



## Smart Street Lighting



The definition of SMART reflects technology that is intelligent, adaptable, energy efficient, and has the potential for interoperability between and among devices and systems. This technology also has the capacity to allow for advanced layers of computerized programmable platforms designed to address the specific needs of the operator, to allow for remote management and control, to improve information communication for the reduction of wasted energy and resources, and to develop specific responses that meet a community's expectation of a secure, safe living environment. Can this all be achieved with the use of lighting? At what price, as well as from what funding source? Smart Street Lighting can answer those questions.

Picture this scenario: You are driving alone in an urban business section late at night. You are lost and all of the retail and business establishments are closed. Your cell phone is dying and you forgot your car phone charger. Your vehicle's engine acts in a peculiar manner, disrupting your travels. You quickly leave the roadway to pull over and find help, because the car has just come to a stop for no reason. Thankfully, you chose to pull into a lighted parking lot near the roadway, so you are not stranded on the road itself. You analyze your present situation to choose the most immediate response. There is no one around. The temperature is dropping, and you only have a light jacket with you. Of course, your gasoline is low so you cannot keep the car on for long. You hope the cell power in your phone lasts until you can secure a tow truck or call someone to come get you. Your sleeping child in the back car-seat starts to stir from stopping and the temperature change drop. You search your phone for a help connection, but you really do not know exactly where you are...

Now picture this scenario: You are driving alone in an urban business section late at night. Something is not working with your GPS, so you are lost. All of the retail and business establishments are closed. Your cell phone is dying and you forgot the car phone charger. Your vehicle's engine acts in a peculiar manner, disrupting your travels. You quickly leave the roadway to pull over and find help, because the car just stops for no reason. Thankfully, you pulled into a lighted parking lot near the road and are glad to be off the roadway. As you analyze your present situation, you notice the lighted pole lamps near your vehicle have grown brighter. You can see the immediate area better. You may be alone, but you feel a bit safer in the brighter illumination. The temperature outside of the car is dropping and you only have a jacket. You exit the vehicle to check the car, and you notice at a nearby intersection, a red alert arrow pointing in your direction. It is blinking continually. One of the pole lights in the lot near your vehicle has a small red beacon that begins to blink in concert with the arrow across the intersection.

Before you can even make a phone connection with your dying cell phone, an emergency vehicle pulls into the parking lot and drives towards you. You are very grateful to see help arrive and the occupants give you information and assistance to allow you to continue safely and warmly on your journey. Your child sleeping soundly in their car-seat in the back never stirs as you are able to continue in a correct direction to get fuel and keep the car warm. The sensors in the street lights alerted central command station that there was a presence in an otherwise unoccupied area. Therefore, the illumination in the programmable light emitting diode (LED) lights automatically increased. The remote viewer installed on the pole pictured a stranded motorist with a disabled vehicle. The networked street lighting system in the roadway activated the emergency directional assistance modality built into the system to identify exact emergency location. Help was dispatched to your exact location immediately. No wasted time. No immediate danger. Problems addressed accordingly and you are happy to safely continue in the correct direction. This is one probable resultant scenario from a Smart Street Lighting installation.

## Traditional Street Lighting

Those tall lonely street lights that run for miles across a town, a city, and a nation attached by power lines are for lack of a better term, at present time, dumb. They are programmed to come on at a certain time of day and stay on at the same full power for an average of about twelve hours over the dusk, into the night, and into the early morning hours despite the time of year, light span during the day, weather

**Traditional Street Lighting wastes tremendous amount of energy and is incredibly inefficient**

changes, or night time visibility or need. Some more modern lights have photocells that activate when the sunlight is gone or when it arrives, thus turning the bulbs on and off. In either case, the lights have no way to relate their status, whether they are truly on or burned out, or if they are wasting energy by continually burning all through the daylight hours. They all waste tremendous amounts of energy and are incredibly inefficient.

The lamp bulbs used for conventional lighting systems are mercury based or high pressure sodium (HPS) and metal halide (MH). The former emit toxic gasses and all are expensive to replace, have low life spans of approximately five years or less, offer no insight for maintenance, and contribute simply a limited range of light that can only be turned on or off. Further, some of these older lights can take minutes to hours to fully come to optimum lighting power. Studies estimate that using these forms of street lighting are a municipality's highest expense ranging from 19% to 40% or more of the overall electric usage cost. In average situations, there is a yearly 20% replacement need for these traditional bulbs. That cost does not include the maintenance operation costs.

Each of these legacy or traditional lighting systems is expensive to operate. The lights themselves use intensive and excessive energy whose cost is increasing yearly. Use and disposal of the mercury based lamps is hazardous to the environment. These lights have no alert system for replacement. Typically, the municipality's light center is alerted by a phone call from a citizen or a full time road crew patrolling areas at night for bulbs that have burned out to record a maintenance need for the day crew to replace that bulb. These routine checks and repair responses are expensive in man hours and equipment use. If the street lights are not maintained adequately, a municipality can experience increased crime due to low or no lighting, traffic accidents due to bad visibility, and increased liability exposure due to irresponsible or untimely lighting replacement. None of the preceding is advantageous for municipalities wanting to reduce energy use for environmental reasons and for energy savings cost. All of the preceding can be rectified by the use of LED lighting and an integrated networking system.

## Intelligent LED Street Lighting

Changing to the use of LED bulbs reduces a municipality's expense just on the light bulbs used from 30% to 80% for electricity consumption use alone. Many places in the world are still using the lighting solutions from the 1960's. These systems are energy wasting, electricity intensive, and contribute nothing but light to community life. Artificial lighting, especially at night, is an essential aspect of city life and a safe assurance for smaller municipalities. The use of such light impacts the sense of community safety and greatly influences business and tourism flow. Studies indicate that the current use of LED lighting worldwide is at 10% and that this figure will increase to 80% by the year 2020. Municipalities world wide are looking to reduce their energy costs, decrease environmental pollution, and obtain more saving resources within their budgets. They are also looking for alternative ways to use energy in smarter, better ways. Using LED lighting is moving into the direction of more efficient effective intelligent lighting solutions.

Intelligent LED Street Lighting has lower power consumption and immediate cost savings

LED lights have many advantages over traditional lighting. They can be switched on without a pre-heat or dim-to-full light capacity wait. LEDs turn on instantly. They can also be turned off many times and not have their on/off capacity compromised or fail. They have a very high lighting capacity and efficiency. The exceptional quality of LED lighting can be dimmed without a noticeable difference in the overall lighting. LEDs have lower wattage and still have enhanced lighting better than traditional bulbs. Combine this with their lower power consumption and immediate cost savings occurs. LEDs are hardy in that they are less sensitive to transient phenomena like weather changes. Finally, LEDs have a superior life span and in some applications can last twenty or more years thus savings on replacement costs, hardware, and maintenance related expenses. SunView LEDs have the highest lumens and the lowest wattage in the lighting market industry.

Although the price of a LED bulb is still more than a traditional street light bulb, the inherent benefits in using LEDs, overtime, enable a municipality to save money in several important ways. Lower electric usage cost, better management, less maintenance costs, and longer life spans offer a municipality a savings that could never be seen with traditional lighting. The small to vast amount of light bulbs needed for street light systems that waste energy at high electricity costs can be adjusted to environmentally clean and lower cost lighting solutions. The decision to simple change the type of light bulb used in a street lighting situation can save any municipality money and conserve energy. However,

there is more to this street lighting ability. The change to LED lighting is the first step to reducing energy cost and increasing energy conservation. It is also the first step to future interoperable applications.

A municipality can save money by changing their street lights to cost effective LED bulbs. Many municipalities are doing this primarily to gain these energy use savings and to eliminate toxic greenhouse emissions from traditional lighting. Because LED bulbs contain computer program ability, they can be used for much more than mere energy effective lighting. More efficient cost savings can be realized from utilizing a street lighting system with network systems that add alternative and additional energy cost savings, maintenance savings, and operation costs savings while improving the sustainable lifestyle and safety of the community it serves. The future of public lighting, the networking of street

lights, and the use of existing power line communication (PLC) as the connective system for a totally new adaptable network that links street lighting to many other beneficial resources for the community at an affordable cost is now within the ability and budget of many municipalities small or large.

**The life span of an LED bulb averages twenty years**

Because the life span of an LED bulb averages twenty years, network systems built using this technology can be assured of savings in years to come and allow for the full advantage of that technology use created by a municipality's needs and desires. Studies show that networked LED street lighting can save an additional 10% to 20% beyond the savings of replacing the bulbs to LEDs. This percentage is further increased by related savings in operational and maintenance costs associated with the networked management system. Welcome to Smart Street Lighting! We have come far from dumb lights on isolated poles connected by power line wires. Now, the ability to have intelligent computer programmable lights that can supply not just varying forms of light, but can contain and maintain other programmable abilities, on two way communication network systems enabled by interconnected poles that reach across a community collecting data and distributing it back for analysis and response is here to stay. The focus from simply lighting streets to keeping streets safe, keeping maintenance and operation costs down, and keeping data specific information directed for specific community cost saving use is the focus for Smart Street Lighting.

Traditional lighting systems need visual inspection by night workers who must be paid for the hours of searching for damaged or burned out bulbs. Smart Street Lighting (SSL) automatically reports problems with bulbs and targets exact location for immediate maintenance. Traditional lighting systems require mappings and paper files of work orders plus a system for management of replacement stock. SSL keeps an ongoing record of bulb usage, replacement time, bulbs available or needed to be ordered for replacement, proactive maintenance schedules, and plans for route repair directives. Traditional lighting burns at the same intensity for a set number of hours. SSL can be programmed to adjust to weather conditions, enhanced for problem areas or circumstances, set to blinking, adjusted for color, and dimmed according to traffic flow or night time activity. SSL can also have the potential to optimize emergency directive alerts at selected and necessary times.

Traditional lighting cost is usually controlled and estimated by a utility company and specific breakdowns of individual usage are not easy to render. SSL accurately calculates every aspect of consumption including the details of time, amount, varying rates, and individual users. Bills can also be automatically generated and sent based on that information. These abilities, and more, are directed by the operations center which is able to see into the workings of the system to predict problems, calculate usage, and avoid system failures. There are also alert check systems that activate when an individual lamp is

tampered with or altered without authorization. Because of this, electric energy theft, an expensive and difficult to identify energy waste concern, can be virtually eliminated. The most fascinating part of the Smart Street Lighting systems is remote management. These intelligent light lamp posts send their data information to a central command system, or operations center, constantly. There, this information can be controlled, adjusted, analyzed, manipulated, and researched which simplifies management overall, provides more comprehensive information, and makes maintenance more effective and less costly. These abilities enable the development of a total comprehensive interoperable system able to enter further into the SMART world stepping into Smart City applications and eventual alignment with Smart Grid systems. One of the other exciting aspects of the development of Smart Street Lighting is financial assistance in forms of local and national rebates and incentives to replace old energy wasting technology and encourage movement into the efficient internet based network.

SunView LED Lighting has designed the finest, updated, most efficient, energy effective bulb in the industry. APANET Green Systems Technology has devised the most energy efficient cost effective networking system utilizing power line communication (PLC) worldwide. Combining these two products and services allows a municipality to open themselves to tremendous savings now and into the future while simultaneously building a platform for network connections that can adapt as their needs change.

*Please download our informative Smart Lighting Technology Brochure for more detailed information. You can also download our Interoperability Brochure and our Sunview Company Overview Brochure from the 'Virtual Brochures' tab on the website.*



**USA: CORPORATE AND  
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