CITY OF MARION

Public Lighting Action Plan

City of Marion

2019

Prepared for
City of Marion

Version	Author	Date	Description of changes
V0a	Keith Harwood	21/5/2019	First internal draft
V1a	Paul Brown	31/5/2019	Release draft ready for Council workshop and review
V1b	Ross McKirdy	30/9/2019	Final draft Action Plan incorporating Council feedback

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About Ironbark Sustainability

Ironbark Sustainability is a specialist consultancy that works with government and business around Australia by assisting them to reduce energy and water usage through sustainable asset and data management and on-the-ground implementation.

Ironbark has been operating since 2005 and brings together a wealth of technical and financial analysis, maintenance and implementation experience in the areas of building energy and water efficiency, public lighting and data management. We pride ourselves on supporting our clients to achieve real action regarding the sustainable management of their operations.

Our Mission

The Ironbark mission is to achieve real action on sustainability for councils and their communities.

Ironbark are a certified B Corporation. We have been independently assessed as meeting the highest standards of verified social and environmental performance, public transparency, and legal accountability to balance profit and purpose.

Contents

1 Introduction

1.1 Background

This Public Lighting Action Plan sets out a succinct roadmap for the management and implementation of projects and asset management processes that improve energy efficiency and service delivery across the City of Marion's metered and unmetered public lighting networks.

This Action Plan has been developed in conjunction with relevant Council staff and is based on the overarching framework as follows:

1. Understanding existing conditions - use audits, condition assessments and existing data sets to understand where your assets are, their characteristics and how they are performing
2. Affecting change – implement projects to address non-compliances identified during audits; implement energy efficient and modern technology to reduce operational and maintenance costs of Council's public lighting.
3. Maintaining and Adapting – implement best practice asset management procedures that leverage smart lighting technology to reduce operational and maintenance costs and ensure that a proactive approach is taken to asset renewal into the future.

This action plan is in draft form and is designed to be concise in order to provide information for Council workshops and feedback. As such only a brief description of the project, as well as anticipated costs and timeframes is provided.

2 Strategic Framework

The following section presents a strategic framework for identifying appropriate actions to improve public lighting across the City of Marion.

2.1 Strategic Approach

The overarching approach to the development of this Action Plan was to identify actions that:

- Provides clear direction for the management and implementation of projects that improve energy efficiency and service delivery across the City of Marion's metered and unmetered public lighting networks
- Leads to the delivery of lighting levels that are appropriate for the space that is being lit
- Prioritises the use of emerging technologies
- Promotes efficient energy consumption and actively reduce the overall greenhouse footprint from public lighting

Fundamentally, this Action Plan is about facilitating effective, logical, ordered and beneficial change. To affect change, three groups of strategies – each with their own actions - have been identified:

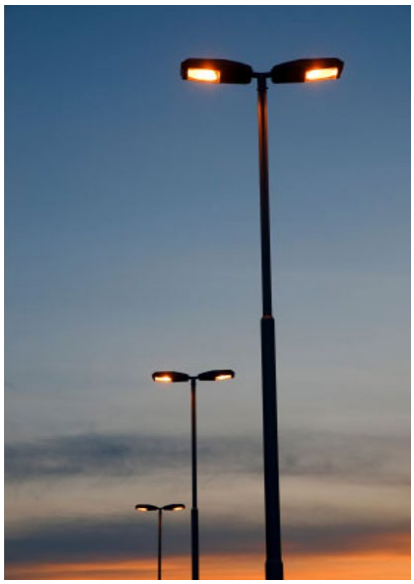
1. **Understanding Conditions**
    a. **Strategy 1: Understand existing lighting levels**
    b. **Strategy 2: Understand existing public lighting infrastructure**
2. **Affecting Change**
    a. **Strategy 3: Provide clear guidance to those overseeing public lighting**
    b. **Strategy 4: Upgrade to energy efficient technology**
    c. **Strategy 5: Introduce smart lighting technology where appropriate**
    d. **Strategy 6: Advocate for changes to the governance of unmetered lighting**
3. **Maintaining and Adapting**
    a. **Strategy 7: Implement best practice asset management processes**

Strategy 1: Understand existing lighting levels

Conduct light level audits to identify areas of non-compliance and establish an ongoing auditing program to address future non-compliances.

Actions

1.1	**Conduct a lighting level audit of all public spaces**	Lighting level audits will provide a summary of existing conditions. They can be carried out efficiently via desktop assessments for street lighting whereas on site assessments are more typical for parks and open spaces. For auditing, resources may be allocated to training of Council staff on asset management, lighting level readings and lighting design, or alternatively this work could be contracted.
1.2	**Identify, prioritise and address areas of non-compliance.**	Lighting level audits (Action 1.1) can be used to prioritise and address areas of non-compliance via upgrades to existing lighting schemes or the installation of new lighting schemes where they did not previously exist.
1.3	**Establish periodic lighting level audits of all public spaces to assess progress and capture new non-compliances as they arise**	Lighting levels will change over time due to targeted improvements to public lighting, shifts in shade patterns from growing trees and new developments, and the removal of lights. Periodic audits should be conducted to both assess progress and capture new non-compliances as they emerge.



Strategy 2: Understand existing lighting assets

Conduct an audit of Council-owned public lighting assets (condition, type, age, etc.), maintain up-to-date records on all (Council, DNSP and privately-owned) public lighting assets, and establish an on-going auditing program of Council-owned public lighting assets.

Actions

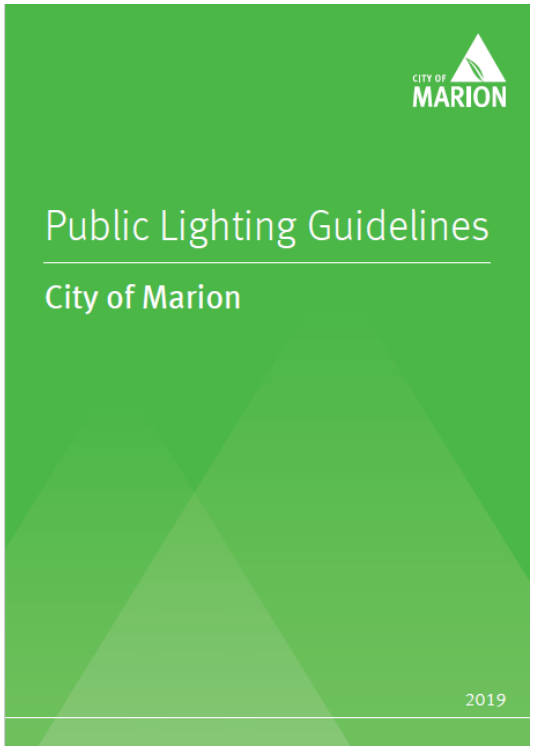
2.1	**Conduct asset and condition audits of all Council owned public lighting**	Asset and condition audits assist with the management, maintenance and future planning of public lighting.
2.2	**Maintain an up to date record of DNSP controlled public lighting**	Lighting owned and/or controlled by South Australian Power Networks (SAPN) forms a large component of the public lighting within Council's Centres. Knowing the location, lamp type and wattage of DNSP lighting is an important foundation for future planning.
2.3	**Establish periodic asset and condition audits of all Council owned public lighting**	Public lighting is not static. Assets will be replaced over time and condition will change as assets age. Asset audits should be carried out every 4 years to capture these changes.

Strategy 3: Provide clear guidance to those overseeing public lighting

Develop appropriate strategies, guidelines and policies to aid Council staff and developers to implement best practice public lighting procedures and projects.

Actions

3.1	**Develop appropriate strategies, guidelines and policies**	A clear set of strategies, guidelines and policies will allow Council staff, residents and developers to better understand the intended direction for public lighting in the City of Marion and ensure a consistent and best practice approach is taken for all future lighting related projects. To ensure successful implementation, overseeing the integration of new guidelines and procedures into existing practices will be critical.

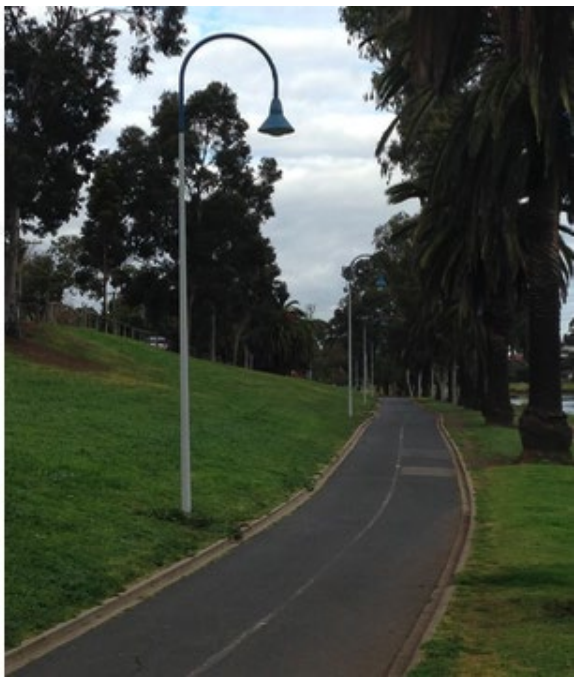


Strategy 4: Upgrade to energy-efficient technology

Upgrade all existing unmetered high intensity discharge public lighting with energy-efficient LED equivalents over a 3 to 5-year period.

Actions

4.1	**Upgrade all existing unmetered high intensity discharge lighting with energy efficient LED equivalents over a 5-year period**	Due to their sheer quantity and old inefficient lamp technology, unmetered street lighting presents Council with the single biggest opportunity to reduce it public lighting related operating costs and emissions. This is typically fast tracked via a bulk changeover to LED equivalent luminaires. Any street lighting bulk change should consider the findings of lighting level assessments (See Action 1.1) and address non-compliances as required.
4.2	**Upgrade all existing metered high intensity discharge public lighting with energy efficient LED equivalents over a 5-year period**	Using the recommendations from audits of Council-owned public lighting (See Action 2.1), energy efficient upgrades can be prioritised based on payback and/or emissions reduction. Any upgrade of Council-owned lighting should consider the findings of lighting level assessments (See Action 1.1) and address non-compliances as required.

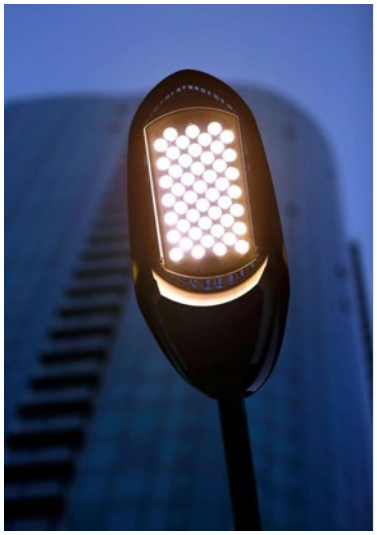


Strategy 5: Introduce smart lighting technology where appropriate

Carry out trials of smart lighting technology and ensure all new lighting infrastructure includes the ability to function as part of a future smart lighting network.

Actions

5.1	**Ensure that all new lighting infrastructure includes the ability to function as part of a smart lighting network.**	All new lighting infrastructure should include the ability to function as part of a smart lighting network. Whilst this might not necessarily mean that smart features will be used initially, they will be future proofed for later use as the benefits and functionality of smart lighting matures.
5.2	**Actively trial smart lighting technology in both metered and unmetered lighting schemes**	Smart lighting is a new and emerging technology. Trials are a logical first step towards widespread adoption and will help Council better understand where smart lighting can benefit them the most.
5.3	**Transition smart lighting to a business as usual process based on the outcomes of trials**	Once preferred technologies and formal governance and protocols are clarified via trials, smart lighting functionality should be implemented on any public light that presents Council with a clear business case.



Strategy 6: Advocate for changes to the governance of unmetered lighting

Build relationships with SAPN, regional alliances and the Public Lighting Working Group (PLWG) to better advocate for changes to governance and regulation on unmetered lighting.

Actions

6.1	**Create formal frameworks for the local government sector and communities to be represented in decisions and processes that lead to the adoption of smart lighting technology on the SAPN network**	Decisions around smart lighting data access, procurement, software and technology type are currently being made by SAPN independent of councils, even though these decisions will heavily impact councils. While councils can discuss these issues with SAPN as individuals, there is no formal framework for the local government sector and communities to be represented in those decisions.
6.2	**Advocate for a more transparent and inclusive technology approvals process from SAPN**	Technology approvals are undertaken without the local government sector formally at the table. SAPN's technology approvals process is opaque and operating in isolation to "sister" DNSPs Citipower, Powercor and United Energy who work together to improve efficiencies, avoid duplication and accelerate the time it takes to approve new smart lighting technology.
6.3	**Advocate for more contestability in customer driven street lighting projects**	Councils can purchase certain hardware (luminaires) through their own contractors and gain from the benefits of competition. However, there is no option for contestability for the installation (labour) or project management of bulk change programs on SAPN assets. In other jurisdictions councils can appoint their own installers or project managers, leading to significant financial and quality improvements.
6.4	**Advocate for SAPN to provide accurate data and reporting on unmetered street lighting.**	Access to the public lighting asset and condition data on a regular basis would enable data driven discussions around governance and regulation on unmetered lighting

Strategy 7: Implement Best Practice Asset Management Processes

Leverage periodic asset audit data to inform maintenance and upgrade works, install ID plates on metered assets and use smart lighting technology for remote fault reporting and adaptive lighting.

Actions

7.1	**Leverage asset audit data to inform maintenance and upgrade works**	The public lighting asset and condition audit data (see Action 2.1) should be used to inform both maintenance, upgrade and renewal works programs.
7.2	**Consider asset identification numbers to encourage public reporting of faults**	The installation of asset identification plates (with unique ID and Council contact details) will assist the public and Council with reporting and identifying faults.
7.3	**Leverage smart lighting technology to assist in identifying and reporting faults**	Smart-enabled luminaires and poles can facilitate remote fault reporting of public lighting assets, increasing the speed with which faults are identified and improving service levels.
7.4	**Leverage smart lighting technology to allow future lighting level control**	Smart lighting technology allows for lighting with higher than required output to be installed now at dimmed levels and adjusted in the future as conditions change. This action's functionality is ideal in areas of high growth. Conversely, dimming can be initiated in instances where lower lighting levels become a future priority.

3 Action Plan

3.1 Structure and Use

Projects or tasks relating to each action described in Section 2 have been provided with a score to determine which are the highest priority (refer to Table 1). The scoring system provides each action with a mark of “High” (3 points), “Medium” (2 points) or “Low” (1 point) with regard to its urgency and its ease. These are then added together to provide a priority score, with a possible range of 2 (lowest priority) to 6 (highest priority).

		Ease		
		High (3)	Medium (2)	Low (1)
Urgency	High (3)	6	5	4
	Medium (2)	5	4	3
	Low (1)	4	3	2

Table 1: Priority scoring for Implementation Plan actions

3.2 Action Plan Overview

Strategy	Action	Specific Projects	Urgency	Ease	Priority Score	Estimated Cost	Target Completion Date	Project Owner
1. Understand Existing Lighting Levels	1.1 Conduct lighting level audits of all public spaces	a. Desktop Independent audit of SAPN LED data set before street lights project completion	2	3	5	$20,000 - $50,000	June 2020	Contractor
		b. Field audits of reserve and shared use path lighting	1	1	2	$40,000 - $100,000	June 2021	Contractor
	1.2 Identify, prioritise and address areas of non-compliance.	a. Address street lighting non-compliances within bulk change projects via lighting design and upgrade recommendations	2	2	4	TBC based on non-compliance levels	2022	Contractor
		b. Address reserve and shared use path lighting non-compliances upon upgrade of any project	1	2	3	Prioritise sites for budget bid post completion of 1.1 b	2021	Open Space Planning Staff Contractor
	1.3 Establish periodic lighting level audits of all public spaces to assess progress and capture new non-compliances as they arise	As required	1	1	2	N/A	Ongoing	Asset Owner/ City Property

Strategy	Action	Specific Projects	Urgency	Ease	Priority Score	Estimated Cost	Target Completion Date	Project Owner
2. Understand existing public lighting infrastructure	2.1 Conduct asset and condition audits of all Council owned public lighting	a. Open Space Public Lighting Audit	3	2	5	$25,000 - $40,000	2020 (see 1.1 b) then every 5 years (2025)	Contractor
		b. Identification of Energy Efficient Upgrade Opportunities for Open Space Lighting	3	2	5	$35, 000 over next three years	2020-2023	Contractor
	2.2 Maintain an up to date record of DNSP controlled public lighting	Source data from SAPN at regular intervals	2	3	5	$0	Every 6 months Ongoing	Contractor
	2.3 Establish an on-going auditing program of Council-owned public lighting assets and maintain up-to-date records on all public lighting assets.	a. Updating of asset register after all maintenance and capital works	2	3	5	Integrate into maintenance/works processes	Ongoing once first audit is complete/ Asset Management System	Asset Owner/Project Manager
		b. Open Space Public Lighting Audit Refresh	3	2	5	$25,000 - $40,00	Every 5 years (2025)	Contractor
3. Provide clear guidance to those overseeing public lighting	3.1 Develop appropriate strategies, guidelines and policies to aid Council staff to implement best practice public lighting procedures and projects	a. Public Lighting Guidelines Action Plan	3	2	5	$15,000	Completed	Manager Engineering, Assets and Environment
		b. Oversee integration of Public Lighting Guidelines into existing practices.	3	1	4		Ongoing	Manager Engineering, Assets and Environment

Strategy	Action	Specific Projects	Urgency	Ease	Priority Score	Estimated Cost	Target Completion Date	Project Owner
4. Upgrade to energy efficient technology	4.1 Upgrade all existing unmetered high intensity discharge street lighting with energy efficient LED equivalents over a 3-year period	a. P-Category Street Lighting Bulk Change incl. detailed design	3	3	6	$1 000 000 approx. within existing budgets.	2021 (in progress)	Contractor
		b. V-Category Street Lighting Bulk Change incl. detailed design	3	2	5	TBC	2021	Contractor
		c. Decorative Street Lighting Bulk Change/Conversion to Standard Lighting incl. detailed design	2	3	5	TBC	2023	Contractor
	4.2 Upgrade all existing metered high intensity discharge public lighting with energy efficient LED equivalents over a 5-year period	Metered Open Space Lighting Upgrades based opportunities identified during Open Space Lighting Audit	2	1	3	TBC through NI Bid process approx. $300,000 - $500,000	2025	Contractor

Strategy	Action	Specific Projects	Urgency	Ease	Priority Score	Estimated Cost	Target Completion Date	Project Owner
5. Introduce smart lighting technology where appropriate	5.1 Ensure that all new lighting infrastructure includes the ability to function as part of a smart lighting network.	Relevant to all projects that involve replacing/upgrade public lighting or installing new public schemes	3	3	6	$0 unless seeking to connect to network immediately	BAU from now	Project Owners
	5.2 Actively trial smart lighting technology in both metered and unmetered lighting schemes	a. Scope and implement smart lighting trial with SAPN/other councils to determine the value of smart capabilities (e.g. switching, dimming, colour temperature) including through collaborative trials	3	1	4	$80,000 - $100,000	2021	Smart Cities Project Officer
		b. Establish project and governance arrangements with LGA, Councils & SAPN (e.g. accessibility to data, ability to dim and relevant levels)			4	N/A	2020	Contractor
		c. Metered smart lighting trial in key precinct/s	2	3	5	$40,000	2020	Smart Cities Project Officer
	5.3 Transition smart lighting to a business as usual process based on the outcomes of trials	Implement smart capabilities to any public lighting scheme that has a clear value proposition within relevant projects Incorporate Smart Lighting Infrastructure (e.g. switching, dimming, colour temperature, fault reporting) into all metered pedestrian lighting.	2	2	4	$150 - $250 per light. Benefit estimated at $200 to 600 per light + road safety improvement for streets.	Ongoing from 2021	Smart Cities SLT Working Group / Project owners

Strategy	Action	Specific Projects	Urgency	Ease	Priority Score	Estimated Cost	Target Completion Date	Project Owner
6. Advocate for changes to the governance of unmetered lighting	6.1 Create formal frameworks for the local government sector and communities to be represented in decisions and processes that lead to the adoption of smart lighting technology on the SAPN network	a. Advocacy via alliances and the PLWG	3	1	4	Unknown	2021	Manager Engineering, Assets and Environment
		b. Collaborative smart lighting trial	3	1	4	$80,000 - $100,000	2021	Smart Cities Project Officer
	6.2 Advocate for a more transparent and inclusive technology approvals process from SAPN	Advocacy via alliances and the PLWG	3	2	5	Unknown	2021	Manager Engineering, Assets and Environment
	6.3 Advocate for more contestability in customer driven street lighting projects	Advocacy for contestable installation (labour) and project management via alliances and the PLWG	1	3	4	Unknown	2020	Manager Engineering, Assets and Environment
	6.4 Advocate for SAPN to provide accurate data and reporting on unmetered street lighting.	Access to the public lighting asset and condition data on a regular basis to enable data driven discussions around governance and regulation on unmetered lighting	1	3	4	Unknown	2021	Manager Engineering, Assets and Environment

Strategy	Action	Specific Projects	Urgency	Ease	Priority Score	Estimated Cost	Target Completion Date	Project Owner
7. Implement Best Practice Asset Management Processes	7.1 Leverage asset audit data to inform maintenance and upgrade works	N/A – Complete as required upon completion of relevant audits which identify faults, non-compliances and energy efficiency opportunities	2	3	5	N/A	Ongoing	Engineering Staff
	7.2 Consider asset identification numbers to encourage public reporting of faults	Incorporate into Open Space Public Lighting Audit	1	3	4	$5 - $10 extra per light (Costed within Open Space Plan)	2020-2021	Open Space Planning Staff Communications
	7.3 Leverage smart lighting technology to assist in identifying and reporting faults	Incorporate into business as usual processes once smart lighting established	2	2	4	In-house system management costs	BaU from 2021	Asset Owner
	7.4 Leverage smart lighting technology to allow for future increases or decreases of lighting levels		1	2	3	In-house system management costs	BaU from 2021	Asset Owner