BEYOND THE BULB:

5 Ways to Transform Operations **with Smart Streetlights**

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Cutting energy costs and reducing carbon footprint are the primary reasons why most utilities and local governments upgrade streetlighting. However, tremendous operational efficiencies also can be achieved by pairing smart streetlights with streetlight operations software — a step that so far is often overlooked. This integrated approach can yield faster installations, fewer maintenance truck rolls, more accurate billing, and less redundant or manual work.

When building a business case for smart streetlighting, it's important to understand the measurable benefits that streetlight operations software can deliver. Streetlight operations software includes mobile applications built specifically for field crews to tap into the features of the smart lighting central management systems (CMS), as well as back-office platforms, so crews can work faster and smarter than ever before.

Streetlight operations software enhances overall project economics by increasing the efficiency of deployment, maintenance and business processes. Additionally, this software amplifies the benefits of smart lighting by accelerating energy savings, reducing expenses and expanding environmental benefits, which helps build stakeholder support for the smart streetlighting investment.

Baltimore Gas and Electric, an Exelon company, began rolling out smart lighting with integrated streetlight operations software in 2021. "We expect to see significant operational efficiencies, especially associated with truck rolls. In many cases, we won't need to roll a truck to diagnose a problem with a streetlight," said Eric Barger, principal project manager for BGE's smart streetlighting deployment.

> *"While utilities and cities are making progress on cutting energy costs and greenhouse gas emissions, they still must manage assets, field crews and vehicles. They still must ensure that billing is correct. They still must respond to calls from the public about broken streetlights. Usually, the benefits enabled by smarter field operations become a much bigger part of total smart streetlighting benefits than initially imagined."*
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> **BOB BORZILLO, President of Sustainable Urban Strategies**

Some of the world's leading utilities and cities are deploying streetlight operations platforms as part of their smart streetlight programs, including Exelon, Dominion Energy, the City of Chicago, London and many more. This playbook explores five types of operational and business efficiencies that a smart streetlighting operations solution can provide.

ONE

Better Data Means **Better Decisions**

Accuracy is paramount for data-driven operational decisions. Typically, the streetlight inventory data maintained by most utilities and local governments contains substantial errors.

“Establishing reliable data quality is the first priority,” said Dave Basil, President and CEO at TerraGo Technologies. “Some customers have found thousands of poles missing entirely from their GIS and billing systems. Others have the wrong wattage on thousands of fixtures. Our streetlight application corrects errors once and for all during the system audit. After the application is up and running, every change to the asset is automatically updated correctly in all back-office systems.”

When Baltimore Gas & Electric began their smart streetlighting project in 2021, the amount of inaccuracies in their existing streetlighting data was surprising. “I thought we kept pretty accurate records,” said Barger. “But when we did some preliminary audits and surveys using the mobile application for our new smart streetlighting platform, we discovered that for more than half of our streetlights, some data was missing or inaccurate. This was shocking to me.”

Most of these omissions and inaccuracies were fairly minor, such as incorrect manufacturer data. But collectively, a large number of inaccuracies can have significant negative impacts.

> *"We might send a repair truck out with incorrect location coordinates. Or, we might send the crew out with the wrong parts. These problems can be hard to track down without accurate asset data."*
>
> **ERIC BARGER, Baltimore Gas & Electric**

In the City of Chicago, each time a fixture is converted to LED, the streetlight operations system supplies data updates to the ComEd billing system, which then automatically reassigns the light to a different tariff. "The City used to handle this back-office process manually, and the inevitable lag would cost them money," said Borzillo.

Complete and accurate streetlight data also helps prioritize repairs. For instance, BGE's smart streetlighting platform can track everything installed on a streetlight pole. "If a streetlight gets knocked down and we know there was a stop sign attached to that pole, we can automatically make that a top priority to fix, because of the traffic safety implications," Barger explained.

TWO

Remote Diagnostics **Saves Time and Money**

A smart streetlighting operations solution helps bridge the gap from the streetlight CMS to back-office systems and field operations. This enables crews to identify and fix problems quickly and efficiently. When a light malfunctions, the CMS system automatically logs alerts, meter readings and failure reports about the problem. Combined with real-time diagnostics data, operators can define step-by-step workflows that walk crews directly from the root cause of the problem to the best solution.

"If a streetlight goes out, is it a problem with the bulb? With the sensor? With the power supply? When the personnel who are heading out to fix the light have all of the right information at their fingertips in a simple to use mobile app, they can fix the problem fast, the first time," said Borzillo.

BGE's dedicated streetlighting department includes both cable crews and light servicing crews. Previously, their standard procedure for diagnosing streetlighting problems was to dispatch a servicing crew in a bucket truck, and examine the fixture from the top down. Now, the remote diagnostics capabilities of their smart streetlighting platform can discern whether the problem is related to power supply — and in those cases, a cable crew will be dispatched.

"Too often, crews try to fix problems blindly without understanding the root cause. This wastes more than just time," said Basil. "If they aren't sure which component failed, they might just go ahead and replace all components: the bulb, luminaire, controller, sensor, etc. But if the problem is the power supply, all of that work wouldn't fix the problem at all! Smart streetlighting operations helps them fix it right the first time."

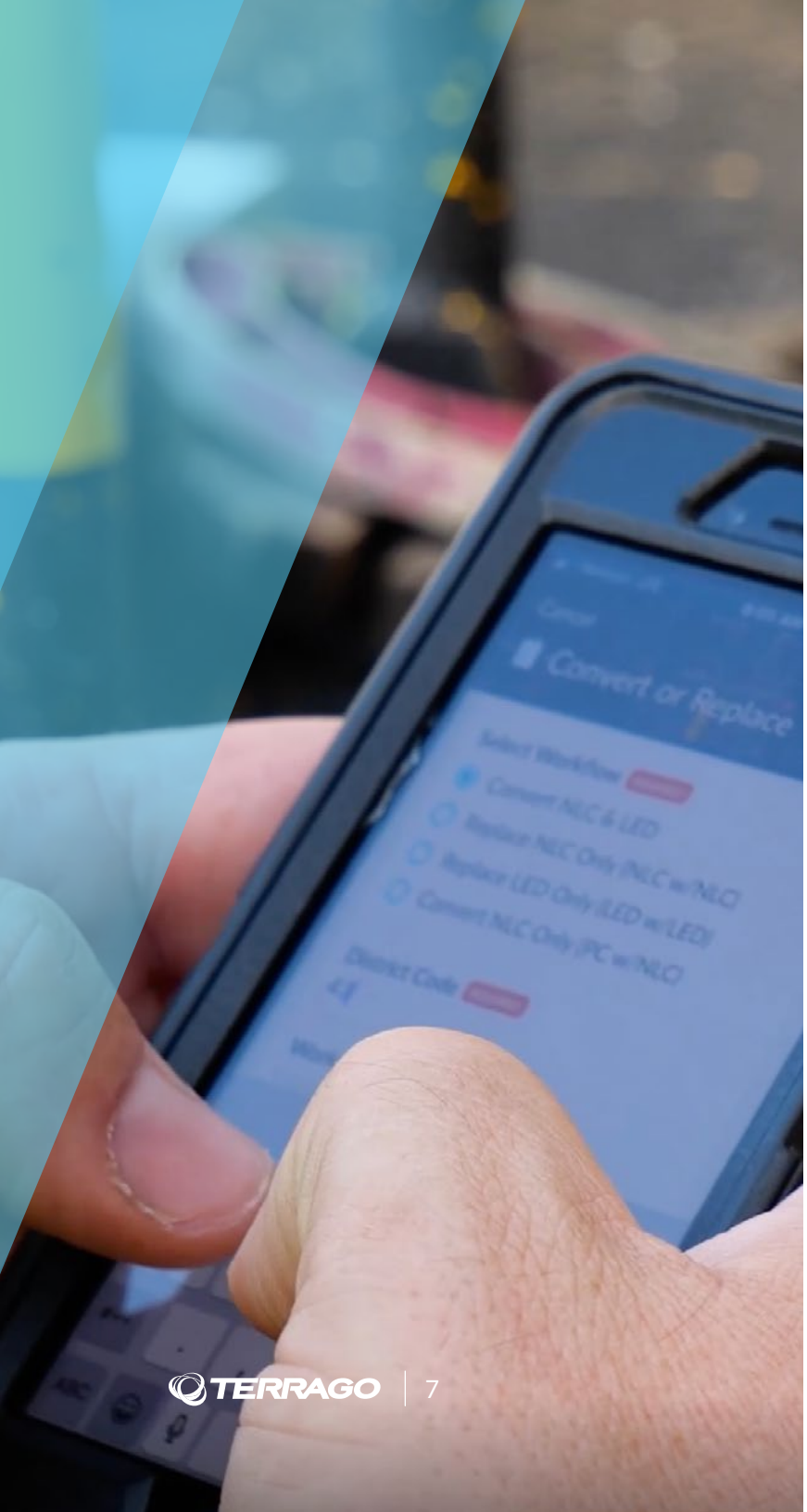
THREE

Connected Field Operations **Reduce Truck Rolls**

The largest operational efficiencies from smart streetlighting typically arise when field crew work is connected to, and leverages, back-office platforms. To optimize streetlight operations, data must be integrated across the CMS, GIS, CRM, asset management and billing systems, to inform intelligent algorithms that dynamically generate the most efficient and productive work order plans.

For instance, with proper system integration, alerts about streetlight problems can automatically generate and prioritize work orders. These orders include full information on the history, nature and cause of the problem, as well as the precise location. This can eliminate considerable manual back-office processes and accelerate dispatch, while also ensuring that the correct set of skills, tools and parts are present on every truck roll.

Similarly, by integrating outage reports from 311 lines and call centers, intelligent algorithms in a streetlight operations platform can identify duplicate reports and consolidate them into a single work order. Chicago's smart streetlighting operations system integrates network outage alarms, citizen service requests and maintenance crew dispatching. It prioritizes repair requests, groups them geographically, and consolidates redundant tickets.



> *"By correlating service requests from citizens and system alerts, we can consolidate work orders, improve our response times and lower operations costs by reducing truck rolls."*
>
> **DAVID REYES, Superintendent of Electrical Operations for the City of Chicago**

"We also help the City of Chicago group work orders and assign the right crews based on the underlying outage data," said Borzillo. "If there's a problem across an entire electrical circuit, affecting several lights, there can be numerous citizen calls, but it's a power problem that can be fixed with one crew."

Once a crew arrives in the vicinity of a broken light, they can also interact with the smart streetlighting system via a mobile app to make sure they're working on the correct light. "If they don't have precise location information, or all of the lights are off because it's daytime, they might not be sure which light is out — which means they might reassign the ticket to a night patrol and roll another truck" said Borzillo. "Instead, if they can use a mobile app to tell the system to turn on all nearby lights, they can instantly spot which light has the problem."

Data about the condition and performance of streetlights also can inform equipment maintenance and upgrade plans. Rather than replace all bulbs in a section of town based on a rigid schedule, an integrated field operations platform enables predictive maintenance. Maintenance crews can be sent to locations most in need, before many lights there begin to fail, thus preventing multiple repair calls.

FOUR

More Data, **Less Paperwork**

In many regions, it's still common for streetlight maintenance crews to receive a stack of paperwork orders at the beginning of each workday. They handwrite short notes on these pages at each job site, and then manually key in that data after they return to the office, before clocking out. This not only wastes time and leaves more room for errors and omissions; it's also never a field technician's favorite part of the job.

If the customer deploys a mobile streetlight operations platform, staff or contractor technicians can enter observations and photos directly into an app while they're on site. Also, the system can prompt them at each site visit to capture crucial information for the asset inventory, such as creating new lights and removing old lights, or updating component types and their condition, location data and non-lighting hardware attached to the pole. This data then updates all the back-office systems that require it, maintaining data quality across the organization.

At first, field technicians may view correcting data as "extra" work that delays them from getting to the next task. Rewarding technicians who gather this data consistently can encourage adoption of this new mindset. Explaining how working together to correct data makes everyone's job easier and better can encourage them to keep up this new habit.

> *"When you can tell your crews, 'Hey, look how rare it is now that you have to make multiple trips to fix the same problem,' they really like that. Then, when you mention that updating the streetlight data actually saves them a lot of time, they understand."*
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> **BOB BORZILLO, President of Sustainable Urban Strategies**

FIVE

More **Satisfied Customers**

Smart streetlighting systems automate the process of identifying outages. Previously, system operators had to rely mainly on calls from the public reporting an outage or other streetlight problem. With smart streetlighting, call centers and 311 workers notice they're not getting as many citizen complaints about streetlight problems.

"It's always most efficient when you know about a problem before anyone calls it in," said Borzillo. "When high-quality, reliable streetlighting operations just happen automatically, public and customer relations get much smoother."

Smart streetlighting operations software helps utilities and municipalities integrate automated alerts with business rules to function more intelligently and proactively, while also avoiding unnecessary truck rolls. For instance, an alert about a network communications failure on a single light might not immediately indicate an actual outage. However, a series of such alerts should automatically trigger the assignment of a maintenance crew.

Putting **Streetlight Data** to Work

After a smart streetlighting operations platform has been deployed, and back-office systems are being regularly updated with data from that platform, the best way to ensure steady efficiency improvements is to make it someone's job to look for problems and opportunities.

"BGE has the advantage of having streetlighting defined as a business unit with its own resources," said Barger, who holds primary responsibility for gleaning maximum value and efficiency from the utility's new smart streetlighting system. "At other utilities, responsibility for streetlighting often gets juggled. But deciding to deploy smart streetlighting can force you to put someone in charge of getting results."

Basil emphasized that the person who stewards a smart streetlighting system should do more than monitor whether this solution is meeting its goals. "They really should be asking around in other departments, seeing where streetlighting operations data would be beneficial, and looking for opportunities to introduce or improve automations," he suggested.

With the right combination of intelligent technology, human attention and collaboration, smart streetlighting can enable a utility or local government to operate more effectively and efficiently. Once smart streetlighting is deployed, the lights work smarter. With streetlight operations software, the people can work smarter too.

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TerraGo StreetlightOps is the industry's only software platform dedicated specifically to meet the unique challenges of smart streetlight deployment and operations. With over 7 million streetlights under management today, StreetlightOps delivers out-of-the-box features designed, tested and operationally-proven for smart streetlight projects. Utilized by 9 of the 10 largest US utilities, including Exelon and Dominion Energy, as well as leading cities, like Chicago and London, TerraGo StreetlightOps is relied upon every day to extend the benefits of the smart lighting network to field operations, accelerating energy savings, reducing operations and maintenance expenses and improving customer service. Networked controls make your lights work smarter. TerraGo StreetlightOps makes you people work smarter. TerraGo was chosen for a World Smart City Award for its next-generation streetlight operations and maintenance software deployed in the City of Chicago.

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