During consultation on the proposed project, NorthConnex has received community comment and heard community concerns, particularly regarding potential air quality and health impacts.

We are aware some information presented in the community has been incorrect and misleading. To address these concerns and ensure the community is informed correctly we have prepared this community update to focus on those misconceptions regarding air quality and health. We would encourage you to also visit northconnex.com.au under – 'Your thoughts - Addressing misconceptions about the project' for further information.
Providing through traffic, particularly trucks, with a continuous free flowing motorway instead of the existing stop start conditions on Pennant Hills Road will cut travel times by up to half.

This means they will be travelling through the area for half the time they are currently, in some cases even less time with the associated reduction in emissions.

The single biggest contributor of pollution in the Sydney basin is wood fired heaters, which account for more than 50 per cent of particulate matter. By comparison cars and trucks combined account for seven per cent.

Existing outlets near residential areas

The use of ventilation outlets is common in urban areas, both in Sydney, across Australia and internationally. By way of example:

<table>
<thead>
<tr>
<th>Ventilation outlet in Sydney near residences</th>
<th>Distance to nearest residents (approximate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Distributor (southern)</td>
<td>10m</td>
</tr>
<tr>
<td>Eastern Distributor (northern)</td>
<td>30m</td>
</tr>
<tr>
<td>Lane Cove Tunnel</td>
<td>100m</td>
</tr>
<tr>
<td>Sydney Harbour Tunnel</td>
<td>200m</td>
</tr>
<tr>
<td>Cross City Tunnel</td>
<td>250m</td>
</tr>
</tbody>
</table>

The health and safety of residents and road users is a priority

The NorthConnex health assessment was carried out in accordance with NSW and international health guidelines and used conservative assumptions such as: calculated health outcomes based on an exposure to the worst-case possible concentration for 24 hours a day, 7 days a week, 365 days a year when the tunnel opens in 2019 and after ten years of operation in 2029.

It also assessed the potential impacts on more vulnerable members of the community including young children, the elderly and individuals with pre-existing respiratory health conditions.

In all cases, the assessments have demonstrated acceptable air quality and human health outcomes can be achieved.

The health assessment concluded that across the project corridor there would be a net health benefit as a result of NorthConnex.

We have learnt the lessons from the M5 East project and have ensured the shortcomings are not repeated. The M5 East project in Sydney's south was the cheapest option on the table at the time. NorthConnex takes account of the lessons learnt, it is not the "cheapest option", as has been suggested, but is wider, higher and flatter with a more efficient ventilation system ensuring both in tunnel and external air quality will be of an acceptable standard to address community safety requirements.

Road tunnels and ventilation outlets do not generate pollution; vehicles using both surface roads and tunnels are the cause of the emissions, and the Government continues to work with industry to address emissions at the source.

The NorthConnex ventilation outlets will more effectively redistribute vehicle emissions away from ground level for dispersion high into the atmosphere.
Modelling has shown the effect of the ventilation outlets on local air quality will be negligible. In the case of small particulate matter (PM$_{2.5}$), worst case scenario modelling indicates a change of around one per cent to existing background levels. This is negligible in comparison to the current daily and seasonal variations in air quality in the area.

The reason the change is so small is that ventilation outlets take existing emissions from traffic, dilute them and more effectively disperse them high into the atmosphere (rather than at roadside where they are currently dispersed).

Vehicles will travel within the tunnel for an average of six minutes, which is a significantly shorter travel time than currently experienced on Pennant Hills Road. As a result, fewer emissions would be generated by vehicles using the tunnel compared to the idling traffic currently releasing emissions at surface level in the local area for most of the day.

**Air quality modelling for the ventilation outlets does consider local conditions**

The air quality modelling has taken into account local topography, including the height of the ventilation outlets relative to surrounding land. Modelling of air-flow and emissions for NorthConnex was carried out using an advanced, US Environment Protection Authority approved modelling package. The air quality assessment includes detailed, in depth observations and recordings of hourly weather patterns at all locations throughout the study area. It also predicted hourly air flow over three years at 60,000 locations in the study area.

The modelling includes detailed consideration of how local terrain influences both air flow and dispersion of emissions and concluded emissions from the ventilation outlets would cause a negligible change in local air quality.

**PM$_{2.5}$ refers to particulate matter 2.5 microns and below including ultra fines**

There is no evidence that air quality or people’s health has been adversely affected from existing tunnels which have outlets located in residential areas. Ultra-fine particulates are included in the measurement and assessment of PM$_{2.5}$, which includes all particulate matter 2.5 microns in size and smaller. Very large populations across Australia and throughout the world are exposed to varying levels of particulates from vehicle emissions every day including residents living on the Pacific Highway and Pennant Hills Road.

![Diagram of predicted annual average contribution of PM$_{2.5}$ at the northern ventilation outlet in 2029](image1)

![Diagram of predicted annual average contribution of PM$_{2.5}$ at the southern ventilation outlet in 2029](image2)
Filtration has not been proposed as it would not provide any significant benefits and is not necessary to meet air quality guidelines.

Filtration has not been proposed because it is not required to achieve acceptable in-tunnel and external air quality outcomes and it would not provide any significant benefit to the community. The design is optimised to ensure air quality standards are met.

Modelling has shown the effect of the NorthConnex ventilation outlets on local air quality would be negligible. In the case of small particulate matter (PM$_{2.5}$), modelling indicates a change of around one per cent in comparison to the background levels.

No road tunnel in Australia uses filtered ventilation outlets to reduce emissions.

Internationally, there are a very small number of road tunnels with filtration systems chiefly in Japan and Norway and they are provided mainly to assist in maintaining in-tunnel visibility. In Japan they are required to address the combination of a high fraction of diesel powered cars and a very high percentage of heavy goods vehicles. The Norwegian system was required for the high dust concentration related to the use of spiked tyres used in icy conditions and large amounts of sand and salt dispersed in wintertime. Sydney tunnels do not have these issues and as such conventional ventilation systems without filtration have been proven to work very safely and effectively.

The Lane Cove Tunnel study did not find a correlation between air quality and the health of residents living around the tunnel ventilation outlet.

The paper by Cowie et al (2012) reported an initial increase in upper and lower respiratory tract symptoms and lower lung volumes by residents involved in the study, however this was only for the first year and did not persist after the first year of operation. This anomaly could not be explained by Cowie et al (2012). The study showed no increase in air pollutants and did not show a significant health effect that could be attributed to the ventilation outlets.

This study, along with other studies of ambient air quality data including the M5 East and Cross City Tunnel has confirmed emissions from ventilation outlets have a negligible impact on local and regional air quality.

The 60-day public exhibition period for the Environmental Impact Statement (EIS) finishes on 12 September 2014. Submissions on the proposed project are welcome and should be addressed to the Department of Planning and Environment.

If you would like further information, to register to receive project updates, would like to provide feedback or discuss the project, you can contact the project team by email enquiries@northconnex.com.au, or call the project information line (free call) 1800 997 057.