

**Submission  
No 211**

## **INQUIRY INTO IMPACT OF THE WESTCONNEX PROJECT**

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**Date Received:** 31 August 2018

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Parliament of NSW  
Legislative Council  
Public Accountability Committee  
Inquiry into the Impact of the WestConnex Project

## **Submission to the Inquiry into the Impact of the WestConnex Project**

The following is a submission to the Inquiry into the Impact of the WestConnex Project.

### **Personal Details:**

1. My name is Noel George Child.
2. I am a qualified and experienced scientist and engineer, with some knowledge of road tunnel ventilation and air treatment and filtration technologies.
3. I have on two occasions in the past completed detailed reviews of international air treatment technologies for the then Road Transport Authority of NSW (RTA).

### **Areas of Concern:**

4. I am concerned about a number of aspects of the road tunnels associated with the WestConnex project and other similar infrastructure development projects, including in particular:
  - (a) The efficacy of current approaches to road tunnel ventilation, and the associated discharge of tunnel exhaust air to the atmosphere;
  - (b) The absence of rigorous and effective review processes that are at genuine arm's length from the promoters, developers and ultimate operators of these items of infrastructure;
  - (c) The possibility of performance failures that will lead to significant public health exposures and risks;
  - (d) The absence of processes that will allow public access to actual operational air quality performance data, both internal and external to prospective road tunnels, and the associated risk that accurate and objective performance data may not be made public; and
  - (e) The complete absence of fall back and contingency ventilation and exhaust air discharge strategies, in the event that the currently proposed approaches fail.

### **Relevance to Inquiry Terms of Reference:**

5. My concerns relate to the following terms of reference:
  - (a) consideration of the governance and structure of the WestConnex project including the relationship between Sydney Motorway Corporation, Roads and Maritime Services, the Treasury and its shareholding Ministers;
  - (b) the extent to which the project is meeting the original goals of the project as articulated in 2012;
  - (c) the relationship between WestConnex and other toll road projects including the Sydney Gateway, Western Harbour Tunnel, F6 and Beaches Link; and
  - (d) any other related matter.

**Details of Submission:**

6. There are a range of issues around road tunnel construction: Do they provide value for money? Do they in part solve a short-term congestion problem at the cost of inducing even more traffic and congestion in the future? Have road tunnels and road networks been properly assessed and prioritized in relation to other transport options, such as public transport infrastructure?
7. These are all important issues and questions and should be addressed. I am not convinced by publicly available evidence that they have been. I am sure that others will address the Inquiry of these matters.
8. My specific interest, and the primary basis of this submission, is the matter of road tunnel ventilation, including both air quality within road tunnels, and air quality near discharge stacks – or other discharge points.
9. I think that the following five questions encapsulate some very important issues regarding tunnel ventilation that do not appear to have been adequately addressed by present and past NSW governments, their infrastructure and transport bureaucracies, and the promoters and ultimate operators and proprietors of tunnels and associated toll roads.
  - (i) Are proposed road tunnel projects being fully, thoroughly and independently modelled to quantify both in-tunnel and discharged air quality under a full range of operating conditions, including worst case traffic, congestion and vehicle emission scenarios? If not – why not?
  - (ii) Is a tunnel ventilation option other than longitudinal ventilation provided by the piston effect of traffic supported by roof mounted fans being included in tunnel designs as a contingency against adverse in-tunnel air quality conditions? If not – why not?
  - (iii) Is provision for available and proven air treatment and filtration technologies being included in the design of tunnel ventilation stacks, as a contingency against adverse and worse than anticipated tunnel exhaust air quality? If not – why not?
  - (iv) Are the NSW government, its transport bureaucracies or current and prospective tunnel and toll road operators party to or subject to a genuinely independent and rigorous review of available air treatment and filtration technologies? If not – why not?
  - (v) Are the NSW government, its transport bureaucracies or current and prospective tunnel and toll road operators making all resources and information regarding the above matters freely available to the public, who through the sale of former electricity infrastructure assets are funders of these projects, and who will be the ultimate users of road tunnel and toll road infrastructure? If not – why not?
10. By way of background to the five questions included in (9) above, the following observations are offered:
  - a) **Road Tunnel Modelling:** There are several highly reputable international organisations that can, at relatively low cost, certainly in relation to project cost and the potential cost of failure, develop detailed computer-based simulations of road tunnels and road tunnel ventilation. These simulations can examine all possible operational scenarios, including “worst case” scenarios associated with adverse vehicle emissions and traffic congestion. The results of this type of independent analysis are used, in countries such as Japan, to inform decisions about tunnel ventilation, and whether or not treatment or filtration of tunnel exhaust gases is required.
  - b) **Tunnel Ventilation Options:** This is an important issue. Longitudinal ventilation, as currently included in the design of all prospective Sydney road tunnels, provides the lowest cost/maxim profit option as far as the toll road and tunnel operators are concerned. Other systems of ventilation appear not to have been seriously considered. This appears to be at odds with international best practice – unless the NSW Government, its departments and agencies, or the project promoters and operators, can clearly and transparently demonstrate otherwise.
  - c) **Air Treatment & Filtration:** Contrary to the position indicated by the NSW government, and I suspect prompted by current and prospective tunnel and toll road operators via lobbyists and the government’s own bureaucracies, cost effective, efficient, proven, reliable and market ready air treatment options are available. That is not to say such technology is always required – but such technology should certainly be considered in relevant circumstances.

- d) **Real Air Quality & Vehicle Emission Issues:** It is noted in relation to the analysis of current Sydney road tunnel projects, that a degree of idealisation appears to have been applied to both base load air quality data, and vehicle emission data. In my view, this serves to emphasise the need for truly independent oversight of the process. As two examples, firstly Sydney's ambient air contains high levels of PM10 and PM2.5 particulate matter already approaching recommended limits. This in turn is the air introduced into road tunnels before the impact of vehicle exhaust emissions. Secondly, large parts of Sydney's (and Australia's) truck fleet is old by international standards, and exhaust emission levels are significantly higher than those often assumed in tunnel air analyses. These two issues alone indicate the vulnerability of "idealised" performance assessments, undertaken in the absence of genuinely independent oversight.
- e) **The Specific Challenge of Long, Heavily Trafficked Tunnels:** It is noted that many of the tunnels under construction and proposed as part of Sydney's future road infrastructure are relatively long by international standards (8 – 10 kilometres), and will be heavily trafficked, with the traffic mix in many cases including a high proportion of high exhaust emitting diesel powered trucks. In international experience, tunnels of this type are frequently the subject of more efficient transverse ventilation, rather than simple longitudinal (or "piston") ventilation, to ensure the maintenance of appropriate tunnel air quality.
- f) **Independent Review of Air Treatment & Filtration Technologies:** The NSW Government should be undertaking (and once did undertake) regular and genuinely independent reviews of road tunnel air treatment and filtration technologies – both in relation to in-tunnel and tunnel exhaust air. I suspect that what may now be happening is that any review being undertaken is being done so from "within the tent" – with attendant concerns regarding the independence of any resulting advice from the inevitable influences of commercial project processes.
- g) **Transparency of Process:** It is of serious concern, given the nature and the source of funding for toll road and tunnel projects, that key organisations charged with responsibility for their delivery appear to have been "fire-walled" against freedom of information and public disclosure mechanisms. This is a critical issue and goes to the credibility and integrity of the government, and its processes. No reasonable person would question the need for confidentiality in commercial matters, but any reasonable person should question the application of secrecy and privacy provisions to the availability of technical and performance data that is clearly in the public interest.

I hope that this submission is of some interest.

I would be pleased to provide evidence to the Inquiry, including further detail on any of the above matters, should that be of value.

I wish all parties every success in exploring the range of very important issues in question.

Yours Very Truly

**Noel Child  
Scientist & Engineer  
Managing Partner  
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