Silver Spring® NETWORKS

WHITEPAPER

Charting the Path to Smart Cities

How Municipal Utilities can Lead Sustainable Community Development

How municipal utilities can lead sustainable community development

Cities and their governing organizations are focused on building an advantage in the growing competition for business investment, attraction of skilled workers, and efficient resource management. Many municipalities are looking to smart city initiatives, built on sophisticated communications networks, to provide an edge, enabling compelling new services that both improve community quality and enable new efficiencies. Municipal utilities have the opportunity to play a leading role in helping the community deploy successful smart city initiatives.

An assessment of smart city initiatives around the globe reveals differing regional agendas as well as many common denominators. Operationally, cities rely on a set of core systems related to business, transport, communication, water, energy and the community. A smart city implies connection and coordination among these systems to optimize sustainable economic growth, improve quality of life, and use resources more efficiently.

To succeed, smart city initiatives demand collaboration among city government, utilities, and the community at large. Municipal utilities have the unique opportunity to leverage near-term success with smart grid initiatives as the foundation for longer-term, broader ambitions. In specific, four areas of opportunity provide a clear path for municipal utilities to rapidly lead the way in building competitive advantage.

Four proven areas of near term opportunity for smart city services

Municipal utilities can chart the path towards smart city growth by starting with four smart grid initiatives that easily translate into smart city value. Most compellingly, municipal utilities can build a single network that can enable not only these initial four smart grid-oriented projects but also additional smart city applications in the future.

Opportunity area	Utility led smart city program
1 Resilient, cost-effective power	Rapid restoration
2 Customer-centric energy and water services	Customer empowerment
3 Safer, more efficient roads and public spaces	Smart street lights
4 Utility managed energy efficiency	Energy savings

1) Rapid restoration

The greater Chicago metropolitan community has experienced return from investment in a more resilient, cost-effective energy infrastructure. Led by ComEd, the city has weathered seasonal storms with quantitative improvements in grid reliability, outage identification time, and speed of restoration. The utility-led program includes the Silver Spring Distribution Automation (DA) solution coupled with a smart meter roll out.

Figure 1

Monitoring the restoration process

By keeping businesses running and enabling high-quality customer service throughout several rough winter seasons, the AMI and DA solutions are now in the midst of growing to cover the entire greater metropolitan area, ultimately reaching 4 million homes and businesses. Figure 1 illustrates one of the operational processes contributing to the program's success. The operations team can use AMI information to verify that 100% of customers have had their power restored before crews leave an outage area.

2) Customer empowerment

The Sacramento, California region has benefited from improved customer service and strong community participation in energy savings programs. These community benefits resulted from the efforts of the Sacramento Municipal Utility District (SMUD) to automate billing processes, dramatically shrink the service connect/disconnect cycle time, and provide customer choice in energy programs.

To empower its customers to make better energy decisions, SMUD deployed the Silver Spring AMI solution at scale throughout the region. The timely, high- quality energy consumption data provides customers with new insights and enables energy savings through demand response programs. Two-way connectivity to every home and business has enabled SMUD to shorten service restoration to as little as 17 minutes from a customer initially calling in. Figure 2 outlines the phased process that utilities such as SMUD have employed to build customer engagement, service satisfaction, and value enabled by AMI information.

Figure 2

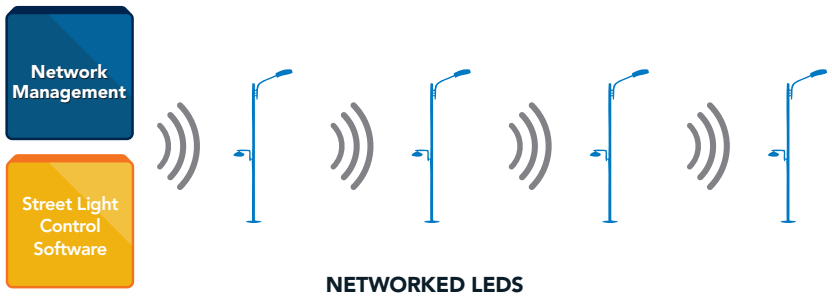
The evolution of customer engagement enabled by AMI information

3) Smart streetlights

The City of Paris, France recognized the opportunity to dramatically reduce energy and operational spend on streetlights through adoption of networked LEDs. Evesa worked with regional government leaders to structure a system of streetlights, streetlight control boxes, and traffic signal control boxes connected and controlled over Silver Spring's smart infrastructure.

The region benefits from a network canopy with sufficient bandwidth to support a broad range of smart city services based on community needs. In the near term, Paris benefits from safe, efficiently managed roads and public spaces. Figure 3 shows how networked street lights maximize energy savings while also improving community safety.

Figure 3



Results
- Energy savings
- Operational savings
- Reduction in crime
- Safer transportation

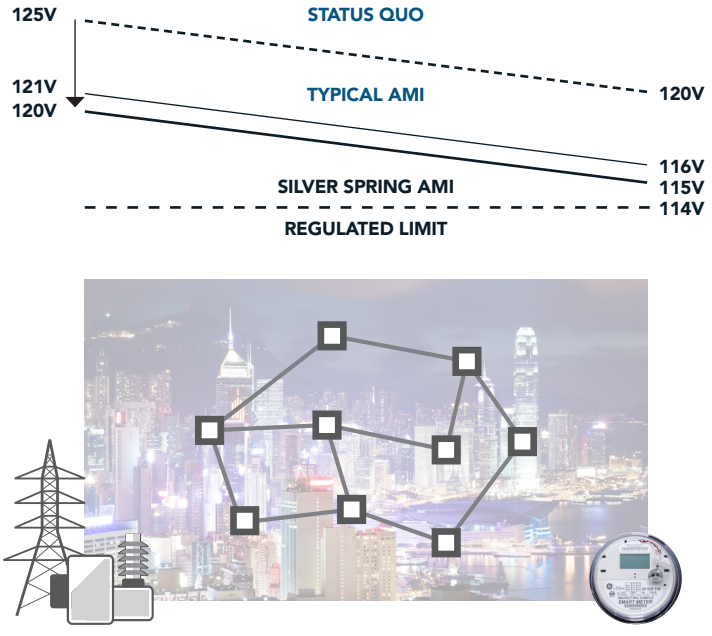
Silver Spring's Smart Street Lights solution combines advanced software controls and efficient network management to deliver maximum energy and operational savings

4) Energy savings

The Modesto, California area covers a diverse community including agricultural business and suburban residents. The Modesto Irrigation District (MID) is a community-owned organization delivering reliable, cost-effective energy and water services. Over the past 4 years, MID has leveraged its Silver Spring AMI solution to reduce operating costs and increase reliability.

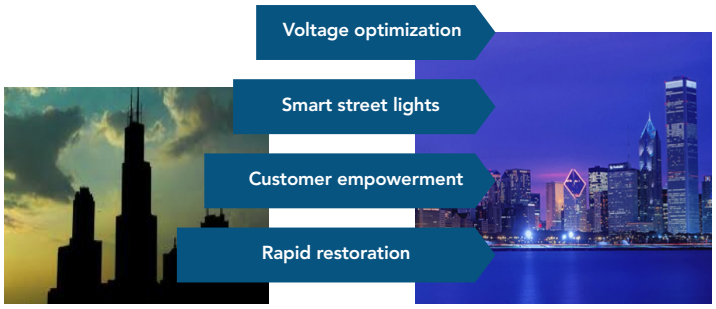
Now MID is leveraging the two-way connectivity and distributed intelligence of the Silver Spring network to reduce energy waste using voltage optimization. The solution combines polling with real-time alerts to make voltage-adjustment decisions using AMI-based information. As a result of reduced voltage levels, the MID operations team can plan reductions in energy budget while the overall community benefits from increased service reliability. Figure 4 highlights the results of the voltage optimization process, which maximizes energy efficiency while maintaining regulatory compliance.

Figure 4



Premise-level voltages based on information from the Silver Spring AMI solution enables municipal utilities to deliver energy efficiency while remaining compliant

Figure 4



- One way communications
- Proprietary networks
- Costly IT system integration
- Limited device choice
- Siloed applications and data

- Two way communications
- Standard IPv6 network
- Open standards based system integration
- Device diversity and vendor leverage
- Multiple applications, shared data

Common paths to smart city growth based on a standard IPv6 network and the Silver Spring smart infrastructure platform

These four communities started from different points, focused on solving their own unique needs, in laying a foundation for a networked city. .But all four followed a common decision process and arrived at the same conclusion for the underlying technology to ensure success with current and future projects.

Figure 5 illustrates the shift in capabilities critical to the success of each project. The opportunity to leverage two-way communications, open standards, choice, and shared data not only enabled the success of each city's first initiative but also ensures the communities can support future applications on common infrastructure.

Municipal utilities, with the ability to deliver on near-term smart grid initiatives, have the unique opportunity to lead their communities on the path toward a whole array of smart city applications. Making the right infrastructure decisions up front can ensure these utilities can maximize the value they deliver.

About Silver Spring Networks

Silver Spring Networks is a leading networking platform and solutions provider for smart energy networks. Silver Spring's pioneering IPv6 networking platform, with 17 million Silver Spring enabled devices delivered, is connecting utilities to homes and business throughout the world with the goal of achieving greater energy efficiency for the planet. Silver Spring's innovative solutions enable utilities to gain operational efficiencies, improve grid reliability, and empower consumers to monitor and manage energy consumption. Silver Spring Networks' customers include major utilities around the globe such as Baltimore Gas & Electric, CitiPower & Powercor, Commonwealth Edison, CPS Energy, Florida Power & Light, Jemena Electricity Networks Limited, Pacific Gas & Electric, Pepco Holdings, Progress Energy, and Singapore Power, among others.

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