



Royal Astronomical Society of New Zealand

(INCORPORATED)

Signatory to New Zealand Urban Design Protocol
Supporter of the International Dark-Sky Association

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Submission on: Proposed National Policy Statement on Urban Development Capacity

Please note the different wording contained in the Policy consultation document and the NPS-UDC A3 Summary_0.pdf document.

Consultation Document:

PA3: When considering the effects of urban development, decision-makers must:

- Recognise and provide for the contribution that urban development will make to the ability for people and communities and future generations to provide for their social, economic and cultural wellbeing.
- Provide sufficient development capacity, whilst maximising the positive effects of development, and minimising the adverse effects of development.
- Have particular regard to the positive effects of urban development at a national, regional and district scale, as well as its local effects.

Summary Document:

PA3. When considering effects of urban development decision-makers must:

- recognise and provide for the contribution urban development will make in enabling people, communities and future generations to provide for their social, economic, cultural and **environmental** well-being.
- provide sufficient development capacity while maximising the positive effects of development and minimising adverse effects of development
- have particular regard to the positive effects of urban development at a national, regional and district scale, as well as local effects.

The word “environmental” missing from the consultation document is critical to the intent and application of the policy.

Our submission is that the word “environmental” be included in policy PA3.

Discussion

New Zealand’s high rate of urbanisation exposes citizens to the benefits and impacts of collective living. In particular the use of artificial outdoor light at night in urban and rural areas is both a benefit and a risk to the welfare of inhabitants.

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There is a growing awareness of the unintended impacts of exposure to light at night, especially with the introduction of blue rich white light sources as part of energy efficiency drives.

“Electric lights differ in terms of their circadian impact. Understanding the neuroscience of circadian light perception can help optimize the design of electric lighting to minimize circadian disruption and improve visual effectiveness. White LED streetlights are currently being marketed to cities and towns throughout the country in the name of energy efficiency and long term cost savings, but such lights have a spectrum containing a strong spike at the wavelength that most effectively suppresses melatonin during the night. It is estimated that a “white” LED lamp is at least 5 times more powerful in influencing circadian physiology than a high pressure sodium light based on melatonin suppression. Recent large surveys found that brighter residential nighttime lighting is associated with reduced sleep time, dissatisfaction with sleep quality, nighttime awakenings, excessive sleepiness, impaired daytime functioning, and obesity. Thus, white LED street lighting patterns also could contribute to the risk of chronic disease in the populations of cities in which they have been installed. Measurements at street level from white LED street lamps are needed to more accurately assess the potential circadian impact of evening/nighttime exposure to these lights.”

Human and Environmental Effects of Light Emitting Diode (LED) Community Lighting- American Medical Association. <http://bit.ly/1XZzs3>

The world wide extent of the impact of urban lighting is revealed in the recently released “The new world atlas of artificial night sky brightness”

Light pollution is one of the most pervasive forms of environmental alteration. It affects even otherwise pristine sites because it is easily observed during the night hundreds of kilometres from its source in landscapes that seem untouched by humans during the day, damaging the nighttime landscapes even in protected areas, such as national parks (for example, the light domes of Las Vegas and Los Angeles as seen from Death Valley National Park). Notwithstanding its global presence, light pollution has received relatively little attention from environmental scientists in the past. This is changing, as attested by the rapidly increasing rate of published works on the subject.

The new world atlas of artificial night sky brightness.
<http://advances.sciencemaq.org/content/2/6/e1600377.full>

The Proposed Policy Statement acknowledges New Zealand’s outstanding natural environment.

Understanding urban environments

New Zealand urbanisation is among the highest in the world. Over 72 per cent of our population live in areas with a population of 30,000 or more people. Our outstanding natural environment and rural economy are internationally recognised. However, day to day most New Zealanders rely on the choices and opportunities our cities provide – including access to goods, services, housing, employment and recreation. The challenges of rapid growth are not unique to New Zealand cities. But New Zealand’s future success and prosperity will depend on the quality of both our rural and urban environments. Each comes with different opportunities and challenges, particularly when it comes to managing natural and physical resources sustainably.

The high rate of urbanisation means that the majority of New Zealand citizens are affected by the use of artificial light in their places of residence. The likelihood that New Zealand’s urban areas will expand and intensify means it is essential that the impacts of this trend must be managed appropriately. Outdoor

lighting is just one aspect of the wider effects of urban development but one that is important to amateur and professional astronomers, and to the general population through unintended medical and ecological impacts.

Submission:

The overall position of the Royal Astronomical Society of New Zealand is: Oppose in part

Our specific submissions are that:

- 1. The word “environmental” be included in policy PA3.**
- 2. Outdoor lighting be acknowledged in the Policy Statement as an integral part of the effects of urbanisation that must be managed to minimise the unintended negative effects on residents and the environment.**
- 3. Research and development be encouraged within New Zealand to increase knowledge of the effects of lighting in urban and rural areas and to develop solutions suited to New Zealand’s situation.**
- 4. An interim policy be adopted to ensure that existing technologies are applied to minimise the negative impacts of light such as:**
 - a. Colour control of lighting to reduce sky glow, human and ecological circadian disruption by minimising or avoiding the use of blue rich white lighting
 - b. Intensity management to reduce lighting levels in off peak times by dimming lights as traffic and pedestrian levels drop
 - c. Shielding and directional control of luminaires to minimise spill and glare by directing all lighting downwards.
 - d. Time and motion controls to minimise unnecessary lighting while providing safety and security when needed.

Thank you for the opportunity to make this submission.

Yours sincerely,

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Supporting Resources

Human and Environmental Effects of Light Emitting Diode (LED) Community Lighting - American Medical Association.

<http://bit.ly/1XZsz3>

<http://darksky.org/ama-report-affirms-human-health-impacts-from-leds/>

The new world atlas of artificial night sky brightness.

<http://advances.sciencemag.org/content/2/6/e1600377.full>

Does the modern urbanized sleeping habitat pose a breast cancer risk?

<http://www.ncbi.nlm.nih.gov/pubmed/21182407>

Artificial light at night: melatonin as a mediator between the environment and epigenome.

<http://www.ncbi.nlm.nih.gov/pubmed/25780234>

Effects of artificial light at night on human health: A literature review of observational and experimental studies applied to exposure assessment.

<http://www.ncbi.nlm.nih.gov/pubmed/26375320>