2013

Maribyrnong City Council

KEITH LOVERIDGE

SENATE COMMITTEE

The impacts on health of air quality in Australia

including:

(a) particulate matter, its sources and effects;

(b) those populations most at risk and the causes that put those populations at risk;

(c) the standards, monitoring and regulation of air quality at all levels of government; and

(d) any other related matters.

***"Clean air is a natural resource. It is an asset that we do not pay for, but we all need; essential to our health and welfare and to our nation's economy. It is a natural resource we cannot afford to squander or undervalue."* Senator Robert Hill (1997).**

Executive Summary

Geographically, the City of Maribyrnong is at the epicentre of the expanding growth in international trade coming into and going out of Australia. This expansion is fuelled mainly by diesel for the ships, trains and trucks that transport goods around the country. The growth brings with it a plethora of problems in the form of increased air pollution and noise; significant contribution to climate change; increased pressure for spending on transport infrastructure; provision for additional health services to cope with the associated increase in health problems and a myriad of related social problems.

There is overwhelming medical evidence documenting the serious adverse health effects of exposure to diesel exhaust, including asthma attacks, strokes, heart attacks, adverse birth outcomes, effects on the immune system, multiple respiratory effects, and neurotoxicity. The World Health Organisation (WHO 2012) recently upgraded the cancer risk from diesel exhaust from 'probably carcinogenic to humans' to 'carcinogenic to humans'. This will present a seismic shift in policy for regulatory authorities.

There is also a growing body of evidence that low-income, minority communities are disproportionately impacted by transport emissions (EPA, undated). The Federal Government's Ambient Air Quality Measure Review (NEPM 2011) also expressed a similar

effect for people from lower socio-economic groups and sensitive subgroups, such as the elderly, children and those with pre-existing respiratory and cardiovascular disease. According to a WHO report (2013), published in January for the European Union, as part of their *Air Policy Review*, the long-term exposure to fine particles (PM2.5) can trigger atherosclerosis, adverse birth outcomes and childhood respiratory diseases. The *"Review of evidence on health aspects of air pollution"*, also suggests a possible link with neurodevelopment, cognitive function and diabetes, and strengthens the causal link between PM2.5 and cardiovascular and respiratory deaths.

The Clean Air Task Force report (2005) *Diesel and Health in America:The Lingering Threat,* estimates that 21,000 people die prematurely each year as a result of exposure to fine particle pollution from diesel exhaust.

Exposure is highest near ports, rail yards, and along high volume truck and rail traffic zones. Populated areas close to high volume transport corridors adjacent to port facilities, which includes both rail and road, are 'subsidising the goods movement sector with their health' (Hricko, 2006).

Emission standards in Australia for non-road diesel engines, such as cranes and other dockside loading equipment, are not as stringent as the U.S. standards as there are no regulations or standards in place to control emissions (NSW EPA 2012).

With the advent of the channel deepening project and expansion of the Port of Melbourne, a significant increase in freight traffic has been predicted. Forward projections from the Port of Melbourne show that container trade will treble in the next 20 years and international container trade will increase from 1.4 million to 7 million containers per annum by 2035. (Western Transport Alliance 2008).

The Regional Rail Link (RRL) will boost the number of trains utilising the rail corridor through Footscray, providing capacity for enough extra train services for up to 9,000 passengers across the network in the peak hour (RRL, 2011). This increase will be fuelled by diesel trains and impact residents adjacent to the rail corridor.

According to an article in The Age (2011), consultants predicted that an area around the Footscray Park Railway Reserve would be 'regularly affected by dangerous levels of nitrogen dioxide from the expanded rail line' (RRL) and the EPA had warned that a planned risk assessment had not been carried out.

The evidence is very clear and unequivocal regarding the human health toll from diesel pollution at levels below the current State and Federal objectives and standards. Additional measures are required to improve the amenity of affected municipalities, such as Maribyrnong, by implementing a reduction in diesel particulate exposure for residents located adjacent to major transport corridors.

Current standards and objectives should not be used by State regulators as a reason for inaction.

Recommendations

That the Federal Government:

1. **Supports the construction of alternative truck routes (on/off ramps) to and from the Westgate Freeway, in order to remove trucks from residential streets.**

2. **Provide funding for reducing diesel emissions through an alternative fuels program, such as CNG and diesel/electric hybrid vehicles.**

3. **Fund a Clean Truck Program, in partnership with the State Government, around the Port of Melbourne terminals.**

4. **Introduce compliance standards for $PM_{2.5}$ as a priority.**

5. **Introduce 8hr standards for diesel particulate matter ($PM_{2.5}$ and PM_{10}).**

6. **Ensure State government regulatory authorities do not use the National Environment Protection Measures objectives and advisory reporting standards as levels that provide protection for human health and wellbeing.**

7. **Encourage changes to State planning legislation that require 'sensitive use' facilities to be located well away from high traffic volume transport corridors.**

The City of Maribyrnong

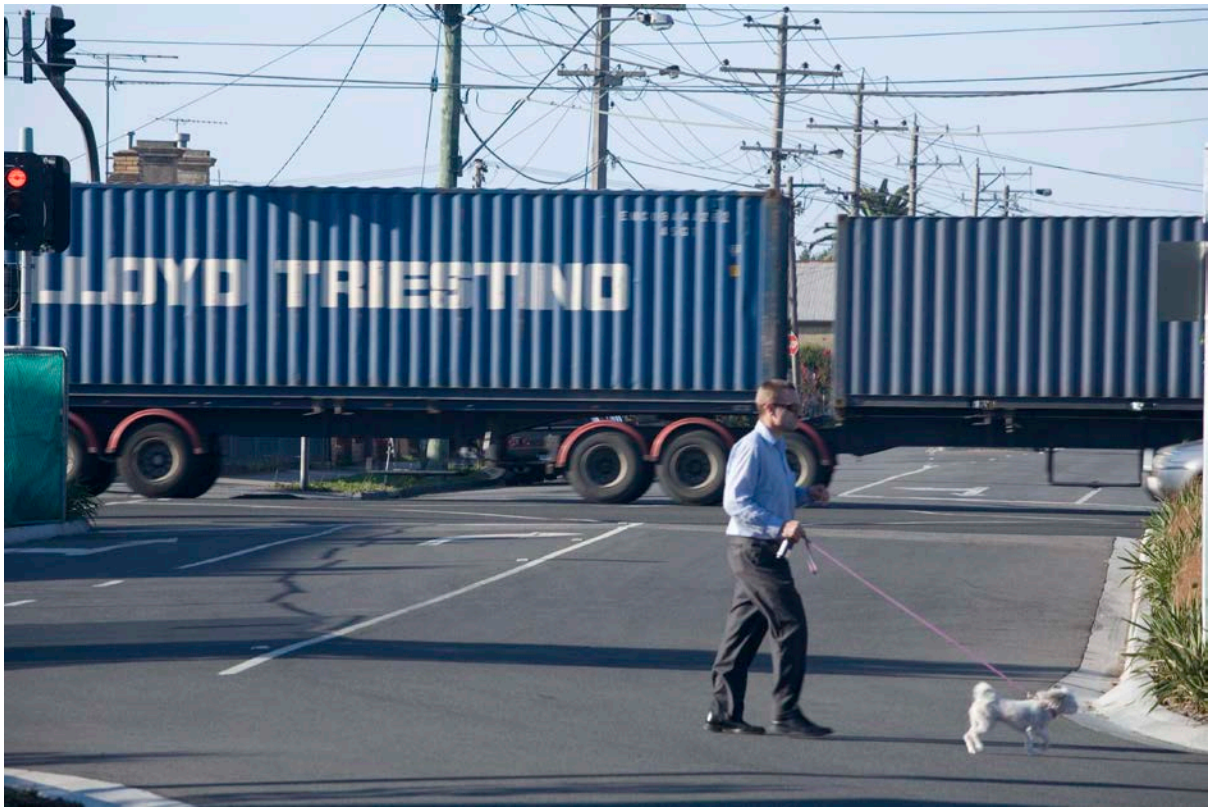
The City of Maribyrnong is one of the smallest and most densely populated municipalities in Victoria. Maribyrnong currently has a population of just over 75,000 which is anticipated to increase by 31% by 2031 to approximately 107,900. Maribyrnong's central location provides easy of access to all the city benefits and transport hub.

Two major interstate, intra-state and suburban rail routes converge at Footscray and provide the nucleus of a well patronised train, bus and tram public transport system. The city is traversed by five important east-west arterial roads and adjoins the Westgate Freeway, all of which provide access to the Melbourne CAD, the Port of Melbourne and major road and rail freight terminals between the Maribyrnong River and the Melbourne CAD. A number of these east-west roads are narrow and highly congested at times.

The two primary foci generating significant travel demand and congestion affecting the City are the Melbourne CAD and the Port of Melbourne.

Even with its close proximity to the city, Maribyrnong is ranked the third most disadvantaged municipality in Victoria. Approximately 1 in 5 people living in the City of Maribyrnong have a disability. Maribyrnong is a diverse municipality and has of the highest rates of culturally and linguistically diverse communities, with 33% of Maribyrnong residents born outside Australia, with 43% speaking a language other than English with the largest populations being Vietnamese, Chinese, Greek, Italian and Macedonian. (Maribyrnong City Council, 2012)

As of the March 2012, the unemployment rate within Maribyrnong was 7.8% compared to the Victorian average of 5.2%.



Discussion

The latest WHO review on diesel exhaust (2012) found that :

> *'Large populations are exposed to diesel exhaust in everyday life, whether through their occupation or through the ambient air. People are exposed not only to motor vehicle exhausts but also to exhausts from other diesel engines, including from other modes of transport (e.g. diesel trains and ships) and from power generators. Given the Working Group's rigorous, independent assessment of the science, governments and other decision-makers have a valuable evidence-base on which to consider environmental standards for diesel exhaust emissions.....'*

A recent 20 year study of 12,315 workers in eight underground mining facilities, *The Diesel Exhaust in Miners Study* (Silverman 2011), concluded that:

> *'The study findings provide further evidence that exposure to diesel exhaust increases risk of mortality from lung cancer and have important public health implications..... Our findings are important not only for miners but also for the 1.4 million American workers and the 3 million European workers exposed to diesel exhaust and for urban populations worldwide.'*

An accompanying editorial stated that:

> *'……this sharp rise in risk at lower levels of diesel exposure necessitates stringent occupational and particularly environmental standards for diesel emission exposure. Furthermore, reducing carbon exposure in the general environment poses an imminent challenge. The necessity for such reduction is becoming increasingly apparent and is essential if the health of large numbers of people is not to be compromised'.*

A further study (Brugge et al, 2007) that looked at the effects of near highway pollutants on exposed populations found that:

> *'The most susceptible (and overlooked) population in the US subject to serious health effects from air pollution may be those who live very near major regional transportation route, especially highways. Policies that have been technology based and regional in orientation do not efficiently address the very large exposure and health gradients suffered by these populations. This is problematic because even regions that EPA has deemed to be in regional PM "attainment" still include very large numbers of near highway residents who currently are not protected.'*

Many health studies have been conducted in relation to diesel emissions, and the overwhelming consensus is that they are harmful to health at any level of exposure. According to a Federal Government paper (NEPM 2011) there is no known safe threshold for diesel exhaust.

Japanese scientists have found a compound in diesel exhaust, 3-nitrobenzathrone, to be the most carcinogenic chemical ever discovered. (New Scientist 1997).

In the U.S., the Clean Air Task Force report (2005) summarised the effects of diesel exhaust:

- *'Fine particle pollution from diesels shortens the lives of nearly 21,000 people each year. This includes almost 3,000 early deaths from lung cancer.*
- *Tens of thousands of Americans suffer each year from asthma attacks (over 400,000), heart attacks (27,000), and respiratory problems associated with fine particles from diesel vehicles. These illnesses result in thousands of emergency room visits, hospitalizations, and lost work days. Together with the toll of premature deaths, the health damages from diesel fine particles will total $139 billion in 2010.*
- *Nationally, diesel exhaust poses a cancer risk that is 7.5 times higher than the combined total cancer risk from all other air toxics.*
- *In the U.S., the average lifetime nationwide cancer risk due to diesel exhaust is over 350 times greater than the level U.S. EPA considers to be "acceptable" (i.e., one cancer per million persons over 70 years).*
- *Residents from more than two-thirds of all U.S. counties face a cancer risk from diesel exhaust greater than 100 deaths per million population. People living in eleven urban counties face diesel cancer risks greater than 1,000 in a million — one thousand times the level EPA says is acceptable.*
- *People who live in metropolitan areas with a high concentration of diesel vehicles and traffic feel their impacts most acutely. The risk of lung cancer from diesel exhaust for people living in urban areas is three times that for those living in rural areas.'*

There has been no corresponding report published in Australia, but these figures can be readily extrapolated to Australian conditions.

According to the Office of Environmental Health Hazards (OEHHA, 2007):

> ' *Exposure to diesel exhaust can have immediate health effects. Diesel exhaust can irritate the eyes, nose, throat and lungs, and it can cause coughs, headaches, lightheadedness and nausea. In studies with human volunteers, diesel exhaust particles made people with allergies more susceptible to the materials to which they are allergic, such as dust and pollen…. Diesel exhaust contains more than 40 toxic air contaminants. These include many known or suspected cancer-causing substances, such as benzene, arsenic and formaldehyde. It also contains other harmful pollutants, including nitrogen oxides.'*

The State of California introduced a Clean Truck Program in the port areas of Long Beach and Los Angeles in 2008 that banned trucks older than 2006 which did not meet Federal emission standards. Diesel particulate pollution is reported to have been reduced by more than 80% (EHP 2012).

Recent research (Science Daily 2011) has found that diesel exhaust can trigger heart attacks and strokes in people with a pre-existing medical condition when in an area close to busy roads. The current reporting standard of 24hrs cannot capture the higher exposure over a shorter period and, in the light of this latest research, should be amended to an 8hr exposure standard.

Diesel exhaust is now ubiquitous in our local environment. Diesel trains, the recent proliferation of diesel-powered cars, diesel buses and trucks, all contribute to the toxic load in our environment. Even though regional air quality has been reported as improving, local air quality in the Maribyrnong area is under threat due to the predicted increase in truck and train traffic and the lack of government action to divert truck traffic away from residential areas.

Francis St. Yarraville

Francis St., Yarraville is a mix of residential, commercial and industrial land use. It is used as a major thoroughfare for up to 20,000 trucks and cars. In 2001/2002, as a result of concerns raised by residents, the Victorian EPA (2002) conducted limited air quality tests in Francis St Yarraville and found that 'the measured particulate concentrations, mostly from diesel trucks, were at elevated levels and that the levels might impact on the health of local residents with pre-existing conditions.' It was also suggested in the report that 'action should be taken to reduce the sources of airborne particles and noise and that the air quality in Francis St represents an issue for environmental protection……'

A night-time curfew was introduced that had little effect on particulate concentrations and served only to divert the trucks to other streets in Maribyrnong. Since then the EPA has done little to address the 'elevated levels' of particulate emissions, except conduct a Francis St., Community Health Perceptions Study (EPA 2003). The results of this limited study were as follows:

> *'Together with the air and noise monitoring reports, EPA will forward this report on community health perceptions to the members of the Government working group dealing with transport issues in Yarraville. It is expected that the three reports will*

assist the relevant agencies in formulating advice to Government on possible further action to address residents' concerns.'

Residents are still waiting for some affirmative action to address the concerns highlighted in the EPA reports. Freeway off ramps were first proposed in the 2008 Eddington report (DOT 2013):

'Community amenity in the inner west should be restored by implementing a Truck Action Plan to remove truck traffic from local streets in the inner west. The plan should include a series of targeted road improvements that form an effective bypass around residential areas, reinforced by local truck bans.'

It was estimated that one million trucks a year would be diverted from residential streets.

A further twelve-month air monitoring study is currently underway with published quarterly reports. The EPA have released three Community Information Bulletins (EPA 2012, 2013). Reports 1 and 2 state that 'levels remain within the Victorian and Australian health-based objectives for air quality.' In a sub-section of the report under the heading *'How Are The Monitoring Results Assessed?'* the EPA state that:

'PM_{10} and NO_2 levels are compared against Victorian and Australian air quality objectives and goals. The objectives are set at levels that protect general human health and wellbeing. The goals …..are used to guide strategies for the management of activities affecting our air quality.'

This gives the impression that if the reported levels fall within the objectives then the air quality must be acceptable. In fact The Age (2012), when reporting on the Francis St. interim results, interpreted the results as 'pollution from vehicle emissions was found to pose little risk to residents, with measurements recording just one day of unhealthy poor air quality over a three-month period.'

The NEPM Review (2011) alluded to this misconception about standards:

'A common argument put forward by commentators was that assessing compliance against not-to-be exceeded standards encouraged the perception that compliance with a standard implies 'no risk'. However, given the lack of identified thresholds for health effects of the NEPM pollutants, there is still a risk to communities, and a more risk-based approach to evaluate impacts across regional populations was advocated.'

'Determining potential population health risk resulting from ambient air quality exposure has been complicated by the fact that epidemiology studies are now indicating there is no clear threshold for effect for the current NEPM pollutants, with exposures below the standards still representing a statistically significant and measurable health risk to the Australian population. This is a shift in thinking, given that when the NEPM was made it was thought sulfur dioxide and carbon monoxide had an identified threshold of effect, and nitrogen dioxide and lead had an

apparent threshold of effect. In light of this new evidence, compliance with the standards alone may not achieve the desired environmental outcome of 'adequate protection'.

Jurisdictions also acknowledged that it is difficult to assess whether the population is adequately protected based on the NEPM monitoring data as networks have been established to assess compliance at GRUB sites, rather than measure the potential range of concentrations across an airshed.'

The results of epidemiological studies worldwide are showing health effects at lower pollution levels which, in many cases, are well within existing standards. One important finding of this review is that there appears to be no threshold below which no health effects are observed.

The review also noted that recent studies in Australia support overseas evidence related to air pollution. The Australian studies found:

'…..adverse health effects ….in the Australian population at pollution levels currently experienced in Australian cities…… Overall, the results of the health reviews show that there are significant health effects at current levels of air pollution in Australian cities. These findings indicate that the current standards are not meeting the requirement for adequate protection of human health. There is evidence that these standards should be revised to minimise the impact of air pollution on the health of the Australian population. This finding was strongly supported by all stakeholders throughout the consultation process.'

Clearly, the EPA in their Francis St. reports, is creating a false impression that not exceeding the objectives means that human health is protected. The EPA have made no effort to clarify this reporting anomaly. Unfortunately, this type of misrepresentation of the 'real' facts about pollution levels, generates a lack of political will to address the problem because the so-called objectives have effectively been met.

Maribyrnong City Council Strategies and Objectives

Maribyrnong City Council has a number of strategies and objectives in place to address the health and well being of the community. The primary objective of Council's *Wellbeing Commitment*, contained in the Maribyrnong Council Plan (2009), is:

'Promoting and protecting the well being of the community…….creating sustainable, healthier and liveable communities by making effective use and reuse of our natural resources and ….promote environments that support the health and wellbeing of the community.'

A number of other Council policies and strategies, including the *Carbon Neutral Action Plan* and the *Integrated Transport Strategy*, refer to the need to reduce vehicle emissions. The *Greening Footscray Strategy* encourages the planting of more trees to improve local air quality. The *Maribyrnong Street Tree Strategy* aims to establish 10,000 new street trees to 2023.

Council has only a limited capability to reduce the number of heavy trucks in the Municipality and relies heavily on State Government intervention to reduce the impacts on health as a result of diminished air quality.

Vegetative barriers

Several scientific studies have explored the use of vegetation barriers in offering some protection against emissions from diesel powered engines. Results from several studies indicate that the maximum collection rate was achieved when trees were planted close to emission sources. As diesel particulate matter moved through the air some of the particles would fall out and settle onto the leaves and branches of trees. Particulates are also collected as a result of filtration by the leaves and branches. The structure of the trees also promotes mixing and dispersion of the pollutants (California ARB 2009).

Council is a member of the Project Steering Committee for the Greening the West program (GTW 2011) facilitated by City West Water, which aims to support greater urban greening opportunities in the west. Greening the West is an ongoing partnership project between Councils, community and industry in the western region of Melbourne to improve community health and combat the growing threats posed by climate change and transport-related pollution.

Natural environment

The natural environment is a key component of liveability, providing opportunities for relaxation and recreation, supporting plant and animal life and delivering essential resources such as clean water and clean air. In order to preserve these benefits and enhance liveability for future generations, there is a need to protect our environment. Environmental imbalances, such as those caused by poor air quality, can lead to an increase in significant

adverse health problems as highlighted previously. Maintaining air quality improves the natural environment and benefits community wellbeing.

Low income and vulnerable groups such as women, children, older people, Aboriginal and Torres Strait Islander people and culturally diverse communities, are likely to be more exposed to these risks and suffer greater health impacts as a result (WHO Europe, 2010).

Walking

Walkability is a fundamental indicator of a city's liveability. There is a substantial body of evidence demonstrating that increased walking improves physical and mental health. In particular, a safe and pleasant walking environment encourages people to engage with their surroundings (Burden D., 2010).

External consultation for Maribyrnong City Council's Walking Strategy (2011) was conducted through a community survey which revealed that the main reasons residents walked were for leisure and fitness, to go to the shops and to get to public transport. Results showed that most people walk in local streets, along the river and in local parks for leisure and fitness.

In the next ten years, population growth coupled with the conversion of industrial land to residential areas, will see increasing pressure placed on the City's pedestrian infrastructure. In some areas of the municipality it is currently unpleasant to walk due to the dominance of cars and trucks and lack of shade. Poor air quality does not encourage physical activity, in fact it has been demonstrated in numerous studies that exercising in a polluted environment is more detrimental than beneficial to overall health and wellbeing (Kargarfard Mehdi, 2011).

Climate Change

Climate change is a significant and emerging threat to local communities and changes the way we must look at protecting vulnerable populations. Climate change can affect human health through a range of mechanisms (Haines, et al 2006). These include direct effects of hazards such as heatwaves, floods and storms, infectious disease patterns and reduced air quality.

Higher summertime temperatures, and the resulting urban heat island effect, increases the energy use for building cooling systems and also hastens the formation of urban smog. Heat islands are formed due to lack of tree cover and high solar radiation absorption by the paved surfaces. According to Akban (2001):

> *'we estimate that between 5-10% of the present electricity demand is spent to cool buildings just to compensate for the increased 0.5-3°C in urban temperatures. Urban trees and high-albedo surfaces can offset or reverse the urban heat island effect.'*

Urban Planning

According to Michael Brauer (2010) of the University of British Columbia in Vancouver, Canada, who assesses the links between traffic pollution and people's health, living next to a busy road could take years off your life expectancy. His research shows that intelligent urban planning can help to alleviate exposure to traffic pollution by locating

‘sensitive-use’ facilities such as hospitals, aged care, schools and childcare centres well away from busy roads and freeways.

He also noted that pregnant women who lived within 50m of a major road were 26% more likely to have a low-birth-weight baby and had a greater chance of a premature birth, compared with women living more than 50m from a major road. Children living in close proximity to main roads were more likely to develop asthma, bronchiolitis and middle ear infections.

Conclusion

The evidence is very clear and unequivocal regarding the human health toll from diesel pollution at levels below the current State and Federal objectives and standards. Additional measures are required to improve the amenity of affected municipalities, such as Maribyrnong, that are consistently exposed to elevated levels of diesel emissions. Current standards and objectives should not be used by State regulators as a reason for inaction.

Health should be given an equal voice in any discussion related to expansion of the transport infrastructure, particularly where there is evidence-based pollution problems that adversely affects the local population.

Research indicates that better urban planning, revision of legislated air quality standards and changes to vehicle emission standards are important tools for reducing human exposure, particularly children, pregnant mothers and the elderly, to urban air pollution.

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*All photos taken in the City of Maribyrnong