

Attachment 8.02

Introduction to Ausgrid's public lighting business

May 2014



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Document and amendment history

Issue No.	Date	Approved By	Summary of Changes
1.0	April 2014	M - SL	Initial Document
2.0	May 2015	John Bedding	Final

PUBLIC LIGHTING – An Introduction to Ausgrid’s Public Lighting Business

1.0 Purpose

The purpose of this document is to provide an overview of Ausgrid’s Public Lighting business. This document is a guide only and should be used in conjunction with more specific topic related documents such as policies, as they will prevail.

2.0 Assumptions

- Street lighting will include street lights on all major and minor traffic routes; it will also include lights within parks, reserves, pedestrian zones, footpaths, cycle paths, car parks, and other public areas;
- The terms public lighting and street lighting are used interchangeably in this document.

3.0 Shortened terms

Shortened Term	Extended Term/Meaning
ACCC	Australian Competition and Consumer Commission
AER	Australian Electricity Regulator
AS/NZS	Australian/New Zealand Standards
BLR	Bulk Lamp Replacement
CFL	Compact Fluorescent Lamp
CNR	Customer Notification Request
DNSP	Distribution Network Service Provider
kWh	Kilo Watts per hour
MBF	Mercury Vapour Luminaire
MBI	Metal Halide Luminaire
MTR	Major Traffic Route
NEM	National Electricity Market
NEM	National Electricity Market
NUoS charge	Network Use of System charge
PE cell	Photo Electric Cell
SLUoS	Street Lighting Use of System Charge
SON	High Pressure Sodium Luminaire
TF	Twin 20 Fluorescent
The Code	The NSW Public Lighting Code
TRL	Traffic Route Luminaire

4.0 Street lighting overview

4.1 Street lights and our network

Public lighting is an important contributor to a safe, secure and attractive visual environment for pedestrian and vehicular traffic during times of inadequate natural light.

A large majority of NSW Public lighting assets are owned and maintained by licensed electricity distributors. Local councils are the primary customers of public lighting services provided by distributors.

Ausgrid operates one of the leading electricity networks in Australia, distributing electricity to the Sydney, Central Coast and Hunter regions of NSW across a 22,275 square kilometre area. Ausgrid services about 250,000 street lights on behalf of 41 local councils, community associations and other small customers across our network. Ausgrid has dedicated crews and contractors that maintain and service all work, including the installation of new street lights and repairing faults.

There are over 120 different types of lamps and luminaires. Different lamp types include compact fluorescent, high pressure sodium, metal halide and mercury vapour. The older types of lamps are gradually being phased out and replaced with newer more energy efficient technologies. Refer to Appendix A for a visual aid to lamp types.

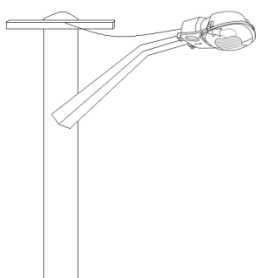
As well as introducing energy efficient street lights as a standard for all our street lights, other service improvements include:

- The systematic replacement of lamps in every street light every 30 months as a pre-emptive measure (bulk lamp replacement or BLR);
- The replacement of intelligent sensors (photoelectric or PE cells) that turn the lights on and off. This is normally done at each second lamp replacement cycle;
- Night time patrols for all lights once every 12 months, and quarterly for some of our Major Traffic Routes (MTR);
- The gradual transfer of power supply for street lights from dedicated street light mains to the more robust and reliable low voltage network.

Street lights are controlled by a photo electric (PE) cell which automatically turns on a light when it gets dark. This is usually incorporated in each luminaire, but a street light control point is used for a group of lights controlled either by a time switch or a single PE cell.

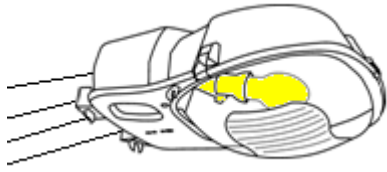
A street light installation is composed of 5 main components; this componentry is used for billing, repair and replacement purposes. The components of an installation are:

- Lamp
- Luminaire
- Bracket
- Support
- Connection



4.1.1 Lamp

A lamp is the light source; for example this may be a compact fluorescent (CFL), a sodium (SOX or SON), mercury vapour (MBF). The most recent energy efficient technology is light emitting diode (LED). See Appendix A for a more complete list of lamp types. The lamp is shaded yellow in the following diagram.



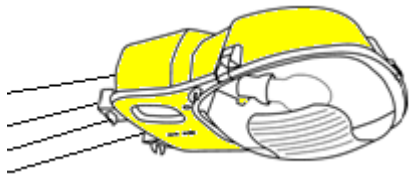
4.1.2 Luminaire

A luminaire is the apparatus which distributes, filters or transforms the light transmitted from one or more lamps. The luminaire includes, except for the lamps themselves, all the parts necessary for fixing and protecting the lamp and, where necessary, circuit auxiliaries together with the means for connecting them to the electrical supply.

Luminaires are classified by Australian and New Zealand standard AS/NZS1158 Lighting for roads and public spaces (reference 1) into the following categories:

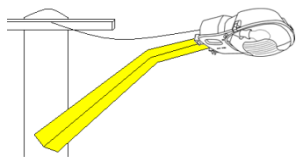
1. **Category 'V'** – or Category Vehicular are generally referred to as *Major Public Lighting*, this category is used on roads where the visual requirements of motorists are dominant.
2. **Category 'P'** – or Category Pedestrians are generally referred to as *Minor Public Lighting*, this category is used on roads where the visual requirements of pedestrians are dominant. It is also applicable to outdoor public areas, other than roads, where the visual requirements of pedestrians are dominant, for example outdoor shopping precincts.

The appropriate lighting category for a particular road is a matter for determination by or in consultation with the local council concerned (see Appendix A).



4.1.3 Bracket

The galvanised steel structure attached to the pole and used to hold the Luminaire in the desired position relative to the road surface or area of illumination.

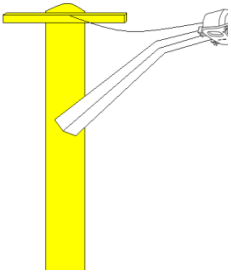


4.1.4 Support

Support structures are used to hold the luminaire at the right height and angle and to provide safe support, insulation and clearance from the ground, vegetation and building infrastructures.

The types of support structures that are used for public lighting are:

1. Dedicated wood, concrete or steel poles;
2. Dual-purpose poles that are used to support our Network as well public lighting and other infrastructure such as telecommunications.



4.1.5 Connection

In general the connection is either overhead (see diagram 1), connected to the low voltage supply or to a dedicated street light (SL) circuit, or by an underground connection (see diagram 2).

Diagram 1. Overhead Connection

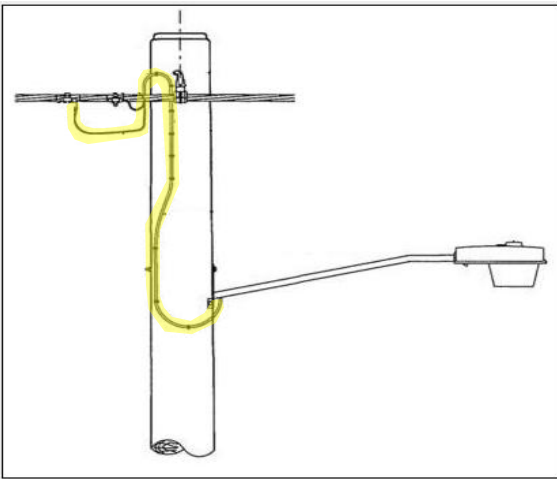
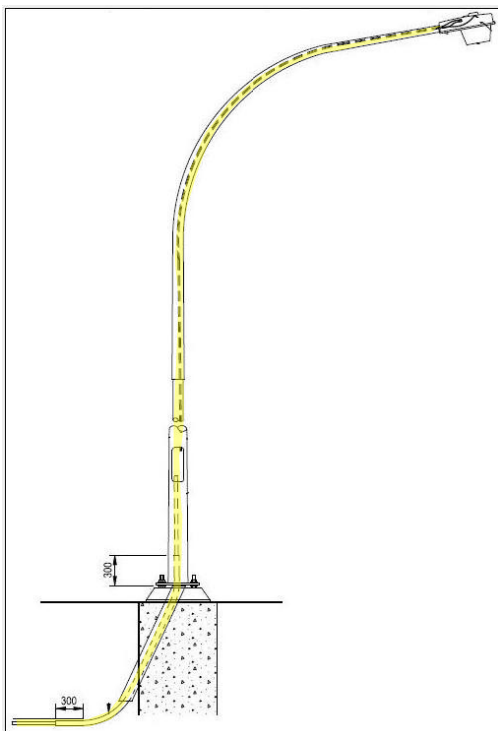


Diagram 2. Underground Connection



There are also underground wiring systems and electrical circuits that connect the luminaires to the network for their electrical supply. As with overhead connections, a PE Cell is used to switch the lamps on and off.

4.2 The Regulatory and Legislative environment

Public lighting is the provision of lighting schemes for roads and public areas that are managed by a public lighting customer (typically a local council, as well as some state and federal government agencies). In NSW there are 3 distribution network service providers (DNSPs) that primarily provide these services ie. Ausgrid, Endeavour Energy and Essential Energy.

The Australian Energy Regulator (AER) is Australia's national energy regulator and an independent statutory authority. The AER is funded by the Commonwealth, with staff, resources and facilities, provided by the Australian Competition and Consumer Commission (ACCC).

Network businesses such as Ausgrid submit regulatory proposals to the AER seeking approval of their prices. In the case of street lighting, such proposals include details of the capital and maintenance costs and total revenue for the AER's consideration.

The AER's pricing decisions generally apply for five years, generally with provision for network businesses to change their prices once per year during the regulatory control period.

4.3 NSW Public Lighting Code

The NSW Public Lighting Code (the Code) is designed to help clarify the relationship between public lighting service providers and public lighting customers. In particular, it sets out:

- minimum maintenance standards and associated service level guarantees;
- minimum requirements for inventories, management plans, performance reporting and billing;
- a requirement that service providers consult with customers in deciding which core lighting types they intend to offer; and

- a mechanism allowing for connection of lighting types outside the core choices offered by Public Lighting service providers.

The purpose of the Code is to provide guidance on the provision of public lighting services by setting out minimum performance standards and outlining the rights and obligations of public lighting services providers and public lighting customers.

Even though the Code is not mandatory, as a Public Lighting service provider Ausgrid must ensure that it operates a Public Lighting scheme safely, efficiently and effectively over the scheme's economic life, in accordance with the AS/NZS1158 series of standards pertaining to the lighting of roads and public spaces.

As a minimum, Ausgrid is committed to providing:

- operate a 24 hour call centre to receive public and Customer Fault reports;
- repair public lighting assets within eight (8) working days on average per customer per year from receipt of a fault report except network underground faults.
- in the case of network supply faults affecting three or more lights in close proximity on 'Category V' roads, the Service provider must maintain communication with the Customer and Road Authority (where these are not one and the same) on the timeframe for repairs; and
- undertake cyclic maintenance of public lighting assets to ensure the efficient and safe operation of the system. A lamp replacement program must be established to achieve agreed maintenance standards and to maintain the designed lighting technical parameters of the Luminaire (see Bulk lamp replacement section in this document).

4.4 Billing

Ausgrid's Public Lighting network is unmetered (termed a type 7 meter), so calculations need to be made to ascertain how much energy the different types of lights consume.

In line with The Code, Public Lighting customers are billed monthly for their energy consumption, Network Use of System charges (NUoS) and for their maintenance charges (SLUoS). Where Ausgrid has funded the public lighting, the SLUoS charge will also contain a capital component.

In order to produce a bill for a customer, Ausgrid records the 5 street light components, the name of the customer and determines the charge type (Rate 1, Rate 2 or Rate 3), as described in the section below.

Rate 1: applies for assets installed, owned and maintained by Ausgrid.

Charges include:

- Public lighting Use of System (SLUoS) charge, which is the capital and maintenance charges on all 5 components i.e. Lamp, Luminaire, Bracket, Support and Connection
- Network Use of System (NUoS) charge and Energy Charge

Rate 2: applies for assets installed by the public lighting customer but maintained by Ausgrid.

Charges include:

- Maintenance charge on the Lamp and Connection components only.
- NUoS and Energy charge.

Rate 3: Rate 3 applies for assets that are privately owned and maintained. Components are not charged.

Charges include:

- NUoS and Energy charge only.

Summary of Charges applied by Rate Type

SLUoS Rate	SLUoS charge components					Network Usage (NUoS)	Energy Usage (Retail*)
	Lamp	Luminaire	Bracket	Support	Connection		
Rate 1	✓	✓	✓	✓	✓	✓	✓
Rate 2	✓	✗	✗	✗	✓	✓	✓
Rate 3	✗	✗	✗	✗	✗	✓	✓
* The retail charge for energy consumption is not part of the SLUoS charges discussed in this document but is shown for completeness.							

4.4.1 Capital and maintenance charges

The components of the street light charges may have a maintenance cost and/or a capital cost, as follows:

- The capital charge of a component reflects its initial cost of provision when the street light is installed. The life of street light assets is usually 20 years and the recovery of capital is over this period.
- The maintenance charge of a component represents the ongoing cost of ensuring that the component is maintained in serviceable condition.

The lamp and connection components are required to be constantly maintained throughout the asset life cycle and are therefore assigned a maintenance charge. For example the lamp undergoes a scheduled replacement program; this is to ensure that the light maintains compliance with standard AS/NZS 1158. The other 3 components being the luminaire, bracket and support are assigned a capital charge to recover the initial outlay.

Components of the SLUoS charge

SLUoS charge component	Capital charge	Maintenance charge
Lamp	✗	✓
Luminaire	✓	✗
Bracket	✓	✗
Support	✓	✗
Connection	✗	✓

Ausgrid bills both capital and maintenance charges to the customer’s Retailer on a monthly basis.

4.4.2 NUoS Charge (for network usage)

Electricity consumed by street lights is transferred through electrical networks. The NUoS charge represents the customer’s usage of the distribution and transmission networks.

The NUoS charge is expressed in ¢/kWh (kilo-Watt hour) and is used when calculating the customer's monthly bill. This charge is levied by the customers' retailer and then recovered by the electricity distributor (Ausgrid).

4.4.3 Energy charge

The energy usage charge represents the energy that the customer has used. It is also in ¢/kWh and is used when calculating the customer's monthly bill. The retailer purchases energy from the electricity market and levies this charge.

4.4.4 Contestable customers

Following the introduction of Full Retail Contestability to NSW in 2003 the public lighting marketplace has the potential to provide all street light Customers with an opportunity to consider their individual public lighting requirements and provide public lighting at their required service levels at competitive costs. This means a Customer has the ability to select their energy supplier. If the customer does not select the energy supplier they remain a 'franchise' customer. However, once a customer chooses an energy supplier they become 'contestable'. This in effect changes the monthly bill they receive from Ausgrid as illustrated below.

NOTE: All Energy Retailers (Origin, Energy Australia etc.) purchase their electricity from the Network Electricity Market (NEM).

4.4.5 Burning Hours Calendar

To calculate the energy consumption of a street light, it is necessary to estimate the number of hours that the lights remain on at night. The Bureau of Meteorology's burning hours calendar is used for this purpose. The burning hours calendar presents the number of dark hours and the number of light hours on any given day. The Bureau of Meteorology takes into account many facets, including and the season, when calculating these hours. For example, there are longer dark periods during the months of winter and therefore street lights will be required to remain on for a longer period of time. This number of dark hours is used when calculating street light energy consumption.

4.4.6 How energy charges are calculated

All street lights are unmetered (with the exception of some privately metered installations) so calculations need to be made to ascertain how much energy the lights consume. The energy consumption is estimated from the number of lamps, the wattage of each lamp and the number of burning hours. The consumption is multiplied by the energy charge in ¢/kWh to determine the total energy charge.

Total Energy Charge (in dollars) =

No of Lamps X Lamp Wattage (kW) X Burning Hours X Energy charge (in ¢/kWh) / 100

4.5 Repair times

As stated by the Code, street lighting service providers are expected to report the average number of days taken to repair a fault (excluding network supply faults) in each Customer's area each year.

The Code refers to eight (8) working/business days as the benchmark for fault repair time (excluding network supply faults). The reference to twelve days is in regard to compensation (\$15 per Public Light) for the first person who made the fault report and if that person is:

- the owner or occupier of a premises that abuts the part of the street that, but for the fault, would ordinarily be illuminated by the Public Lighting Asset; or
- a Customer of the Service Provider for the relevant Public Lighting

5.0 Types of Customer initiated projects

There are 3 common types of customer initiated projects:

- Minor capital works;
- Major capital works; and
- Contestable works.

5.1 Minor capital works

The definition of minor capital works is:

- Installation of 7 or less luminaires and / or brackets;
- Rate 1 assets will continue to be Rate 1;
- If up to 2 dedicated poles are required then will be capital; and
- Residual values (of replaced equipment) must be recovered.

5.2 Major capital works

A project is considered to be major capital works when it involves:

- Installation of 8 or more luminaires and / or brackets;
- Rate 1 assets will continue to be Rate 1;
- If more than 2 dedicated poles are required then only the dedicated poles will have to be contestable and a new tariff for these will be Rate 2; and
- Residual values (of replaced equipment) must be recovered.

5.3 Contestable works

These involve:

- Installation of 1 or more rate 2 luminaire(s) and /or bracket(s);
- Recovery of residual value of replaced assets is not applicable; and
- Rate 2 assets will continue to be Rate 2.

Refer to the tables in Appendix F for a summary of how to determine whether a project is to be treated as minor, major and contestable works.

6.0 Public lighting data

6.1 Data storage

Ausgrid keeps all asset information and in a central database. This provides single source of asset information including:

- accurate and timely data on which to make decisions about our priorities for completing work and also for scheduling resources for the timely completion of work; and
- an efficient way of compiling information to assess the required funding for maintaining or upgrading the network.

Public lighting information includes energised and de-energised dates, type of light and associated components, component history data, rate type, location, age, associated notations and comments, scheduled and completed work regarding the asset.

6.2 Data capture

Ausgrid's Street Lighting Field Data Capture Form is commonly known as the "pink sheet". This form is used by Ausgrid field crews as well as some contracting groups that perform work on our street lights. They are used for the following:

- To capture all maintenance work performed on public lights;
- Record upgrades to the public lighting components;
- To capture details of new street lights; and
- To remove obsolete street lights.

The pink sheet approach to recording field information serves a number of purposes:

- **Accurate Data** – Data accuracy is critical to our network asset management system as it greatly assist in all decision making processes.
- **Scheduling** – To ensure all street lights are included in scheduling and that adequate time has been given to each region in order to repair, replace and maintain street lights.
- **Ordering** – By recording what work has been done in the field, we can determine what materials were used. This will assist our storage warehouses to replenish stocks when necessary. It will also allow storage warehouses to hold sufficient stock in order to improve the efficiency of replacing broken equipment without delay.
- **Billing** – Customers are billed based on our SAP-PM inventory, therefore it is critical to contain the most up to date data within our system in order to calculate the correct bills for our customers.
- **Budgets** – By booking time and repair work to the correct job location, activity type and work type, funding can be directed to the appropriate areas for continued efficient operations.

An example of a pink sheet can be found in the Appendix C of this document.

6.3 Outages and the CNR database

The Customer Notification Request (CNR) Database is used to record faults within the Ausgrid network as reported by customers. When a resident notices that a street light is out or has been damaged they have the option to contact the Ausgrid Call Centre on 1800 044 808, or visit the Ausgrid homepage on www.Ausgrid.com.au and follow the links to report the issue.

Once the public lighting customer has lodged the issue either verbally or via the internet, a Contact Centre representative will create a notification within the CNR database. This notification will then be assigned to a depot based on the location of the faulty street light. On a regular basis (usually daily) the depots will print out the notifications within the CNR database, which lists all the street lights that need to be repaired. The jobs are then allocated to our street lighting crew who are dispatched to complete the work.

Once the field crew have completed repairing a street light they will close off the job that was originally created by the Contact Centre, indicating that the light had been repaired and is now working. The field crew also fill out the pink sheet (see above). The pink sheet records the type of work that was performed on the street light and is sent to the Street Lighting Group for further processing. The Street Lighting Group will create and close a notification in SAP-PM to reflect any new components on the street light and any other changes that occurred.

Refer to the flowchart in Appendix E for an overview of the process.

7.0 Street light organisational structure

Ausgrid's public lighting network is operated and maintained on a day-to-day basis by the following groups:

- **Chief Engineer** – The public lighting group reports to the Chief Engineer. The Division of the Chief Engineer is responsible for overseeing the strategic management of the network within the regulatory framework. The division plans and develops the network, sets engineering policies and standards, monitors compliance and provides reports for the Board and our Regulators.
- **Public Lighting Group** – is responsible for the development and deployment of commercial standards and policies for public lighting that are consistent with strategic objectives and align with regulatory requirements; assisting the regulatory framework to support street lighting matters and ensure alignment with Ausgrid's regulatory requirements; assisting implementation of public lighting pricing, maintenance and development strategies of regulatory and commercial nature; reporting to public lighting customers, Regulators and other Government bodies as required.
- **Engineering Public Lighting** – is responsible for providing technical advice and expertise to Ausgrid Planners and field staff as required; technical input (specifications) for Street lighting tenders, and provide technical evaluation of such tenders; Monitor failure rates (monthly) of Street lighting luminaires and provide advice as appropriate; Coordinate all operational matters in relation to: response times; trials when appropriate; traffic route audits; and project manage accelerated capital replacement programs; Manage Street lighting Network Standards; ensure the CNRDB (Customer Notification Request Database) is managed appropriately by constantly monitoring and reporting response times to Operational Field staff; handling particular street light outage complaints from all customers where appropriate. (eg "Ministerial", Local Members, the public); Project manage specific street lighting projects as required; manage suppliers where appropriate on issues such as quality control of stock; and representing Ausgrid on industry forums, government bodies and standards committee meetings
- **Network Asset Data Management** – responsible for identification and resolution of street light data issues discovered in iAMS, street lighting bills and in the field. Responsibility to ensure an accurate inventory is kept by updating the system, performing field checks and utilising EA systems to resolve all inaccuracies.
- **Performance Reporting** – creates monthly, quarterly and annual performance reports.
- **Public Lighting Billing** - Ensures accurate and timely billing of all street lights in EA's network area to over 100 customers. Provide support to the Network Billing group during monthly bill runs by producing backing sheets and matching all invoices for SLUoS (Street Light Use of System) accounts. Answer in a timely manner all customer queries regarding their street light bills and provide inventory table and calculations upon request.
- **Customer Interaction Centre** – Responsible for recording all customers reported street light outages from the public lighting hotline and web based reports into Ausgrid's Customer Network Request (CNR) database, and management of customer complaints.
- **Regulation and Pricing Group** – responsible for regulatory compliance and development, and coordinating all pricing proposals and relevant submissions to the Australian Energy Regulator.
- **Network Development** - is responsible for the program management, development and delivery of Ausgrid's capital and maintenance programs including life cycle program management and delivery of efficient and effective network asset management services. Network Development is also responsible for determining the resourcing delivery strategies for all programs as well as the ongoing monitoring and reporting of these programs to ensure they are aligned with Ausgrid's vision of providing an efficient, safe, reliable and sustainable network

- **Network Contracts Group** – responsible for management of Bulk Lamp Replacement Contract on behalf of the public lighting group
- **Network Operations Group** – responsible for the delivery of capital and maintenance programs on our network and have the day to day responsibility for managing the system, managing customer connections and the interface with Accredited Service Providers (ASPs). This division is responsible for public lighting field services, planning, and public lighting contestable works.
- **Health, Safety and Environment** - HS&E is committed to working with all people at Ausgrid to identify and control hazards, prevent exposure to health and safety risks and support the health and wellbeing of our workforce.

8.0 Maintenance activities for public lighting

8.1 Bulk lamp replacements

The most efficient maintenance regime for Ausgrid to ensure that their lights are functioning correctly and maintain compliance is to perform a scheduled bulk lamp replacement on all their public lighting assets. By performing bulk lamp replacements on a constant cycle the need for routine inspections and the incidence of spot repairs will decrease. The aims of the bulk lamp replacement program are to:

1. Maintain the light output levels of all public lights to the standards as set out by AS/NZ1158;
2. Maintain the public lighting assets in a manner that is efficient and cost effective; and
3. Reduce light failures by replacing the lamps and PE cells in accordance with manufacturer specifications.

Ausgrid's current BLR cycle is 30 months. The AER determines the cycles we should use for BLR's. The bulk lamp replacement is performed by dedicated Ausgrid field crews and by contractors. Currently, during a bulk lamp replacement the lamp is systematically replaced each cycle, and the PE cell is replaced every second cycle. This is a pre-emptive measure to ensure that installations always maintain compliance with AS/NZS 1158.

The scope of works for the Bulk lamp replacement contractors include:

- Servicing of luminaires;
- Cleaning of visors;
- Replacement of PE cells (every second cycle); and
- Minor non-electrical repairs (re-saddling of plastic conduits, tightening coach bolts)

It should be noted that the BLR crews in the Southern and Eastern regions are also permitted to do electrical works. Clause A5.1 of Part A of the South and East Contract defines electrical work as follows:

- **General Electrical** - General electrical work is that which can be completed within 25 minutes of onsite time and will generally include such things as the replacement of fuse elements, the erection and removal of low voltage insulation and the reattachment of loose metal conduits.
- **Minor Electrical** - Minor electrical work can be completed within 45 minutes of onsite time and will generally include the replacement of street lights and/or brackets up to and including two metres in length. This may also include circuit tracing to detect and rectify public lighting faults.
- **Major Electrical** - Major electrical work can be completed within 90 minutes of onsite time and will generally include the replacement of street lights and/or brackets longer than two metres in length. This may also include circuit tracing to detect and rectify public lighting faults.

8.2 Night patrols

A night patrol program for major public lighting has been implemented to ensure that Ausgrid meets the guidelines of AS/NZS1158.1.2 Section 14.5.2 which states the minimum service availability of lamps at a compliant public installation to be 95% and to ensure that all major lighting schemes maintain the as designed illumination levels that provide a safe environment for the public.

Night patrols are also necessary for major public road lighting because customers are unable, or it is unsafe for customers to report faulty lights on major traffic routes.

BLR contractors conduct night patrols at various intervals for the lights in their respective areas. Additionally, quarterly night time Traffic Route Luminaire (TRL) patrols are done on all the major roads. These are completed by BLR contractors in the East and South Regions and by Field Services throughout the remainder of the regions within Ausgrid. These activities have all been factored in the bulk lamp replacement costs.

8.3 Pole inspections

- Pole inspection refers to the inspection of steel standard poles or standards (only used for street lights).
- There are two types of footings for Steel Standards in Ausgrid's Network area – Rag bolted or direct buried.
- The number of steel standard poles varies between the regions as does the costs involved for inspection and treatment.
- There is also a restoration cost component for pole Inspections. This cost is already factored into the inspection of steel standards. Network Standard NS145 - Pole Inspection and Treatment outlines the requirements for inspecting street light standards.

8.4 Types of repairs

Luminaires are classified by AS/NZS1158 Lighting for roads and public spaces into the following categories:

1. **Category 'V'** – this category refers to roads where the visual requirements of motorists are predominant.
2. **Category 'P'** - this category refers to roads where the visual requirements of pedestrians are predominant. This category is also applicable to outdoor public areas other than roads, for example outdoor shopping precincts.

All street light repair work is initiated as an overhead repair, as failures most commonly occur for two reasons:

- The globe or PE cell may be replaced; or
- The luminaire may not have power (eg. a blown fuse).

If the overhead crews determine the fault is underground then it will be referred to the underground crew. Repair work is further classified into the following:

- **Minor Repair Works** where only the lamp and PE cell is changed. Approximately 15 minutes average time is required for such tasks.
- **Major Repair Works** which involves any other overhead works over and above minor works, such as a head change, bracket change, reconnections etc. These jobs take approximately 29 minutes on average.

8.5 Types of repair work

8.5.1 Overhead repair work

Street light repairs are always initiated as an overhead repair. This involves physically travelling to the faulty light and assessing and if necessary repairing one or more of the following four street lighting components: the lamp; luminaire; bracket; or connection as required.

8.5.2 Underground repair work

If the overhead crew determine the fault is underground then the job is forwarded onto the underground crew. This process is quite labour intensive as it requires assistance from a range of teams and is also a time consuming process – average time from power on to power off can range from 6-16 weeks depending on the availability of crews at the time of the incident.



9.0 Reporting


Public Lighting Reporting is a critical aspect within Ausgrid as it provides information to the business and its customers. Based on the reporting information the business is able to make informed decision on critical areas. It highlights what assets are out in the field, when assets have been energised or de-energised, what work has been raised and completed, it also displays financial information, as well as other crucial information.


There are a number of reports that are produced automatically via SAP as a result of the monthly bill run. These reports may also be manually created by using the appropriate SAP transaction and entering the correct selection criteria. Ad hoc reporting is usually completed through Business Objects. There are also a number of reports produced through excel as a result of extracting information directly from SAP.

Appendices

Appendix A – Types of street lights

<p>Mercury Vapour Discharge (MBF)</p>	
	<p>MBFs lights are used for residential and major traffic routes. They range from 80W, 250W or 400W.</p>
<p>Compact Fluorescent Lamp (CFL)</p>	
	<p>CFL lights are used for residential lighting. They are 42W. They are a white light. They are being replaced by the 29 Watt LED Streetlight.</p>

High Pressure Sodium (SON)	
	High Pressure Sodium lights are very efficient and produce a distinctive orange light. They range from 50W to 1000W.

Twin 20 Fluorescent (TF)	
	These lights are gradually being phased out. They are being replaced by the 29 Watt LED Streetlight.

Metal Halide Light (MBL)



These lights cast a true white light and are usually used in areas that require special lighting like near security cameras.

Light Emitting Diode (LED) Streetlight



Latest technology in Streetlighting. Presently used for residential lighting. This LED Streetlight has a total energy consumption of 29 Watts.

Appendix B – Connection types



Street Light Control Point	
	Automatically turns on and off a bank of lights using a time switch.

Photo Electric (PE) Cell	
	Automatically turns on and off the light based on night fall and day light. May control a single or group of lights.

PE Cell (larger view)



Appendix C – The Street Lighting Field Data Capture Form – commonly referred to as the ‘pink sheet’

STREET LIGHTING FIELD DATA CAPTURE

Customer Request
 BLR Follow-Up Work
 Night Patrol
 Minor Capital
 Contestable

New Light
 Removed Light

Work Centre: _____

Crew: **Your crew's name** Date: **Today's Date**

House No.	Street	Suburb
Pole ID	Lamp No.	NP No./Project ID
Comments		

MAINTENANCE WORK PERFORMED

Corrective (light on) M2 Capital – New M7 Capital – Replace (light off) M7 Breakdown (light off) M3 Nature Induced (light off) M4

Lamp	<input type="checkbox"/> Repair/Replace	<input type="checkbox"/> Installation or repair error	<input type="checkbox"/> Low or no light output	<input type="checkbox"/> Obsolete
Luminaire	<input type="checkbox"/> Repair/Replace	<input type="checkbox"/> Broken	<input type="checkbox"/> Deteriorated - age/heat	<input type="checkbox"/> Deteriorated - corrosion
	<input type="checkbox"/> Clear	<input type="checkbox"/> Not working	<input type="checkbox"/> Obsolete	<input type="checkbox"/> Rotated
PE Cell	<input type="checkbox"/> Repair/Replace	<input type="checkbox"/> Broken	<input type="checkbox"/> False Operation - age/heat	<input type="checkbox"/> False Operation - installation/manufacture
	<input type="checkbox"/> Install	<input type="checkbox"/> Missing		
Choke	<input type="checkbox"/> Repair/Replace	<input type="checkbox"/> Deteriorated - age/heat	<input type="checkbox"/> Deteriorated - corrosion	<input type="checkbox"/> Damaged
		<input type="checkbox"/> Obsolete		
Bracket	<input type="checkbox"/> Repair/Replace	<input type="checkbox"/> Deteriorated - age/heat	<input type="checkbox"/> Deteriorated - corrosion	<input type="checkbox"/> Misaligned / loose
		<input type="checkbox"/> Obsolete		
Wiring	<input type="checkbox"/> Repair/Replace	<input type="checkbox"/> Broken - vehicle impact	<input type="checkbox"/> Broken - insulation stripped	<input type="checkbox"/> Loose conduit
		<input type="checkbox"/> Corroded connection	<input type="checkbox"/> Cracked insulation	<input type="checkbox"/> Damaged insulation
		<input type="checkbox"/> Fatigued tail connections	<input type="checkbox"/> Service broken - bird strike	<input type="checkbox"/> Service broken - loose wiring
		<input type="checkbox"/> Wrong polarity/phasing - install/repair error		
Starter	<input type="checkbox"/> Repair/Replace	<input type="checkbox"/> Broken		
Visor	<input type="checkbox"/> Repair/Replace	<input type="checkbox"/> Deteriorated	<input type="checkbox"/> Broken / missing	<input type="checkbox"/> Hanging down
		<input type="checkbox"/> Obstructed		

SUPPORT DETAILS

	Exist/Old	Replace/New
Timber		
Steel Standard		
Decorative		
Concrete		
Wall mounted		
Smartpole		
Suspended		
Phatze		
Column Size		

BRACKET DETAILS (Timber and Wall Mounted ONLY)

MAJOR ROADS	Exist/Old	Replace/New	MINOR ROADS	Exist/Old	Replace/New
Type 1 (2m outreach x 1m uplift) / Hunter B			0.5 outreach		
Type 2 (3m outreach x 3m uplift) / Hunter D			1.2m outreach/ Hunter A		
Type 3 (4.5m outreach x 2.4m uplift)			2m outreach		
Type 4 (2m outreach x 1m uplift)			3.5m outreach		
Type 5 (2m outreach x 1m uplift)			4m outreach		
Type 6 (6m outreach x 2.5m uplift) Hunter G					
Type 7 (4m outreach x 4m uplift)					
Hunter C (3m outreach)			BRACKET MOUNTING	Exist/Old	Replace/New
Hunter E (1.5m x 3m front or back mounted)			HEIGHT (m)		

LAMP DETAILS

LAMP TYPE	Exist/Old	Replace/New
Incandescent (inc)	No. of Lamps	Lamp Wattage
Tubular Fluorescent (TF)	No. of Lamps	Lamp Wattage
High Pressure Sodium (HPS)		
Low Pressure Sodium (LPS)		
Mercury Fluorescent (MF)		
Compact Fluorescent (CF)		
Tungsten Halogen (TH)		
Mini Halide (MH)		

CONNECTION

	Exist/Old	Replace/New
Overhead		
Underground		
CONTROL TYPE	Exist/Old	Replace/New
Individual PE Cell		
Group PE Cell		
Relev/Contact/SCP		
NOTATIONS	Exist/Old	Replace/New
Aeroscreen/Out of fitting		
Approved shade installed		
Frangible		
Floodlight		

Sodium Lamp Type: SON-E SON-T

From Contractor via Business Objects Report

From CNR Database

Entire street light replaced

ASP Work

Project via Customer

M2: Corrective/Preventative repair of component(s): Lamp, PE Cell, Choke, Wiring and/or Visor

Tick a box in the first column for component(s) replaced or installed

Tick a box in the second column to explain the reason for the component replacement(s)

If a component(s) has been replaced tick what was there in the 'Exist/Old' column

Tick the replace/new column for the component(s) that has been installed

Write in the number and wattage of lights that were removed AND installed

M7 (New or Replaced): Installed/Replaced street light component(s): Luminaire, Bracket, Pole and/or connection

M4 Replacement of component(s) due to the equipment failing because of nature: Lamp, PE Cell, Choke, Wiring and/or Visor

M3 Replacement of component(s) due to the equipment breaking: Lamp, PE Cell, Choke, Wiring and/or Visor

Sodium lamp type: E(lliptical) or T(ubular)

Appendix D – Public lighting Customers

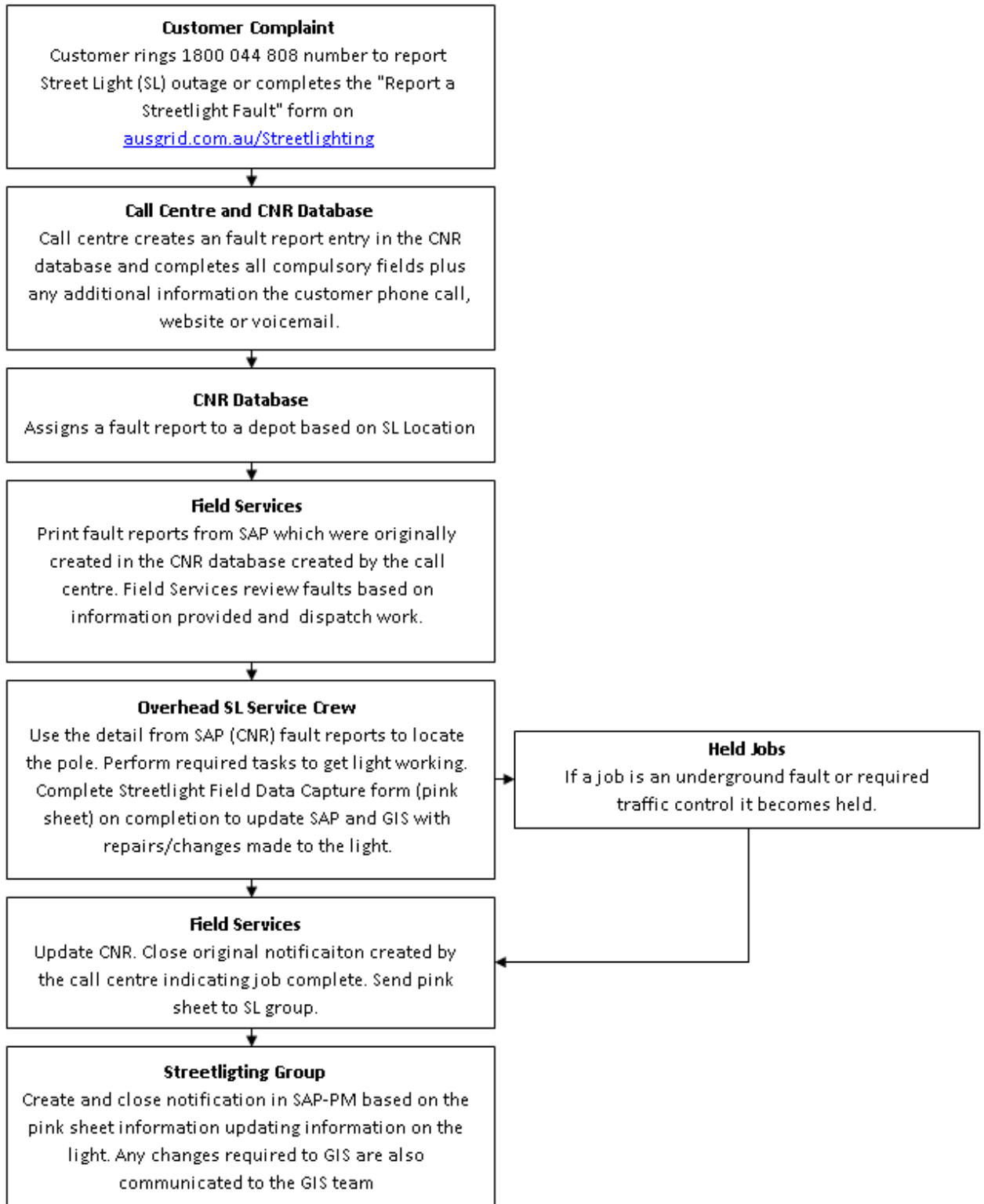
Below is a list of all major Public Lighting Customers. There are 41 councils in total.

PUBLIC LIGHTING CUSTOMER COUNCILS

Ashfield Council	Marrickville Council
Auburn Council	Mosman Municipal Council
Bankstown City Council	Muswellbrook Shire Council
Botany Bay City Council	Newcastle City Council
Burwood Council	North Sydney Council
Canterbury City Council	Parramatta City Council
Cessnock City Council	Pittwater Council
City of Canada Bay Council	Port Stephens Council
City of Ryde	Randwick City Council
City of Sydney	Rockdale City Council
Gosford City Council	Singleton Shire Council
Hornsby Shire Council	Strathfield Municipal Council
Hunters Hill Council	Sutherland Shire Council
Hurstville City Council	The Hills Shire Council
Kogarah City Council	Upper Hunter Shire Council
Ku-ring-gai Council	Warringah Council
Lake Macquarie City Council	Waverley Council
Lane Cove Municipal Council	Willoughby City Council
Leichhardt Municipal Council	Woollahra Council
Maitland City Council	Wyong Shire Council
Manly Council	

The street lighting group also has other smaller customers such as Defence Energy Services, Department of housing, NSW Maritime, RMS, State Transit Authority. There are 56 smaller organisations, totalling to 97 public lighting customers in total.

Appendix E – Overview of the outage and CNR process



Appendix F – Types of Customer initiated projects

MINOR CAPITAL WORKS TABLE

Rate 1: Installation of 7 or less luminaires and / or brackets

Rate 2: Installation of 1 or more luminaire and /or bracket(s)

	Rate 1 Ausgrid Funded Assets	Rate 2 Customer Funded Assets	Combination Rate 1 and Rate 2		Rate 3 Private (Unmetered Supply)	Private (Metered Supply)	Permanent Unmetered Supply (PUMS)
			Number existing Rate 1 assets > Number existing Rate 2 assets	Number existing Rate 2 assets > Number existing Rate 1 assets			
Project Type	Minor Capital Works	Contestable Works	Not applicable. Projects will have to be split. Rate 1 - Field Services Rate 2 -Short Form Contract	Not applicable. Projects will have to be split. Rate 1 - Field Services Rate 2 -Short Form Contract	Not Applicable	Not Applicable	Not Applicable
Residual Value Treatment	Collect residual value	Residual value not applicable	Rate 1 - Collect residual value Rate 2 - Residual value not applicable	Rate 1 - Collect residual value Rate 2 - Residual value not applicable	Not Applicable	Not Applicable	Not Applicable
Rate Category Impact	Rate 1 will continue to be Rate 1	Rate 2 will continue to be Rate 2	Rate 1 will continue to be Rate 1 Rate 2 will continue to be Rate 2	Rate 1 will continue to be Rate 1 Rate 2 will continue to be Rate 2	Not Applicable	Not Applicable	Not Applicable
Tariff impact	If up to 2 dedicated poles are required then will be capital	-	-	-	Not Applicable	Not Applicable	Not Applicable

MAJOR CAPITAL WORKS TABLE

Rate 1: Installation of 8 or more luminaires and / or brackets

Rate 2: Installation of 1 or more luminaire and /or bracket(s)

	Rate 1 Ausgrid Funded Assets	Rate 2 Customer Funded Assets	Combination Rate 1 and Rate 2		Rate 3 Private (Unmetered Supply)	Private (Metered Supply)	Permanent Unmetered Supply (PUMS)
			Number existing Rate 1 assets > Number existing Rate 2 assets	Number existing Rate 2 assets > Number existing Rate 1 assets			
Project Type	Major Capital Works	Contestable Works	Major Capital Works Rate 1 - Field Services Rate 2 - Short Form Contract	Contestable Works	Not Applicable	Not Applicable	Not Applicable
Residual Value Treatment	Collect residual value	Residual value not applicable	Rate 1 - Collect residual value Rate 2 - Residual value not applicable	Rate 1 - Ausgrid to collect residual value, reimburse brackets, luminaires and installation costs to the ASP as applicable Rate 2 - Residual value not applicable	If Rate 3 assets are altered - they will have to change to metered.	Not Applicable	Not Applicable
Rate Category Impact	Rate 1 will continue to be Rate 1	Rate 2 will continue to be Rate 2	Rate 1 will continue to be Rate 1 Rate 2 will continue to be Rate 2	Rate 1 will continue to be Rate 1 Rate 2 will continue to be Rate 2	Rate 3 will continue to be Rate 3	Not Applicable	Not Applicable
Tariff impact	If more than 2 dedicated poles are required then only the dedicated poles will have to be contestable and a new tariff for these will be Rate 2	-	-	Rate 1 and Rate 2 will be done as contestable	Not Applicable	Not Applicable	Not Applicable