

SUBMISSION ON BEHALF OF
THE ASTRONOMICAL SOCIETY OF VICTORIA INC
TO
THE ENVIRONMENT AND PLANNING REFERENCES COMMITTEE OF
THE VICTORIAN PARLIAMENT
ON THE
CONTRIBUTION OF ENVIRONMENTAL DESIGN TO
PREVENTION AND PUBLIC HEALTH IN VICTORIA

Date of submission:

30 June 2011 by email, hard copy following by mail

Name of submitter:

Dr Barry A. J. Clark
Director of the Outdoor Lighting Improvement Section
Astronomical Society of Victoria Inc (Registered number A0002118S)

Submitter's contact details:

Address: Watch Out Observatory
6 Dunluce Court
Viewbank
Victoria 3084
Telephone: (03) 9459 2760
Email: bajc@alphalink.com.au

**Documents Accompanying this Submission on CDROM
Listed by File Name**

Please note that some of the following items listed were obtained by the submitter as single copies for research, teaching and private study purposes. If readers desire additional copies for their own use, please obtain such copies in accordance with any applicable copyright requirements.

AmerMedAssn2009Resolution 516 on LP.doc. Advocating and support for light pollution control efforts and glare reduction for both public safety and energy savings. *American Medical Association, Resolution 516.*

ANSES (2010) *Press kit. Lighting systems using light-emitting diodes: health issues to be considered. 25 October 2010.* France: Agence nationale de sécurité sanitaire de l'alimentation, de l'environnement et du travail (ANSES, the French National Agency for Food, Environmental and Occupational Health Safety). Online at <http://www.afssa.fr/Documents/PRES2010CPA14EN.pdf>. The full report in French is at <http://www.afssa.fr/Documents/AP2008sa0408.pdf>

Holzman2011NewScientistLANBlueAlert.doc. Blue alert: the dark side of night light. Article by D. C. Holzman in *New Scientist*, Issue 2811, 10 May 2011. Online at

<http://www.newscientist.com/article/mg21028111.400-blue-alert-the-dark-side-of-night-light.html>

KloogEtAl2008IsraelBreastCancer.pdf. Kloog I, Haim A, Stevens RG et al. (2008) Light at night co-distributes with incident breast but not lung cancer in the female population of Israel. *Chronobiology International*, 25(1): 65-81. ISSN 0742-0528 print/ 1525-6073 DOI: 10.1080/07420520801921572. Online at <http://dx.Doi.org/10.1080/07420520801921572>

KloogEtAl2009LAN&ProstateCancer.pdf. Kloog I, Haim A, Stevens RG et al. (2009) Global co-distribution of light at night (LAN) and cancers of prostate, colon, and lung in men. *Chronobiology International*, 26(1): 108-125. DOI: 10.1080/07420520802694020. Online at <http://dx.Doi.org/10.1080/07420520802694020>

KloogStevensHaimPortnov2010LAN&CancerWorldwide.pdf. Kloog I, Stevens RG, Haim A, Portnov BA. (2010) Nighttime light level co-distributes with breast cancer incidence worldwide. *Cancer Causes Control*. Published online, 3 August 2010 DOI: 10.1007/s10552-010-9624-4 Online at <http://dx.Doi.org/10.1007/s10552-010-9624-4>

LightPollution2011Wikipedia.mht. .From http://en.wikipedia.org/wiki/Light_pollution

Lp40Lighting&CrimePt1.doc. Outdoor lighting and crime, Part 1: Little or no benefit, by B. A. J. Clark. Available at the website of the Astronomical Society of Victoria Inc, light pollution pages, <http://www.asv.org.au> and elsewhere.

Lp140Lighting&CrimePt2.doc. Outdoor lighting and crime, Part 2: Coupled growth, by B. A. J. Clark. Available at the website of the Astronomical Society of Victoria Inc, light pollution pages, <http://www.asv.org.au> and elsewhere.

Lp181V2.6LightPollution.doc of 20 May 2009. *A rationale for the mandatory limitation of outdoor lighting*. Report by B. A. Clark. Melbourne: Astronomical Society of Victoria Inc. Online at the light pollution page of <http://www.asv.org.au>. (Note that a substantial revision of this report (Version 3.0) is in progress and may be available to the Committee later in 2011.)

Lp220OutlineSubmissionStKildaRdBuilding2009.doc of 22 March 2009. *Melbourne Planning Scheme: Amendment C125 and Planning Permit Application 2008/0758 – 324-332 st Kilda Road, Melbourne*

Lp231RectangularStadiumLighting.doc of 8 December 2009. *Adverse effects of the Rectangular Stadium lighting*. Letter to Minister Pallas from B. A. Clark

LP238StrayLAN&Sleep.doc of 24 August 2010. *A compilation on the topic of stray light at night and sleep* by Barry Clark (extract from the Draft Version 3.0 of *A rationale for the mandatory limitation of outdoor lighting* by B. A. Clark)

LP239LightingAAMIPark.doc of 7 October 2010. *Adverse effects of lighting at AAMI Park and elsewhere*. Letter to the Premier Brumby from B. A. Clark, includes copy of Premier's Media Release of 31 August 2010

Lp241T5Streetlights.doc of 24 November 2010. *Proposed 'energy-saving' streetlights are health and environmental hazards*. Letter to party leaders from B. A. Clark

Lp243UpperLimitLAN.doc of 11 Jan 2011. *A simple upper limit for outdoor ambient light at night*. Note by B. A. Clark to the 'Lights' list forum of the Department of Astronomy and Astrophysics, Australian National University.

Lp244ParksAlienation.doc of August 2004. *Some adverse environmental and social effects of alienation of parkland*. Notes for members of the Astronomical Society of Victoria Inc and the Royal Park Protection Group Inc.

PrivateEye2005.pdf Conflicts of interest- let there be light. *Private Eye*, issue 1142, p 28 (30 September 2005). Online at <http://www.radstats.org.uk/no091/>

Stevens2009BreastCancer&LAN.pdf. Stevens RG. (2009) Light-at-night, circadian disruption and breast cancer: assessment of existing evidence. *International Journal of Epidemiology* [Epub ahead of print, 23 April 2009] PMID: 19380369. Online at <http://www.ncbi.nlm.nih.gov/pubmed/>

The Meaning of Light-Clark.ppt. Lighting for life. Slide lecture presented by B. A. Clark at 'The Meaning of Light' event at Federation Square, Melbourne, 3 June 2010.

UKRoyalComArtificialLight2009. *Artificial light in the environment*. The [UK] Royal Commission on Environmental Pollution, 2009. London: HMSO

UNESCO2007.pdf. *Star Light. Declaration in defence of the night sky and the right to starlight. (La Palma Declaration)* International Conference, La Palma, Canary Islands, Spain 2007. Online at www.starlight2007.net

PREFACE TO RESPONSES TO THE SPECIFIC TERMS OF REFERENCE

This submission is primarily about light pollution (see [LightPollution2011Wikipedia](#) on the CDROM). Many different definitions of light pollution exist, but the internationally accepted one that follows modern practice of defining pollution by cause rather than effect is “Light pollution is the introduction by humans, directly or indirectly, of artificial light into the environment”.

This definition is an outcome of the La Palma Declaration ([UNESCO2007.pdf](#)), which urged governments to promote “The intelligent use of artificial lighting that minimises sky glow and avoids obtrusive visual impact on both humans and wildlife...” There is no indication that the Victorian Government has taken any notice of this suggestion, but much evidence that the Government’s actions and inactions fly in the face of it.

Adverse effects of light pollution are well known (eg [Lp181V2.6LightPollution.doc](#) and [UKRoyalComArtificialLight2009.pdf](#)). To appreciate the rapidly growing appreciation of how serious some of these effects are in terms of health and wellbeing, see [AmerMedAssn2009Resolution 516 on LP.doc](#), [Holzman2011NewScientistLANBlueAlert.doc](#) and [The Meaning of Light-Clark.ppt](#). New discoveries continue to be made in this area at a rapid rate.

This preface provides the basis for the remainder of this submission to address the Terms of Reference directly.

TOR 1. REVIEW THE EVIDENCE OF THE CONTRIBUTION OF THE NATURAL AND BUILT ENVIRONMENTS TO THE PROMOTION OF HEALTH AND WELL BEING

The built environment is undoubtedly a major factor in the comfort, convenience and productivity of modern life. Without it, we would not have the science or the means that have so successfully enabled and promoted health and wellbeing. But some aspects of the built environment are far from optimal either in design, execution or application, particularly when they encroach on aspects of the natural environment that have been an essential part of our evolution as a species. As a key example, widespread application of artificial lighting has transformed civilisation and enhanced the quality of life but these benefits have been accompanied by the largely hidden costs of substantial ecological and environmental degradation and undesirable social and health consequences stemming from interference with the natural light-dark cycle and the resulting disruption of the natural circadian (about 24-hourly) body rhythms. So the issue really seems not to be what features promote health and wellbeing, but the larger matter of the features or aspects of what we are already doing that need to be modified or minimised to avoid degrading health and wellbeing. There is compelling evidence that widespread action along these lines is highly desirable or necessary. Examples will be given in the responses to the remaining TORs.

TOR 2. IDENTIFY AND REPORT ON THOSE ELEMENTS OF ENVIRONMENTAL PLANNING AND DESIGN WHICH PROVIDE THE MOST PROMISING OPPORTUNITIES FOR IMPROVING HEALTH OUTCOMES IN VICTORIA

The response to this TOR is not so much the proposal of new initiatives but identification of the pressing need to stop doing those current aspects of planning and design that lead to unhealthy outcomes.

1. Parkland

Because of the diminishing number and size of backyards, passive recreation in parkland includes an increasing number of people who make astronomical observations both by day and night. This is on top of the increasing number of people there for other kinds of passive and active recreation. The population and population density of Melbourne are increasing towards the levels of third world countries but the amount of usable parkland available is shrinking because of alienation (Lp244ParksAlienation.doc). One of the common forms of alienation is the installation of more and brighter lighting, particularly sports lighting. This often takes place contrary to the principle that no group of parkland users has the right to degrade the amenity of the parkland for other users. The area of land affected by sports lighting is typically many times the area of the playing field that is illuminated.

Actual crime in parks or anywhere else is not reduced by more and brighter security lighting, path lighting or sports lighting, regardless of what many planning authorities, the police and the lighting industry say and believe. The facts are that more light at night reduces the fear of crime while increasing the crime rate slightly (Lp40Lighting&CrimePt1.doc, Lp140Lighting&CrimePt2.doc). There is more supporting evidence from other researchers provided in Lp181V2.6LightPollution.doc.

Regardless of the location, exposure to the blue component of light at night is inimical to health (eg AmerMedAssn2009Resolution 516; ANSES (2010); The Meaning of Light-Clark.ppt; Holzman2011NewScientistLANBlueAlert.doc). The use of blue-rich sports and other lighting using metal halide lamps or blue-white LEDs in parks, sports grounds and sports stadiums after the end of civil twilight needs to be banned outright for health reasons. Doubtless this will upset some people, but maybe they would be even more upset to get breast or prostate cancer as a potential alternative.

Even at dim levels, outdoor artificial lighting at night in or near parks degrades habitat, especially if the light sources are blue-rich. The adverse effects of light pollution can extend over vastly greater areas than those for which the illumination was intended.

Few would deny that parks and sports grounds are essential assets for public health and wellbeing. If the Government truly wants to do the right thing for the health of its constituents it would keep open and fully up-to-date public registers of parkland areas and all losses from alienation, increase the areas of parkland commensurately with the number of users, stop and reverse all non-offset alienation of parkland, and apply existing applicable environmental and health legislation to stop and reverse the installation of blue-rich sports lighting and its use after the end of civil twilight.

(TOR 2 continued)

2. Lighting for Main Roads, Streets and Public Places

UNESCO's interest in reducing light pollution stems from its commitment to human rights, insofar as ready access to natural darkness is regarded as an inalienable human right. On the other hand, all-night street and public lighting has become an accepted amenity of modern life as a result of its promotion by the lighting industry as fulfilling a natural desire for personal safety at night. The facts are that while outdoor lighting does reduce the fear of crime and does allow people to walk about at night with less likelihood of collisions, falls and getting lost, it aids criminals slightly more in committing crime than it helps law-abiding citizens to avoid becoming victims. Despite the absence of reliable evidence that lighting prevents crime, the Australian standards on public and outdoor lighting (AS/NZS1158.3.1-2007 and AS 4282-1997) still reflect lighting industry propaganda to the contrary.

There is no reliable evidence that street lighting reduces traffic accidents, and the effect of main road lighting in reducing accidents is now known to be much smaller than was believed up to the end of the twentieth century. Reductions in main road lighting have taken place in the UK in particular since then, but not in Australia. Some municipalities in the UK, USA and other countries have introduced (or re-introduced) street lighting curfews in the second half of the night (primarily as an economy measure) and so far there have been no significant changes reported either in crime or traffic accident rates.

In Melbourne, main roads are almost all lit by high pressure sodium (HPS) lamps, which have a pinkish-yellow light. Most of the lighting in suburban streets is by mercury vapour (MV) lamps, which emit about 3.3 times as much blue light as HPS for a given amount of visible light. HPS also gives about 50% more visible light than does MV for a given amount of electricity. As a general rule, lamps necessarily containing mercury (ie MV, fluorescent, compact fluorescent, induction, and metal halide) typically produce an excess of blue light.

In an attempt to provide a more energy efficient street light, a group of northern suburbs councils backed trials of a 'low energy' streetlight utilising a type of fluorescent lamp (the 'T5'). The council group now has a team at the Municipal Association of Victoria (MAV) promoting the widespread introduction of these relatively expensive 'low energy' streetlights, with some success already in getting the Government to assist with funding. Unfortunately, for a given amount of visible light, the T5 lamps emit about 15% more blue light than the MV lamps they are displacing. See Appendix 1 of Lp181V2.6LightPollution.doc for details of the calculations.

Many attempts have been made by the submitter to alert politicians and responsible authorities concerned of the severe long-term threat to health that will be posed by the changeover that has already started (eg see Lp241T5Streetlights.doc). It seems that the complaints eventually end up with the MAV people, who simply continue to assert that the product they are promoting is safe and superior, and (correctly) that it complies fully with AS/NZS1158.3.1-2007 (which still encourages the replacement of HPS lamps by lamps such as the T5 that emit more blue light). Regardless, the evidence is already strong enough to claim that flooding Melbourne with even more blue light at night, as is already happening, is at least as ill-advised as it would be to spray nature strip weeds with arsenic or to mix asbestos in the road surface to improve wear resistance.

(TOR 2 continued)

There are economical energy-saving streetlights commercially available in the form of low wattage HPS lamps in full cutoff fittings. The T5 program needs to be axed immediately on the grounds that the product supplied is unsuitable for its intended purpose. Existing installations of these fittings need to be removed forthwith or made safer by the fitting (at the supplier's expense) of orange-yellow lenses that will absorb most of the hazardous blue light.

3. High Rise Buildings

Multi-storey and high rise buildings have long been advocated as a solution to urban sprawl. Hitherto there have been few if any reasons for opposing this solution as inimical to health. This has now changed.

Japanese researchers have identified three roughly equal sources of outdoor ambient light (and hence artificial skyglow) in large cities: street and public lighting; advertising signs and other commercial lighting; and light of indoors origin escaping from buildings through doors, windows and skylights. The health issue here is that the more outdoor ambient light there is in a city, then the incidences of breast cancer and prostate cancer are reliably higher (KloogEtAl2008IsraelBreastCancer.pdf; KloogEtAl2009LAN&ProstateCancer.pdf; KloogStevensHaimPortnov2010LAN&CancerWorldwide.pdf).

Section 4.7, Building Height Limits, in Lp181V2.6LightPollution.doc includes an analysis of the amount of light contributed by tall buildings to the ambient light level of a city by night. The higher the individual buildings, the more there are of them, and the more they are spread out all make them undesirable from a public health viewpoint. Much of the problem arises from continuation of outdated thinking of the twentieth century in terms of making buildings with a reinforced concrete structure and walls of glass. In most cases the buildings have no curtains, drapes or other means of preventing the escape of internal light through the large transparencies. Worse, a Premier of Victoria even urged companies to leave their lights on all night to show the world how prosperous we think we are, regardless of the greenhouse gas problem that was already evident at the time.

If we are to persist with multi-storey and high rise buildings, it will need to be on the basis that it will be illegal for any occupant above ground level to allow the escape of internal light at night after the end of evening civil twilight. Also, no external floodlighting of any building or rooftop structure and no internally illuminated signs or company logos should be permitted. All of these measures would also reduce the substantial number of bird deaths and disorientations known to be connected with illuminated tall structures (eg Section 4.4.2, Animal migrations, in Lp181V2.6LightPollution.doc).

4. Illuminated Advertising Signs

The analysis in Section 4.7 extends to the case of illuminated advertising signs. When Australian Standard AS 4282-1997 'Control of the obtrusive effects of outdoor lighting' was being formulated, advertising industry representatives on the committee managed to have advertising signs exempted on the grounds that the industry would self regulate. It has since

(TOR 2 continued)

failed to do so in key environmental aspects including the amount of light radiated directly as waste at and above the horizontal, and the blue-rich nature of the illumination typically used.

5. Setting Limits

Measurements of artificial skyglow during recent Earth Hour events have revealed virtually no darkening, despite the large proportion of ordinary householders and others who do make an effort to reduce their use and waste of artificial light. Cityscape photographs of Melbourne and elsewhere in Victoria during and after the events show clearly that the non-participants are Vic Roads, street lighting suppliers, commercial/retail organisations, occupants of tall buildings, sports lighting operators and the outdoor advertising industry. Severe curbs have to be applied if we wish to reduce the substantial incidence of breast and prostate cancers that are clearly related to ambient light levels a night in cities and towns. There are many other health issues such as obesity, diabetes and dementia for which the causal/contributory involvement of blue light exposure at night is becoming clearer as investigations continue.

How much light at night is acceptable? Working in terms of illuminance (the amount of light that falls on a surface), sunlight amounts to tens of thousands of lux, overcast daylight can be a thousand lux, twilight passes through ten lux and the brightest full moon gives 0.27 lux. Playing field levels with sports lighting at night range from about 100 lux for training to over 1500 lux in major competitions. Spectators receive about one third of these values.

Present allowable outdoor ambient lighting levels at night are recommended by the International Commission on Illumination (CIE), which has a large representation from the lighting industry. For cities the amount is as much as 25 lux, dropping through intermediate lighting zones to 1 lux in environmentally sensitive locations. Such values are included in AS 4282-1997 as limits applying in the plane of windows of habitable rooms.

Taking account of current knowledge of the adverse biological effects of blue light at night on humans, the maximum safe level at bedroom windows is derived in Lp238StrayLAN&Sleep.doc and Lp243UpperLimitLAN.doc as 0.1 lux. The same value was reached independently by Dr Jan Hollan of the Czech Republic, who was largely responsible for that country being the first in the world to adopt a national law limiting the allowable effects of light pollution.

At present, the illuminance outdoors in central Melbourne is typically about 10 lux, but individual peaks of as much as 1500 lux exist on footpaths near shop window displays and advertising signs. Metropolitan rail stations are often lit to 500 lux or more, and the lamps are currently being changed from HPS to blue-rich metal halide. At present, Swanston Street is being remodelled in a way that will include blue-rich white lighting to daylight levels for the whole night. Such lighting excesses represent a large health risk, flying in the face of Government policy to cram ever more people into city apartments in Melbourne.

Melbourne is not alone in this respect. Excessive and therefore unhealthy outdoor lighting levels are common throughout Victoria. Compliance with the requirements of Australian Standards for lighting is no guarantee of healthiness. Illumination maxima and spectral content of illumination in Victoria need to be set by legislation, not by vested interests.

(TOR 2 continued)

6. Wind Farms

Although wind farms have not so far been any sort of issue for ASV operations, there are some astronomical connections with them and with research done by the submitter in connection with road lighting and road accidents. That completed research is included in a document recently submitted to the Victorian State Coroner in relation to a current inquest. It is not an ASV document. Suffice to say here that there is now new evidence that is likely to lead to a substantial increase in the setbacks required for wind farms in order to limit the loss of wellbeing they sometimes impose on residents and others in the vicinity. Again this is an instance of needing to get right what we are already doing rather than introducing new initiatives in environmental health.

7. Overview

In a single sentence TOR 2 seems best answered thus:

By far the most promising and widespread opportunities for improving health and wellbeing in Victoria appear to centre on the need at the planning, design and enforcement stages to rid the whole state of its present and forthcoming profligate excesses of outdoor lighting and light pollution.

TOR 3. ASSESS THE EXTENT TO WHICH THESE FACTORS ARE CURRENTLY TAKEN INTO ACCOUNT IN ENVIRONMENTAL PLANNING AND DESIGN IN BOTH THE PUBLIC AND PRIVATE SECTORS, AND THEIR EFFECTIVENESS, WITH PARTICULAR REFERENCE TO NEW GROWTH AREAS

The short answer is hardly ever. Following are some examples in support of this contention.

1. The Role of the Environment Protection Authority

About two decades ago the Astronomical Society of Victoria (ASV) wrote to the Environment Protection Authority (EPA) with a request that it take action to curb certain instances of obtrusive lighting affecting the operations of the ASV and its individual members. The response was that obtrusive lighting complaints by the public were well outnumbered by noise complaints, so the EPA could not devote resources to the problem. When individuals rang the EPA to complain about specific instances, they were told that there was no point in complaining about light pollution as the EPA had no authority to act. Eventually the ASV received a letter pointing out that obtrusive lighting was outside the EPA's charter, which covers air, water and soil pollution and noise. The word 'light' isn't even included in the Environment Protection Act 1970. It was suggested that the ASV should contact the responsible Minister to seek a change in the charter. The ASV did so and the Minister's representative replied that the Minister would consider acting only if a recommendation to do so was received from the EPA. This run-around continued until it was clear to the ASV that there was no prospect of early change.

The advent of AS 4282-1997 appeared set to make a difference but an ASV enquiry brought an EPA response saying that obtrusive lighting was entirely up to local councils to deal with. This proved to be a terrible setback for the ASV as there was no policy leadership from anywhere in the Government. Councils became reluctant to act at all because enforcement differences between councils could result in people living near municipal boundaries being treated differently from others.

Despite the serious health and ecological issues now attached to blue light exposure at night, the EPA still appears to have no interest in light pollution.

2. Responsibilities of Ministers and Others

a. Sports lighting

In a conference with the then Minister for Planning about obtrusive sports lighting, the submitter raised the issue of whether a Minister could approve something that appeared to breach a Victorian Act that the Minister did not administer. The Minister's adviser sidestepped the question by saying that for the case in point it would be up to the head of a particular Government body to make the complaint before an answer could be given. That body was and still is critically dependent on Government funding. Later advice received was that no breach was taking place. The breach still seems to be taking place, but it is a matter of opinion. Examination of the lighting after its installation indicated that it failed by a factor of about thirty to comply with a spill light constraint set by AS 4282-1997, and also failed to comply with an assurance by the Minister that spill from the new lighting installation would be less than that previously generated by the original sports lighting. Regardless, a

(TOR 3 continued)

complaint about the amount of spill was dismissed because sports lighting that could be used for colour TV broadcasting was exempt from the provisions of AS 4282, while dimmer lighting is not exempt. Since then the lighting in question has rarely if ever been used for colour TV broadcasting, but it is routinely used at dimmer settings.

b. Railway station lighting

On another occasion, the submitter complained to the then Minister for Transport about a press release lauding the Minister for announcing an expensive program of increasing lighting at metropolitan railway stations with the supposed aim of reducing crime. Since the 1960s, there had been a series of similar previous announcements of lighting ‘improvements’ at stations, each time accompanied by claims that crime would reduce. One or at most two of these were evaluated pseudo-scientifically for changes in crime despite the absence of prior planning for a controlled trial. Regardless of the actual result usually being what is euphemistically termed ‘mixed’ and unreliable in any case, accompanying publicity claimed crime was now better controlled and more amenable to reductions from planned further increases in lighting. Furthermore the political party in power made sure it let the public know that the party should get the credit for such a clever use of public money.

In this case, a written response came from the Director of Public Transport, who seemed to believe the propaganda about crime reduction. When confronted with scientific evidence that increasing lighting would tend to increase crime while decreasing the fear of crime, he replied that the police believed that reducing fear of crime was an important part of their job and that it didn’t matter if this actually resulted in a small increase in actual crime. The policeman who was claimed to have made this statement was contacted and he confirmed that the view was his and that he believed it to be true. Meanwhile the Director denied that he or anyone else had a duty of care to advise passengers that exposure to the brighter lighting at night meant an increased risk of breast cancer.

c. Some recent letters to Ministers

Lp231RectangularStadiumLighting.doc, LP239LightingAAMIPark.doc and Lp241T5Streetlights.doc are just three recent examples of dozens of carefully compiled letters on light pollution that have been sent to Ministers, other politicians and heads of government organisations over the last decade. In about a third of the cases no response has been received. In most of the remainder an acknowledgement has been received promising a detailed response but generally nothing further has been heard despite follow ups. The relatively few full responses that have been received have generally missed the point or been erroneous in technical detail and dismissive. The common line seems to be ‘thanks for your interest in this aspect of Government policy (but we know best)’. For example, the letter to Premier Brumby about the AAMI Park decorative lighting was not answered but the lighting was brought into operation, complete with blue LEDs. Consider this against the French Government’s warning on the use of blue LEDs: see ANSES (2010).

Presumably at a lower level of responsibility than Ministerial, why the Docklands Ferris wheel has approval to use blue LEDs may be the next problem of this sort to arise, but the proposed use of dozens of blue LEDs at a city intersection in honour of Greek enterprise is another possibility.

(TOR 3 continued)

An ASV communication not so far mentioned was sent to a local member for onforwarding to a Minister about an ill-advised scheme to put 'fairy lights' on the West Gate Bridge. It was not answered. Fortunately the current Government later decided to drop the scheme.

3. Municipal Councils

Letters sent on behalf of the ASV to local councils about obtrusive and poor quality lighting experienced in practice or apparent in planning documents have rarely attracted any written response. Most councils are generally cooperative and helpful when the matter is about spill light nuisance from individual streetlights and the like. A few are openly hostile and do their utmost to delay rectification and frustrate the ratepayers involved. In one case, the council employee concerned set up a classic run-around with the council's lighting and power contractor that ensured no prospect of him having to do anything. Eventually the contractor said that the approval of the Essential Services Commission would be needed to allow a trial of any streetlight modified to emit less blue light, spill less light and use less energy. The ESC ignored two written requests about this. Repeated complaints to the council CEO were answered dismissively by the employee's supervisor. If this sort of generally uncooperative and obstructive attitude is typical, the prospect of any genuine improvements in health and environmental outcomes from local council planning processes related to lighting seem slim.

4. Victorian Civil and Administrative Tribunal

On behalf of the ASV, the submitter has appealed against numerous planning proposals involving obtrusive and excessive lighting.

In one case, a local council decided to add more and brighter lighting to a park. The appeal case was heard by the head of VCAT. He accepted the evidence submitted that the additional lighting was unlikely to decrease crime and that the lighting would degrade the local environment. The Council's barrister pointed out that part of the area involved had a heritage overlay and that the installation of security lights in a heritage area was outside VCAT's jurisdiction. The appeal was then ruled invalid.

In another VCAT hearing, the submitter made a case that proposed lighting on private land appeared to breach the Environment Protection Act 1970 and the Health Act 1958 then in force. The Panel Chair angrily said that her duty was to administer the Planning and Environment Act 1987 and that it was no concern of hers if other Acts were breached as a consequence.

More recently, a Planning Panel heard a case concerning a proposal for a building to be erected in St Kilda Road near the Shrine of Remembrance with a height in excess of that applying in the vicinity. The submitter provided an objection on behalf of the ASV (Lp220OutlineSubmissionStKildaRdBuilding2009.doc) pointing out that the proposal would have an adverse impact on the heritage-listed Melbourne Observatory and would also have potential adverse effects on public health insofar as it was yet another tall building that would increment the already excessive amount of ambient light in the vicinity and thereby increase the health risks of cancer and other adverse outcomes of excessive light exposure at night.

(TOR 3 continued)

The proponent's barrister complained about the Panel's inclusion of the objection in the hearing but the Panel did not change this decision. The objection was duly presented at the hearing and apparently well received. It was actually applauded by several of those present. The Panel Chair then said that while the presentation was interesting, the case was not about any possible adverse health outcomes of any new building on the site (even though the outcomes were height-dependent); rather the only issue that mattered was whether overshadowing of the Shrine and its forecourt was tolerable or not. So here is yet another case where approval of a planning application would result in likely adverse health outcomes despite these apparently being contrary in this case to the Public Health and Wellbeing Act 2008. It also seemed that an outcome contrary to provisions of the Heritage Act 1995 would be of no concern.

This experience with the St Kilda Road building case is certainly not unique. Much the same has happened with other objections by the ASV, for instance an objection to the amounts and type of lighting proposed to accompany the construction and operation of the Desalination Plant. The objection was privately lauded by some members of the planning panel, but no change was made to the plans for much of the construction work to be done under intense blue-rich lighting at night. In the long run, the high rates of pay will prove to be a terrible bargain for some of the workers. As far as is known, none of the workers have been warned of the increased risk of prostate cancer in future if they work at night under lights that are bright enough for immediate safety at the workplace.

5. Overview

The submitter is reminded of the situation in ancient Egypt, where change was suppressed so completely that the religious hierarchy managed to survive more or less intact for three thousand years. Perhaps that comparison is too harsh and Byzantium would be closer in terms of bureaucratic procedures and eventual outcomes that tended to be independent of the facts.

Of course we really do far better than these precedents but our established processes for dealing with environment and health in planning seem better suited to evolutionary advances instead of sudden disturbances imposed by important biological discoveries. But the light at night issue has been building up for years in the face of disinterest and disbelief that have allowed the eventual impact to grow.

Surely it should not be up to an unpaid volunteer to have to alert the Government repeatedly to something that its subject matter experts should already be on top of, viz the toxic nature of seemingly innocuous chronic exposures to light at night. That cities and towns are still being designed for 24/7 lifestyles, the Swanston Street lighting being a case in point, is anachronistic pandering to a tragic fiction.

TOR 4. DETERMINE OPPORTUNITIES TO INFLUENCE ENVIRONMENTAL PLANNING AND DESIGN FOR HEALTH, INCLUDING CONSIDERATION OF THE ROLE OF LEGISLATION, GUIDELINES, AND PUBLIC-PRIVATE PARTNERSHIPS, AND THE COSTS AND BENEFITS OF VARIOUS OPTIONS

Doubtless there are many ways in which a good outcome can be achieved for all concerned. But perhaps the biggest snag arises when vested interests take over the processes for the express purposes of creaming off a disproportionate share of the rewards for participation. A prime example of this occurred in England during the past two decades. Here is an outline of what happened:

By the 1990s, scientific research in the UK and US had reasonably well established that there was little if any effect of outdoor lighting on the actual crime rate. A young female psychologist refused to accept this and did a PhD on the topic with financial assistance from a leading street lighting company. Her thesis and journal papers have since been criticised by other researchers as biased towards lighting as a means of preventing crime. At the time, she was involved in a relationship with the manager and major shareholder of the lighting company (PrivateEye2005.pdf). Armed with dodgy research results indicating that upgrading street lighting in England would reduce street crime by about 20%, the UK lighting profession and industry convinced the UK Government to proceed. That Government did so by means of a public-private partnership costing roughly the equivalent of a billion AUD. In due course the awful truth became apparent- the crime rate worsened but the exact change was confounded by other influences and nobody had bothered to set up a controlled trial in advance to allow reliable estimates of the actual effect of the lighting changes on the crime rate.

The lesson of this and some other parts of this submission is that governments must always be wary of vested interests with a hidden agenda. The influence of such interests may be subtle, eg through third-party specifications with generously high levels, indifference to or suppression of the health and environmental costs, and ad hoc exemptions for the worst practices.

It would help the cause of public health greatly for adverse effects of artificial light to be mentioned specifically in the Environment Protection Act 1970, the Planning and Environment Act 1987, the Public Health and Wellbeing Act 2008, and the charter of the Environment Protection Authority. Where it is clear that particular Australian Standards are out of date or otherwise not strict enough to guarantee good health and environmental outcomes, the Government should issue its own mandatory specifications.

In the case where major contributions to adverse health and environmental outcomes are already taking place, eg in the case of virtually all public lighting, the government should direct the responsible authorities involved to take specific action to ameliorate the problems. There are precedents in other countries specifically relating to the replacement of all unshielded and semi-shielded light fittings by full cutoff fittings that allow no direct emission of light at or above the horizontal. Vic Roads, local councils and their lighting suppliers should be high on the list for such direction.

There is a degree of urgency about the need for preventing ongoing installations of inefficient, environmentally damaging and unhealthy lighting on the roads and streets of present and proposed new housing developments around Melbourne's outer fringes in particular.

(TOR 4 continued)

The mechanics of financing and managing developments in Melbourne and any other parts of Victoria are of no concern to the ASV, important though they may be for Victorians in general. But one further large-scale issue for the ASV is the need to reduce overall artificial skyglow in the state as a means of maintaining and growing the quality of what the state can offer tourists from the northern hemisphere- the markedly superior natural beauty of the pristine southern sky. This is not a trivial matter, and Victoria needs to stay competitive into the foreseeable future. Dark sky parks, reserves and regions are becoming more prevalent overseas and the prospect for introducing these into Victoria now needs to be considered seriously. The ASV has already received positive responses from local government people near Heathcote where the ASV has its own Dark Sky Site.

TOR 5. PROVIDE RECOMMENDATIONS FOR FUTURE PLANNING AND INVESTMENT; AND THAT THE COMMITTEE WILL CONSIDER:

(a) the effectiveness of the Environments for Health Municipal Public Health Planning Framework;

Professor Richard Stevens first discovered the link between light exposure at night and breast cancer in 1987. In a more recent paper reviewing the very substantial progress since then, he stated “Lighting of the night sky is as important an Earth issue as global warming”. (Stevens2009BreastCancer&LAN.pdf, page 5)

The submitter is unfamiliar with the Framework in question. One would have to wonder about its value if its work has not yet caught up with the discoveries that led Stevens to make his claim.

b) the State Public Health and Wellbeing Act 2008, the Transport Integration Act 2010 and the Planning and Environment Act 1987

The Planning and Environment Act 1987 nowhere includes the terms ‘health’, ‘light’ or ‘precautionary’ but it does provide scope for action in relation to effects on the environment. It has to be said that the Act as it stands has been of very little value in attempts by the ASV to curb any of a long series of lighting installations that continue to degrade the environment and make people ill.

The Public Health and Wellbeing Act 2008 does not include the term ‘light’ but implies it as an ‘emission’ in connection with ‘nuisance’. It does include a definition for ‘Precautionary Principle’. A legal opinion might therefore be of interest in respect of whether local councils are themselves committing ongoing nuisances by allowing their public lighting and sports lighting to emit light in the blue region of the spectrum in amounts sufficient to invoke the Precautionary Principle as conducive to certain diseases such as breast and prostate cancer.

The ASV has no view on the Transport Integration Act 2010.

(c) international experience such as the World Health Organisation's (WHO) Healthy Cities initiative

The only known connection here for the submitter is that the WHO issued a statement in 2007 classifying shiftwork as a probable carcinogen, with an explanation that the connection had been demonstrated for breast cancer in nurses with a long history of shiftwork, and that the effect was probably related to circadian disruption. The WHO is rather conservative in its pronouncements. The associated delay would appear likely to lead to many otherwise avoidable illnesses and deaths.

(d) the consistency of policy approaches across the Victorian Government to promote health through evidence based environmental planning and design measures

(TOR 5 continued)

The responses of the Ministers of the time to the many written complaints from the ASV on light pollution matters, or the absence of responses, clearly indicate that successive Victorian Governments have failed dismally in this aspect.

(e) the role of public open space in promoting health

The record of successive Victorian Governments in alienating parkland or allowing other bodies to do so suggests that there is a long way to go in ensuring preservation of what is left of our once plentiful public open space, let alone expanding it commensurately with the rapidly growing population in the interests of promoting health and wellbeing. See also Item 1 under TOR 2 above.

(End)