Submission No 27

INQUIRY INTO HEALTH IMPACTS OF AIR POLLUTION IN THE SYDNEY BASIN

Organisation: Groups Against Stack Pollution

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Subject:

Summary

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Submission to the

INQUIRY INTO THE HEALTH IMPACTS OF AIR POLLUTION IN THE SYDNEY BASIN
By GENERAL PURPOSE STANDING COMMITTEE NO. 2
New South Wales Legislative Council
From RAPS (Residents Against Polluting Stacks Inc)

Introduction

RAPS (Residents Against Polluting Stacks) is a wholly voluntary community organization with the following aims:

"***(a)*** *To seek the installation and operation of air pollution treatment systems in the M5 East tunnel, and any other effective methods of reducing the impact of air pollution and stacks on the local area*
(b) *To seek fair and equitable infrastructure planning and pollution assessment processes and regulations.*
(c) *To support ecological sustainability in all projects affecting the local area.*
(d) *To share information, and offer advice and assistance to individuals and groups with similar objectives.*
(e) *To disseminate information to the public on issues related to urban air pollution and planning.*

RAPS was formed in 1998 as a result of community concern about the potential impacts of the decision, made without public consultation and outside the normal processes of environmental assessment, to combine the 3 stacks planned for the M5 tunnel into one and to locate it at Turrella.

As a result of the continuing problems being experienced by those living close to the stack and the tunnel portals and the growing concern about conditions inside the tunnel, the focus of the organization has extended to encompass more general community concerns about air quality and its impact on community health and wellbeing.

Our experiences in our negotiations with a variety of governmental organizations has led us to become increasingly concerned about the attitudes towards air quality regulation adopted by those organizations with a responsibility towards the maintenance of community health and amenity.

Comments under specific terms of reference:

(a) changes in the emissions of various air pollutants and the impact of those changes on air quality in the Sydney basin over the past three decades, including any 'hot-spots' where pollution is concentrated

It is clear that there have been significant changes in emissions over the last 30 years, notably with the reduction in lead emissions to the atmosphere and a general lowering of carbon monoxide levels due to the introduction of unleaded petrol and the use of catalytic converters in motor vehicles

Unfortunately there is little data to enable accurate assessment of comparative data for other important pollutants. This is because the technologies used for the measurement and speciation of some pollutants have changed significantly and data collected in the nineteen seventies is difficult to harmonise with more recent measurements.

The most significant change is in the assessment of particulate matter, which is, in all probability, the most significant urban pollutant.

Even with the most recently installed measurement equipment in ambient air quality monitoring stations, it is impossible to distinguish adequately between motor vehicle pollutants (which are significantly more harmful) and pollutants of a terrestrial origin (dust, which is significantly less harmful).

Although much of the medical literature uses the PM10 measurement as the causal referent for particulate matter, compelling evidence over the last decade suggests that the harmful agents are actually those particles less than 1 micron in diameter (PM1), which may make up less than 1% of the PM10 measurement. Although PM1 particles are technically included in the PM10 measurement, the inclusive gravimetric measurement used

must necessarily underestimate and under-represent their importance[1].

Although there have been a number of significant initiatives, such as the "no burn" regulation, aimed at improving urban air quality, the optimistic reports of apparent reductions in particulate matter levels may have, in fact, masked significant increases in the harm caused by this pollutant.

If, as it seems, the nature of particulate pollution has changed during the last 30 years through an increase in the proportion of fine and ultra fine particulate matter, then the self congratulation expressed by the bodies charged with promoting improvements in air quality is certainly not justified.

In summary:

- It is generally accepted that motor vehicles are the predominant source of the majority of harmful pollutants in urban areas.
- In the last 30 years there has been a significant growth in the number of vehicles and the number of kilometers traveled by vehicles
- Vehicles and especially diesel vehicles are the predominant source of fine and ultra fine particles, nitrogen dioxide and, ultimately, ozone.
- Current monitoring technologies and methods are inadequate to distinguish the shift towards finer and finer particles in vehicle emissions and consequently are inadequate as predictors or measurers of potential harm.
- Monitoring and regulation based on single pollutants ignores the impact of additive, interactive and synergistic effects of pollutants.

As a community group our question is:

If current monitoring methods for particles fail to adequately represent their potentially harmful impacts, is it appropriate to continue to use them,

- when the published results indicating reductions of levels may be misleading and productive of a false sense of security and
- when those methods are used to assess current air quality initiatives and regulate future significant pollution generating projects?

(b) the impact of NSW air pollution laws (including the Clean Air Act 1961, the Protection of the Environment Operations Act 1997 and any regulations made under those Acts) on air quality over the past three decades

From a community perspective, the air pollution laws and regulations appear to depend too much on licensing of polluters and treat dilution of aerial pollutants as an adequate final disposal mechanism.

There is an increasing body of research into the long distance movement of pollutant clouds from major industrial pollutant sources. Although much of the research is located in the northern hemisphere, there are a number of significant observations of similar long distance pollutant transport in Australia.[2] Current regulation appears to be inadequate to deal with such impacts, which in one case has been suggested to be impacting on rainfall patterns in Sydney.

The use of dilution as a solution to pollution 'problems' and 24 hour averaging measurement are fundamentally at odds with other pollution laws and actions relating to water and land based pollution, where we are told constantly that every little bit counts.

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[1] Since the publication of the 'Six Cities Study ' by Dockery and Pope in 1993[1]. there have been literally hundreds of articles in peer reviewed medical journals dealing with aspects of vehicle and particulate pollution and the adverse effects caused by both long and, more recently, short term exposures to these pollutants. See 'Medical Evidence about impacts of vehicle pollution' (Appendix A) A summary of concerns and issues relating to particulate matter and specifically diesel exhaust is provided as Appendix B 'Why is diesel exhaust so damaging to health?'

[2] Rosenfeld,D. Suppression of Rain and Snow by Urban and Industrial Air Pollution. SCIENCE (2000) 287:pp1793-1796

It may be useful to contrast the response, close to panic, following the reported discovery of *Cryptosporidium* organisms in Sydney's water system, when the most likely adverse impact was a moderate stomach upset, and the past and current regulatory responses to particulate air pollution which is responsible for significant ill health and discomfort throughout the population and up to 2,000 excess deaths per year in Sydney alone.

In its report released in September 2003, the Australian Bureau of Transport and Regional Economics estimated that in 2000 twice as many people died, in Sydney, from the effects of vehicle exhaust than from motor vehicle accidents. Total cost of the mortality and morbidity associated with exposure to vehicle pollution was about $1.5 billion for Sydney alone.

Yet, perhaps because these effects are less visible and dramatic than road accidents, very little seems to be done by regulators to address this deplorable situation.

Even where laws and regulations are in place there is a lack of will on the part of regulators to enforce them or to act to promote good practice.

This lack of will becomes a complete aversion when the offender is another government instrumentality.

Specific case:

When NSW Health in 2003, following a study conducted into pollution levels inside the M5 East tunnel recommended to the RTA that it should warn people with asthma and similar respiratory conditions about the potential danger of using the tunnel during times of traffic delays, not only did the RTA fail to do so in a prompt and precautionary way but it argued against the validity of the advice. NSW Health sought legal advice on its powers to instruct the RTA to provide warnings to drivers, and was told that while it had the power to do so, it would be more appropriate to use 'persuasion' when dealing with another public authority.

When the RTA eventually it agreed to provide the advice more than two years later, it did so in a tokenistic and minimalistic way, hiding the warning text deep within its labyrinthine web site:

Adequate or even good environmental laws and regulations are useless without the will to enforce them and clear lines of responsibility for this enforcement.

(c) the causes of air pollution in the Sydney basin over the past three decades

Increases in air pollution in the Sydney basin are considered to be largely the result of the growth in the number and use of motor vehicles, so the main causes of air pollution must relate to the policies and actions which have led to this growth.

These causes include:

1. Lack of a viable public transport infrastructure,
2. Active promotion of roads and tunnels, leading to induced traffic
3. Failure to provide adequate alternative modes of transport for goods.
4. Inappropriate location of goods handling and transfer facilities.

Road projects have been approved based on flawed standards, inappropriate benchmarks and inadequate assessments of real and long term impacts in terms of traffic and air pollution. The conditions of approval set to regulate such projects are often vague, unenforceable, unenforced and yet seemingly set in stone.

It is all too easy for example to equate 'air pollution' with that which is measured at the designated air quality monitoring stations, based on a 24 hour average. Yet such a measure does not provide an adequate assessment of the impact of the pollution on an individual's total exposure which is the sum of the impacts from their activities at home, during travel, in the work place and during recreation.

As an example of how an individual's exposure to air pollutants can be significantly changed is provided by the impact of road tunnels. Sydney now has five tunnels operating or under construction and is planning a sixth in the near future. These tunnels are currently unfiltered, with all the exhaust being emitted unfiltered from one

(eg the M5 East, Harbour and Cross City tunnels), or at the most two exhaust stacks (eg the Eastern Distributor and Lane Cove tunnels).

It is well established that emissions in tunnels, and especially from exhaust stacks are more concentrated and therefore more toxic than ambient air. As a result, the distribution and concentration of vehicle pollutants for hundreds of thousands of daily commuters and residents have changed in ways which were not adequately foreseen by the regulatory authorities.

The main aim of these projects is to promote the free flow of traffic, with significant expected benefits in air quality promoted as a result of the reductions in travel time and stop-start motoring. In our experience with the M5 East, these benefits have often been short-lived, soon overtaken by increases in traffic volumes, far in excess of the numbers predicted in the EIS process.

More significantly, the inept design of the tunnel ventilation system led to this benefit being at the expense of the increased exposure of a relatively small group of residents who lived close to the stack and more recently, the tunnel portals.

The M5 East project, as initially planned with three ventilation stacks on the top of hills and relatively short tunnel segments between ventilation outlets, would have operated without significant impacts on residents living round the stacks (excepting, possibly, a visual one) and with acceptable in-tunnel conditions. However, the design was changed post the EIS process, due to political pressure, to one stack in a valley as the only emission outlet.

What is particularly galling to the community is that, according to RTA figures, this change from good design to bad design was accomplished at a cost of over $30 million in construction costs and an additional $2 million a year in operational and maintenance costs.

In addition the energy consumption and the consequent greenhouse gas emissions were almost doubled. Expert witnesses at the RTA sponsored International Tunnel Workshop in 2000 ,[3] prior to the opening of the tunnel were uniformly critical of the energy consumption, noting expense and consequent pollution impacts from power generation. The ventilation system is estimated to produce over 40,000 tonnes of greenhouse gases per year.

In many ways, the M5East tunnel project provides an object lesson in the dangers of political interference in the basic design of major projects and the flaws in the EIS process which allow the proponent of a project to self-approve significant changes, without independent scrutiny or public consultation, provided the essential nature of the project is not changed.

This issue has been canvassed by three Parliamentary Inquiries into the M5 East stack, with the 1999 Parliamentary Inquiry recommending (recommendation 5) the EPA &A Act be amended to prevent such a situation re-occurring, and repeated this recommendation in both the 2001 and 2002 inquiry reports, but these recommendations have been ignored.

As a result, the RTA, with Planning's tacit consent, has been able to make a mockery of the EIS process and make critical changes without public knowledge, consultation or independent scrutiny to both the Cross City and Lane Cove tunnel projects, with adverse air quality impacts for motorists and residents.

Another fundamental flaw in the EIS process relates to validity and rigour of impact assessments, carried out by the RTA, and its bevy of consultants (ventilation design, air quality, traffic planning, public relations) promoting the proponent's own interests, which may be diametrically opposed to good planning or sustainable development principles. Their aim seems to be to build roads regardless of their merit or impact. They are very selective about the information they present to the public and have, in our experience, repeatedly presented dubious and misleading information which aims to minimise the negative impacts, gloss over the lack of crucial details, and grossly exaggerate the potential benefits of the proposal. Tunnels are promoted as beneficial because of the number of traffic lights motorists can avoid, or because they supposedly relieve local streets of traffic without looking at the impacts of induced traffic or new bottlenecks further down the road system.

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[3] http://www.rta.nsw.gov.au/environment/airquality/roadtunnelsvehicleemissions/tunnelventilationworkshop/index.html

Every new tunnel is a crucial missing link in a non-existent transport plan and we are continually assured that filtration of fumes is not necessary, despite local and overseas evidence to the contrary!

There is little independent scrutiny of the validity of their predictions and even when shown to be inaccurate, or challenged by departments such as the EPA, or independent experts, the falsehoods are rarely corrected.

One of the essential parameters used to attempt to predict air quality impacts from motorway projects is the number and type of vehicles which will use the completed motorway and the rate at which usage will grow.

During the design development, there are conflicting pressures on this essential measure. Low traffic estimates make it easier to comply with air quality requirements while high estimates are significant in promoting the financial viability of the project and returns to investors in PPP situations. Low traffic number growth estimates allow for projected improvements in vehicle emission technologies to be factored in to air quality compliance in future years.

Much of the air quality problem experienced with the M5 tunnel is due to the use of an artificially low traffic growth rate of 1% per annum during planning. The actual growth was more than 1% per month and by November 2003, weekday average traffic numbers had already exceeded the numbers projected to be reached in 2022. thus negating the expected significant reduction in vehicle emissions from newer technologies.

Successive studies carried out to predict air quality impacts from stacks appear to vary to suit requirements of the project.

Study year	1994	1996	1997	2001
length	3 km	3.8 km	3.8 km	3.8 km
no. of stacks	1	3	1	1
height	15 m	15 m	<40 m	35m
diameter	12 m	9.5, 6.5x2	12 m	8 m
V. volume	2000	2000	2000	856
background	54µg/m^3	54µg/m^3	54µg/m^3	48.4µg/m^3
stack addition	5µg/m^3	4.5µg/m^3	13µg/m^3	6.6µg/m^3 or 0.9µg/m^3
Max impact	**59µg/m^3**	**59µg/m^3**	**67µg/m^3**	**49.3µg/m^3**

The table shows a series of predicted air quality impacts from the various proposed stack designs for the M5 tunnel stack. Between 1997 and 2001 the NEPM goal for particulate matter changed from 150 µg/m^3 to 50 µg/m^3. The predicted maximum stack impact underwent a similar change!

Other examples include:

- When the air quality measures for the CCT showed exceedences of air quality goals at Harris St, Ultimo, the predictions were instead based on Goat Island, in the middle of Sydney Harbour, where they were found to be under the limit. Likewise, when the EPA objected to such baseless air quality predictions being published by the RTA, it was told it was too late for anything to be done and no retractions were made.
- In the case of the Lane Cove tunnel, the EPA determined up to a 10-fold increase in cancer risk for most "affected receptors" (individuals) exposed to toxic stack exhaust, but nevertheless allowed a reworking of the data to include discounts for future vehicle technology improvements and average the results over a 70 year lifetime. This massaging produced 'acceptable' health risks.

The following points illustrate some of the key inadequacies with the actual benchmarks and standards used to assess and regulate the impacts of emissions in and from tunnels:

- the conditions for in-tunnel pollutant exposures are defined by limits set in 1995, representing, in the words of the PIARC standard setting document , 'the art of tunnel ventilation over the last 15 years'. Thus, they are out of date, especially as they were set before the explosive increase in knowledge about the adverse impacts of vehicular emissions and, in particular, particulate matter. Thus, they also do not represent modern medical knowledge.
- Limits for external emissions are based on NEPM goals when the NEPM specifically states that such goals are unsatisfactory for the assessment of point sources such as tunnels.[4]
- The limits for particulate matter based on PM10 measurements are inappropriate because the differences between the composition and potential harm of particles from vehicle emissions when compared to those in the ambient air.[5]
- Effective limitation of particulate emissions inside the tunnel is based on a flawed use of a visibility measurement when the particles capable of causing the greatest harm are effectively invisible because they are smaller than the minimum wavelength of visible light.
- The 24 hour averaging of ambient levels of particulate matter (PM10) intended to protect the public are in fact incapable of giving meaningful information of use in the prediction of likely health impacts.[6]
- Reductions in particulate emissions (nominated as PM10) resulting form the 'EURO' series of design improvements for diesel engines have not led to proportionate reductions in adverse health impacts from these emissions as, in many cases, they have actually resulted in increased numbers of finer and finer, more harmful particles.[7]

The processes and standards currently used to approve and regulate tunnels are grossly inadequate, inappropriate and fail to provide appropriate protection to the public both as tunnel users and as residents living close to the tunnel stacks and portals, significantly increase pollution impacts.

It is our contention that, because of the uncertainties of the processes in place to identify and quantify the potential additional impacts of projects, there needs to be some transparent, accessible and effective way of identifying and rectifying unpredicted additional or new environmental impacts.

Decisions made about the nature of projects and the safeguards applied to them during the approval process, such as specific conditions of approval, are made in the assumption that the predictions of environmental impacts are correct.

If these predictions are later found to be incorrect or, more seriously, to have misrepresented the impacts, then there must be some effective and easily enforceable way in which the unplanned adverse impacts are later corrected.

We believe the public is entitled to expect that:

- the design of these tunnels would reflect international best practice, especially in terms of their safety and ventilation systems and value for money
- the regulations for these tunnels would reflect international best practice, especially in terms of standards to protect public health and safety and accepted precautionary principles

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[4] *"Conversely, the air quality of some localised areas within major airsheds are dominated by local activities such as that experienced in a road tunnel or a heavily trafficked canyon street. Air quality management in these areas is complex and needs a different approach to that directed at meeting ambient standards intended to reflect the general air quality in the airshed".*
p13 from NEPM 1998

[5] "The NEPM PM10 standard....is a legislative entity and applies only to the ambient background, and a population of 25,000 people. It does not and should not, be applied to a point source such as a tunnel stack from which an entirely different composition of pollutant arises." Executive Director of the National Environment Protection Council, Dr. Bruce Kennedy,

[6] Guidelines for Concentration and Exposure-Response Measurement of Fine and Ultra Fine Particulate Matter for Use in Epidemiological Studies. Schwela, D., Morawska,L., Kotzias, D. WHO, European Commission. EUR 20238 EN. 2002

[7] Kittelson,D B, Watts, Jr.W. F (1998) Review of Diesel Particulate Matter Sampling Methods. Supplemental Report # 2 EPA Grant Review Of Diesel Particulate Matter. http://www.me.umn.edu/centers/cdr/reports/EPAreport2.pdf

- the standards and regulations would be strictly enforced
- mechanisms would be in place to promptly and adequately respond to any foreseen or unforeseen problems, including the emergence of new knowledge and the development of new guidelines
- all public agencies involved in planning and regulation , and especially those proposing and developing new projects, sould be held accountable for their performance and that mistakes made would be rectified in both current and later projects.

(d) the health impacts of air pollution on any 'at risk' groups

The health impacts of air pollution result from the total exposure of individuals to air borne pollutants from any source.

Actions which reduce exposure to ambient pollution levels may be insignificant in relation to exposures in the home or workplace.

In relation to motorway tunnels and stacks, there have been persistent complaints about adverse impacts on residents close to the stacks and especially those close to the portals of the M5 and Eastern Distributor tunnel.

Relatively small scale portal emissions are permitted from the Eastern Distributor, where the portal design is complex and slot like. The conditions of approval for the M5 do not permit portal emissions for operational purposes (day to day running) but permit them during emergencies and maintenance periods.

In fact, portal emissions from the M5 tunnel have been relatively frequent and have been of significant volume during some periods. Their occurrence during the period over which NSW Health was conducting its study into residents' health led to a significant distortion of the exposure levels experienced around the tunnel.

This distortion made it necessary for the findings of the study (that no impact from the stack could be detected) to be reassessed as it would appear that the major exposure to the pollutants was not around the stack, as was assumed, but close to the portals.

Although recent portal emissions from the M5 do not appear to have been on the same scale as occurred during the 6 to 8 months between September 2003 and April 2004, residents living near the portal at Bexley North report continuing problems with a heavy fall-our of dust and continuing health problems.

Many are trying to sell their houses because of health concerns.

The proposal by the RTA to 'solve' their in- tunnel air quality problems by increasing portal emissions appears to be a dangerous and irresponsible policy, at odds with a precautionary approach to ensure the maintenance of the health of local residents.

Proceeding with this policy will inevitably result in the production of a permanently blighted area with high levels of exposure to vehicle pollutants.

Road tunnels can be the cause of significant health risks to both those living around them and to those using them. These risks are compounded if (as is the case of the M5E) the design of the ventilation system is inadequate or if exposures of motorists in the tunnel increased as a result of traffic congestion resulting in longer than expected transit times.

Using current annual average ambient pollution levels, a commuter using the M5E tunnel can effectively increase the length of his or her 'pollution day' by about two hours. This is a significant and unconsidered addition to the pollution exposure of the individual, with the potential to significantly increase adverse health impacts.

Future planning of road developments should consider these significant additional impacts. A motorist traveling between the southern suburbs and North Sydney will use the M5, Cooks River, Airport, Eastern distributor, Art Gallery, Cahill Expressway, and Sydney Harbour tunnels, a total of nearly 10km of tunnels in a single trip

(f) the effectiveness of current laws and programmes for mitigating air pollution

The Auditor General's report into air quality in April 2005 found that effectively no one had overall responsibility for air quality in NSW.

The general public believe that the EPA is independent of political influence and ministerial control and able to exert control on pollution in the state.

This is clearly not the case and the NSW EPA lacks the independence of a body such as the US EPA, able to take proactive action to curb significant pressure groups such as the US trucking lobby. Such an action is unimaginable in NSW.

The functions which were historically the concern of the EPA are now constrained by its incorporation into the Department of Environment and Conservation, competing within that organization for funding and programs with a vital and proactive national parks and wildlife constituency and under departmental and ministerial control which must limit its ability to act independently over issues.

Although national air quality standards may respond slowly to new knowledge about the adverse impacts of pollution, there is an inescapable feeling that these standards are governed more by what is regarded as politically convenient than by what is clearly desirable. There is a similar slowness of response in the development of more specialised standards for special situations such as indoor air quality and, of particular interest to our organization, road tunnels.

Instead of acting as a source of advice and regulation suitable to local conditions, NSW Health and DEC use the lack of international standards and guidelines (such as those for fine particles and short term exposure limits in tunnels) as an excuse to "wait and see", while relying on standards that are demonstrably 10-20 years behind the science, as a basis for the design. At the same time they acknowledge that *"once constructed, it is usually not feasible to make changes to the project that were not allowed for in the original design"* (J. Woodward, Submission for Board Meeting-EPA 10/02 11 November 2002, p3)

As outlined above, the Department of Planning, with the advice of DEC and NSW Health has inappropriately used NEPM ambient air quality standards for the control of tunnel emissions, and continues to do so, in spite of categorically contradictory advice from the NEPM documentation: *"Conversely, the air quality of some localised areas within major airsheds are dominated by local activities such as that experienced in a road tunnel or a heavily trafficked canyon street. Air quality management in these areas is complex and needs a different approach to that directed at meeting ambient standards intended to reflect the general air quality in the airshed"*. p13 from NEPM 1998

The emissions from tunnels are fundamentally different from, and significantly more harmful than, equivalent quantities and concentrations of 'ambient' particulate pollutants.

The Department of Planning (or its predecessors) have used this inappropriate construct in the conditions of approval for 4 tunnels, leading to the provision of an inappropriate performance standard for the design of tunnel ventilation systems.

This approach, fundamentally at variance with modern and progressive Maximum Achievable Control approaches, is an effective licence to pollute up to the NEPM goal, and leads inevitably to increased pollution levels, that are not adequately detected by the pollution monitoring mechanisms set up to supposedly protect the public.

(g) strategies to reduce the health impacts of air pollution;

As mentioned previously, there appears to be a lack of symmetry in the responses and the regulatory efforts which address different pollution problems. Air pollution is by far the most damaging form of pollution affecting society. It appears accepted that 2000 people die prematurely each year in Sydney as a result of air pollution, and many thousands more suffer health impacts.

Although this is more than double the number of people dying as a result of motor accidents, it is clear that much greater attention and resources are given to road safety than is given to the protection and promotion of air quality.

Until this contradiction is clearly identified and accepted at all levels of government and administrative policy and action, little or nothing of lasting value is likely to eventuate.

We find it untenable that tunnels are allowed to operate and be constructed in the full knowledge that the designs, standards and regulatory frameworks are deficient. While well aware of the mounting evidence of the dire health consequences of exposure to vehicular pollutants, the focus of the different departments seems to be more on "strategically managing" the public's perceptions and reaction to issues rather than on solving the actual problems. The RTA can hide behind a claim of "meeting the standards", regardless of their inappropriateness and inability to offer the required public safety protection.

The lack of an environmental licence and appropriate regulatory standards for such projects has meant that monitoring and compliance with project conditions continually falls between the cracks of bureaucratic blame shifting. Unlike environmental licences that are regularly reviewed, project conditions seem immutable, regardless of their inappropriateness, except for changes requested by tunnel consortia that save money or shorten construction time.

Advice by the EPA and NSW Health as to the interpretation of conditions or additional measures that should be taken can be, and is, regularly ignored by the RTA, and Planning seems quite powerless to ensure compliance.

There are clear examples both locally and overseas where decisive action has significantly improved serious air pollution problems.

- The UK Clean Air Act of 1956 has effectively banished the awful smogs which used to be experienced in London.
- Tokyo has reduced particle pollution by more than 50% during the last 20 years, even though there has been significant growth in population.
- The municipality of Madrid has decided to filter all of the tunnels in its new Calle 30 ring route, a total of 55km of tunnels, in order to protect residents living close to tunnel exhausts and to improve ambient air quality across the city.
- The introduction of unleaded petrol has effectively removed lead from the list of serious air pollutants in Sydney and led to a reduction in carbon monoxide and other pollutants.

Suggested policies and actions.

It would appear to us that all that is required to prevent further deterioration of urban air quality and to promote continuing improvement is the will to act and a determination by all levels of government that every action and development is part of a pattern of improvement.

In the case of developments likely to produce emissions which can affect air quality, the following are seen to be effective actions and policies :

1. reduction of gaseous and particulate pollutants at source
2. the use of maximum achievable control (MAC) technologies in all industries potentially producing air pollutants
3. strict control on the location of unavoidable or irreducible pollutant releases,
4. recognition that pollutant releases from major sources such as coal fired power stations and metal smelters can impact hundreds of kilometers away from the source.
5. greater efforts to control emissions from 'mobile sources' other than road vehicles and including diesel train engines, earth moving and construction machinery, mobile power generators, air port machinery etc.

6. In relation to planning approvals, project assessment must be based on true cost, and long term cost to community, including impacts on public transport, health and amenity.

We would contend that, in relation to air pollution, regulation and legislation should concentrate on:

- A holistic approach to urban planning and development considering as a primary constraint, not only the possibility of adverse impacts on air quality but, the promotion of significant improvement to air quality.
- Increased powers, accountability and resources for DEC and NSW Health with a clear reaffirmation of their responsibility to act at all times to prevent developments with the potential to adversely affect air quality.
- Restoration of the EPA to its position as an independent regulatory authority with adequate funding, and giving it the responsibility to promote improvements in air quality and regulatory standards for specific activities and environments.
- Using proper standards for both ambient and special environment regulation (indoor, road tunnel, stack emission) that reflect latest science, taking into account short term impacts, cumulative impacts, and additive and synergistic impacts.

Thank you for the opportunity to contribute to this inquiry. We hope that its findings will help to produce lasting improvements in air quality for Sydney.

On behalf of RAPS (Residents Against Polluting Stacks)

Mark Curran

Appendix A.

Medical Evidence about impacts of vehicle pollution

Since about the year 2000, there has been an explosive growth in research reporting adverse health impacts resulting from exposure to vehicle pollutants and especially, particulate matter. Starting mainly with epidemiological studies, this research has progressed to the explanation of some of the detailed physiological mechanisms causing the ill effects. The outstanding recent insight is the identification of the crucial impacts of ultra fine and 'nano' particles, the size and solubility of which make them uniquely harmful. From this it follows that the measure, PM10, commonly used in regulation, is actually inappropriate as it under-represents these particles which are less than 1 micron in diameter.

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Appendix B

WHY DIESEL EXHAUST IS SO DAMAGING TO HEALTH

Mark Curran March 2006

It is not long ago that diesel engines were regarded as being safer alternatives to the petrol engine and the 'smoke' was thought of as a minor irritant, important because it was unsightly, smelly and reduced visibility in tunnels.

Modern medical science has clearly shown that this is not the case and that diesel exhaust is one of the most dangerous and widespread of modern pollutants.

All of the exact mechanisms by which diesel exhaust causes harm are not yet known but it is clear that the harmful effects are related both to the size and composition of the particles in the exhaust. Diesel exhaust is now known to be a carcinogen[i ii] and particulate pollution has been fairly labelled as the 'new asbestos' for its ability to cause serious illness and death.

In 2000, the respected New England Journal of Medicine [342.pp406-13] listed the following health impacts from particulate air pollution

- Rhinitis and laryngitis Large particles are deposited in the nose, pharynx, and larynx.
- Tracheitis, bronchitis and bronchiolitis Particles larger than 10μ cleared by cilia. Smaller particles and fibers deposited in bronchioles and alveola ducts.
- Asthma and chronic obstructive pulmonary disease. Allergens and irritants are deposited in large airways causing chronic inflammatory changes
- Cancer Carcinogens (asbestos and polycyclic aromatic hydrocarbons) come into contact with bronchial epithelial cells, causing mutations on proto-oncogenes and tumor-suppressor genes and leading to malignant transformation.
- Interstitial disease Small particles and fibers are deposited in terminal bronchioles and alveoli. Penetration of interstitium results in fibrosis and formation of granulomas.

All particles are dangerous and there is no safe level of exposure, but weight for weight, toxicity appears to double with each halving in the diameter of the particles inhaled. "Nano' particles less than about 100 nanometers in diameter severely irritate the lung, irrespective of their composition and can carry adsorbed toxins directly into lung tissues, easily penetrating cellular membranes.[iii]

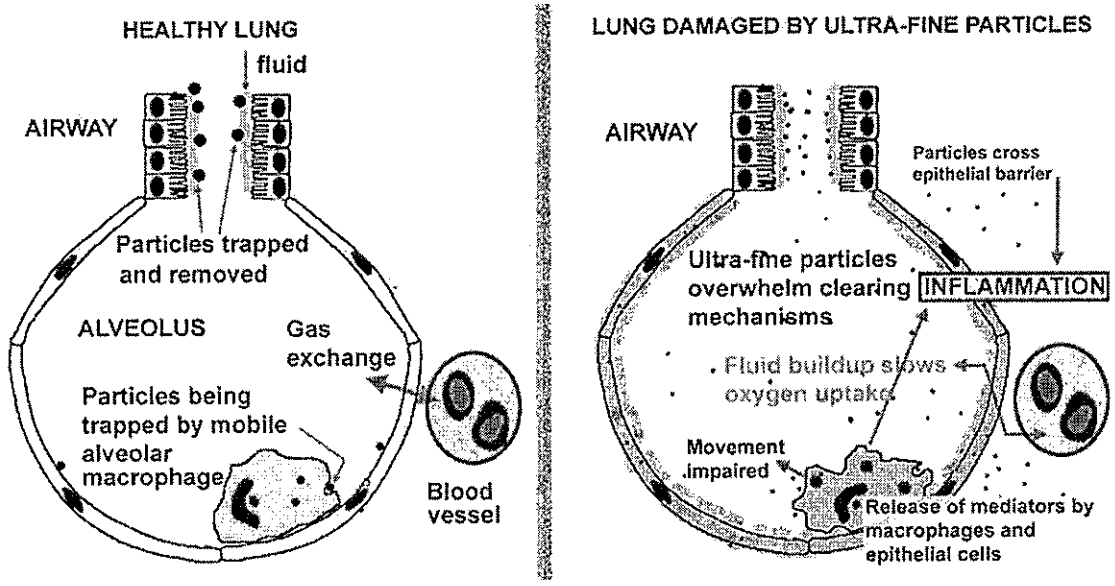


Diagram after Stone V. & Donaldson K. (1998) 'Small particles-big problem'. *Aerosol Soc Newsletter. 33.*

Diesel exhaust contains up to 100 times more ultra-fine and 'nano' particles than does exhaust from petrol engines.[iv]

Proof of the benefits of reducing particulate matter levels.

By strictly regulating emissions from vehicles and a series of other measures, Tokyo reduced ambient particle levels by more than 50% between 1975 and 1998 (from >100μg/m^3 in 1975 to < 45μg/m^3 in1998) . The economic benefits of this reduction, mainly by its impact on health costs and including the value of wages not lost, has been estimated to have totalled $A 47.5 BILLION up to 1999.

Voorhees. A.S. Benefits Analysis of Particulate Matter control programs – A case Study in Tokyo. - J. Risk Research Vol. 8, 311-329 (June, 2005)

Growth of medical knowledge

Over 300 papers on the health effects of fine particles and vehicle emissions have been published in the last 10 years.

- In 1993 Dockery and Pope[v] published the findings of their '6 cities' study which clearly associated increases in particulate matter with increases in mortality and hospital admissions.
- In 2001, Friedman and Powell[vi] showed that the reduction in vehicle emissions during the Atlanta Olympic Games significantly reduced childhood asthma attacks.
- In 2004 Ann Peters (*et al*)[vii] published highly significant research which showed that short term exposure to vehicle pollutants could trigger the onset of myocardial infarctions (heart attacks).

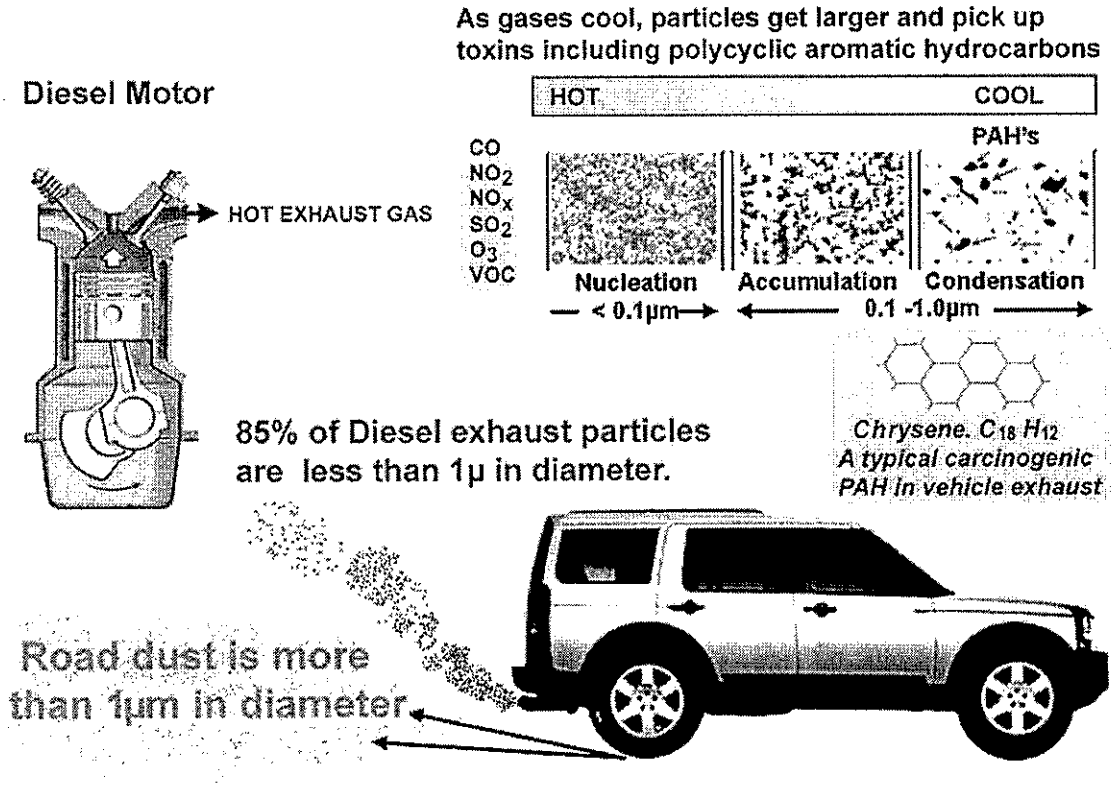
These are just landmarks in the steady progress of medical knowledge showing the adverse impacts of vehicle pollution and especially particulate pollution on all stages of the human life cycle, from before birth[viii], through childhood[ix] and early adulthood[x] to the causation of early mortality.[xi]

In addition recent research carried out for the World Road Association (PIARC)[xii] shows that particles interact with another significant pollutant, nitrogen dioxide in an additive way especially inside tunnels.

Particles in vehicle emissions consist mainly of carbon but also include fibers, metal fragments and soluble salts. The carbonaceous particles carry carcinogenic polycyclic aromatic hydrocarbons (PAH) and other volatile, and also carcinogenic, organic compounds (VOC) on their surface.

Diesel particles, which are mainly less than 1 μ (micron) in diameter and have an median diameter of about 0.2 μ (200 nanometers), are by far the most dangerous of the commonly found particles.

We are exposed to these pollutants at high concentrations in our cars or beside busy roads. In addition, every time we travel through an unfiltered urban tunnel our exposure jumps 10 fold. Tunnels might be good for traffic but unfiltered tunnels are bad for health!



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