoring instruments undergoes a preliminary quality assurance check. This data is then preliminary until a monthly quality assurance check or validation process has been undertaken. This process is undertaken each month by a person or organisation accredited by the National Association of Testing Authorities. For further detailed description and explanation of the quality assurance and data validation process, visit the Office of Environment and Heritage. Link: <https://www.dpie.nsw.gov.au/air-quality>



Road tunnel ventilation system

Sydney is a major international centre with residential, commercial, industrial, and natural occurrences such as bush fires, all contributing to air pollution. Major contributors include wood heaters and home heating, contributing 51 per cent of PM_{2.5}. Motor vehicles are an important contributor to emissions, contributing 14 per cent of PM_{2.5}.

How tunnel ventilation works

Ventilation systems work by drawing in fresh air from the tunnel entry, which is then pushed through the tunnel by the movement of vehicles and jet fans.

Before the tunnel exit, air is pushed up and out of the tunnel through a ventilation structure and high up into the atmosphere where it mixes and dilutes with fresh air.

There are no emissions from the tunnel entries or exits where vehicles enter and exit. Research from around the world clearly shows emissions from well-designed tunnel ventilation systems have no measurable effect on local or regional air quality.

The WestConnex ventilation systems

WestConnex systems feature ventilation structures located at the exit of each tunnel to remove air from inside the tunnel.

The system has been designed to:

- meet NSW's stringent air quality requirements, which are among the highest standards in the world
- maintain safe air quality inside and outside the tunnel
- manage emissions from predicted traffic volumes now and long into future



Traffic has reduced along Parramatta Road after opening the New M4 Tunnels

Tunnel ventilation in NSW

An independent Air Quality Scientist from the National Institute of Water & Atmospheric Research is undertaking an analysis of local air quality comparing it before and after the opening of the New M4 Tunnels.

Findings from pre-opening compared to post-opening have shown improvements to air quality along Parramatta Road as a result of the New M4 Tunnels.

Initial results show that there has been a statistically significant reduction in traffic along Parramatta Road which has therefore reduced the levels of traffic related air quality pollution at Concord Oval, Haberfield Public School, Ramsay Street and St Lukes Park high are where the air quality monitors are located. These preliminary findings demonstrate a very positive outcome for local communities living in these areas. The project team will continue to analyse the results and will share more information with the community as more information becomes available.



New M4 Tunnel portals and ventilation outlet



Monitoring operates 24 hours per day, seven days per week and must meet strict operational guidelines that are set out in Australian Standards. External air quality will vary during the year due to the changing seasonal climate, wind speeds and external events such as dust storms, bush fires and construction works in the area. Personnel visit the stations twice a month during weekdays to test and calibrate the equipment and ensure the data they collect is accurate.

Ambient air quality monitoring stations

Air quality monitoring stations are installed along the WestConnex corridor to collect data in local areas on the surface. These stations help us keep track of what the air quality was like before the project, during construction and after opening the motorway to ensure there is no measurable impact on local air quality and to assess any improvements.

Air quality exceedances

When there is an exceedance in air quality levels on our project, a report is published on the WestConnex or Linkt website. To date, exceedances have largely been due to bush fires, dust storms and technical errors.

Here's how we're monitoring pollutants

What is being monitored?	How?	For how long?	Where will results be published?
Outside tunnel: Ambient or local air quality nearby the WestConnex project	Ambient monitoring stations are placed in locations along and close to the project corridor	<ul style="list-style-type: none"> • Prior to construction; • During construction; and • For up to at least two years after the tunnels open 	While a project is in construction data is available on the WestConnex website here: https://www.westconnex.com.au/air-quality
Inside tunnel: Air quality in the tunnel and ventilation outlets	Monitoring equipment inside the tunnel and ventilation outlets	24/7, at all times during operation of the tunnels	When a project is open and operating, data is available on the Linkt air quality website here: https://www.linkt.com.au/sydney/using-toll-roads/about-sydney-toll-roads