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Lighting Council Australia comments on the Smart Cities Plan

Lighting Council Australia welcomes the opportunity to comment on the Australian Government's Smart Cities Plan. We applaud this initiative to focus on building an agile, innovative and prosperous nation through action around the opportunities for our cities. Cities need a clear vision for their economic future. Only with such a vision and the accompanying policy framework can cities deploy technology in the smartest ways possible.

Lighting Council Australia has knowledge of the technology required to enable smart cities. Our members supply the majority of the smart street lighting products available on the Australian market today. This submission focuses on the subject areas of smart, energy efficient technology and the use of sensor networks to gather real time data that can be analysed and used to provide innovative services within smart cities.

Technology solutions

A smart city could be defined, at least in part, as a city in which information and communications technology is merged with traditional infrastructures, coordinated and integrated using new digital technologies. Smart cities use technology to enhance the lives of the people inhabiting cities. Twenty-first century technologies offer new promise for the future of cities: more efficient resource usage and greater connectivity between people and places. Smart cities should facilitate the process of people living meaningful and fulfilled lives, enabled seamlessly by technology and offering opportunities for all.

Technology should enable us to live more sustainably and comfortably by enabling new services. Example services such as 'space' as a service (co-working and co-living spaces) and ride-sharing are becoming more common. An example application could automatically coordinate pollution monitoring and road toll levels to deter traffic if pollution levels increase above set points. Such services enabled by real time data collection can reduce pollution and road congestion.

The forecast web of machine-processed data is starting now. The internet of things will include sensor networks collecting, disseminating and using data. Individuals, businesses and governments will be empowered through greater situational awareness provided by data collection, analysis and real world applications.

Leveraging open and real time data

Data collection undertaken by the Australia Bureau of Statistics (monthly data) and the Australian Government Sensis (five yearly) will continue to be important. However an increase in the collection, analysis and use of real-time data will drive further efficiencies, services and solutions.

Networks of sensors and smart devices will collect real-time data. Mobile phones and their applications already collect, disseminate and use data streams. Other city infrastructure such as new technology street lighting devices are being enabled to act as sensor networks, collecting and communicating data relevant to transport, environment, city management, energy, safety and security service applications.

New technology smart street lights are being increasingly recognised as a platform for the collection of smart cities data for the following reasons:

- Street lighting is ubiquitous, being regularly spaced every 30 – 80m along most urban roadways and streets of Australia;
- Street lighting is located in public spaces above roads and away from buildings, providing good visibility for various sensors and wireless communications devices;
- Street lighting is already connected to a reticulated electricity supply, thereby helping to reduce rollout cost.

The opening of data streams and an understanding of data patterns are leading to new services and new applications. Data is not useful until it is used so sharing anonymised, validated data is important and will continue to lead to innovation, reliable service delivery and more efficient use of infrastructure. Public agencies could access essential sensor data and private enterprise could share agreed data.

Using data, analytics and communications systems will enable new services in the following areas:

- Environment and water: waste and water treatment; pollution control
- Built environment and city management: green buildings; urban design; urban services; smart use of buildings
- Urban mobility: last mile solutions; urban logistics; intelligent transport systems (e.g. transport journey planning applications provide real time travel information to help commuters better plan their journeys).
- Energy: smart energy management; energy efficiency; renewables
- Safety and security: public safety; command and control systems
- Smart health care services

Use of energy efficient, smart-ready technologies

New technology LED street lights offer increased energy efficiency, reduced maintenance costs and longer lifetimes over traditional street lighting technology. Street lighting infrastructure owners (electricity utilities) are now starting to install this new technology.

Lighting Council Australia strongly recommends that any upgrades of traditional street lighting incorporate smart-ready LED luminaires. Smart-ready LED luminaires include cabling and connectors able to accommodate the connection of sensors and communication devices at a later date.

What is smart street lighting?

The term smart street lighting refers to street lighting infrastructure that is effective as a simple street light and has additional features designed to increase efficiencies, productivity and services.

Smart street lighting infrastructure will comprise (at least) LED luminaires (able to be dimmed if needed), data collection sensors and communication technology. Other features could include digital signage, CCTV, speakers, 'push to talk' emergency system and electric vehicle charging.

The combination of the pole, data collection, data sharing, analytics and application development will increase services.

How infrastructure owners and their customers would like to use smart street lighting

The Lighting Council Australia Smart Street Lighting Stakeholder Forum (SSLSF) held on 12 May 2016 in Sydney heard from electricity utilities, road authorities, local governments and regulators about how they would like to use smart street lighting and the current Australian regulatory frameworks for street lighting. A summary of views follows.

Local governments are starting to investigate the following features of smart street lighting and smart poles:

- Variable lighting levels:
    - to increase light levels around event precinct areas and create night economies; and
    - to decrease light levels and save energy when vehicles and pedestrians are not on the streets.
- Increased control, centralised monitoring, outage detection, fault prediction, maintenance planning and asset management improvements.
- Image sensing (CCTV, photography, traffic and pedestrian movements).
- Parking vacancy sensing to support smarter parking and payment applications.
- Digital signage for way-finding, alerts, announcements, entertainment and revenue generation.
- Speakers for music, alerts and announcements.
- Façade lighting (colour changing) for entertainment and ambience.
- Electric vehicle charging stations.

Road authorities believe there is value and opportunity in smart street lighting and are looking for potential improvements in the following areas when considering new smart road lighting systems:

- An increase in pedestrian and driver safety.
- Asset cost reductions over time due to decreased energy usage, reduced maintenance costs and improved lifetimes.
- Asset management due to increased efficiencies in scheduled maintenance.
- Contract administration and other potential benefits.
- Other benefits may include: traffic sensors and CCTV to be used for active traffic management systems; parking vacancy sensing to support smarter parking and payment applications; environmental sensors to monitor factors such as temperature, rain, flooding and air quality.

Other applications will inevitably be developed when new data streams become available.

Stakeholders at Lighting Council's forum raised the following issues that will require resolution before smart street lighting networks can be widely rolled out:

- More work is needed on developing the business cases, quantifying the benefits and providing the investment assurance needed to justify capital outlay. Collaboration and coordination between all levels of government in Australia, government agencies, regulators and industry stakeholders will be needed to develop this work. Smart cities will require a high capital outlay but have significant inter-generational benefits. Smarter investment through value capture should be considered for inclusion in business cases as smart pole real estate and data streams will likely have value for some businesses and service providers.
- The current regulations may not easily accommodate new smart lighting technology (e.g. there is a need to meter the new variable output loads and the new devices that will be included in the street lighting network). Regulators stated they are willing to develop the regulatory solutions to enable the development of this market.
- Standards and specifications are needed that can be referenced in regulations and bridge the current knowledge gaps.

About Lighting Council Australia

Lighting Council Australia is the peak body for Australia's lighting industry. Its members include manufacturers and suppliers of luminaires, lighting control devices, lamps, solid state lighting and associated technologies. Lighting Council's goal is to encourage the use of environmentally appropriate, energy efficient, quality lighting systems.

Lighting Council Australia would welcome further engagement with the Department regarding any of the points raised in this submission. Should you wish to contact us, please contact me directly or David Crossley, Technical Manager (dcrossley@lightingcouncil.com.au or 0415 428 731).

Yours sincerely

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