

Dr Tim Stephens

BA (Hons) LLB (Hons) Syd M.Phil Cantab PhD Syd

3 Logan Avenue • Haberfield, NSW 2045
Phone: 02 9798 4928 • E-Mail: tim.stephens@sydney.edu.au

Thursday, 22 October 15

Department of Planning and Environment

Dear Sir/Madam,

WestConnex Project – Environmental Impact Statement

I write in relation to the Environmental Impact Statement ('EIS') for the WestConnex project.

I teach and research in environmental law at the Faculty of Law at the University of Sydney, with my research addressing a range of environmental issues, including the regulation of air pollution. I am also a resident in the Parramatta Road corridor of the WestConnex project. I make this submission in a personal capacity.

My submission relates primarily to defects in the EIS in relation to the assessment of air quality impacts in areas in Haberfield where there will be additional traffic volumes on surface roads as a consequence of the project.

The EIS does not adequately assess the impacts of ultrafine particles in areas where traffic volumes will increase. The EIS states that 'for the purpose of the project assessment it has...been assumed that the effects of ultrafine particles on health are adequately represented by those of PM2.5' (9-9).

This assumption is incorrect and should be revisited in a revised EIS. This is because, first, it cannot be assumed that ultrafine particles have the same health impacts as PM2.5, and second, because ultrafine particles have a much broader distribution either side of roadways than PM2.5 and other pollutants.

There is agreement in the literature that ultrafine particulates, which make up a minor fraction of the total mass of particulate matter, carry higher health risks than larger particles emitted from vehicles. This is because of their small size, large number, and high surface area. They are more effective in transporting toxic materials to human organs and tissues than larger particles.¹ There are physiological and epidemiological studies of the impacts of ultrafine particles on human health that should have been considered in the EIS.

It also cannot be assumed that ultrafine particles disperse in the same manner as PM2.5, which generally reach urban background levels within several hundred metres of the roadside. Multiple studies, including in Australia, have shown that concentrations of ultrafine particles do not decline as rapidly as a function of distance from roadways as other pollutants.² These have found that ultrafine roadways did not reach background levels during daytime until around 300 metres from major roads. Studies in the United States have also found a significant diurnal variation in the spatial distribution of road pollution. Nitrous oxides and ultrafine particles remain at elevated concentrations for up to up to

¹ Health Effects Institute, *Understanding the Health Effects of Ambient Ultrafine Particles* (Health Effects Institute, Boston, Massachusetts, 2013).

² Hitchins et al (2000), 'Concentrations of submicrometre particles from vehicle emissions near a major road' (2000) 34 *Atmospheric Environment* 51.

Dr Tim Stephens

BA (Hons) LLB (Hons) Syd M.Phil Cantab PhD Syd

3 Logan Avenue • Haberfield, NSW 2045

Phone: 02 9798 4928 • E-Mail: tim.stephens@sydney.edu.au

1000 metres at night time and during pre-sunrise hours (even with lower traffic volumes) from motorways and other major roads.³

The EIS projects an overall improvement in ambient air quality as a result of the project and with improving fuel standards and vehicle technology. While this may be the case for PM2.5, larger mass particles, and other pollutants, the same cannot be said for ultrafine particles, the majority of which are produced as a result of diesel combustion.

The proportion of diesel vehicles in the light vehicle fleet is rapidly increasing in Australia. Since 2010 the number of passenger vehicles and light commercial vehicles registered with diesel fuel increased by 96.4 per cent and 62.9 per cent respectively.⁴ They now account for 19.7 per cent of the fleet, a figure that is rapidly rising. The EIS is therefore incorrect in stating that 'diesel passenger vehicles have represented a very small proportion of the total passenger fleet' (9-28).

The EIS should have included in its assessment of future air quality impacts the effect of a growing diesel vehicle fleet, the significant lag in the implementation of vehicle emissions standards in Australia, and the failure of those standards to set particle number limits. The EIS notes that newer cars and vehicles emit a lower mass of particles than older vehicles, however modern diesel vehicles are emitting an increasing number of particles, orders of magnitude greater than some older petrol vehicles. And it is particle number, rather than mass, which is of greater importance when assessing the health impacts of ultrafine particles.

Yours sincerely,



Dr Tim Stephens

³ Hu et al, 'A wide area of air pollutant impact downwind of a freeway during pre-sunrise hours' (2009) 43 *Atmospheric Environment* 2541.

⁴ Australian Bureau of Statistics, *Motor Vehicle Census* (2015). Available at <http://www.abs.gov.au/ausstats/abs@.nsf/mf/9309.0>