



## Get a Hold of Your Assets

### WHY UTILITIES SHOULD CONDUCT A GEOSPATIAL AUDIT OF THEIR STREETLIGHTS

This White Paper provides an overview of the current state of the average utility streetlight inventory and the benefits of adding a geographic information system (GIS)-based inventory. Some considerations for incorporating this into ongoing asset management efforts and eight other benefits are provided.

## GET A HOLD OF YOUR ASSETS

Running a utility, whether a co-operative or municipally or investor owned, is not easy these days. Utilities are struggling with how to fund new assets, maintain existing ones and meet new conservation, efficiency, clean air, water and waste regulations. Distributed energy resources (DERs), smart grid, digitization and new developments in data analytics all present new challenges. There are also human challenges such as a coming wave of pending retirements, plus increasingly engaged and demanding customers looking for more and more services – but without large rate increases. Costly upgrades to key elements of distribution and transmission infrastructure have often taken priority over other actions to ensure the utility's key mission of reliably delivering safe and affordable electricity. Utilities require accurate information about their assets to properly assess and prioritize alternatives in terms of ongoing programs and capital deployments. However, very few have either the time or internal resources to get an accurate, up-to-date asset inventory.

Developing (or updating) a GIS-based inventory provides eight key benefits that can offer many efficiencies and position utilities for the long run. This White Paper will focus on the challenge and opportunity that is streetlight asset management and offer suggestions to help get your inventory in order.

Historically, streetlight management has not been a high priority for most utilities. There is often a significant capital improvement backlog, particularly in terms of energy efficiency initiatives. Many utilities, especially those that contract out maintenance to a third party, have yet to develop a comprehensive streetlight capital improvement plan and/or a streetlight management program. Many lack the comprehensive assessment inventory necessary to even start this type of analysis.

Others have multiple inventories and/or databases that often conflict. One of our clients, for example, had a billing database that suggested it serviced 50,000 streetlights while its asset inventory only suggested 30,000!

### CHALLENGES WITH CURRENT INVENTORIES

There are usually two significant problems with most existing streetlight inventories: a lack of accuracy and a lack of clarity around ownership.

There's a popular adage that states that **if you can't measure it, you can't manage it**, and this applies perfectly to streetlight operations and maintenance. It is exceptionally rare to find a utility (or a municipality) with a complete and accurate inventory of all fixtures and their individual attributes. Almost all miss arm and/or fixture height, for example, which is a key parameter for good design. (See our [White Paper on Photometric Design](#) for a complete list.) Many utilities own only some or none of the lights in a given community. It is common to see significant discrepancies in what utilities and municipalities believe exists and what is physically on the street. After analyzing well over 200 communities, we have found that when comparing the utility's inventory with those of the municipality, both end up being wrong – 100% of the time!

One U.S. city conducted its own audit to verify the ownership of the streetlights appearing on its bill, and found they were being charged for almost 4,000 lights that didn't exist. In addition, the lack of legal standards has led to a lack of consistency in the actual operation and maintenance of streetlights. Not surprisingly, this inconsistency in policy often results in erratic O&M practices and some very different states of repair. While some systems are incredibly well maintained, most current streetlight networks have certain weaknesses such as wire deterioration, poor pole condition, a lack of proper fusing and a lack of bonding.

See RealTerm Energy's White Paper [How Many People Does It Take to Change a Streetlight?](#) for a list of potential hazards.

## LINKING INVENTORIES TO ASSET MANAGEMENT

Asset management provides a defensible way of prioritizing projects and resources. A key part of this defense is basing asset replacement decisions on the best available information. Achieving the best available information involves asking the following questions:

- › What is the current state of the assets? (inventory)
- › What is the required level of service?
- › Which assets are critical for performance?
- › What are the best O&M and capital replacement strategies?

### ASSET MANAGEMENT IN A NUTSHELL

According to the Institute of Asset Management, asset management involves the balancing of costs, opportunities and risks against the desired performance of assets, to achieve the organizational objectives. Asset management enables the application of analytical approaches towards managing an asset over the different stages of its life cycle. Asset management is the art and science of making the right decisions and optimizing the delivery of value.

The asset inventory should accurately describe the location, condition, useful life, replacement cost and energy consumption of the assets at a minimum. Other critical factors such as transformer locations and other electrical hardware should be clarified in the inventory as well. The objective is to make sound decisions that optimize investments, mitigate and manage risk, and account for the potential impact of other factors such as weather and climate change. This will augment and enrich current auditing and rate filing efforts related to cost of service and rate applications, annual reports and other regulatory demands from PUCs or other agencies. Getting a handle on the other ancillary equipment on streetlight poles presents new revenue-generating opportunities in terms of service fees and rental agreements from telecoms and other third parties. Using location parameters and digital records made possible by a GIS makes the most sense for an efficient and dependable streetlight asset inventory.

## WHY USE GIS FOR YOUR ASSET INVENTORY?

A GIS is a powerful, affordable and easy to use utility asset management solution that can record and track an almost unlimited amount of information in an easy-to-see-and-use format. Inputting key streetlight asset data (we suggest both before and after an LED upgrade) provides the following benefits:

1. **Allows for easy analysis of collected geospatial data layers** leading to the output of virtually any kind of information product. A geospatial inventory enables staff to identify each individual light in the system and view its history and characteristics.
2. **Provides a layer of information**, permitting a means to effectively plan and track future maintenance schedules and record completed repair work at each location from that point moving forward.
3. **Clearly reveals any gaps and errors** that might exist in the current inventory data, including any assets near end of life.
4. **Improves accuracy in the utility's billing system** by ensuring that all street and security lights are properly accounted for and billed.
5. **Reduces costs and delays** that result from incorrect fixture and/or part orders.
6. **Provides an accurate accounting of assets, cost of service and depreciation required for setting rates** – including future LED tariffs. This is a huge benefit in terms of operations and capital replacement planning.
7. **Optimizes both energy savings and street-lighting performance** during the design and installation phases of an LED upgrade.
8. **The resulting streetlight dataset could serve as the backbone for utilities to build a GIS** with which other systems and/or additional layers of geospatial data can be merged. A GIS can integrate with several other systems to maximize the efficiency and functionality of the platform, including, but not limited to, CMMS, EAMs, SCADA and CAD files.

Additional layers can include hydro pole identifiers, transformer locations, traffic lights, street layouts, water meters, town parcels, future smart control systems and many others. A few forward-thinking utilities have developed apps that enable citizens to report streetlight outages or other issues with ArcGIS Online, enabling utility staff to respond rapidly and easily. Others (Meehan) suggest pulling crime statistics from the police department's GIS and layering these

on top of streetlight outages. In short, GIS should be thought of as a platform that can be used to solve business issues and not just mapping.

As increasing types and amounts of new technology become available, utilities will be able to greatly increase their economies of scope by offering many new services. Streetlights are a natural asset to start with as the cost, reliability and performance of both fixtures and controls make the business case to upgrade extremely compelling.

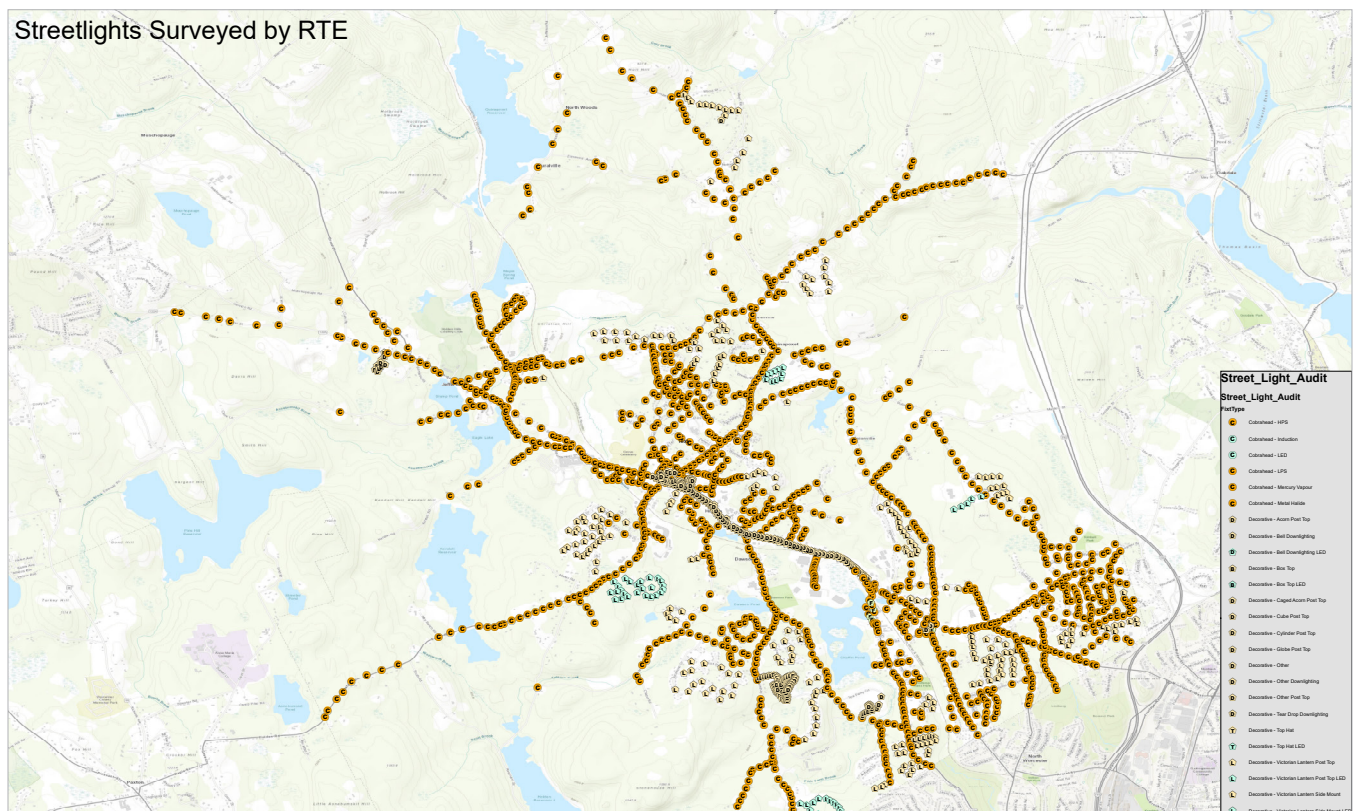
## WHAT IF WE LACK STAFF TIME OR EXPERTISE?

Many utilities lack the staff time or expertise to conduct a complete asset inventory due to existing budget pressures and other demands to increase service efficiency. Sending staff to inspect existing infrastructure may be viewed as an inefficient use of their time, they may lack the tools or training required, and often they are simply too busy with ongoing work.

RealTerm Energy (RTE) specializes in exactly this type of work. We are currently working with more and more utilities looking to simply improve their asset inventory or who are getting ready to upgrade their streetlight

network. We developed a utility-customized ESRI application to capture and record detailed streetlight data and measurements. This mobile street-lighting app offers a significant benefit. No specialized equipment or expensive software licenses are required for authorized users to access our survey data online, and all data can be easily exported to MS Excel or file geodatabase. Our field team commonly records and verifies between 13–20 characteristics unique to every single streetlight pole. For those upgrading to LED, our project team utilizes this baseline geospatial streetlight data to develop a comprehensive photometric design plan. A sample map that we produced for one New England municipal utility is provided below as an example. Photometric design plans are then performed for each unique street type and intersection. They follow IES RP-8-14 recommendations whenever achievable using the selected fixture manufacturer(s) for all cobra-head and decorative fixtures. A thorough review of the existing site conditions is also conducted to minimize delays in the later stages of the project. Our utility clients have stated that they experienced significant cost savings from the timely and accurate completion of the asset and design work.

Anyone interested in receiving sample reports, case studies or a quote is asked to contact us at: **866 422-5200** or [info@realtermenergy.com](mailto:info@realtermenergy.com)





## REFERENCES AND RECOMMENDED SOURCES

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