SYDNEY CHILDREN'S HOSPITAL
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The Hon. Gladys Berejiklian, MP
Premier of New South Wales
Member for Willoughby
280 Willoughby Road
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29th November 2018

Dear Premier,

We are writing as a group of concerned paediatricians and child health advocates. It has come to our attention that the NSW government is well advanced in planning for road tunnels linking the Northern Beaches via North Sydney to the WestConnex via Rozelle. It is our understanding that these will be 3 lane tunnels surfacing along the Warringah Freeway. The current design includes ventilation stacks at Cammeray immediately to the North of the North Sydney CBD. This would effectively release 15km of unfiltered vehicle emissions in a location which already frequently sees spikes in emissions related to freeway traffic. What is of grave concern is that this particular location is within a very short distance of a high concentration of educational and care facilities. Notably this includes 32 primary and high schools, 32 pre-schools and 15 hospitals and nursing homes. It seems beyond comprehension to us that the current design would be contemplated. There is no parallel of tunnels of this length being ventilated in an unfiltered fashion into such a densely populated and already polluted region anywhere else in Australia.

The health effects of airborne vehicle pollution impact a range of populations, ages and organ systems but our particular concern relates to the specific effects on children's health. There is clear and incontrovertible evidence in the literature that vehicle pollution, even at low levels, adversely affects child health. To support our arguments we have only included references from high quality studies published in the last ten years.

The World Health Organization has long been aware of the effects of traffic pollution on human health and in 2016 published a detailed report including recommendations(1). While national data for Australia was comparable with most developed nations in this report it did not report location specific data within Australia. In a robust analysis of particulate matter (PM2.5) exposure across 4 transportation modes (train, bus, automobile and ferry), readings were at least 4 times higher than urban data quoted for Australia in the WHO report(2). Of particular note the latter data was captured across transportation modes from North Sydney to Sydney CBD, the precise area of concern. Most alarming to us is the trend of increasing days per annum in Sydney East (including

North Sydney) where the National Environment Protection Measures Council maximum targets for PM10 and PM2.5 are exceeded, as reported by the NSW office of environment and heritage (3).

While multiple childhood health outcomes have been studied in relation to vehicle pollution exposure, the area that has received the most attention is respiratory health. The rising international incidence of childhood asthma is widely publicised. Whilst not the only factor, rising ambient pollution is felt to have played a major role in this. This has been very eloquently demonstrated in the medical literature. Direct correlations have been made between levels of particulate matter exposure and the prevalence of childhood asthma. This has been repeated across multiple locations and at multiple time points to control for weather and other fluctuations, with consistent patterns being seen(4). Of all the data published to date, the most compelling argument pointing to a link was the reduction in asthma presentations seen in Atlanta during the 1996 Olympics. (5). The study, published in the reputable Journal of the American Medical Association (JAMA) demonstrated that asthma presentations decreased across a range of health settings (19% to 44% reduction) while peak traffic counts and ozone concentrations were reduced due to traffic mitigation for the Olympics. Notably all other health presentations remained stable during the same time period.

The association between air pollution, specifically PM2.5 particulate matter derived from traffic emissions, and low birth weight has been well studied. A recent systematic review pooling study results, the highest level of available evidence, has confirmed this association (6). In terms of population health low birth weight rates are a crucial indicator of overall health status and affected individuals have significantly higher lifelong cardiovascular, neurodevelopmental and respiratory morbidity. A very large study from the United States (North-eastern and Mid-Atlantic region) conclusively demonstrated a link between the incidence of low birth weight infants and atmospheric PM2.5 concentrations (7). This article not only summarises the extensive literature on the topic but also makes the observation that PM2.5 traffic related emissions are derived from the burning of fossil fuels in internal combustion engines but also from road dust. The latter particles were also associated with increased rates of low birth weight, so that even as we transition to electric vehicles, dangerous particulate matter levels will remain problematic.

There is also a plethora of literature linking both childhood and adult cancer with traffic pollution. We will focus on the available evidence relating to increased incidence of childhood leukaemia, the most common of all childhood cancers. A very large and well-coordinated recent Spanish study elegantly demonstrated a relationship between the distance one lived from various road types and the risk of leukaemia (8). Furthermore in the USA the Centre for Disease Control (CDC) was concerned enough to commission a systematic review of the available literature. Again the pooled data (including several thousand leukaemia cases) demonstrated a positive association between childhood leukaemia and residential traffic exposure(9).

There has long been a concern that air pollution including particulate matter and nitric oxide (NO) may have a detrimental effect on the developing human brain. There is a growing body of literature which reports a link between air pollution and poor developmental, learning and behavioral outcomes. In the city of Los Angeles where there is a high rate of automobile use, air quality is

closely monitored and the rate of autism appears to have increases in areas where pregnant women are exposed to high levels of traffic derived pollution (10). Most compelling however was a study published on 19th November 2018, again in JAMA, which reported an association between Autism Spectrum Disorder (ASD) and prenatal exposure to NO (11). This study is powerful as it is a population-based cohort encompassing nearly all births in Metro Vancouver, British Columbia, Canada, from 2004 through 2009, with follow-up through 2014. It is robustly constructed both in terms of the measurements of air pollution and standardized diagnosis of ASD.

In conclusion we implore you to further explore the potential impacts of vehicle pollution relating to this project. We have grave concerns that the health impacts on children, who are the most susceptible to prolonged exposure due to the high concentration of educational facilities in the affected area, have been underestimated. There is a large body of high quality recent literature to substantiate our concerns. In addition we urge your government to follow the international trend of moving from automobile to more active forms of transport, with the lifelong health benefits of the latter being substantial.

We remain at your disposal to discuss our concerns further.

Yours sincerely,

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