



**City of Sault Ste. Marie Street Light Asset Management Plan – Rev 1  
2024-08-02**

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## 1. Introduction

This asset management plan (AMP) for the street light system in Sault Ste Marie which outlines the strategies and activities necessary for managing street lighting to ensure safe reliable operation, energy efficiency, and cost-effectiveness. This plan is designed to assist in making informed decisions regarding maintenance, upgrades, and financial planning for the City's street lighting infrastructure. The intention of this Asset Management Plan is to meet the requirements of Ontario Regulation 588/17.

## 2. Current System Overview

- Quantity of Streetlight:
  - 9122 Streetlights
- Types of Lights:
  - LED (100%): All units are high-efficiency LED lights known for their energy-saving capabilities and long lifespan.
- Control Systems:
  - Smart Lighting Control: Implemented for all LED units, allowing for remote monitoring, troubleshooting, and adjustments.
- Geographical Coverage: Comprehensive coverage across the City, including main roads, residential streets, parks, and public areas.

## 3. Objectives

- Reliability: Ensure streetlights operate consistently, reducing outages and improving public safety.
- Energy Efficiency: Minimize energy consumption through the use of efficient LED lighting technologies.
- Cost-Effectiveness: Optimize maintenance and operational costs while maximizing the lifespan of assets.
- Public Safety: Enhance visibility in public areas to improve safety and security for residents.
- Compliance: Adhere to industry regulations regarding street lighting standards and environmental impact.

## 4. Asset Inventory

- Street Light Fixtures: 9,122 LED units, various models with different wattages. The life expectancy of the street light luminaires is estimated to be 18-25 years. A major replacement project was completed 8-9 years ago.
- Poles: 2907 poles, 52 being decorative, are dedicated to only streetlights and are either aluminum, steel, concrete, or wood. The life expectancy of the street light poles is estimated to be 40-60 years. Majority of the streetlights are attached on PUC Distribution owned poles, which are maintained as per distribution system requirements.
- Overhead Secondary Services: There are 4277 overhead services owned by PUC Distribution to streetlights, majority of which are shared with other PUC Distribution Customers. The life expectancy of secondary services is 40-50 years. Some overhead services have a dedicated transformer that is only feeding streetlights with a life expectancy of 40-50 years.

- **Underground Secondary Services:** There are 1545 underground services owned by PUC Distribution to streetlights, majority of which are shared with other PUC Distribution Customers and is within PVC Ducts. The life expectancy of secondary services is 40-50 years. Some underground services have a dedicated transformer that is only feeding streetlights with a life expectancy of 40-50 years.
- **Load centres:** There are 91 load centres within the street light system, which have a life expectancy of 40 years.
- **Control Systems:** PUC operates a centralized smart control system covering all LED lights with features such as dimming, failure detection, and energy monitoring.

## 5. Asset Condition Assessment

### 5.1. Luminaires, Nodes, and Communications

- The streetlight control system monitors the luminaires, nodes, and the communications.
- There is no formal condition assessment data for these assets, but failures are known right away from the control system and these are placed in the ongoing queue for repairs.

### 5.2. Poles, Service Conductors, and Load Centres

- There is no formal condition data for these assets other than age.
- Very poor conditioned poles that may pose a safety risk are immediately planned for replacement. We are made aware of these through Customer reporting and visual inspections that are performed when at a location to repair a failed streetlight or to perform stray voltage testing. Concrete type poles have been the most common type affected by deterioration and safety concerns. As of 2009 PUC no longer installs new concrete type poles due to this.

## 6. Maintenance Strategies

### 6.1. Preventive Maintenance

- **Regular Inspections:** Inspections occur when at a location to perform a repair or when a Customer calls reporting a potential issue. Assets in poor condition are identified during this process and prioritized for replacement. PUC is in the process of developing a preventative maintenance program for the streetlight system.
- **Stray Voltage Testing:** all metal streetlight poles are tested annually for the presence of stray voltage. The presence of any detectable stray voltage is corrected upon discovery.
- **Annual system patrol** to locate and prioritize any additional or unknown streetlight outages (additional to the adaptive controls/SmartLinx system).
- **Component Replacement:** Scheduled replacement of components nearing end-of-life to prevent unexpected failures.

### 6.2. Corrective Maintenance

- **Fault Repairs:** addressing reported outages or malfunctions. Where underground faults are present, they are repaired. Where needed temporary overhead repairs are used in replacement of the underground cable when a fault is present.
- **Emergency Repairs:** Priority handling of critical issues such as damaged assets, widespread outages, or motor vehicle accidents (MVAs).

- Daily Inspections: Crew of workers from 4pm to 12am correct any known issues with the streetlights.

### 6.3. Predictive Maintenance

- Smart Monitoring: Utilizing data from smart control systems and street light monitoring software to predict failures and plan maintenance activities proactively. This software notifies maintenance teams of issues such as bulb failures, power supply problems, and system malfunctions in real-time.
- Data Analysis: Regular analysis of performance data to identify trends and potential issues before they become critical.

## 7. Financial Analysis

### 7.1. Budget Allocation

- The total replacement cost of the street light system is estimated to be \$140M.
- Operational and Maintenance Costs: Historically about \$1.1M annually, covering energy consumption, ESA fees, software costs, and general operation and maintenance.
- Replacement and Upgrades: approximately \$650,000 annually allocated for new or replacement streetlights, poles, services, and control system updates. Budget varies based on road reconstruction and subdivision projects.
- PUC expects required funding to remain in line with the above costs for the next 5-10 years, with typical inflationary costs added. Excluded from the expected required funding is a detailed system condition assessment and any City or other third party driven system enhancements.

### 7.2. Funding Sources

- Municipal Budget: Primary funding is from the City of Sault Ste Maries budget allocations.
- Provincial and Federal Grants: Applications for energy efficiency grants and infrastructure improvement funds may be an option depending on programs available.
- Developers: All streetlighting for new housing and other types of developments are fully funded by the developer.

## 8. Risk Management

### 8.1. Risk Identification

- Technical Failures: Risks related to aging assets, vehicle accidents, malfunctioning of material/parts, or control system malfunctions.
- Environmental Risks: Damage due to weather events like storms, freezing rain/ice build up, high winds, or flooding.
- Financial Risks: Potential budget cuts or funding shortfalls affecting maintenance and upgrade plans.

### 8.2. Mitigation Strategies

- Technical: Regular updates of control system, preventive maintenance plan is being developed, and planned asset renewal. PUC maintains adequate inventory for all typical streetlight system assets.

- Environmental: Strengthen infrastructure with weather-resistant materials and robust design standards.
- Financial: Prioritize critical maintenance and replacement tasks to ensure continuity even in tight budget scenarios.
- Development of a preventative maintenance program, detailed asset condition assessment, and renewal strategy.

## 9. Existing Levels of Service

### 9.1. Overall System

- The streetlight monitoring and control system allows PUC to be made aware system failures. PUC strives to have the entire system in operational condition and renewing end-of-life assets by safety risk priority annually while staying within the program budget.
- Our anticipated failure rate of the streetlight nodes is approximately 5% annually.
- The luminaires, poles, and service conductors have a much lower failure rate than the nodes and typically require replacing as per their life expectancy referenced in section 4 above.
- Any reported or witnessed critical concerns are resolved immediately. Any medium to high-risk items are planned for replacement within the annual budget process.

### 9.2. Customer Reported Outages

- Customer reported streetlight outages are typically resolved within 1-week for simple resolutions.
- If a failure occurs in the underground secondary system, the repair time may be longer due to underground locate requirements and potentially duct bank design and works.
- Outages resulting from motor vehicle collisions are typically resolved within 1-day.

## 10. Improvement Strategies

### 10.1. Smart City Integration

- Plan: Integrating with City-wide smart City initiatives.
- Benefit: Enhanced monitoring capabilities such as noise, speed, cameras, etc. which will improve safety throughout the city.
- PUC has 20 speed sensors implemented throughout the streetlight system.
- PUC has 30 cameras ready to be implemented once agreements are in place with the City Police.

### 10.2. Energy Efficiency Programs

- Plan: Implement dimming schedules during low traffic periods and adaptive lighting based on real-time data.
- Cost: Minimal, utilizing existing smart control systems infrastructure.
- Benefit: Reduced energy consumption, lower operational costs, and extended lifespan of lighting components.

## 11. Conclusion

This asset management plan provides a comprehensive framework for the effective management and improvement of the City's street lighting system. Through strategic maintenance, financial planning, and

continuous improvements, the City aims to ensure reliable, efficient, and cost-effective street lighting that enhances public safety and environmental sustainability.

## 12. Appendices

- Appendix A: Asset Details

## Appendix A: Asset Details

Figure 1: Age of Streetlight Luminaires

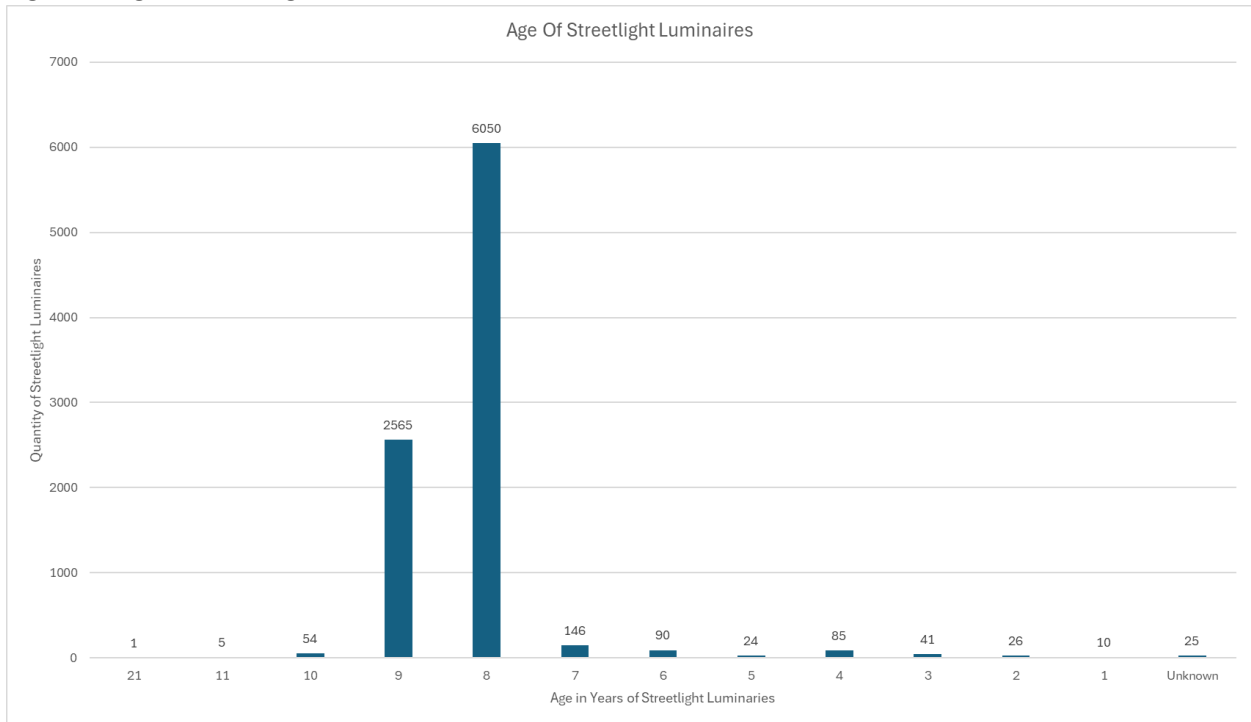


Figure 2: Age of Streetlight Poles (the poles shown as over 70 years old are unknown as an accurate install date is not in the GIS)

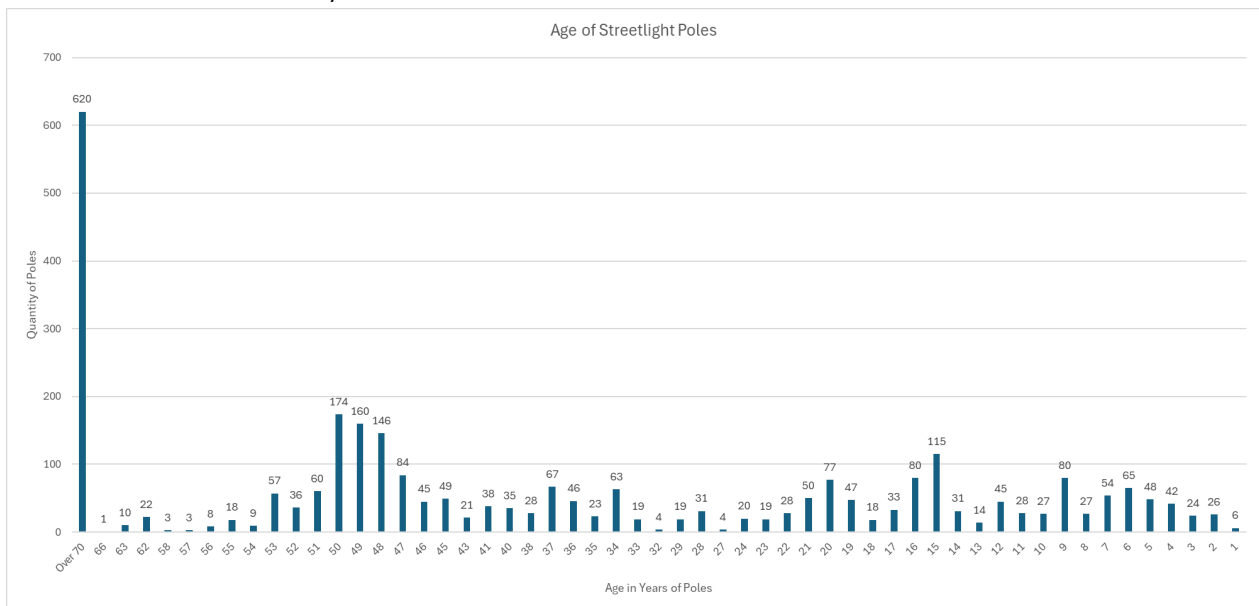




Figure 3: Material of Streetlight Poles

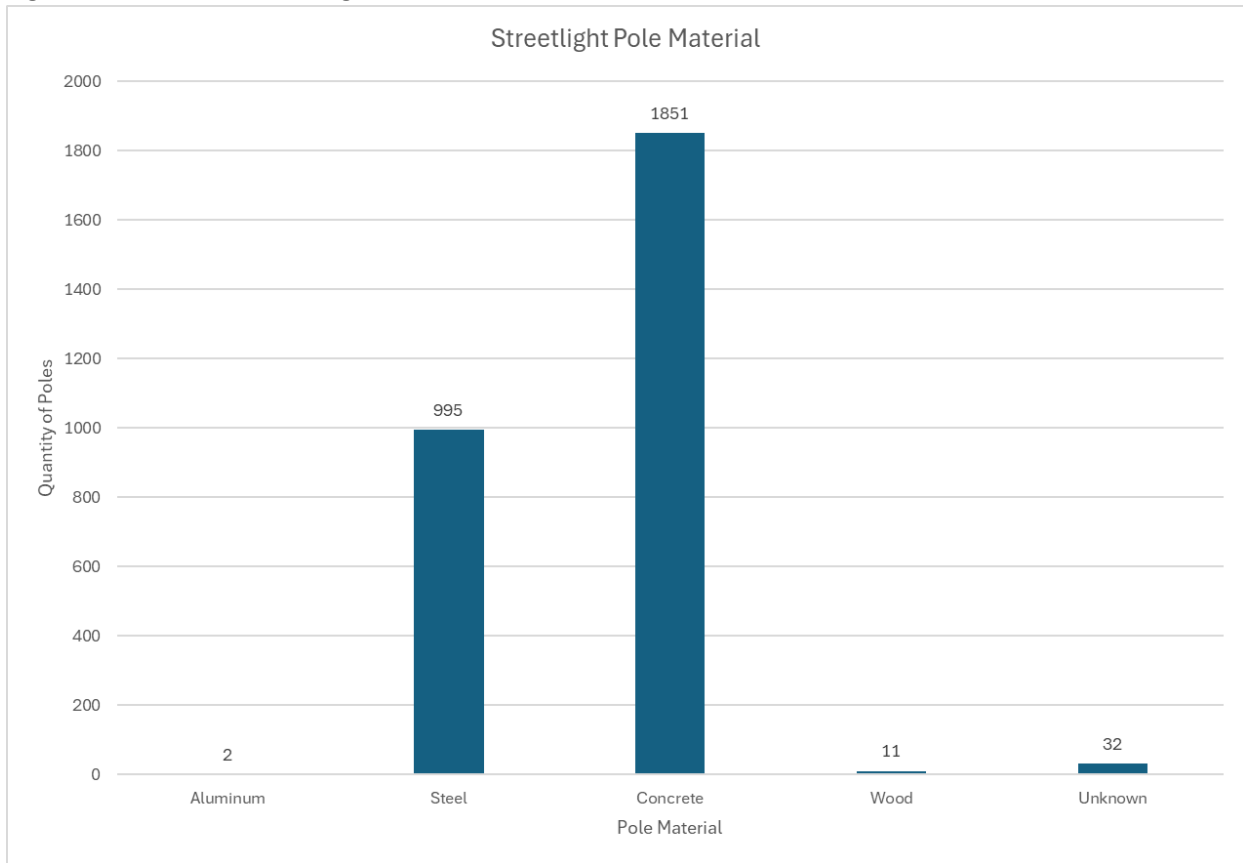


Figure 4: Age of Overhead Secondary Services

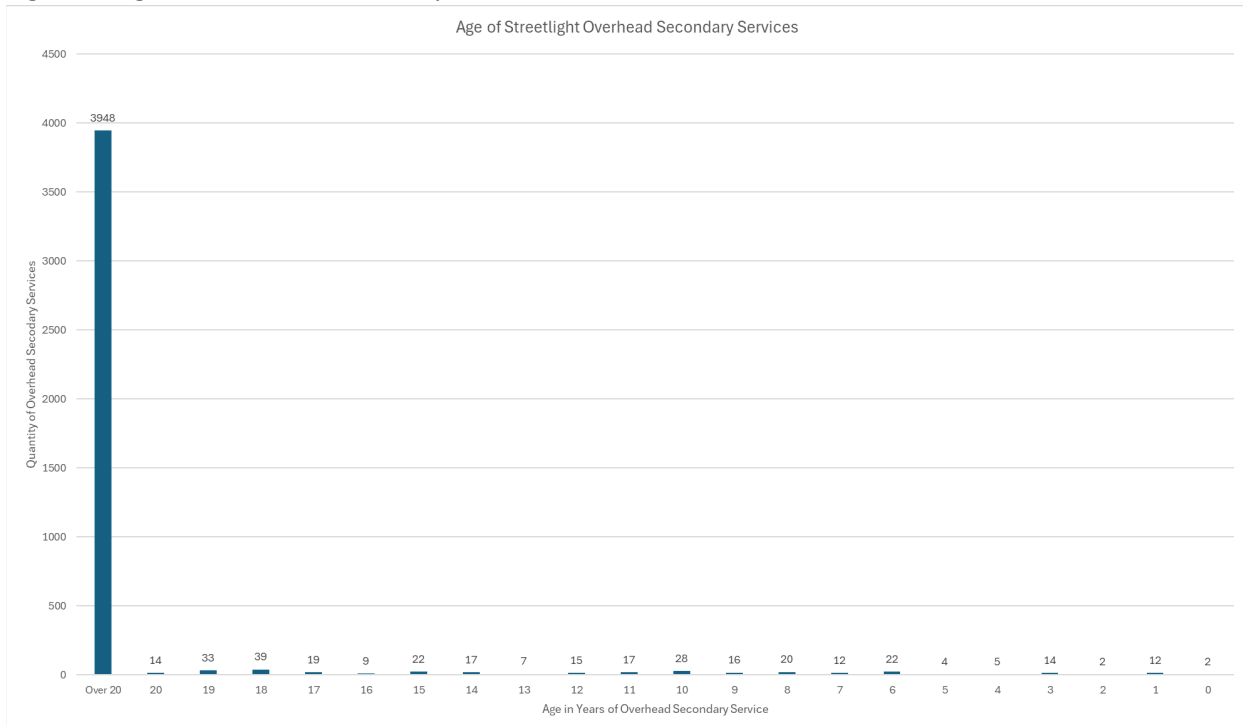


Figure 5: Age of Underground Secondary Services

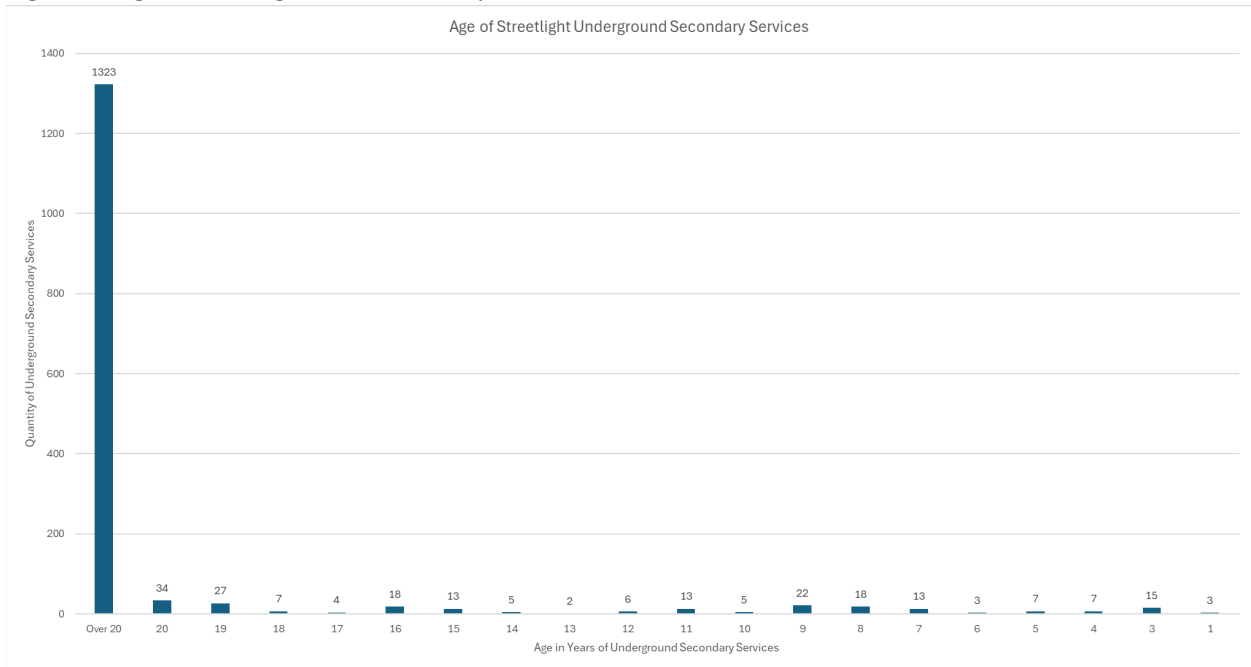


Figure 6: Age of Streetlight Loadcentres

