

# Siemens Response to RFQ Streetlights



# SIEMENS

*Ingenuity for life*

9225 Bee Cave Rd  
Building B, Ste 101  
Austin, TX 78733

[This page was intentionally left blank.]

**Contents**

- A. Covering Letter .....3
- B. Company Profile .....5
  - Executive Summary .....5
- C. Key Personnel.....9
- D. References.....21
- E. Approach .....22
  - 1. Audit .....22
  - 2. Financial Stability .....24
    - Financing Possibilities .....24
  - 3. Design .....28
    - Additional Energy Savings.....28
    - Improved Light Levels.....28
  - 4. Project Management .....29
    - Project Management Approach .....29
  - Triple Constraint: Cost, Time, and Scope=Quality .....31
  - 5. Technology Procurement .....33
    - a. Fixtures .....33
    - b. Smart Controls and Other Smart City Solutions .....33
  - 6. Installation & Maintenance .....34
  - 7. Construction Administration .....37
  - 8. Acquisition of Streetlights .....37
  - 9. Rebates/Incentives.....39
    - Siemens Rebate Process .....39
    - Ledger Adjustments.....40
    - Rebate Submittals .....40
- F. Value Added Services .....41
  - Public Relations.....41
  - Siemens Maintenance Options .....41
    - Spiridon Service Management Program.....42
- G. Additional Information .....44
  - Siemens and the Environment .....44
  - Siemens Invests in the Future of People.....45

[This page was intentionally left blank.]



## Intelligent Traffic Systems

Cities of Rockland, South Portsmouth and Biddeford and Town  
of Falmouth, Maine  
Attn: Nathan Poore, Falmouth Town Manager  
271 Falmouth Road  
Falmouth, Maine  
04105

Marcus Welz, ITS CEO  
Rajarshi Ghosh, ITS CFO  
Intelligent Traffic Systems  
9225 Bee Cave Rd, Building B, Ste 101  
Austin, TX 78733  
Address: (512) 837-8300  
Telephone: (512) 421-6617  
Fax: Marcus.Welz@siemens.com  
E-mail: Rajarshi.Ghosh@siemens.com  
Date: February 24, 2016

Mr. Poore;

Thank you for the opportunity to participate in the bid proposal process with the Communities of Rockland, South Portland, Biddeford and Falmouth. We appreciate the chance to earn your business and hope to enjoy a long working relationship with the Communities. At Siemens our goal is to provide the very best equipment, maintenance and support in the industry; allowing your citizens and guests to have as trouble-free and enjoyable experience as possible.

The primary contact person for this proposal shall be:

Clint Schuckel  
781-999-3008  
Clint.Schuckel@siemens.com

This response represents an accurate representation of Siemens and our capabilities to the Communities of Rockland, South Portland, Biddeford, and Falmouth, Maine in reference to your request for qualifications for the conversion of community street light system to LED fixtures and from utility owned to municipally owned and maintained fixture on utility owned poles. Siemens, Inc., Intelligent Traffic Systems presents our team as the most qualified to expeditiously and in the most cost-effective manner provide the following services for all four communities:

- Investment Grade Audit
- Lighting design, as described in our response
- Financial analysis to indicate ROI
- Savings and payback period details
- Completing applicable incentive applications
- Procurement
- Applying on behalf of the communities for available applicable grants and rebates
- Project management
- Streetlight LED conversion
- Recycling and/or disposal of waste materials
- Consultancy in regard to streetlight acquisition from utilities

Our project team will include the following firms:

- Siemens ITS
- Sebago Technics
- Enterprise Electric (Lisbon Falls, ME)
- Milliken Bros., Inc. (Portland, MA)

This submission contains our accurate representation of this project and the process in which we will fulfill the requirements stated in the communities' request for qualifications. Thank you once again for permitting us to compete for your business. We look forward to hearing from you in the future.

With kind regards,



Marcus Welz  
ITS CEO



Rajrashi Ghosh  
ITS CFO

Siemens Industry, Inc. Intelligent Traffic Systems  
9225 Bee Cave Rd  
Building B, Ste 101  
Austin, TX 78733

## B. Company Profile



### Executive Summary

Siemens has the experience, qualified and certified personnel, knowledge and understanding of this streetlight purchase and conversion project and the critical relationships to successfully bring the project to completion on time and in budget to the satisfaction of the 4 municipalities involved with the RFQ. We have carefully assembled a complete team of local and national resources to provide the turnkey services the Towns require for this project, from purchase/tariff consulting to LED fixture selection, to installation and maintenance.

### Siemens has the experience

Siemens' ability to undertake this project is evidenced by our team's depth of experience to successfully complete several large LED streetlight retrofits over the past two years, including two (completed) and one (active) project performed in a group procurement setting (35 municipal customers in total). In sum, we have retrofitted nearly 50,000 fixtures with LED technology in approximately 45 communities, many via performance contract. We are also the only ESCO that has self-performed retrofits giving us particular insight as to the nature of the work.

### Siemens has the personnel

At Siemens we employ only the finest Project Managers, Roadway Lighting Engineers, Field Technicians and Network Analysts. We pride ourselves on the high level on training, education and certification of all our team members. Our customers expect their projects to be managed in an excellent, innovative and responsible way, and this applies to all of our projects from large multi-million dollar projects all the way to smaller turnkey projects. Our project management processes and certifications are models for project management around the globe. Professional project management is a vital success factor for Siemens. We have been a project company since inception and currently we have over 15,000 certified project managers world-wide.

As a large, multi-billion dollar company, Siemens has a wealth of employees to draw from for our projects including our New England based team that focuses exclusively on streetlight retrofit projects. We do not operate with a handful of employees, stretched thin to populate our projects, but rather we pride ourselves on our strong team structure.

### Siemens has the knowledge and understanding of the project.

Siemens has implemented thousands of streetlight retrofits and over 1,500 guaranteed energy performance contracts. We also have successfully completed three very similar group

procurement projects with the Metropolitan Area Planning Council (MAPC) and Cape Light Compact. In sum, we have retrofitted nearly 50,000 fixtures with LED technology since 2013 in approximately 45 New England communities, many via performance contract. Previous and current New England projects are located in Connecticut, New Hampshire, Massachusetts, and Rhode Island. Our highly relevant experience working in multiple states and utility territories will directly benefit your project.

### Siemens has the relationships

Throughout our projects, our team has proven that we have the technical, financial, and contractual ability to assemble the right people and companies to implement these initiatives quickly and efficiently. For this project, we will team with local engineering firm, Sebago Technics, as well as local electrical contractors. All these factors combine to provide your member communities the full confidence that the Siemens team is amply qualified to successfully perform this work.



### Siemens ITS History

Siemens Industry is a division of Siemens AG. Siemens Industry, Inc. (SII) began operations October 1, 1979. With nearly 50,000 U.S. employees, the company is unmatched in the U.S. marketplace with its products, services and combined solution offerings.

Siemens acquired Automatic Signal/Eagle Signal Corporation in 1997, Gardner Transportation Systems in 2000, and Republic ITS, a U.S. leader in streetlight and traffic signal equipment installation, maintenance, and service in 2010 to enhance its presence in the intelligent traffic solutions (ITS) market in the USA. With these business acquisitions, along with our extensive dealer network, Siemens Intelligent Traffic Systems (ITS) business unit has the ability to solve streetlight and traffic management problems throughout the country and around the world.

### Siemens ITS Locations

Siemens ITS is headquartered in Austin, Texas at 9225 Bee Cave Rd, Building B, Ste 101. We currently employ 90 employees located in our Austin facility with an additional 200 in field offices around the country. Engineering of Intelligent Traffic System solutions, including the development of associated Intellectual Property (software products) are produced at our Austin headquarters. Siemens ITS also has a manufacturing facility in Marion, KY where our traffic controllers are made. Additionally Siemens has an office in **Maine at 66 Mussey Road, Scarborough, ME and employs 60 individuals there.** Additional nearby Siemens Industry office locations:

8 Progress Rd  
Billerica, MA

21 E Pearl St, Suite 2  
Nashua, NH

Two International Dr Suite 350  
Portsmouth, NH

1222 North St  
Burlington, VT

### **Our Successes**

Siemens' project history completing group procurements for streetlight retrofits in New England over the last 3 years provides a strong example of relevant experience and customer references. We would welcome the Towns to contact any municipal officials that have been involved with the work listed below to confirm that our customer service and professional competency was excellent, and we delivered each project on time and on budget:

- Metropolitan Area Planning Council (MAPC) Group Procurement #1:
  - 4 Boston, MA area communities
  - 8,000 streetlight fixtures
  - Construction: 2013 to 2014
  - Approximate value: \$3.0M
  
- Cape Light Compact, MA Group Procurement
  - 22 communities in Cape Cod, MA
  - 16,000 streetlight fixtures
  - Construction 2014 to 2015
  - Approximate value: \$6.2M
  
- City of New Bedford, MA
  - 10,000 fixtures
  - Construction 2014 to 2015
  - Approximate value: \$5.4M
  
- City of Manchester, NH
  - 9,000 fixtures
  - Construction 2015
  - Approximate value: \$3.3M
  
- Metropolitan Area Planning Council (MAPC) Group Procurement #3:
  - 9 MA communities
  - 18,000 streetlight fixtures
  - Construction: 2015 to 2016 (approximately 50% complete to date)
  - Approximate value: \$7.5M

### **Legislation, Standards, Grants and Rebates**

Our lighting expertise utilizes both in-house experts that exclusively focus on roadway lighting applications, and our partners in engineering firms and fixture manufacturers to supplement internal resources as necessary. As a result, we are familiar with the IESNA published standards as well as ongoing studies in the research community that will ultimately revise these standards. Siemens also stays current on the latest in fixture performance as new chip sets are introduced, and in the wireless controls market via frequent correspondence with manufacturers and their distribution networks.

In 2015, Siemens successfully secured over \$1.0M in incentive funds for our New England customers specifically for streetlight LED retrofits. These funds offset 15-25% of the customers' gross project costs. We diligently work to identify all potential grant/incentive sources, including creative means of maximizing these resources, and often provide technical assistance to our customers in application materials.

### Unique Technologies

The growth of the wireless industry has included streetlights applications, especially in the last two years, that can couple a "smart photocell" with a controls ready photocell receptacle on top of the fixture. The potential applications can be categorized as 1) lighting, 2) non-lighting, and 3) revenue applications.

- Lighting: real time monitoring, scheduled on/off, schedule dimming\*
- Non-lighting: Water meter reading, City cellular, video, gunshot detection
- Revenue: wifi capability for lease to telecomm companies

As Siemens is not a streetlight controls or lighting manufacturer, we can remain vendor neutral. We are well-positioned to provide the towns with the necessary data to determine which, if any, of the industry's best technologies are worth pursuing based on a cost/benefit analysis, and if not attractive at present, how to build-in future compatibility.

\*Requires acceptance by CMP for the Towns to realize associated energy savings.

### Municipal Operations and Maintenance Requirements

The Customer Service group within Siemens Mobility ITS was formed in the late 1990's when traffic signal LED retrofits became cost effective and municipalities in California and Massachusetts initially received the legislative authority to purchase their streetlights from the local electric utility. Since this time, we have converted and maintained hundreds of thousands of streetlights for dozens of communities across the US. Our Account Manager, Clint Schuckel, was in charge of streetlight maintenance for an 8,500 fixture municipal-owned system in Newton, MA for nearly ten years. During his tenure, the City conducted maintenance under both contract and in-house resources and completed a city-wide retrofit to reduce operating costs.



The combination of our company's 15-year+ streetlight maintenance experience and the public sector work history of our team members make Siemens uniquely knowledgeable in municipal operations and maintenance requirements.

## Experience with Streetlight Acquisition

Siemens has performed consulting services for a variety of communities across the US examining the feasibility of purchasing their streetlight systems from the local utility. This has given us diverse experience in working with various State legislative framework (or lack thereof) and utility procedures and requirements, which vary significantly. Specifically, we've analyzed streetlight system purchase, tariff changes, and cost/energy savings in the following States within the last three years:

- Massachusetts
- New Hampshire
- Connecticut
- California
- Nebraska

As one example of the work moving beyond just consulting services, we are about to begin LED streetlight installations in Cheshire, Connecticut where our scope of services included an examination of the purchase and conversion of the Towns 1,765 fixtures to LED. As part of our analysis, we completed separate payback calculations for the purchase, the conversion to LED, and then the combined payback.

## C. Key Personnel

Our Siemens project team consists of individuals who have worked together on tens of thousands of streetlight retrofits, are all New England-based, and each spend nearly 100% of their time focusing solely on streetlight LED retrofits. We have worked with Acuity on a number of retrofits, including Manchester and Derry, NH and Melrose, MA, a combined 13,000 total fixtures retrofit in the last year.

Our team member resumes listed below include the following:

- Siemens Contract Development and Consulting: Clint Schuckel, PE, Account Manager
- Sr. Applications & Energy Engineer: Richard O'Hearn, CEM
- David Spence, Project Manager (construction phase)
- Dan Reed, Field Foreman (construction phase)

Siemens believes that the strongest team for this initiative is one that combines our New England and national expertise with the development and utilization of Portland area talent, local knowledge, and resources. For these reasons, we reached out to the following local firms to discuss working together, with Siemens serving as general/prime contractor:

- Sebago Technics (South Portland-, ME based GIS consultant): Steve Sawyer
- Enterprise Electric (Lisbon Falls, ME-based electrical contractor): Jeff Kelly
- Milliken Bros. Inc (Portland, ME-based electrical contractor): Jeff Milliken

The scope of work for these firms would be determined at a later date as it would be entirely dependent on the Towns' requirements and preferences, the results of the purchase/conversion financial analysis, and the relative costs of CMP-performed work per review of the options described in the PUC October 7, 2015 approval.

**Resumes for key personnel follow this page.**

## Clint Schuckel

Account Manager

### Summary

Mr. Schuckel is the customer's single point of contact for Siemens LED retrofit street lighting projects, ensuring the best possible outcome for our clients. Prior to becoming an Account Manager, Clint served as an Energy Engineer for approximately 25,000 LED streetlight conversions in nearly 30 Massachusetts municipalities since joining Siemens in 2012.

As an Energy Engineer, Clint provided technical support to these efforts by completing the design and energy analysis for outdoor lighting projects, securing the maximum available utility rebates on behalf of customers, facilitating the purchase of street lights from the local electric utility, and providing engineering assistance for traffic signal projects. As a former municipal official who for nearly a decade was responsible for the maintenance of thousands of street lights and traffic signals and led related energy efficiency efforts, Clint understands the many components of city and town infrastructure energy efficiency projects that result in favorable public reaction, significant financial cost and energy savings, and the successful completion of contracts on schedule and budget.

### Education

Bachelor of Science, Civil Engineering/Municipal Program, University of Michigan  
Master of Science, Civil Engineering/Transportation Program, Texas A&M University

### Employment History

#### 2012 - Present

Siemens Industry, Inc.

2013-Present, Account Manager

2012-2013, Senior Project Engineer

Responsibilities include:

- Primary contact with customer
- Siemens interface for contractual and finance issues
- Assist with time schedules
- Assist with documentation

#### 2003 -2012

Director of Transportation Division, City of Newton DPW, MA

#### 2010 – 2012

Senior Project Manager, GLS/Alliance Energy

## 2002 – 2003

Transportation Engineer, Howard/Stein-Hudson Associates

## 2000 – 2002

Civil/Transportation Engineer, Vollmer Associates LLP

## 1997 – 2000

Project Engineer, Bellomo-McGee Inc

## 1996 – 1997

Research Assistant, Texas Transportation Institute

## Reference Projects

### City of Manchester Street Light Conversion

**Role:** Account Manager

**Project Details:** Street light conversion and maintenance contract for 9,000 lights

**Completed:** Active contract

### City of New Bedford Street Light Conversion

**Role:** Account Manager

**Project Details:** Street light conversion and maintenance contract for 10,000 lights

**Completed:** Active contract

### Cape Light Compact Street Light Retrofit

**Role:** Account Manager

**Project Details:** Streetlight retrofit for 8,100 lights for multiple cities

**Completed:** Active Contract

## Certifications

- Professional Engineer (Massachusetts – Civil #45080)
- Professional Traffic Operations Engineer (ITE – #1036)
- Roadway Lighting Fundamentals and Analysis, LightFair Institute
- IMSA Work Zone Safety, Traffic Signal Technician II
- Roadway Lighting I, Traffic Signal Inspector

## Richard O'Hearn Jr., CEM

Senior Energy Engineer

### Summary

Mr. O'Hearn has over 7 years in the roadway lighting industry, focusing on turnkey & energy efficiency projects on the national level. He has acted as a consultant for a joint venture between the U.S. Dept. of Energy & the National Renewable Energy Labs, as the industry expert in roadway lighting data collection. Since joining Siemens Mr. O'Hearn has been involved in numerous energy analysis projects and has added rich value and expertise to each opportunity he has been assigned.

### Education

Post-Bachelors Program, Accounting; University of Massachusetts Dartmouth  
Bachelor of Science, International Business; Massachusetts Maritime Academy

### Employment History

#### 2014 – Present

Energy Engineer, Siemens Industry, Inc.

Responsibilities include:

- Utility analysis
- GIS data oversight
- Luminaire selection
- Energy calculations
- Utility bill adjustments
- Rebate calculations & applications
- Energy Assessments
- Investment Grade Audits
- Project Energy Management
- Guaranteed Energy Savings Analysis and Management

#### 2014 – 2014

Program Manager, Lighting Solutions, ConserVision Energy

#### 2012 – 2014

Sr. Project Manager, Phillips Lighting

#### 2007 – 2012

Applications Engineer, Speclines

### Reference Projects

#### City of Manchester Street Light Conversion

**Role:** Energy Engineer

**Project Details:** Street light conversion and maintenance contract for 9,000 lights

**Completed:** Active contract

### **City of New Bedford Street Light Conversion**

**Role:** Energy Engineer

**Project Details:** Street light conversion and maintenance contract for 10,000 lights

**Completed:** Active contract

### **Cape Light Compact Street Light Retrofit**

**Role:** Energy Engineer

**Project Details:** Streetlight retrofit for 8,100 lights for multiple cities

**Completed:** Active Contract

## **Other Experience Relevant to this Project**

AutoCAD, Lighting Design, Project Management, Facility Simulations

## **Certifications**

Certified Energy Manager (CEM), Association of Energy Engineers; 3/2013

AGi32: Emphasis on Roadway Lighting & Design, Lighting Analysis; 3/2010

## **Professional Associations**

Plymouth Energy Committee (Plymouth, MA), Committee Member; 6/2013 - Current

## David Spence

Senior Commercial Project Manager & Technical Project Manager

### Summary

Mr. Spence has over 17 years of experience with Siemens in Technical and Commercial Project Management and Material Handling, Infrastructure, Traffic Solutions, and Energy Solution projects. He is experienced in Customer Service and Customer Relationships. Mr. Spence has managed installation teams ranging from 12 to 60 employees and is an expert in financial analysis and controls on customer projects.

### Education

Master of Science in Business, Accounting; University of Phoenix

Bachelor of Science in Business, Accounting; University of Phoenix

Associate's Degree, Contract Management; George Washington University

### Employment History

#### 1997 – Present

Siemens Industry, Inc.

2014-Present, Senior Commercial Project Manager & Technical Project Manager

2010-2014, Senior Project Manager

2007-2010, Commercial Project Manager

1997-2007, Project Manager

Current responsibilities include:

- Manage all aspects of the construction phase of projects
- Manage financial aspects, including timeline, deadlines, and financial obligations
- Manage project schedules
- Supervise and manage all third parties, including subcontractors and suppliers
- Supervise and manage all project team members as they relate to the current project
- Ensure projects are completed on time and in budget

### Reference Projects

#### City of Manchester Street Light Conversion

**Role:** Commercial Project Manager and Technical Project Manager

**Project Details:** Street light conversion and maintenance contract for 9,000 lights

**Completed:** Active contract

#### City of New Bedford Street Light Conversion

**Role:** Commercial Project Manager

**Project Details:** Street light conversion and maintenance contract for 10,000 lights

**Completed:** Active contract

### **Cape Light Compact Street Light Retrofit**

**Role:** Commercial Project Manager

**Project Details:** Streetlight retrofit for 8,100 lights for multiple cities

**Completed:** Active Contract

### **Other Experience Relevant to this Project**

Electrician and Electronic Controls Technician, US Navy trained

Certified Classroom Instructor, US Navy trained

MS Project, MS Office, SAP

### **Certifications**

Project Management Professional, Project Management Institute; May, 2006

PM3@Siemens, Siemens Project Management Excellence, September 2007

Certified Manager, Institute of Certified Professional Managers; October 2013

## Dan Reed, Field Supervisor

---

### Experience Summary

Dan has led Siemens LED retrofit crews for the installation of nearly 25,000 LED streetlights in Massachusetts within the last year. He supervises and trains electricians to quickly become proficient at the task of completing LED streetlight retrofits in a safe and efficient manner and has personally completed thousands of LED installations.

### Experience

- Lead Streetlighting Technician, Siemens Industry, Inc./Republic ITS, 2006 – Present
- Journeyman Electrician, Kinsman Electrical Services, 2005-2006
- Owner, Capital Wiring Specialists, 1999-2005
- Journeyman Electrician, Commercial Electrical Contractors, 1996-1999
- Journeyman Electrician, Paul's Electric Inc., 1994-1995
- Journeyman Electrician, Lighting Care Co. Inc., 1989-1994

### Licenses

- CT Contractor License # ELC.0185664-E1
- MA Master License # 17195A
- MA Journeyman License # 35636E
- ME Master License # MS40089206
- NH Master License # 10650M
- RI Journeyman License # B-011925
- RI Master License # A-004113
- VT Master License # EM-4167



## Education:

University of Maine, Orono, ME  
Bachelor of Science,  
Civil Engineering, 1973

## Registrations:

Professional Engineer:  
Maine #3736  
New Hampshire #05122  
Vermont #4040

## Memberships:

American Society of Civil Engineers

Maine Institute of Transportation  
Engineers

Maine Better Transportation Association,  
Board of Directors and President

## Training:

Traffic Signals Design and Operation  
Workshop, Electric Light Company,  
2010, 2011, 2012, 2013, 2014 and  
2015

BlueTOAD and Dynaflo Workshop,  
TrafficCast, 2010

Adaptive Traffic Signal Design Workshop,  
Naztec, 2011

Mr. Sawyer has over 40 years of broad-based experience in the transportation field, including route location/planning studies, preparation of contract documents (PS&E), and on-site construction administration. He possesses creative management capabilities and is skilled at making persuasive public presentations that build consensus on difficult issues. He has led many large complex technical teams that have successfully left their mark on the northern New England landscape. Currently, projects include the replacement of the Sarah Mildred Long Bridge, between Kittery and Portsmouth, and the replacement of the I-91 bridges over the West River in Brattleboro, VT.

## Selected Project Experience

- **Street Light GIS Mapping** - South Portland, ME
- **Replacement of Sarah Mildred Long Bridge** - Kittery, ME & Portsmouth, NH
- **Thornton Heights Complete Street** - South Portland, ME
- **William Clarke Drive Improvements** - Westbrook, ME
- **Maine Street Traffic Improvements** - Brunswick, ME
- **Main Street Multi-use Path** - South Portland, ME
- **Rochester Street Reconstruction** - Berwick, ME
- **I-91 Brattleboro Bridge Project** - Brattleboro, VT
- **Downtown Transportation Improvement Plan** - South Berwick, ME
- **City-Wide Advanced Traffic Management System** - Dover, NH
- **Broadway Traffic Signal Upgrades** - South Portland, ME
- **Maine Mall Traffic Signal Operations** - South Portland, ME
- **Upper Route 1 Safety and Environmental Improvements** - Kittery, ME
- **Route 1 Traffic Signal Improvements** - Kennebunk, ME
- **Exit 3, I-295 Improvement Study and Design** - South Portland, ME
- **Portland Intermodal Transportation Center** - Portland, ME
- **Routes 1/3 Traffic Signal Operations** - Ellsworth, ME
- **Bicycle/Pedestrian Improvement Study** - Kittery, ME
- **Downtown Traffic Circulation Study** - Orono, ME
- **On-Call Traffic Engineering Services** - South Portland, ME
- **Cummings Road Reconstruction** - South Portland and Scarborough, ME
- **Concord Coach Lines Bus Terminals** - Augusta, ME and Lebanon, NH

In 2008, Steve was instrumental in the development of a specific traffic signal systems operational practice within the firm which is quite unique to our industry. Current clients include South Portland, ME; Ellsworth, ME; Dover, NH; and Kennebunk, ME. As part of these assignments, Sebago engineers are providing daily monitoring and management of these systems via remote access to ensure their optimum efficiency.

Under Steve's leadership the firm has broadened its transportation geographic presence beyond Maine's borders. In 2014, NHDOT selected Sebago for a multi-year on call statewide contract for traffic engineering. In 2015 VTrans selected Sebago for a multi-year on call statewide roadway and traffic engineering contract.



### Education:

University of Maine, Orono, ME  
Bachelor of Science,  
Survey Engineering, 1992

### Registrations:

Professional Land Surveyor:  
Maine #2316

### Certifications:

GIS Professional (GISP):  
#67994

### Memberships:

Former Member of the Legislative  
Working Group on Maine's Freedom of  
Access Laws, (Fall 1995)

Maine Library of Geographic  
Information Board, Chairman,  
appointed by the Maine Speaker of the  
House of Representatives (2002-2005,  
2008-Present)

### Awards:

Public Works Director's Commendation  
(July 2005)  
Public Works Employee of the Month  
(Oct 2004)  
Police Department Commendation  
(2004)  
Corecipient of Public Works Team Award  
(2002)

Mr. Giles has more than 24 years of experience in the field of survey and mapping. Jon is a certified GIS Professional (#67994) through GISCI. Since 2007, Jon has been the GIS Manager for Sebago Technics' GIS Team overseeing the integration of field collected data, tabular data, and mapping data into GIS applications for our municipal and utility clients. He is also a licensed surveyor in the State of Maine, he has performed boundary, engineering, topographic, GPS control surveys, legal research, and right-of-way services, specializing in the creation of GIS facilities data for public, private, and utility clients.

Starting in 2007 Jon began assisting Verizon Communications in Maine, now FairPoint Communications, with on-going, statewide mapping services including utility poles and underground communication lines. This work continues to the present. In addition to the FairPoint project, Jon was responsible for a large GIS mapping project detailing the location of underground utilities on the former Loring Air Force Base in northern Maine for Maine Public Services (now Emera).

Sebago Technics' GIS Team has provided mapping services to over a dozen Maine and New Hampshire communities for the last decade. Our GIS Team has completed natural resources, zoning, utility, shorezone, tax map maintenance, and parcel mapping projects for several Maine towns including: Lewiston, South Portland, Portland, Ellsworth, Waterboro, Raymond, Andover, Starks, and Poland.

As GIS Manager, Jon has also overseen the mapping and data collection of several large sanitary and storm sewer systems in Maine, including Ellsworth, South Portland, and Lewiston. In these projects he has been deeply involved with data collection methods, schema development, data processing, and final GIS data deliverable production.

Previously, Mr. Giles served as Vice President of an aerial mapping and GIS consulting firm where he managed the firm's survey, GPS, and GIS related work. He conducted sales of aerial mapping projects throughout New England. During his career with the City of Portland, he served as GIS Coordinator. Jon supervised the planning, implementation, and development of a large municipal GIS system and also has extensive experience with software maintenance, data collection, data and software purchasing, GIS data conversion, contract management, and coordinating inter and intra departmental projects.

As Sebago Technics' GIS Manager, Mr. Giles has been integral in the application of GIS and data collection technologies on the company's GIS Team.

### Presentations & Publications:

"Map Accuracy for GIS Practitioners", Presenter at the New England URISA Workshop, Portsmouth, NH, November 2008.

"Imagery for the Land Surveyor", presenter at the Maine Society of Land Surveyors Annual Meeting, Rockport, ME, February 2007.

"Clearing Up the Cloudiness, How to Take Advantage of the Maine Orthophoto Program", presenter at the Maine Municipal Association's Technology Conference, Augusta, ME, March 2006.



**M**s. Quintal joined Sebago Technics in 2014 as a Digital Mapping Technician providing GIS and survey support to our surveying and engineering staff. Ms. Quintal has a graduate's certificate in Geographic Information Systems (GIS) from the University of Southern Maine and is a board member of the Maine GIS Users Group.

Prior to joining Sebago Technics, Ms. Quintal was employed by Blue Marble Geographics (BMG) in Hallowell, Maine. Ms. Quintal provided support and training to a world-wide audience including data management best practices, the integration of GIS into existing workflows and systems, the optimization of routine tasks, and the creation of meaningful datasets for use in both the private and public sectors. BMG specializes in highly accurate coordinate conversion software packages including the Geographic Calculator and Global Mapper software lines.

As a part of her graduate work in GIS, Ms. Quintal collaborated with the Androscoggin Emergency Management Agency to develop flooding evacuation maps for the Cities of Lewiston and Auburn, Maine. The pre-flooding analysis used geospatial data including LiDAR, 2010 census population statistics, and locally collected historical flooding data to identify tiered evacuation zones to assist with the allocation of limited resources. Her work was recognized at the State level and presented at the Northeast GIS Arc User Conference in 2012. Ms. Quintal's expertise in LiDAR provided her with the opportunity to present at the Annual Meeting of the American Society of Photogrammetry and Remote Sensing in Louisville, Kentucky in March of 2014. Her presentation covered the processing and analysis of LiDAR point cloud data including terrain surface modeling, contour generation, watershed delineation and the calculation of cut and fill volumes.

### Education:

University of Southern Maine,  
Graduate Certificate in Applied Geographic  
Information Systems

University of Maine at Farmington,  
Bachelors of Art in Business Economics

### Registrations:

Pursuing Maine Land Surveyor in Training (LSIT)  
Notary Public

### Presentations:

Maine Society of Land Surveyors (MSLS) Spring  
Meeting 2015: Google Earth Pro for Land  
Surveyors

American Society of Photogrammetry and  
Remote Sensing (ASPRS), Louisville, KY: LiDAR  
processing and Terrian Analysis

Northeast Arc Users Group Conference 2012:  
Flood Evacuation Planning: A collaboration  
between academia and local government

### Organizations & Committees:

Maine GIS Users Group: 2012- Current

Urban and Regional Information Systems  
Association (URISA): 2012- Current

Community Emergency Response Team:  
2010- Current

Town of Sabattus Budget Committee: 2009-  
2012. Chairperson: 2010-2011

Town of Sabattus Technology Advisor Committee:  
2010-2011

### Representative experience:

#### Street Light Inventory - City of South Portland, ME

Ms. Quintal completed the design and analysis of a street light inventory project for the city of South Portland. The project included the analysis of existing utility pole GIS data provided by the city combined with light fixture details provided by Central Maine Power. The combined datasets created an interactive map representing light fixture type, wattage and costs associated with each utility pole. The geospatial data was used to calculate operational cost savings and return on investment to for the City to convert leased street lights to new energy efficient L.E.D. owned by the City.

#### Signalized Intersection Geodatabase - City of South Portland, ME

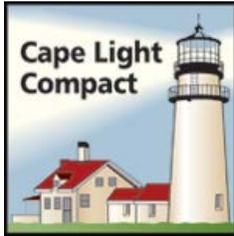
The City of South Portland requested the services of Ms. Quintal and the Transportation Engineers expertise at Sebago Technics to build a GIS database containing information for each of the signalized intersection within the city. The database includes attribute information such as control brands, type of pedestrian signaling and location of vehicle detection equipment, for example, for each of the 40 signalized intersections. Field inspections and existing plans where complied to create the database. PACTS, the Portland Area Comprehensive Transportation System, is using this dataset as a model for surrounding towns to building a comprehensive inventory to facilitate best traffic management systems in the region.

**LIDAR** - LiDAR data is a 3 dimensional point cloud that captures ground surface elevation as well as building and vegetation heights. Specialize software tools and technology are used to extract terrain models and feature dimensions to assist with the creation of existing condition plans. Ms. Quintal experience in both LiDAR and survey allows for the creation of highly-accurate models with reduced time in the field.

#### Survey Crew Member

Ms. Quintal is a part of the survey team and performs topographic surveys, Construction layout, boundary survey, and data collection using traditional survey equipment, GPS and High-definition scanning.

## D. References



### Cape Light Compact

Project Description: LED Streetlight Retrofit of ~16,000 fixtures in 23 towns and fire districts

Contact: Kevin Galligan, Program Manager

Address: 3195 Main St.

Barnstable, MA 02630

Phone number: 508-375-6444

Email address: kgalligan@galliganenergy.com



### New Bedford, MA

Project Description: LED Streetlight Retrofit of ~16,000 fixtures

Contact: Scott Durkee, Director of Energy Office

Address: 133 William St.

New Bedford, MA 02740

Phone number: 508-961-3014

Email address: SDurkee@newbedford-ma.gov



### Manchester, NH

Project Description: LED Streetlight Retrofit of ~9,000 fixtures

Contact: Christopher Proulx, Public Utilities Coordinator

Address: 475 Valley St.

Manchester, NH 03103

Phone number: 603-624-6444

Email address: cproulx@manchesternh.gov

## E. Approach

### 1. Audit

The Audit portion of the project would be performed by our partner, Sebago Technics. The below audit information comes directly from them.

The audit report is intended to assist decision makers in determining the best approach for replacing the participating municipalities existing unmetered street and outdoor lighting with more efficient LED technology. Maine State Law dictating transfer of ownership of residential street lighting took effect in October 2014. This new law gives communities the option to upgrade fixtures to reduce energy usage and cost as well as operational and maintenance cost. An analysis of information gathered from multiple sources will be performed during the preparation of the audit report.

The audit report will include:

- 1) The creation of a Geographic Information System dataset, delivered as an Esri Shapefile and Excel Spreadsheet, including the location and attribute information associated with the lighting fixture
- 2) Location of deficiencies in the current street lighting network
- 3) Baseline energy use, energy cost and operations & maintenance
- 4) Estimated retrofit energy use and operations & maintenance costs
- 5) Estimated sources of funding, including rebates
- 6) Calculation of estimated total conversion cost (remaining design tasks, product, and installation), energy reduction, and simple payback

The audit process will be a multi-step process including data acquisition, reconciliation, analysis and estimations.

#### **Data Acquisition:**

The construction of the Geographic Information Systems (GIS) inventory will be performed using three types of data acquisition; Existing, Digitized and Field Collected. Utilizing multiple data sources will help to reduce the cost to create the GIS inventory and increase the accuracy of the data.

#### ***Existing Data-***

The State of Maine has an abundant data catalog of high quality, authoritative GIS datasets that can be used to facilitate the asset inventory portion of the audit, such road centerline mapping including road naming. Sebago would propose to use State GIS data layers such as road centerlines when better alternatives are not available for the 4 municipalities themselves.

In addition to the State Data, each participating municipalities will be asked to provide any Geographic or non-Geographic data that may assist in the creation of the inventory.

#### ***Digitized Data-***

There are many publicly available imagery data sources such as Google Earth & Google Street View, Bing Maps & Bing Streetside, and high resolution State acquired orthoimagery. These imagery sources vary in the date of collection, resolution and geographic accuracy. Each imagery sources contains an amount of relevancy in regards to this project. The expertise in the Sebago Technics GIS department will be leveraged to determine the use and appropriateness of each dataset for the creation of asset location data of utility pole and pole numbering (where possible). An in-office digitization process will facilitate faster dataset creation, which will reduce costs by reducing the amount of time spent in the field.

#### **Field Collected Data-**

Prior to the start of field collection, an analysis will be conducted to determine areas of greatest need (location with little to no existing information or inadequate imagery for digitizing). A field collection schedule will be established based on the number of field crews, location and estimated time to complete each section. Roads and neighborhoods will be the bases of collection areas. Each crew will be tasked with specific areas and provided with equipment for efficient data collection.

#### **Attribute Information:**

The greatest value in the GIS data is in the attribute information associated with each lighting fixture. The following attribute information will be collected for each lighting fixture:

<b>Attribute</b>	<b>Description</b>	<b>Example</b>
Object ID	Unique numerical value assigned to each data point	1000, 1001, 1002....
Northing	State Plane System	332553.73
Easting	State Plane System	2927365.34
Street Name	The Street Name per the State of Maine Next Generation 911 system	Cook Rd
Pole Number	As shown on pole and as stated on Ledger	64/ 3, 64/ 3: to Match ledger format as close as possible
Utility Description	Asset as described by Utility	SL-SE-0050: to match utility inventory as close as possible
Style	General Description of asset	Cobra Head, Flood Light, Other
Lamp	Type of technology in use based on NEMA labeling of asset	Sodium Cutoff, Sodium Enclosed, Sodium Post-top
Wattage	Power Consumption based on NEMA label	0070, 0100, 0250
Ledger Status	Reconciliation status based on a comparison between the Ledger and collected data	Match (M), Match Assumed (MA), Removed ( R), Not-Matched (N)

Audit	Issues found with pole, utility or light	Rewire (U)= Utility to rewire, Not in Inventory (A/C/U), Addition Action needed
Comment	Notes detailing condition, scope or other characteristics/ status of location	AB@AUDITFIRM: NO FIXTURE ON ARM, RO@SIEMENS: OUT OF SCOPE
Imagery		Image of light fixture, when necessary

**Data Format and Precision:**

The geographic precision of the location of each light fixture will be sufficient to determine which side of the road the fixture is secured from and the left/ right direction as relative to local features such as driveways & nearest utility pole.

**Reconciliation:**

After the data collection phase, data will go through a reconciliation stage with regards to the ledger, as provided by either the customer or utility company. The primary matching attribute between these two sets of data will be the pole number, since this is a unique identifier within both data sets.

**2. Financial Stability**

**Financing Possibilities**

Within Siemens, financial considerations are integrated alongside other aspects of the project development through our financing arm, Siemens Financial Services (SFS). SFS is a provider of advisory and financing solutions for our customers. Leveraging Siemens’ global footprint, SFS finances infrastructure, equipment, working capital needs, as well as acting as a manager of financial risks within Siemens. The combination of financial and industry know-how forms the basis of our knowledge in both Siemens’ core markets and related industries.



SFS offers a comprehensive range of customized, needs driven asset financing and leasing solutions to organizations of all sizes requiring financing for equipment or services from Siemens. Our customers range from large international corporations, municipalities, and public-sector entities to small, privately owned firms. With more than 2,600 employees, financing experts worldwide, and a financing supported project volume of approximately \$53 billion, SFS considers itself well-prepared to address our customers’ financing needs. In particular, SFS has executed more than \$1.5 billion in performance contracts and helps our partners execute hundreds of millions of dollars in performance contracts each year. We have substantial

experience in arranging financing for our partners' projects, either through their own balance sheet or through our large network of relationships with banks and capital market investors. This experience, as well as our knowledge of the markets, has enabled our partners to entertain a broader scope of financing options.

As relevant examples for this project, we have provided financing to the following streetlight retrofit projects in New England over the last 3 years, all of which are similar in size to the four communities represented in this RFQ:

- Natick, MA (2,400 fixtures)
- Winthrop, MA (1,200 fixtures)
- Gloucester, MA (2,850 fixtures)

We have attached additional information about Siemens Financial Services on the next two pages.

[usa.siemens.com/finance](http://usa.siemens.com/finance)

# Answers for Mobility Management

Energy Efficiency Solutions financed by Siemens Financial Services

**Siemens Financial Services can facilitate your municipality's investments in energy efficiency**  
You already recognize that investing in energy efficient street light equipment makes sound business and environmental sense. What if the project could pay for itself, with financing payments offset by anticipated energy savings?

Siemens Financial Services (SFS) can help finance your investment in green energy efficient solutions from Siemens Mobility.

- **Get your streetlights converted to LED without upfront capital investment**

Our financing model is designed so that anticipated multi-year energy savings match or exceed your payments, in certain cases providing excess savings which you may reallocate to expand the scope of a project or bring forward other essential capital projects.

Project implementation costs and capital investments are anticipated to be payable through the savings expected from lower energy consumption and operational costs reductions over the contract period.

- **Overcome budget constraints**

With a flexible financial solution to meet your individual needs. We aim to provide a self-funding project that does not require grants, funding or other capital allocation.

- **Keep it simple**

Improve cash flow, forecasting, and budgeting, by setting up predictable monthly payments.

- **Combine Siemens capabilities**

Utilize SFS' expertise in municipal and industrial financing, while Siemens Mobility ensures sound project execution, maintenance and equipment performance.

**What sets us apart?**

At SFS, we understand the difficulties city managers face when deciding on new investments or necessary upgrades with limited funds available in public coffers. Legal requirements, fluctuating and often unpredictable public income and the wish to please the voting public all shape fiscal planning. SFS and Siemens deploy their joint experience and deep understanding of mobility technology and finance to match the solution to your individual requirements.

Our focus on the mobility sector is driven by a dedicated team of financing professionals, who understand the unique challenges Siemens customers face. We offer easy processes that make it convenient for you to do business with us.

**Answers for mobility.**

## Products and solutions for Mobility projects

In addition to the **financing attached to Siemens Mobility's energy efficiency solution**, we offer various options to enable investments in innovative technology and sustainable infrastructure through efficient financial solutions. These include:

- **Asset Finance** over the entire lifecycle of essential use equipment for all, or a major portion, of the project, which may include existing assets as well as additional capital purchases in relation to the project.
- **Tax-exempt Lease Purchase** options including tailored and tax-exempt leases to meet your specific requirements. Leasing allows the municipality to control the timing of payments and eases its budget forecast. Fixed rates at inception in a relatively low rate environment provides for predictable and affordable financing. Additions and upgrades can be accommodated flexibly. The installments on such lease purchase can also track closely expected savings to be delivered through the Siemens contract.
- **Structured Loans (fixed or floating rates), Project Finance & Equity Participations:** Leveraging our in-depth project finance expertise, the Infrastructure Finance team within SFS supports the capital needs of developers and investors in infrastructure and Public-Private Partnership (PPP) projects in the United States and Canada. Whether your needs are to finance the construction and operation of a new infrastructure project or the acquisition of an existing infrastructure asset under a long-term concession, SFS can provide a customizable suite of solutions to meet your financing needs. Our financial strength enables us to structure, underwrite and hold significant amounts of senior debt as well as to provide non-senior forms of capital, including equity.

Eligible customers include public agencies and municipalities. Financing options would be subject to appropriate State statutes. All financing transactions are subject to, among other things, satisfactory due diligence, credit and other approvals and completion of documentation acceptable to SFS. In financed transactions, Siemens Mobility typically provides the maintenance services over the term of the contract to ensure optimal performance.

## Getting started

If you are interested in the financing of your energy efficiency investment in Siemens Mobility solutions, please contact your Mobility Sales representative or SFS representative:

Eliacid Heredia Pizarro

+1 (732) 590-2593

[eliacid.heredia@siemens.com](mailto:eliacid.heredia@siemens.com)

### About Siemens Financial Services (SFS)

Siemens Financial Services, Inc. (SFS) is the U.S. arm of the global Financial Services unit of Siemens, which is an international provider of business-to-business financial solutions. SFS helps facilitate investments, providing commercial finance, project and structured finance with specific asset expertise in the energy, healthcare, industry, and infrastructure & cities markets. Employing more than 2,900 employees worldwide, SFS supports Siemens as well as other companies with their capital needs and acts as an expert manager of financial risks within the Siemens Company. By leveraging our financing expertise and our industrial know-how we create value for our customers and help them strengthen their competitiveness. Beyond that, financing is key in creating trust for technological solutions – and acts as a key enabler when it comes to the market launch. As of September 30, 2013, the total assets amounted to approximately \$ 25.3 billion. For more information, visit: [www.usa.siemens.com/finance](http://www.usa.siemens.com/finance).

*DISCLAIMER: Siemens Financial Services, Inc. ("SFS") is not recommending any action. SFS is acting for its own interests. SFS is not a registered municipal advisor and is not subject to any of the fiduciary duties imposed on municipal advisors. Without limiting the generality of the foregoing, SFS is not an advisor to, or fiduciary of, any obligor or prospective obligor with respect to any transaction or any of the discussions, undertakings, and procedures leading thereto, or any information or material provided in connection therewith. Obligors and prospective obligors should consult their own legal, financial, and other advisors, as deemed appropriate, before taking any action regarding any transaction, all matters related thereto, and any information or material provided in connection therewith. The content of this brochure does not represent an offer or commitment by SFS to enter into a financing transaction and does not create any obligation for SFS.*

Siemens Industry, Inc.  
498 Seventh Avenue, 16th Floor  
New York, NY 10018

212.672.4000

Subject to change without prior notice  
Order No.: RCM-BRO-0010  
Printed in USA  
© 2014 Siemens Industry, Inc.

The information provided in this flyer contains merely general descriptions or characteristics of performance which in case of actual use do not always apply as described or which may change as a result of further development of the products. An obligation to provide the respective characteristics shall only exist if expressly agreed in the terms of contract.

All product designations may be trademarks or product names of Siemens AG or supplier companies whose use by third parties for their own purposes could violate the rights of the owners.

[usa.siemens.com/finance](http://usa.siemens.com/finance)

### 3. Design

One stage impacted by the data collected is the design stage, where Siemens will work closely with local personnel – including Town officials and police – to identify areas where improvements to the system can be made. There are two drivers for improvements: additional energy savings and improved light levels.

In past projects the majority of each project is based on the approach that a roadway lighting conversion is a **one-for-one energy conservation measure (ECM) under the assumption that the customer is generally satisfied with existing light levels**. For this majority, Siemens fixture selection approach is based on the perceived lumen methods, created by the Lawrence Berkley National Laboratory in July 1995<sup>1</sup>, which has allowed Siemens to maximize energy savings for customers without sacrificing the quality of the lit environment. While energy savings is a driving factor for a system conversion, Siemens believes that a properly lit environment is as equally important as the energy & cost savings LED brings to the customer.

#### Additional Energy Savings



Recognizing that not all projects are the same, there are always isolated populations of assets where this approach is not appropriate, and additional efforts need to be made to make sure the lit environments are not being sacrificed. A well-planned vetting process used to identify these locations is used. One of the most important elements of this process is the inclusion of local individuals and groups who know the community best. By incorporating the input

from these individuals & groups, Siemens performs a design stage – as described below – to try to maximize the qualitative value of each project.

A visual inspection of the data collected is a great method for identifying areas where additional energy savings can be achieved. Siemens will provide an online web based map for others' use to review in a collaborative manner. By identifying locations where the existing wattage(s) are not consistent with the others found on the same roadway, Siemens will ask the important question "Does this make sense?" In working with local personnel, Siemens will identify why these locations derive from the standard along that roadway. In some instances, these are locations that light intersections and pedestrian walkways, but in others it is simply a matter of an outdated infrastructure that can be improved. In these instances, Siemens will bring more consistency to the system, which can result in both additional energy savings and/or improved light levels.

#### Improved Light Levels

Siemens will also work closely with the community to identify areas where improvements to the lit environment can be made. This includes areas with high rates of vandalism/crime or pedestrian or vehicle accidents, or roadways where the geometry has changed in recent years

<sup>1</sup> Reengineering of Lighting Photometry, S.M. Berman, LBNL-42327-L-213

without an adjustment to the existing lighting. In these instances, Siemens will run the proposed system through a photometric analysis, in an attempt to achieve or get as-close-as-possible to IESNA recommended practices in reference (but not limited) to **RP-8-14 Roadway Lighting**, **RP-20-14 Lighting for Parking Facilities**, **RP-22-11 Tunnel Lighting**, **DG-19-08 Design Guide for Roundabout Lighting**, and **G-1-03 Security Lighting for People, Property, and Public Spaces**.

In many instances, achieving IESNA recommended environments requires time- and money-consuming activities like adding/removing/moving locations – including overhead distribution poles – which can sometimes interfere with other below-grade infrastructure. Nevertheless, the final design that can achieve IESNA recommended practices will be delivered to the customer for future improvements, if those improvements are not feasible at the time of the conversion.

#### 4. Project Management



Our project team is 100% New England-based, has worked together on 2 large streetlight retrofit group procurements (MAPC-3 and Cape Light Compact), and several other municipal retrofits that each consisted of 1,000 to 10,000 streetlights. We have also worked together in 3 New England states where purchase legislation was passed in previous years and these projects occurred in various utility territories. This experience will be critical to the success of this “first out of the gate” group procurement in the State of Maine.

##### Project Management Approach

At Siemens we employ only the finest Project Managers, Engineers, and Field Technicians. We pride ourselves on the high level on training, education and certification of all our team members. Customers expect their projects to be managed in an excellent, innovative and responsible way, and this applies to all of our projects from large multi-million dollar projects all the way to smaller turnkey projects. Our project management processes and certifications are models for project management and certifications around the globe. Professional project management is a vital success factor for Siemens. We have been a project company since inception. Currently we have over 15,000 certified project managers world-wide. The PM@Siemens process involves the following business processes:

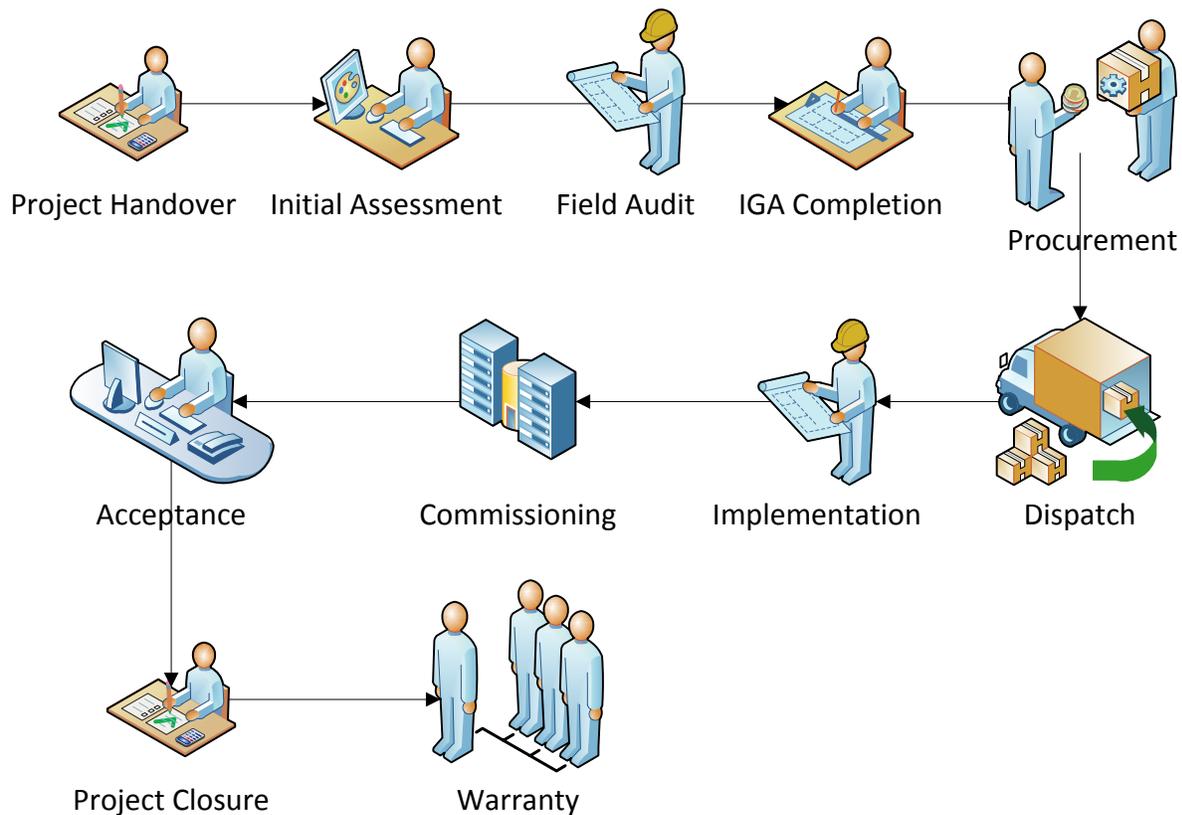
- Customer relationship management
- Supply chain management
- Product lifecycle management

Siemens complete project management approach involves a strong project manager, directing all aspects of the project, with all team members ultimately reporting to him. From the start of the project, detailed planning, implementation, project controlling, rigorous testing and

milestone checks, finishing with customer acceptance and project closure, Siemens works to provide the absolute best solution for each customer, meeting and exceeding expectations.

For this project(s), Siemens Project Manager will be David Spence. Mr. Spence has over 17 years with Siemens as a Project Manager and represents one of our brightest and best. He has experience managing multiple teams, including local labor unions and CDM Smith staff. His resume can be found along with our other key staff members in our Attachment section.

The following is a high level overview of our Project Management Methodology which ensures that our projects are completed on time and in full. Bear in mind that not all milestones may be necessary as it is based on size and level of complexity.



- Phase – Project Opening & Clarification
  - Structure & create project
  - Update Supply Chain/Logistics concept
  - Enter order entry calculation
  - Milestone PM100 – Order Receipt Clarified
- Phase – Detailed Planning
  - Create/release technical realization plan
  - Confirm & evaluate reference selection
  - Update supply chain/logistics concept

- Create project execution plans
  - Finalize quality plan & hazard analysis
  - Create/release detailed planning
  - Milestone PM200 – Approval of Detailed Planning
- Phase – Procurement
  - Place purchasing, manufacturing & service orders
  - Finalize supply chain/logistics
  - Ensure fulfillment of orders
  - Prepare dispatch, documentation/stage products
  - Milestone PM300 – Dispatch Approval
- Phase – Dispatch
  - Prepare dispatch/stage products
  - Place logistics service order
  - Conduct & monitor supply chain/logistics execution
  - Prepare infrastructure/schedule & request resources
  - Receive & verify products at site
  - Milestone PM400 – Material & Resources at Site
- Phase – Implementation
  - Prepare site
  - Installation of system
  - Milestone PM550 – Implementation Completed
- Phase – Project Acceptance and Closure
  - Work off open points
  - Clarify open claims with contract partners
  - Create closing invoice/execute receivables management
  - Create final customer documentation
  - Hand over service-relevant documents
  - Close site including deconstruction of infrastructure and clearing of surplus material
  - Milestone PM670 –Project Closure
- Phase – Warranty
  - Process Step
    - Perform warranty activities
    - Document end of warranty according to contractual requirements (e.g. Final Acceptance Certificate)
    - Milestone PM700 – End of Warranty

### Triple Constraint: Cost, Time, and Scope=Quality

Time constraints, cost constraints and quality or scope constraints are the three parts of the “time constraint triangle.” These three attributes will make or break a project if not considered in a symbiotic relationship.



Time constraint refers to the amount of time available to complete a project. The cost constraint refers to the budgeted amount available for the project. The scope constraint refers to what must be done to produce the project's end result. These three constraints are often competing constraints: increased scope typically means increased time and increased cost, a tight time constraint could mean increased costs and reduced scope, and a tight budget could mean increased time and reduced scope.

The discipline of project management is about providing the tools and techniques that enable the project team (not just the project manager) to organize their work to meet these constraints

**Time** – This refers to the actual time required to produce a deliverable, which in this case, would be the successful installation of the LED fixtures. Naturally, the amount of time required to produce the deliverable will be directly related to the amount of requirements that are part of the end result (scope) along with the amount of resources allocated to the project (cost).

**Cost** – This is the estimation of the amount of money, or available budget, that will be required to complete the project. Cost itself encompasses various things, such as: resources, labor rates for contractors, risk estimates, bills of materials, et cetera.

**Scope** – These are the functional elements that, when completed, make up the end deliverable for the project. Although scope can potentially change during the project life-cycle, a concept known as 'scope creep,' Siemens policy is to avoid this with every possible measure.

The major take-away from the Triple Constraint, being that it is a triangle, is that one cannot adjust or alter one side of it without in effect, altering the other sides. So for example, if there is a request for a scope change mid-way through the execution of the project, the other two attributes (cost and time) will be affected in some manner. How much or how little is dictated by the nature and complexity of the scope change. As an added example, if the schedule appears to be tight and the project manager determines that the scoped requirements cannot be accomplished within the allotted time, both cost AND time are affected.

At Siemens we manage the triple constraint by two primary means, detailed planning and communication. Planning up front for the project and changing the plans as details change is critical in adjusting the constraint triangle. Just as critical is communication, both to the towns involved and within the Siemens team, including subcontractors. Siemens has successfully completed hundreds of projects using this methodology. We strive to come in on time, within budget while delivering a quality project.

### Communication

Along with recognizing how the triple constraint functions, it is imperative that the project manager convey that information to the project stakeholders. Making sure everyone who is involved with the project recognizes the importance of the constraint will make discussions regarding the scope, time and cost far easier. In many cases, the stakeholders are likely to be the main reasons for scope creep or budget adjustments in a project. Having them aware up front of what the ramifications might be for any requested or mandated changes will make dialog easier

in follow-up meetings and will also make them scrutinize their change requests more thoroughly rather than assuming that any change will have no issue on the project release cycle.

## Ongoing Planning

The Siemens' project manager will stay on top of all the key attributes of the triple constraint thus making the likelihood of project success that much higher. Being cognizant of any fluctuations to the key attributes, whether they are unexpected or requested, and adjusting the project plan as needed to ensure that time and budget constraints are met.

## 5. Technology Procurement

### a. Fixtures

Siemens is familiar with both the quantitative and the qualitative benefits of converting from an HID street lighting system to an LED street lighting system. The improvements to the quality of light are founded on the fact that the system operates in a Mesopic environment<sup>2</sup>, and that each lamp type (HPS, MH, MV, LED) provides light that is perceived differently by the human eye. Under the conditions present in a roadway lighting system, the LED solution can have an initial lumen output from the fixture that is less than that of its HID counterpart, and still produce the same perceived environment depending on the Scotopic/Photopic (S/P) ratio, which is a correction factor determined by the spectrum of the light source, as recognized by the industry.



The Siemens' fixture selection approach is based on the perceived lumen methods, created by the Lawrence Berkley National Laboratory in July 1995<sup>3</sup>. This approach has allowed Siemens to maximize energy savings for customers **without** sacrificing the quality of the lit environment. While energy savings is a driving factor for a system conversion, Siemens believes that a properly lit environment is as equally important as the energy & cost savings LED brings to the customer.

All fixtures selected by Siemens are DLC listed. With the objective of a **one-for-one energy conservation measure under the assumption that the customer is generally satisfied with existing light levels**, a community-wide street light conversion project is executed under the primary intent of providing an optimal energy savings opportunity without sacrificing the lit environment.

### b. Smart Controls and Other Smart City Solutions

The roadway lighting industry is clearly headed in the direction where "smart" photocells serve as wireless control devices to monitor, dim, and measure the fixture's energy use and lumen

<sup>2</sup> Luminance Levels ranging from 0.005 cd/m<sup>2</sup> – 5 cd/m<sup>2</sup>

<sup>3</sup> Reengineering of Lighting Photometry, S.M. Berman, LBNL-42327-L-213

output. These devices can also serve as communication nodes for other public uses such as for police/fire or remote water meter reads. They could also become revenue generators by providing bandwidth for fee-based public use or lease by telecomm providers. When viewed from a purely energy savings perspective, however, it is debatable about whether these controls are currently cost effective or if it is better to wait for the technology to mature and thus, get more affordable. The timeline for utility acceptance is also uncertain.

Currently, the ROI will be longer if wireless controls are included in this project as the costs greatly exceed the energy savings benefits. However, there are viable and low-cost options that Siemens can provide now that enable future compatibility so that communities can be ready to incorporate wireless controls without installing new LED fixtures, nor requiring a labor-intensive, i.e., costly installation. Ultimately, it is our standard practice during project development to filter through and boil down the vast array of information about emerging technologies to allow our customers to make an informed choice in this regard.

We have done exactly this exercise in the MAPC-3 group procurement and would be happy to provide samples of controls-related analyses upon request. We are also in contract negotiations to install a controls system in Providence, RI later this year.

## 6. Installation & Maintenance

### *Description of Work*

Following approval of the design and in consultation with each community, Siemens will procure the selected fixtures. During the lead time prior to fixtures arriving, we will work with the Towns to site staging areas for temporary product storage containers and receptacles for recycling of old fixtures, cardboard, etc. At this point, an initial project schedule will be submitted to the Town and its representative members, and updated on a weekly basis thereafter as fixture ship dates and installation progress require. We also hold a construction kick-off meeting to inform various Town departments, discuss logistics, and answer questions.



Upon award, Siemens will meet with the towns to refine and detail the schedule to best meet the needs of the towns.

Siemens will adhere to all Federal, State, Local and CMP/National Electrical Code standards as required during the construction phase of the project.

### ***Submittals***

Typically the LED/photocell manufacturer's catalog cut sheets serve as the project submittals and are approved by the Town prior to materials order.

### ***Quality Assurance & Warranty***

At Siemens, quality is everyone's responsibility. Our global strategy is based on three cornerstones: service, process, and personnel. Without the synergy of all three we would not be able to maintain our quality of service. The Siemens Quality Control Program is the basis on which we execute all projects, large or small. Siemens top+ Quality incorporates Lean Six Sigma practices, ISO guidelines, and other industry-recognized standards. The program is stringent enough to maintain Siemens quality across all projects, yet flexible enough to meet individual client needs. We believe the success of our business is directly related to our client's satisfaction and the quality of our performance. As such quality is a multi-directional responsibility. Quality is managed from the top down and implemented, reported, and improved from the bottom up.

A ten-year product warranty will require the fixture/photocell manufacturers to provide a replacement fixture for all equipment that fails, with the failure cause determined to be a warranty-related issue, at no cost to the warranty holder. Non-warranty issues include but are not limited to: damage from vandalism, vehicles, or tree branches, power surges, power failure from the utility or the wire feed from the utility's secondary distribution feed. If a community chooses to self-perform maintenance or contract maintenance to others, a warranty transfer will be required approximately one year post-installation. The warranty holder will transfer from Siemens to either the community or their maintenance contractor. If a community opts to contract with Siemens for service during the ten-year product warranty period, Siemens will hold the warranty during this time. Logistically, this means that Siemens is responsible to remove and replace all fixtures with a warranty-related failure and all shipping/receiving tasks at no cost or required effort by the community.

### ***Installation***

Siemens project managers will staff work crews as necessary to adhere to schedule requirements to ensure that any delays related to fixture delivery or weather events are minimized. A critical component of this effort is to communicate project status to Town on a weekly basis.

### ***Field Quality Control***

Please see the Quality Assurance section.

### *Adjusting and Cleaning*

Adjustments for a small portion of fixtures may include rotating, tilting, lumen output changes (if field adjustable fixtures are selected), or the installation of house shields. This generally occurs within the first 60 days post-substantial completion.

Cleaning is performed in later years per the terms of a maintenance agreement and/or manufacturer specifications.

### *Disposal*

Siemens attests to the fact that this scope of work may require Siemens to ensure all hazardous waste materials generated from the streetlight conversion projects are properly disposed of in accordance with all applicable laws and regulations. Certificates of recycling/disposal will be made available upon request. Siemens currently does business with several different hazardous waste recycling companies across the United States to recycle existing fixtures from LED installations and ongoing maintenance work (which is mostly HID streetlight lamps, capacitors, and ballasts). This requirement is typical for our projects.

### *Maintenance*

Should the towns request Siemens to provide maintenance, we would provide the services listed below.

LED street lights must be maintained using the manufacturers' recommendations and requirements to ensure their optimal performance toward achieving the energy savings guarantee. Siemens and our local partners have the full ability to perform all maintenance tasks (preventative and on-call) to ensure the system is maintained per manufacturer's recommendations.

If a community opts for a service contract, maintenance would be provided in an approach customized to their resources and requirements. City employees, Police and Fire Departments and residents can call 1-800 LIGHTS-ON (1-800-544-4876), 24 hours per day, 365 days per year, or go online to our customer/public portal in order to request repairs. Siemens will submit monthly reports/invoices including date a repair was reported, when the repair was completed, and the nature of the repair.

Additional services that are not included in the warranty, but that could be incorporated into a fixed fee basis, a time and materials basis, or via specific price quotations, include:

- Response and related repair to pole knockdowns
- Replace standard or decorative fixtures
- Repair or replace foundation or pole



- Repair or replace electrical service pedestal and foundations
- Install new streetlights
- Rewire poles and light fixtures to correct fault
- Repair or replace damaged standard arms and fixtures
- Locate and mark streetlights and conduits for underground service alerts.
- Perform a comprehensive streetlight audit, collecting information such as pole and fixture type, wattage, GPS coordinates, etc.
- Paint poles
- Physically test and treat wooden poles
- Perform visual inspection of the City's infrastructure
- Repair lights and associated conduit or power issues that are not operating properly prior to the contract start date

**7. Construction Administration**

Siemens Project Manager and Field Foreman perform spot checks; the GIS application we use for the installation phase allows full documentation of the work to allow us to proactively identify any quality issues. The GIS application can be shared with the towns, and in combination with in-person meetings, be used to keep all parties current. We welcome contact with our references to confirm ALL our recent streetlight retrofits have been completed satisfactorily.

**8. Acquisition of Streetlights**

Recognizing that this project represents the first time that the State legislation and associated PUC rulings related to municipal streetlights will be applied in Maine, Siemens recognizes that the Towns' goals are to maximize savings and minimize operating costs through the application of LED lighting technology. CMP has laid out three options for which this can be achieved and a detailed analysis will be required to determine which option best meets this objective. It is important for Siemens to develop a collaborative working relationship with CMP at the start of this process to ensure the end result is an 'apples to apples' comparison. The table below outlines the CMP options under which the Towns may proceed:

Option	Supply LED Fixture	Install LED Fixture	Maintain LED Fixture	Rate	Section
1	CMP	CMP	CMP	Street Lighting Service	n/a
2	Community	CMP	CMP	Delivery Only Lighting Service	53.2
3	Community	Community	Community	Delivery Only Lighting Service	53.3

While performing a 10-year lifecycle cost for each of these options, Siemens would be seeking answers to the following example questions for each option:

Option 1: CMP provides, installs, maintains fixtures

- What LED manufacturers are offered by CMP? Are they the most cost effective in terms of price/performance based on our market knowledge?
- CMP's existing SL tariff only lists a 50W option for LED (page 150.03); will other wattage levels be added? If so, when?
- What fixture selection methodology is used by CMP to determine HPS equivalency?
- What is CMP's proposed fixture pricing?
- How does CMP's fixture + installation pricing compare to Siemens' data collected for options 2 and 3?
- Will group depreciation of these new assets cost more long term than having the community purchase?
- What is CMP's proposed installation schedule and remedies for delays?
- What is CMP's standard response time for outages and remedies for delays?

#### Option 2: Community provides fixture, CMP installs and maintains fixtures

- How does CMP installation pricing (CMP T&C Section 53.7) + compare to private contractor costs?
- What is CMP's proposed installation schedule and remedies for delays?
- What is CMP's proposed installation schedule and remedies for delays?
- What is CMP's standard response time for outages and remedies for delays?
- How will LED fixture warranty vs. non-warranty issues be addressed?

#### Option 3: Community provides, installs, and maintains fixtures

- What are the costs associated with all aspects of the purchase?
  - Purchase price
  - Additional cost of insurance (\$1M liability coverage, coverage against loss/ice storm)
  - Property tax loss from converting a taxable asset to a tax exempt one
  - Town staff resources to process service requests, procurement of maintenance contracts, contract management
- How does community's pricing for fixture supply & installation compare to option 1 or 2?
- How does community's pricing for maintenance (time/materials, trip based, fee per light per month) compare to option 1 or 2?
- Do firms submitting pricing for installation/maintenance have requisite training (CMP T&C per 53.4B) or commitment to secure?
- 

Note: Installation of fusing by the utility costs would be included in all options according to the associated pricing in CMP T&C Section 53.7.

The result of the above analysis of each option will provide a 10-year cost and a 10-year savings benefit using agreed upon escalation factors, borrowing costs if applicable, etc. Longer terms could be studied if requested. With the Towns' input, qualitative pros and cons would also be included with each option, allowing an informed decision regarding the optimal choice. All results and Town decisions would be documented in a draft report for Town review and with comments incorporated, submitted as a final report. Once agreement has been reached,

Siemens will use our extensive past experience to guide the city through the acquisition and transfer of assets. We have also helped Towns with "day 1" maintenance and the transition period from ownership of the HPS system to later conversion to LED.

### **9. Rebates/Incentives**

In the past, the Efficiency Maine Business Program offered prescriptive cash rebates for high-efficiency lighting products. A custom program – which is traditionally what a streetlight project falls under – would provide up to 50% of project costs, including labor, for retrofits.

Custom rebates were capped at \$0.28/kWh saved in the first year, and only projects that result in a yearly savings of at least 35,000 kWh were eligible, which is far below the anticipated savings for projects of this size. Siemens is well versed in the qualifying process for both the products and projects, and has a strong history of working with utilities in obtaining rebates for customers. Furthermore, Siemens partners are qualified Efficiency Maine professionals, emphasizing the familiarity of these programs.

In addition to the above mentioned programs, in 2012 Efficiency Maine launched a competitive Large Customer Program specifically targeted to large businesses and government facilities; customers with a peak load of at least 500 kW are eligible. The program provides between \$50,000 and \$2,000,000 through a series of periodic "program opportunity notices" for large energy efficiency and distributed generation projects. Up to 50% of total project costs could be reimbursed for projects that meet the requirements of these projects. Once a complete inventory has been compiled, Siemens can determine whether or not any or all of customers meet the demand load requirement, and will work alongside/on-behalf-of the customer to achieve a qualifying status for any grants and/or rebates found to be available for street light projects.

#### **Siemens Rebate Process**

Part of every Siemens project is the rebate application process, which many customers have elected to have done by Siemens as their representative, since the application requires submitting new system data, which Siemens already has.

The existing system data is taken directly from the audit data. All matched assets are given an LED counterpart on the rebate application along with a cut sheet to show LED system characteristics. Furthermore, DLC listings are pulled from the qualified products list, to provide further enforcement that all LED fixtures used meet the stringent technical requirements, a requirement for rebate programs.

Siemens' relationship with the utilities has shown to be helpful in the instance when an LED replacement is not yet on the DLC listing. In these cases, Siemens works with the rebate programs' technical experts to review the new fixtures' DLC application, to provide a degree of certainty that the fixture will be placed on the list before the projects completion. In 100% of

these scenarios have resulted in the fixture being put on the DLC qualified products list, and the rebate has been issued.

### **Ledger Adjustments**

Weekly or bi-weekly ledger adjustments are sent to the utility from Siemens on behalf of the customer. While Siemens tracks – through the use of GIS technology – the installation in near-real time. Part of the ledger adjustment submittals is the downloading of the most recent installation data, to confirm quantities and types. This data is then supplied to the utility in a flexible format, whether it simply be a summary table or a copy of the asset list as provided by the utility, with new energy related values supplied.

### **Rebate Submittals**

Siemens has a successful track record for obtaining the maximum allowable rebates available by program providers. In some instances this has included timing challenges where the customer was at risk of losing \$400,000 in rebate dollars if all applicable street lights were not installed before a specified date. Not only was Siemens successful in installing and filing under those time constraints, but Siemens actually achieved this feat ahead of schedule.

In addition to being familiar with rebate processes and being able to meet challenging demands found in these programs, an additional benefit of the Siemens solution is whether the customer wants the rebate dollars to go directly to them, or to Siemens to be applied to the project costs, Siemens can accommodate. This option can sometimes help streamline the Customers' own internal processes, making the project as a whole that much easier for the Customer. As street lighting and traffic signal systems form our core business, Siemens has extensive experience working within the various forms of legislative framework across the US that has created the ability for municipalities to purchase and convert their streetlights to more energy efficient fixtures. We understand that each State has a slightly different set of rules and regulations that govern how these transactions are to occur, how assets are valued, and how joint-use poles are treated. However, our experience completing turnkey projects in other utility territories across the U.S. allows us to quickly breakdown the new tariffs and asset valuation and advise the Towns on the most cost effective approach to maximizing energy and cost savings. In New England alone, we have worked in 4 states and 7 different utility territories on streetlight projects since 2013.

## F. Value Added Services

### Public Relations

At the Communities' request, Siemens will draft project-related press releases and provide technical assistance relative to the preparation of any grant applications for project funding.

The conversion of the Communities' streetlights to LED technology is a "good news story" that the City can and should share with its residents throughout the course of the project. Initially, Siemens can assist by providing the energy savings and cash flow in the format of public documents that justify and describe this investment to help foster public support and answer basic questions (FAQ's) about the project. This information can be posted on the City's website, sent out as a press release, or distributed via a City e-newsletter or by social media. In addition, we have coordinated ceremonial project kick-off ("first light") installations as a press event as well as utility rebate check presentations. Once the project begins, there is the option to utilize a web-based audit tool can provide "dashboard" displays that will indicate in real-time the progress of the project under various metrics as selected by the towns: fixtures audited or converted, energy savings realized to date, etc. We have found these tools to be extremely helpful in similar projects we have completed where our customers were interested in both monitoring the project in real-time and pushing information out to the public in a proactive fashion.

As a large multi-national company Siemens has a long track record of providing community outreach, public relations and education on projects and services. Siemens dedicated support staff is available to develop and execute an outreach program to demonstrate the benefits of the LED conversion to the citizens of Manchester. Siemens can also conduct briefings and round-table discussions with City Stakeholders to educate them on the LED conversion process so they may respond to citizen inquiries.



Below we have provided links to two examples of news coverage on projects where Siemens assisted the city of New Bedford and the Cape Light Compact Cities.

<http://www.southcoasttoday.com/apps/pbcs.dll/article?AID=/20140906/NEWS/409060317/-1/ARCHIVE>

<http://www.mvtimes.com/2013/06/26/edgartown-oak-bluffs-see-savings-led-street-lights-16035/>

### Siemens Maintenance Options

Siemens also offers industry leading maintenance with an experienced team. Our maintenance philosophy is referenced in Section E.6 and we have included additional details on our service management program below.

### **Spiridon Service Management Program**

Siemens recognizes that speed, efficiency, and comprehensive service are the keys to customer satisfaction in our industry. With this in mind, we are constantly seeking innovative ways to improve our service delivery. We have developed in-house a suite of applications that represent what we believe to be the forefront of customer account management and maintenance tracking in our industry.

Siemens utilizes Mcompanion software to dispatch and track our service technicians. Mcompanion runs on the Google OS and each technician is provided with a laptop and Smartphone. This software will track time arrived onsite, time work ended, materials, additional items, vehicle usage and equipment to produce a work report for the City. This information is then pulled into our SAP system which will feature a secure web portal the City can access to provide progress on technician work on call outs and maintenance activities as well as a list of assets, asset map, real-time status of scheduled maintenance and service request calls, history per functional location, real-time equipment inventories, maps and event reporting as well as digital photographs of equipment. Our Spiridon Service Management Program includes:

- Service request management and scheduling, including time stamping and dispatching
- Scheduled Maintenance Management and scheduling
- Installed base details, including inventories of equipment and GIS data.
- Detailed service descriptions, allowing to tailor the service rendered in the field to the precise specifications of the City
- Agency Information Management, including contacts and billing information
- Contractual Information, including frequencies of scheduled maintenance, contract periods and "Not to Exceed" limits
- Internal communications, such as pertinent notes
- Report generation, including invoices and materials use
- Inventory control, including real-time tracking of available and installed equipment incl. pole ownership date (if available)
- Initial contract data Business type / Start-End date / included work / excluded work / limits
- Dispatch Dedicated dispatcher / Visual Planning Board / Mobile front end / Time stamping
- Preventative maintenance Scheduled maintenance / Mobile front end / internal open ticket reports
- Customer relationship Agency Information / contact information / conversations /
- Logistic Inventory / Procurement Centralized procurement module incl. inventories / Mobile front end
- Billing
- Asset Management Equipment structure as defined
- Utilization / Payroll



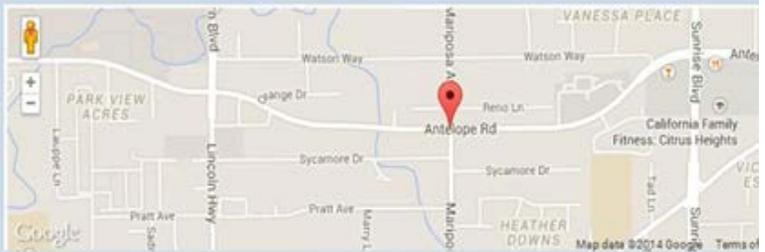
Service as a Global Concept

Siemens Global Website Siemens IC MOL RCM CS Customer # 003040158:City of Huntington Beach

Back

History for functional location 9461-0030401585-0000000004

Description: TS ANTELOPE RD / MARIPOSA AVE  
 Customer: 0030401585  
 Name: CITY OF CITRUS HEIGHTS  
 Count of orders: 4  
 Count of open orders: 0  
 Count of maintenance orders: 4  
 Count of response orders: 0  
 Count of project orders: 0



Order ID	Order Type	Problem/Description	Technician	Region	Created On	Actual Finish	Actual finish	Technician final response
005100853131	Routine	ANTELOPE RD / MARIPOSA AVE	Gerald R Shelke	SII MOL RCM Sacramento	03/08/2014	03/31/2014	11:35 AM	121.1, 24.5. Dusted cabs. At
005100853131	Routine	ANTELOPE RD / MARIPOSA AVE	Nicholas Maciejewski	SII MOL RCM Sacramento	03/08/2014	03/31/2014	11:35 AM	no problems found
005100883125	Routine	ANTELOPE RD / MARIPOSA AVE	Josef Rys	SII MOL RCM Sacramento	04/30/2014	05/29/2014	01:45 PM	Pm check completed ok.
005100907447	Routine	ANTELOPE RD / MARIPOSA AVE	Michael Dean	SII MOL RCM Sacramento	07/02/2014	07/30/2014	02:30 PM	ok at this time
005100939410	Routine	ANTELOPE RD / MARIPOSA AVE	Ruben Quiroz	SII MOL RCM Sacramento	08/29/2014	09/24/2014	12:30 PM	pm

Screenshot of customer portal

## G. Additional Information



### Siemens and the Environment

Siemens is committed to a greener future. We have declared our intention to halve the CO<sub>2</sub> footprint of our operations by 2020 and become carbon neutral by 2030. Siemens believes that as a leading innovator in energy efficient technologies, we have a clear responsibility to lead by example. In total, our operations and 300 factories result in annual emissions of 2.2 million metric tons of CO<sub>2</sub>. Cutting our footprint by 50% would mean cutting emissions equivalent to about 1.1 million metric tons of CO<sub>2</sub> or 90,000 U.S. households. We will accomplish this by eliminating a vast majority of our carbon emissions, while also supporting projects that reduce greenhouse gases emissions outside of Siemens, known as carbon offsets. We are targeting facilities, vehicles and fuel. We will use four main levers:

- 1) We will invest \$110 million in energy efficiency measures in our offices and factories.
- 2) We will create showcases of distributed energy systems at our own sites. Distributed energy systems are not only changing the energy generation landscape, but also affecting our own sites: Combining power generation – for instance, distributed power plants, wind, PV – with storage solutions and intelligent energy management technologies is a future scenario that is already happening today.
- 3) Efficiency does not stop at manufacturing sites. As Siemens' car fleet (about 45,000 vehicles) accounts for roughly 300,000 tons of CO<sub>2</sub> emissions annually, we are including our company cars in our CO<sub>2</sub>-neutral aspiration.
- 4) We will buy clean power. To make up for the emissions that cannot be avoided in the near term, we will purchase electricity from renewable sources like wind parks and "carbon credits" from organizations working to reduce carbon around the world, ranging from reforestation efforts to updating power plants.

At Siemens we have the technologies, we have the business cases, we have the responsibility, and now we have the commitment.

#### Siemens Industry Environmental Practices

##### 1. Packaging

- a. Siemens ITS Austin, Texas uses packaging materials that contain recycled content and are recyclable in local programs. Our shipping and receiving departments recycle or reuse all packing and shipping materials including, but not limited to corrugated materials and packaging materials. We have designated in-house recycle/reuse areas to facilitate optimum processes.

## 2. Business Practices/Operations/Manufacturing

- a. Siemens ITS Austin, Texas recycles materials in our warehouse and in our entire facility. We provide multiple recycling bins throughout the facility for the various types of recyclable materials.
- b. Siemens uses intelligent light sensors to reduce energy consumption resulting from lighting that has been left on.
- c. Siemens uses recycled paper wherever possible, and prudent.
- d. Siemens ITS Austin also uses heating and cooling sensors so we only cool/heat when the building is occupied. Additionally our sensors will only activate when occupancy is expected to further decrease our carbon footprint.

Siemens scored 90 out of a maximum of 100 points in the Dow Jones Sustainability Index (DJSI). Our corporate philosophy in regard to sustainability is: Sustainability is and will remain a major success factor for Siemens and thus also for our customers.

### Siemens Invests in the Future of People

Since 1998 the Siemens Foundation has invested more than \$90 million in the United States to advance education in Science, Technology, Engineering, and Math, also known as STEM. Pairing Siemens' core competencies with the growing needs of society, this afternoon the Siemens Foundation will announce a new STEM middle-skill initiative to drive the development of the essential skills needed for high-growth jobs in STEM fields including energy, health care, information technology and advanced manufacturing. These middle-skill jobs typically require strong technical skills and a two-year degree, occupational license or certificate. The Foundation's work will focus on young adults in the United States.



Partnering with the Aspen Institute's College Excellence program and the National Governors Association Center for Best Practices, the Foundation will help young adults understand the potential of STEM middle-skill jobs and identify and scale proven training models to realize that potential. In so doing, the Siemens Foundation will play a leading role in preparing the next generation with the skills required to meet the needs of our economy, while advancing economic opportunity for all Americans.