



**CHICAGO
INFRASTRUCTURE
TRUST**



CHICAGO INFRASTRUCTURE TRUST

CHICAGO SMART LIGHTING PROJECT

Part II – Request for Proposals

January 9, 2017 – 4 pm CST

ComEd

An Exelon Company

powering lives

This submission includes trade secrets or other proprietary data. In the event of a FOIA request or subpoena, please contact Joseph Svachula (630-576-6108); joseph.svachula@ComEd.com

Trade Secrets; Basis for Each Redacted Item

This proposal includes trade secrets or other proprietary data.

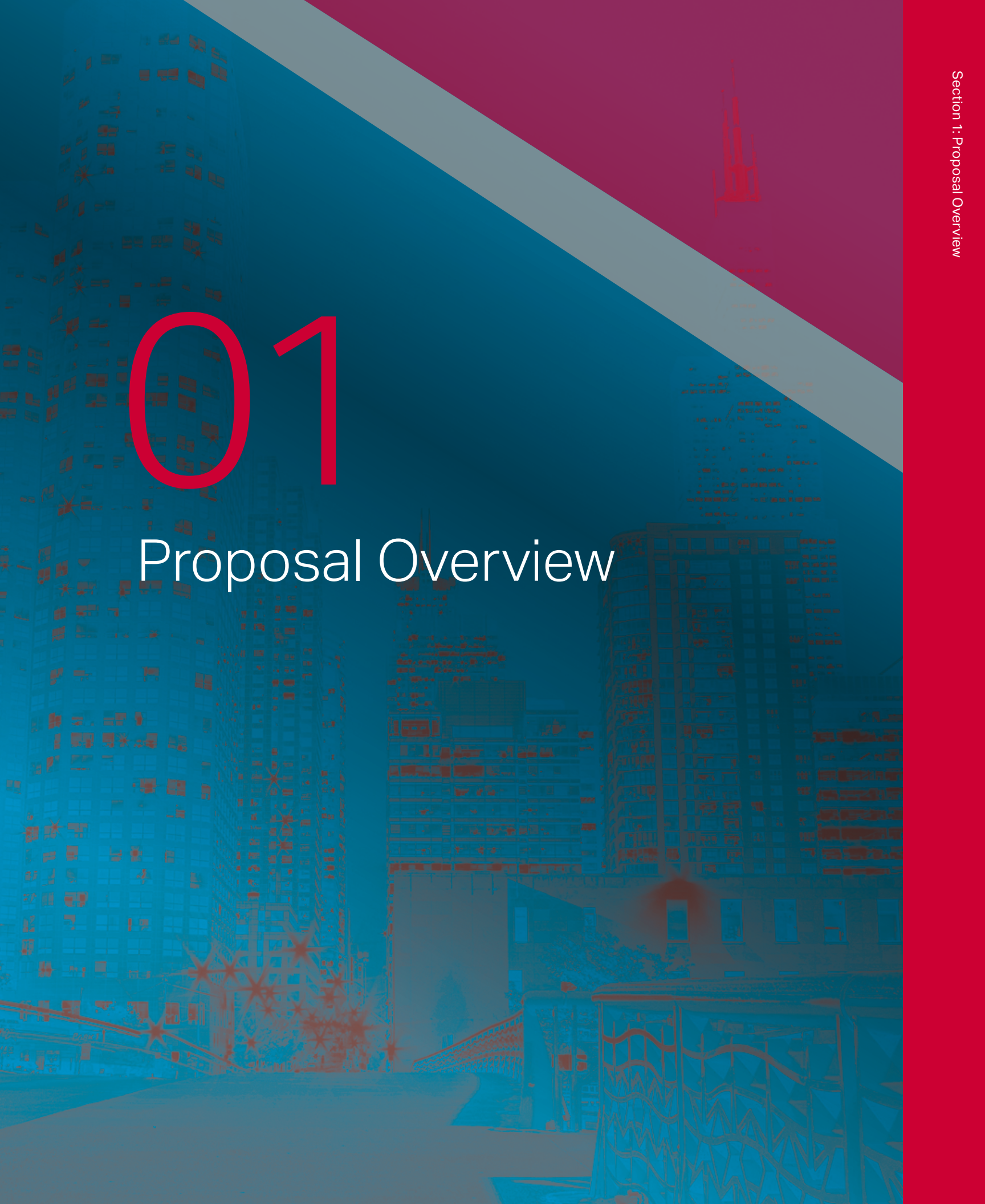
As provided for in Section 7.7 of the Chicago Smart Lighting RFP (Transparency Website; Trade Secrets), ComEd has elected to designate certain sections of this Proposal as confidential. This version of the proposal has been redacted to remove any such confidential information.

This page provides a written explanation of the basis under which each item redacted has been deemed confidential, making reference to the Illinois Freedom of Information Act.

1. **Section 1; Local Economic Initiatives Commitment:** Personal contact information has been redacted from this section as this constitutes confidential private information protected from disclosure under Exemption 6 Sections 2(c-5) and 7(1)(b) of the Illinois Freedom of Information Act ("FOIA").
2. **Section 4; Additional Functionality:** The emergent technology description and image redacted from Section IV constitutes confidential trade secret information protected from disclosure under Section 7(1)(g) of the Illinois Freedom of Information Act ("FOIA") in that disclosure could cause Respondent or its team members competitive harm.
3. **Section 5; Form 11:** Personal contact information has been redacted from each Form 11 submittal within this section as this constitutes confidential private information protected from disclosure under Exemption 6 Sections 2(c-5) and 7(1)(b) of the Illinois Freedom of Information Act ("FOIA").

01

Proposal Overview



SECTION I - PROPOSAL OVERVIEW

Proposal Letter

January 9, 2017



Chicago Infrastructure Trust
35 East Wacker Drive, Suite 1450
Chicago, Illinois 60601
Attention: Leslie Darling

Re: Chicago Smart Lighting RFP

Dear Ms. Darling:

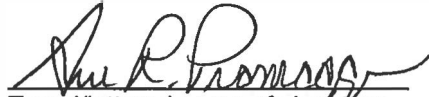
On behalf of Commonwealth Edison Company, I submit with this letter its response to the Chicago Infrastructure Trust's ("CIT") Request for Proposals ("RFP") including Addendums 1 and 2 for the Chicago Smart Lighting Project. In this connection, I state the following:

1. I have full authority to bind Proposer with respect to this response to the RFP and any oral or written presentations and representations made to the CIT or the City of Chicago.
2. Commonwealth Edison Company has read and understands the RFP and is fully capable and qualified to provide the goods and services as described within this RFP.
3. I have read and understand the RFP, including addenda numbers 1 and 2.
4. Commonwealth Edison Company understands that the CIT and the City of Chicago will rely on Proposer's response to the RFP and Proposer agrees to be bound by its representations and statements made in its response and in any oral or written presentation(s) made during the evaluation and selection process.
5. Commonwealth Edison Company agrees to hold its Proposal open for a period of 275 days from the date and time established as the deadline for the submission of Proposals to the CIT.
6. Commonwealth Edison Company commits to achieving the specified hiring requirements for the Asset Condition Assessment, as outlined in Section 4.3.8.1 of RFP Volume I: Instructions to Proposers.
7. If requested by the CIT or City of Chicago, Commonwealth Edison Company agrees to furnish additional information or documentation or to make one or more oral presentations or demonstrations to assist the CIT and the City of Chicago in evaluating its Proposal.
8. Neither I nor Commonwealth Edison Company has any beneficial interest in or relationship with any other party working or performing services for, or otherwise affiliated with, the CIT or the City of Chicago; and has no conflict of interest which could interfere with the provision of services to the City of Chicago.
9. Commonwealth Edison Company understands that the CIT and the City of Chicago will rely upon the material representations set forth in the RFP and that Commonwealth Edison Company has a continuing obligation to update any information which changes or which Proposer learns to be incorrect. If the CIT and the City of Chicago determine that any information provided in response to this RFP is false, incomplete or inaccurate, or if any provision of the requirements of the Request for

Proposal is violated, the Contract may be void or voidable, and the CIT and the City of Chicago may pursue any remedies under the Contract, at law, or in equity, including terminating the Commonwealth Edison Company participation in the project or transaction and/or declining to allow the Commonwealth Edison Company to participate in future transactions with the CIT and the City of Chicago.

- 10. It is understood that an original and multiple copies of the Proposal have been submitted for consideration. Commonwealth Edison Company warrants that all copies are identical to the original in all respects.
- 11. Commonwealth Edison Company acknowledges that any comments, requests or exceptions to Volume II, Terms and Conditions, or any other requirements stated in this procurement have been identified within its Proposal.
- 12. If selected by the CIT and the City of Chicago, Commonwealth Edison Company agrees to negotiate in good faith for the Chicago Smart Lighting Project with the City of Chicago, in conformance with the exceptions stated in this response to the RFP.
- 13. I declare that all required forms provided in the RFP have been examined by me and to the best of my knowledge and belief are true, correct, and complete.
- 14. Commonwealth Edison Company understands and acknowledges that the certifications, disclosures and acknowledgments contained in the Proposal and provided in its Proposal and the required forms in this RFP may become a part of any contract awarded to the Proposer by the City of Chicago in connection with the Chicago Smart Lighting Project RFP.

Signed:


Typed/lettered name of signatory

As:

Chief Executive Officer & President
(Relationship to Proposer/Title/etc.)

Executive Summary

STATEMENT OF INTEREST

Commonwealth Edison (ComEd) has enjoyed a century-long partnership with the City of Chicago (City) and has been proud to support the City’s vision of a growing economy, strong communities, world-class education, and sustainability for all Chicagoans. We propose a project approach that we believe would be the most effective way to achieve the goals of the Chicago Infrastructure Trust (Trust) and the objectives of the Smart Lighting Project. While we clearly understand the scope of the Request for Proposals (RFP), our proposal includes a unique project structure that is possible only with ComEd – a collaboration through which the City can work with a **known and trusted local partner that is publicly regulated and so offers transparency, oversight, and accountability. While we have proposed modifications to the contracting approach that addresses our status as a regulated utility, we believe that the approach we have outlined is responsive to the core elements and requirements of the RFP. The partnership approach proposed by ComEd does not require privatization of the existing poles and wires and provides a path to City and Parks ownership of the new LED luminaires and Lighting Management System¹.**

Taking the role as Lead Respondent and Prime Contractor/Consultant, ComEd has assembled a team of industry-leading partners, subcontractors, and subconsultants that will provide expertise in their areas of specialization to implement the project. Our implementation team is comprised of the following firms. Additional partners have been identified should Public Relations or Smart City applications become part of the final scope:

- ComEd
- Meade
- The Will Group (MBE)
- GE; Current, powered by GE
- AECOM
- Silver Spring Networks
- Accenture
- Primera Engineers (WBE pending)
- Taylor Electric Company (MBE)
- City Lights (M/WBE)
- MZI Group, Inc. (MBE)
- PMI Systems, Inc. (MBE)
- EverLights (WBE)
- AGB Investigative Services (MBE)
- Quantum Crossings (MBE) (future work orders)

Our team brings a wealth of local expertise in large-scale infrastructure work, performing LED conversions and collaborating with leading technology vendors to develop innovative smart grid and smart city applications. We have also implemented Lighting Management Systems from different suppliers running on the ComEd mesh network. We have the experience to execute this project successfully and deliver on the promise of a smarter, safer and more sustainable Chicago.

We also recognize the opportunity this project creates for the citizens of Chicago, and are earnestly committed to creating jobs and employing local individuals from Chicago’s diverse communities. Our team reflects the diversity of the City, and we are proud to be continuing our legacy of partnership and support for minority, women, and veteran-owned businesses.

A PARTNERSHIP ONLY POSSIBLE WITH COMED

ComEd is a public utility subject to regulation by the ICC under the Public Utilities Act (“PUA” or the “ACT”). Pursuant to that Act and the rules and regulations of the ICC, ComEd has been providing streetlight service in northern Illinois for many years under the terms of its Rate RDS - Retail Delivery Service. The City has been taking service under that tariff as a Dusk-to-Dawn Lighting customer for some time. Under that same tariff, ComEd has also been providing a Fixture-Included Lighting service to many municipalities in its service territory.

¹ As detailed in Section 4, ComEd proposes to deploy the lighting management system utilizing the existing ComEd smart meter communications network, which ComEd owns. ComEd will continue to own and operate its smart meter communications network and associated software for the benefit of the City.

Among other options, this latter service includes an LED lighting option. Supplementing the terms of service for street lighting that are contained in Rate RDS are ComEd's General Terms and Conditions.

Taken together, these two tariffs comprehensively provide for the pricing, terms and conditions under which ComEd currently offers an LED Fixture-Included streetlight service. ComEd proposes to provide the City's requested smart streetlight service through either revision to these existing tariffs, related tariffs such as Rider NS, and/or through a newly developed tariff. Any such modifications to its existing tariffs or any newly filed tariff will be subject to ICC review and approval before becoming effective. As evidenced by the seamless collaboration between ComEd and the City to leverage existing infrastructure to provide for alley lighting, it is important to note that we believe a tariffed model can be adapted to fit the needs of this project and of the City. This regulatory framework also provides an additional and valuable level of transparency, customer protection, and review by regulatory authorities.

Looking to the future, should the City ultimately desire to utilize the control nodes installed through this smart lighting project as electricity metering points, ComEd believes it would be best positioned to ensure compliance with any statutory and ICC requirements for the performance of metering-related functions. Naturally, we fully understand the technical and operational requirements of providing meter service, and have developed and are already investing in maintaining these systems for our 3.8M electricity delivery customers. We believe this fact would allow us to better fulfill any statutory or regulatory requirements for metering service more efficiently than any other party, should this be deemed prudent in the future.

ComEd has been providing street lighting service under tariffs to the City and suburbs successfully for many years and in a manner that is supported by the expertise and review of public, regulatory authorities. ComEd proposes building upon that model to provide the City with a world-class smart streetlight service.

PRIME CONTRACTOR



ComEd: local streetlight innovator, a leader in Smart Cities and impactful innovation, a leader in the execution of capital infrastructure programs, and a difference-maker in Chicago communities.

Commonwealth Edison Company is an energy delivery subsidiary of Exelon Corporation, as well as one of the largest utilities in the United States. Headquartered in Chicago at One Financial Place, 33rd Floor, 440 South LaSalle Street, Chicago, IL 60605, ComEd is an Illinois corporation formed 109 years ago, with its principal place of business exclusively in Illinois, and authorized to do business in the State of Illinois. It is 99% owned by Exelon Energy Delivery Company, LLC, which is 100% owned by Exelon Corporation. ComEd provides electric service to approximately 3.8 million customers across Northern Illinois, or about 70 percent of the state's population.

ComEd owns and maintains over 70,000 poles on which City alley light fixtures are installed. We also own, operate, and maintain 176,000 streetlights in the surrounding suburbs. Over the past year and a half we've performed LED conversions on over 10,000 of these lights. Beyond operational expertise with streetlights, ComEd has become an innovator in smart streetlights through the implementation of Smart LED Streetlight Pilot projects in Lombard and Bensenville including back-office installation, configuration, and testing of two different Lighting Management System (LMS) packages communicating through our expanding Advanced Metering Infrastructure (AMI) network.

ComEd has been a committed partner to the City of Chicago for more than 100 years. ComEd has powered Chicago for over a century, fueling the City's economic activity and growth. A local company rooted in Chicago's neighborhoods, ComEd has been proud to provide critical support as the City pursues its vision of a growing economy, strong communities, world-class education, technology and innovation, and sustainability for all Chicagoans. ComEd will serve as the single contractual entity for execution of the Contract with the City and brings its leadership in the execution and community-centered deployment of major capital infrastructure programs to the Smart Lighting Project.

PRIME TEAM MEMBERS



Meade: local contractor with a vast knowledge of Chicago's electrical infrastructure

Founded in 1908, **Meade Electric Company** is one of the largest privately held specialty contractors in the country with current revenues exceeding \$500M annually. Meade holds one of the oldest Chicago Electrical Licenses and is currently the largest day to day underground contractor for the City of Chicago Office of Underground Construction. Meade serves hundreds of local, state, federal and national clients and is a licensed design firm in the State of Illinois.

Meade has over 2000 employees including over 80 different skilled trades for clients with the highest of safety standards. Meade is the largest employer of IBEW Local 9 employees. As a 100 year old locally owned and operated Chicagoland contractor, Meade has a vast working knowledge of the Chicago Electrical infrastructure. Meade has performed Traffic Signal, Street Lighting, Fiber Optic Cable and Utility upgrade projects for the City of Chicago in addition to many local municipalities as well as state and county agencies. Using this experience, Meade will lead our effort on the large-scale LED conversion as well as the targeted infrastructure stabilization repairs.



The Will Group (MBE): local lighting tech pioneer



For over 30 years, **The Will Group** (TWG), Chicago-based and African-American owned, has expanded its role to go beyond the boundaries of the traditional lighting business. The Will Group companies, which include **Electrical Resource Management, Inc. (MBE)** and **Lyons View Manufacturing & Supply, Inc. (MBE)**, have participated in a variety of projects creating jobs by offering construction management services, QA/QC, utility coordination, consulting services, infrastructure surveying and lighting design, in addition to electrical distribution and assembly.

TWG has worked with the City of Chicago for nearly 30 years, supporting the upgrade of 70,000 alley lights in the late 1990's with the Bureau of Electricity and multiple CDOT projects from streetscape upgrades to the Wacker Drive reconstruction. As the City moved to LED, TWG was proud to supply the material utilized on the South Lake Shore Drive extension, which was the first LED installment in Chicago. Today, TWG supplies all fixtures for the residential blocks program that is bringing white light and LED technology into all 50 wards.

Founder Steve Davis developed a reputation for TWG as innovators by piloting intelligent fixtures in the Chicagoland area over 10 years ago. TWG introduced Smart Fixtures to the City of Chicago in the early 2000's and has continued demonstrating pilots on emerging technologies for wireless communications, outage reporting, and lighting system dimming controls. TWG will lead the Asset Condition Assessment effort; assemble all LED fixtures installed at their local facility in the Austin neighborhood, and serve as the primary supplier of materials for the project.



Current, powered by GE: digital industrial company partnering with utilities and cities.



Current, powered by GE, is a first-of-its-kind energy company that integrates GE's LED, Solar, Energy Storage and Electric Vehicle Charging businesses. Current meets the unique needs of a wide range of municipal and utility customers, and provides them with the hardware, software and sensors they need to be more reliable, efficient and profitable. Current, powered by GE is connecting LEDs with state-of-the-art software and sensors, where world-class hardware meets unprecedented software technology providing the greatest flexibility to meet your needs now and in the future. GE will supply components for LED fixtures that will be assembled locally by TWG.

OTHER TEAM MEMBERS

AECOM: designing, engineering and managing Chicago's infrastructure

AECOM is one of the largest providers of construction and management support services in the world and has played a leading role in the engineering and construction of Chicago's infrastructure. From rebuilding the Dan Ryan Expressway and South Lake Shore Drive, to lighting up Congress Parkway, to bringing Chicago new Jane Byrne and I-55/Lake Shore Drive interchanges simultaneously while introducing the Loop Link to downtown, AECOM has done it all in the realm of engineering and construction in the City of Chicago public way.

In addition to serving as the General Engineering Consultant to the Illinois Tollway for over 60 years, AECOM also provides Program Management services for the Aldermanic Streets Menu Program at the Chicago Department of Transportation (CDOT), the Capital Improvement Program of the Chicago Transit Authority (CTA), the O'Hare Modernization Program of the Chicago Department of Aviation (CDA), and the Capital Improvement Program of the Chicago Public Schools (CPS). AECOM will support ComEd in the management and execution of project deployment.



Silver Spring Networks: delivering the intelligence to power a brilliant future

Silver Spring Networks was founded in 2002 with the goal of creating a communication platform for the smart grid based on open, Internet Protocol standards, allowing continuous, highly reliable, highly secure, two-way communications between utilities and their grid devices. Building on this heritage, our proven platform has been extended to connect and control streetlights and a growing ecosystem of Smart City equipment.

Silver Spring's networking platform offers the city the scale, performance, security and extensibility needed for intelligent street lighting and future smart city applications. Silver Spring's utilizes the Streetlight.Vision smart city central management software to enable operators to monitor and control networked streetlights.

Accenture: helping organizations maximize their performance and achieve their vision

Accenture is a leading global professional services company, providing a broad range of services and solutions in strategy, consulting, digital, technology and operations. Accenture has a proud history working with the City of Chicago and different civic stakeholder groups across the city. Accenture's Chicago office serves as Accenture's U.S. headquarters, with over 5,600 employees working at our office. Accenture supports over 50 Chicago-based not profit organizations – annually helping over 4,000 residents to build skills, get a job or build a business in the City of Chicago. Accenture will support ComEd in the integration of systems and technologies.

MBE/WBE PARTNERS

Our team also includes several Minority/Woman Business Enterprises (MBE/WBE) that will contribute their specialized skills to the overall effort while enjoying an opportunity to expand their business through meaningful, productive work. Profiles of these partners are provided in the MBE/WBE Participation Plan.

PROJECT UNDERSTANDING

The City of Chicago and the Chicago Park District, through the Chicago Infrastructure Trust, are initiating the Chicago Smart Lighting Project to increase energy efficiency, address issues of deteriorating infrastructure and improve the quality and reliability of lighting resulting in enhanced public safety and quality of life, and to support the deployment of new and emerging digital technologies. The project will:

1. Convert a substantial proportion of Chicago existing outdoor light fixtures to LED.
2. Repair/stabilize existing lighting infrastructure within constraints of the available budget.
3. Establish a City-Wide Lighting Management System for the remote monitoring and control of outdoor lighting.

OUR APPROACH

ComEd is a long-time, trusted partner in Chicago and an infrastructure expert. We own and maintain over 176,000 streetlights and have already conducted multiple LED conversion projects in the Chicagoland area using different lighting management software solutions.

LARGE-SCALE LED CONVERSION

Our team offers the complete package of expertise and qualifications necessary to conduct the City-wide LED conversion and perform stabilization repairs to increase the reliability of existing lighting infrastructure.

We will provide and install LED luminaires meeting specifications of the Chicago Department of Transportation (CDOT) Division of Electrical Operations (DEO), and will manage all logistics; from the supply of material, local assembly support and staffing of installation crews. The scheduling of installation will be dictated by the City with various components of the work issued by Work Order.

TARGETED INFRASTRUCTURE STABILIZATION REPAIRS

Repairs to existing infrastructure will be performed on a targeted basis subject to available budget and conducted under the direction of the City. We will conduct an asset condition assessment to supplement existing data on poles and circuits provided by the City to identify problem locations and the solutions that will stabilize the infrastructure to perform the LED conversion, improve safety by addressing structural deficiencies, increase reliability of circuits and extend the useful life of the infrastructure to match the life of the LED.

LIGHTING MANAGEMENT SYSTEM (LMS)

Our smart lighting service will leverage ComEd's smart meter communications network, proven lighting control devices, and Silver Spring Networks' Streetlight.Vision CLMS platform. We believe that with this solution the City can feel confident that they are choosing a proven LMS for the large-scale implementation Chicago demands.

Key aspects of this proposal are:

- The City will be leveraging ComEd's existing Chicago-wide Advanced Metering Infrastructure (AMI) communications network as the backbone for the smart lighting system, significantly reducing project cost and risk, and employing existing systems and processes to ensure project success.
- ComEd will be offering the only LMS that has been proven at the scale required by Chicago. Examples around the world include the City of Paris, Florida Power & Light's 500,000 streetlight deployment, and the City of Copenhagen's city-wide network.
- ComEd's fully managed solution guarantees network performance for the City. ComEd will continue to own and operate this existing network on behalf of the City, and will manage the solution with dedicated, local ComEd solution experts backed by Silver Spring's two 7x24 Network Operations Centers with redundant secure datacenters.

Project Management & Implementation Plan

As the experts in safe, modern electricity delivery, ComEd is best equipped to manage and execute this project. We have extensive experience leading diverse, multidisciplinary teams through all stages of major capital improvement initiatives and have assembled a team of top local talent and industry experts including recent, proven expertise in community-centered rollout of new technology pursuant to the Smart Grid Law.

The Project Management and Implementation Plan (PMIP) we are providing for the Chicago Smart Lighting Project is representative of the PMIPs that ComEd routinely employs to manage major capital improvement projects. While the document is designed to follow ComEd standards so that we can quickly finalize the plan and begin project execution, the content within this PMIP directly correlates to each of the City's requirements defined by the RFP. To assure that we have addressed the City's PMIP requirements there are two methods for cross-referencing the PMIP with RFP requirements:

1. Cross reference table which maps the RFP and Form A requirements to specific section(s) of the PMIP
2. Call-out boxes in the margins of the PMIP which reference the RFP requirement.

Our Project Management and Implementation Plan, shown on the following pages as Exhibit 1, is a standalone reference document that will guide the execution of the project should our team be selected by the CIT.



An Exelon Company

Project Management Implementation Plan

Chicago Smart Lighting Project

Document History

Document Revision

Version #	Release Notes	Author(s)	Issue Date
1.0	Initial Draft for response to RFP	ComEd	

Document Owner

Name	Title	Organization	E-Mail

Document Distribution

Name	Title	Role	E-Mail
Blaise, Michelle	SVP	Executive Sponsor	Firstname.lastname@ ComEd.com
Svachula, Joe (Joseph)	VP	Executive Sponsor	
Gersna, Joe (Joseph)	Director	Portfolio Director	
Kadich, Michele	Mgr	Program Manager	
Frieh, Carla	Mgr	Program Manager	

Prepared by:	NAME HERE
Version:	1.0
Document #:	PMIP-001
Date:	January 9, 2017

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2. SECTION II - CROSS REFERENCE TABLE

The table below provides a quick reference to show how the areas of response within *Form 1 Response to RFP Checklist* for the Project Management Implementation Plan correspond to the specific sections/locations in this document.

	Form 1 Response to RFP Checklists	RFP section	Addressed in this PMIP
<input type="checkbox"/>	Implementation Overview	Sec. 4.3.6.4 – first bullet “Implementation Overview”	Sec 4.0-4.1, p. 7
<input type="checkbox"/>	Team Structure	Sec. 4.3.6.4 – second bullet “Team Structure”	Sec 4.2, pp. 7-8 Sec 7.1, p. 15 Appendix B
<input type="checkbox"/>	Approach to Project Phasing	Sec. 4.3.6.4 – third bullet “Approach to Project Phasing”	Sec 6.1, p. 12
<input type="checkbox"/>	Schedule Milestones	Sec. 4.3.6.4 – fifth bullet “Schedule Milestones”	Sec 6.3.3, p. 14
<input type="checkbox"/>	Approach for Performing the Work	Section 4.3.6.4 – sixth bullet “Approach for Performing the Work”	Sec 8, pp. 22-33
<input type="checkbox"/>	Project Management Plan	Sec. 4.3.6.4 – fourth bullet “Progress Reporting” Sec. 4.3.6.4 – seventh bullet “Project Management Plan”	Sec 6.3, pp. 13-14 Sec 7.2, p.16 Sec 7.4, pp. 16-17 Sec 7.9, p. 20 Sec 7.10, p.21 Sec 7.11, p.21 Sec 8, pp. 22-33 Sec 9, p. 34 Appendix A
<input type="checkbox"/>	Communication and Coordination	Sec. 4.3.6.4 – eighth bullet “Communications and Coordination”	Sec 6.4, p.14 Sec 7.7, p. 18 Appendix A
<input type="checkbox"/>	Quality Management Plan	Sec. 4.3.6.4 – ninth bullet “Quality Management Plan”	Sec 7.8.1, p. 19 Sec 7.8.2, p.20

For ease of review throughout this document, look for the red box to reference the corresponding RFP section(s)

Example:

Responds to: RFP Sec. 4.3.6 Project Management Implementation Plan Requirements

3. SECTION III - TERMS AND DEFINITIONS

Project Management Office: The Project Management Office operates at the executive level, managing organizational efficiencies and ensuring that they are directed towards strategic objectives. The Project Management Office also takes on the role of minimizing organizational risk while maximizing return on investment

RACI Matrix: A matrix defining the level of responsibility/role of key program groups or individuals will be developed upon award using the following:

- **Responsible (R)**: This Party is responsible for deliverable; set of goals to be achieved, budget to be maintained, Project Milestones to be achieved.
- **Accountable (A)**: This Party has been delegated the creation of the work/deliverable and will deliver to the Responsible Party.
- **Consulted (C)**: This Party's input is needed for decision making by R or A party.
- **Informed (I)**: This Party receives email/copy of document informing them of update/change/plan, no input required.

Risk Score: An organizational wide process to determine the risk-based prioritization scores for system performance projects and programs. The score is determined based on the probability of an event to occur and the impact of the event in the areas of reliability, safety, and environment. The area with the highest impact or score defines the risk score for that project or program.

4. SECTION IV - EXECUTIVE SUMMARY

Responds to:
RFP Sec.
4.3.6.4 PMIP
Submittal
Requirements

With approximately 3.8 million customers across northern Illinois, ComEd manages the electrical infrastructure of the nation's third largest metropolitan region, and executes an average of more than \$1.7B annually in capital expenditures across hundreds of projects.

ComEd has a long track record of delivering major projects – on time and on budget, while delivering record system performance. ComEd manages its capital programs through an internal organization comprised of engineering, procurement, project management, and project controls support. ComEd has an established framework for, and proven track-record of, successfully executing its portfolio of work.

ComEd requires a project management plan for all projects greater than \$500,000 and this Project Management Implementation Plan (“PMIP”) integrates individual plans to manage:

- Scope Development
- Procurement/Contracting
- Resource/Staffing Management
- Schedule Development
- Risk Management
- Cost Management
- Quality Management
- Safety
- Stakeholder Management
- Communications
- Change Management
- Record Management

4.1. Project Management Implementation Plan Overview

Responds to:
RFP Sec.
4.3.6.4
“Implementation
Overview”

This Project Management Implementation Plan (PMIP) sets forth the methods, management, organization, schedule, budget and other parameters that ComEd will use in managing and executing the Chicago Smart Lighting Project. ComEd's Quality Management System (QMS) is aligned with International Organization for Standardization (ISO) 9001 and 9002 standards, ComEd specifications, standards, and practices, as well as nationally recognized quality programs.

This document will be revised or re-affirmed on an annual basis from issuance of the original version. The revision history and corresponding changes are summarized at the start of this document. ComEd is the document owner and will be responsible for annual updates or re-affirmation.

4.2. Organization and Team Structure

Responds to:
RFP Sec.
4.3.6.2
Organization,
4.3.6.4 “Team
Structure”

A cross-functional ComEd team has been assembled in response to the Chicago Infrastructure Trust's Chicago Smart Lighting Project Request for Proposals (RFP) to bring smart LED streetlight service to the City.

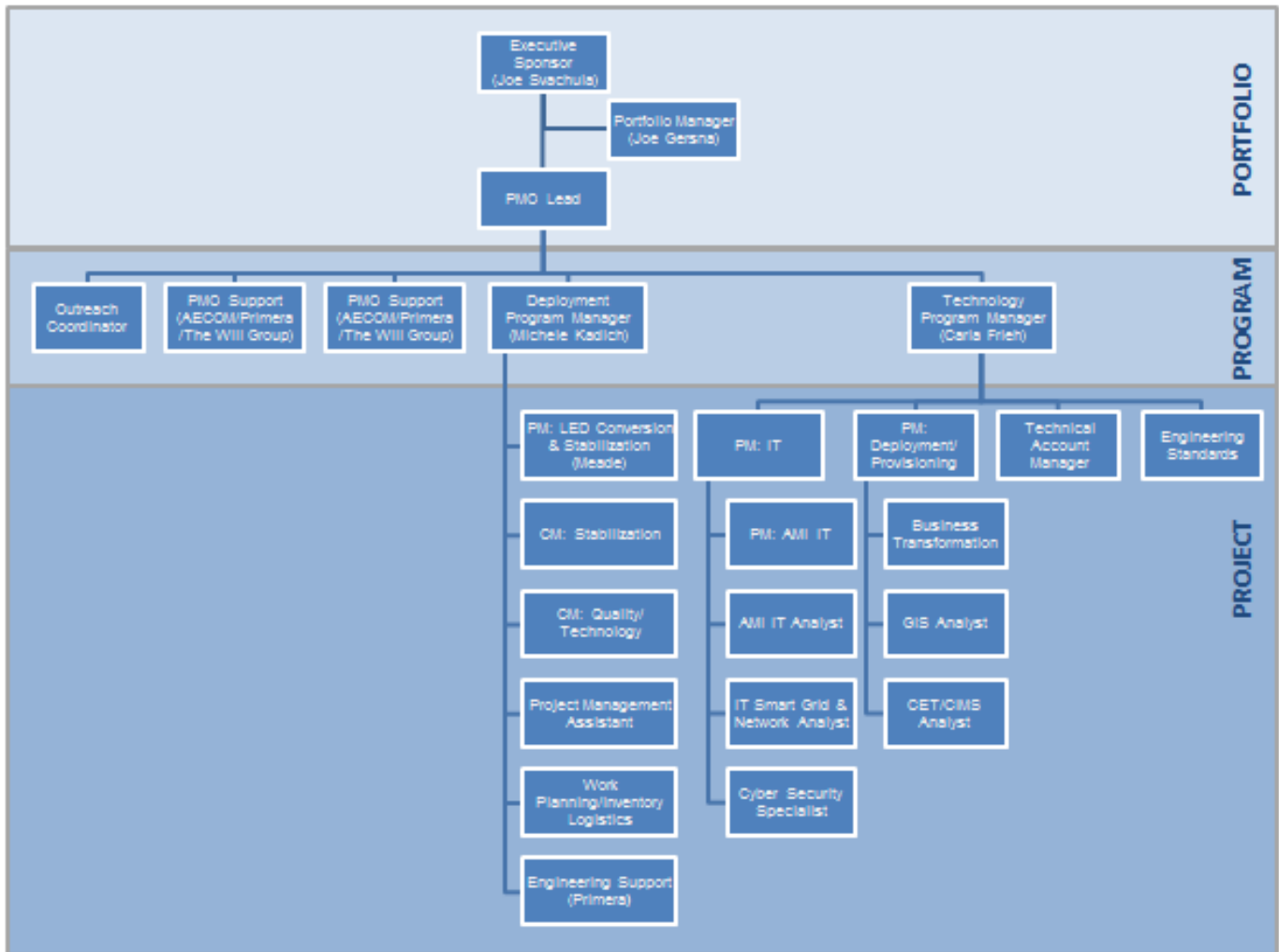
ComEd will serve the City of Chicago in the role of Prime Contractor/Consultant with support from Meade, Current, powered by GE, The Will Group [MBE firm], AECOM, Primera, Silver Spring Networks, Accenture, and a cast of well qualified M/WBE firms.

The Chicago Smart Lighting Project will operate as a portfolio with overarching governance and oversight, within which three distinct programs will be managed to maintain focus and control around day to day operations. At the project level ComEd will support the City in identifying the priority scope, and will then

plan an appropriate execution strategy, manage dedicated construction crews, and complete the scope as scheduled.

A Program Management Office (PMO) will be established to lead the overall execution of the effort for program and project management, and for project controls. This team will reflect the diverse business commitments made for the overall project, with substantive management roles to be filled by The Will Group, Primera, and AECOM. and the PMO will leverage the expertise of partnering contractors for implementation of the work—hereafter referred to as ComEd or the ComEd Team. The Portfolio Manager will oversee the overall execution for the Chicago Smart Lighting program’s three (3) program areas of work: LED Fixture Conversion, Targeted Infrastructure Stabilization Repairs, and the City-wide Lighting Management System. They will also oversee the public relations and outreach aspects of the project to the extent these items are included in the final program scope elected by the City.

Fig. 4.2 – Organizational Structure



5. SECTION V - SUMMARY – PROGRAM AREAS OF WORK

5.1. Chicago Smart Lighting Project - Areas of Work

Responds to:
RFP Sec.
3.0 Project
Scope of
Work

The portfolio is composed of three (3) main program areas of work:

- LED Fixture Conversion
- Targeted Infrastructure Stabilization Repairs
- City-Wide Lighting Management System

5.1.1. LED Fixture Conversion

Responds to: RFP
Sec. 3.1
LED Light
Fixture
Conversion

The primary objective of this program is to install smart LEDs on stable infrastructure, converting existing City and Parks outdoor lighting luminaires to LED “equivalents”. This includes:

- supplying new LED luminaires
- removing/salvaging/disposing/or recycling of existing luminaires
- new luminaire and lighting control hardware installation
- documenting LED conversion work

5.1.2. Targeted Infrastructure Stabilization Repairs

Responds to:
RFP Sec.
3.2 Targeted
Infrastructure
Stabilization
Repairs

The Targeted Infrastructure Stabilization Repairs work consists of the following two areas of work:

- Lighting infrastructure condition assessment – collecting lighting condition attributes and organizing collected data into a database. This data will be used to identify and prioritize subsequent stabilization work.
- Infrastructure stabilization repairs – those activities primarily associated with targeted, directed, pole and wiring replacements and/or repairs to the existing outdoor lighting infrastructure. The objectives of this work are to:
 - (i) improve safety by increasing light pole structural stability
 - (ii) increase reliability by focusing on repairs that will have the greatest impact toward reducing failure rates
 - (iii) extend the useful life of existing lighting infrastructure

The repair prioritization will focus on work that can be performed above ground (e.g. work that will make temporary aerial wiring more permanent rather than replacing with new underground conduit and wiring). This prioritized approach will increase system reliability to the greatest extent possible and extend the useful life of the lighting infrastructure to at least as long as the new LED fixtures.

5.1.3. City-Wide Lighting Management System

Responds to:
RFP Sec. 3.3
Lighting
Management
System

The ComEd Team is responsible for the design, installation, start-up, commissioning, operation, and maintenance of a networked lighting management system. The City-wide Lighting Management System (“LMS”) will provide for remote monitoring and control of lighting; secure and timely data transmission; a lighting asset inventory; collection of energy usage data; mobile device application(s) to be used by City staff, integration into the City’s 311 system, and development of adaptive lighting strategies. The LMS may be integrated into the City’s 911 system in the future.

Upon award, a comprehensive project plan, or “Deployment Playbook”, for Design, Start-up, Installation, Configuration, Commissioning, Data Migration, Training and Knowledge Transfer, and Supporting all aspects of the LMS itself will be developed, with each phase containing a detailed list of milestones, accountabilities, and supporting tools like checklists and data validation.

The LMS will provide near real-time updates on lighting performance, which will enhance the City’s ability to provide responsive and efficient lighting service in the event of failure, and nearly eliminate wasted energy that results from lights burning in the day due to equipment malfunction.

6. SECTION VI - PORTFOLIO MANAGEMENT

The ComEd Team utilizes an array of tools to closely manage scope, schedule and budget. In regards to the general budgeting approach, ComEd adheres to an approved multi-year budget plan that aligns scope targets with program and project budgets. For example, the EIMA Storm Hardening portfolio of work was assigned a target of 123 projects with a budget of approximately \$75M for the calendar year 2015.

With respect to project scheduling, Project controls specialists are tasked with the development of detailed project schedules. The Project Controls Team monitors the project schedule to an approved baseline. Recovery efforts are made when necessitated to adhere to the schedule baseline.

ComEd's Project Managers meet weekly with their assigned scheduler to adjust schedules accordingly. Scheduling tools such as Primavera are used to manage project schedules, and scope is linked to schedule by creating work tasks in ComEd's Asset Suite 8 work management tool. These tools assist in effectively managing work and meeting schedules on assigned projects.

6.1. High Level Planning

ComEd understands that work orders will be assigned by Project Phase, and that each Phase will be assigned by geographic areas composed of assigned regions no smaller than ten contiguous Atlas Pages. The City expects to complete the Chicago Smart Lighting Project in four phases, with each phase being one year in duration. The chart below depicts ComEd's understanding of the Chicago Smart Lighting Project planning for phased implementation.

Table 6.1 – Project Phasing and Work Order Assignment

Work Order #	Activity	Future Years																
		Year 1				Year 2				Year 3				Year 4				
		90d	180d	270d	365d	90d	180d	270d	365d	90d	180d	270d	365d	90d	180d	270d	365d	
100.01	LED Conversion	[Blue bar]																
100.02	¹ Assessment: 120 days Ph.1 / 300 days total	[Green bar]																
100.03	² Stabilization & Repair																	
100.04	City-Wide Lighting Mgmt.	[Orange bar]																
200.01	³ LED Conversion				w.o.	[Blue bar]												
200.02	⁴ Stabilization & Repair				w.o.	[Grey bar]												
300.01	³ LED Conversion								w.o.	[Blue bar]								
300.02	⁴ Stabilization & Repair								w.o.	[Grey bar]								
400.01	³ LED Conversion															w.o.	[Blue bar]	
400.02	⁴ Stabilization & Repair															w.o.	[Grey bar]	

Notes:

- ¹ Asset condition assessment to be completed within 300 days of work order execution; for Atlas Pages assigned in Year 1/Phase 1 those portions of the assessment related to Atlas Pages must be completed within 120 days
- ² City will issue a work order, based on information gathered from the assessment, relating to infrastructure stabilization repair work to be completed in Year 1/Phase 1
- ³ City will provide Atlas Pages no later than 120 days prior to the expected commencement of the LED Conversion project phase, work order to be issued once pricing and luminaire selections and submittals accepted
- ⁴ City will provide a work order prior to the expected commencement of the Stabilization & Repair project phase
- core services of the city-wide LMS are assigned through the base Contract

For the LED Fixture Conversion work ComEd anticipates being assigned work orders sequentially over the term of the Contract prior to the commencement of each Project Phase. In regards to Targeted

Responds to:
RFP Sec. 2.2.2
Project Phasing
& Work Order
Assignment

AND

RFP Sec.
4.3.6.3 Phased
Implementation
Guidelines

Responds to:
RFP Sec.
4.3.6.4 –
“Approach to
Project
Phasing”

Infrastructure Stabilization & Repair work, ComEd anticipates a Work Order for the first Project Phase once the initial asset condition assessment data has been received and processed by the City. It is understood that such work orders for future Project Phases will be provided prior to the commencement of each respective Phase. Note that ComEd requires a work order at least 45 days before the City’s anticipated execution.

The ComEd Team has the technical expertise to analyze the assessment data, review any deficiencies identified, and, if the City is amenable, recommend expeditious solutions.

6.2. Risk Management

To ensure the success of the Chicago Smart Lighting Project, the ComEd Team will encourage and support proactive and transparent discussion of risk among all stakeholders. Identified risks will be managed with a robust methodology and will be a focus of each Portfolio review.

Risks to the execution of the Chicago Smart Lighting work will be managed through a process of risk identification, risk analysis, and risk response planning. Risks will be entered at the Project level where associated with a specific work order, or at the Portfolio level where associated with a risk category common to multiple Programs. The Program Leads are responsible for ensuring that risks are actively identified and managed in the risk register. The Portfolio Manager is responsible for monitoring the risk management process and facilitating the risk review discussions.

Identified risks will be entered and tracked in a risk register on the Chicago Smart Lighting SharePoint site, where planned data fields include a unique tracking number, category of risk (e.g. external affairs, or traffic), the risk identifier, accountable person, cause, effect, mitigation strategy, probability and impact risks score (see Figure 6.2), status of mitigation action,; and any schedule impacts.

Risk responses are entered in the risk register with the data fields of mitigation action, person accountable for the mitigation action, due date, and mitigation status. The person accountable is responsible for developing and implementing mitigation actions to reduce the risk and associated risk score to a level acceptable to the risk initiator.

Fig. 6.2 – Risk Scoring Matrix (example)

IMPACT	VHI	5	10	15	20	25
	HI	4	8	12	16	20
	MOD	3	6	9	12	15
	LOW	2	4	6	8	10
	VLOW	1	2	3	4	5
		VLOW	LOW	MOD	HI	VHI
		PROBABILITY				

The status of all risks in the risk register will be reviewed weekly with Program Managers and escalated, as necessary, to the Portfolio Manager for any portfolio level risks. The ComEd Team person assigned responsibility for addressing the risk mitigation action shall report on the progress of the mitigation actions and any additional mitigation actions that may be required. The risk will be closed when the risk impact and probability have been effectively mitigated through the risk response actions to the satisfaction of the risk initiator, the Program Manager, and the Portfolio Manager. The person accountable shall ensure that any changes to processes, standards, etc. are clearly documented and communicated to all affected stakeholders.

6.3. Portfolio and Program Performance Reporting

Responds to:
RFP Sec.
4.3.6.4
"Progress
Reporting"

Progress performance reporting of the Chicago Smart Lighting Project portfolio will be accomplished through a central reporting system (described below) and presented at a monthly meeting with the City and facilitated by ComEd. The objective of the meeting will be to discuss the previous month's results and forecast performance for the remaining months of the current fiscal year. At these meetings, the Program Manager will be responsible for summarizing the previous month's performance. For any variances from targets, the Program Manager will identify cause and recovery actions as well as justification.

In anticipation of these meetings, the Project Controls group will publish updates with feedback from Program Managers on a weekly basis. Program Managers will report the Program's progress to ComEd Leadership on a monthly basis via project reports. The monthly executive reports will be reviewed with ComEd Leadership during monthly meetings.

The planned reporting system will utilize a database to integrate data from ComEd's financial tracking system Work Planning Tool ("WPT") and Primavera 6's ("P6") schedule application, as well as the risk register, major unit targets, quality metrics, and an overall portfolio dashboard.

6.3.1. Scope Reporting

ComEd acknowledges that the City has encouraged proposers to submit proposals for annual LED conversions which exceed the minimum annual LED conversion requirements for annual fixture conversions. ComEd finds this certainly achievable given our proven project delivery capabilities, however, ComEd emphasizes that productivity will be set/dependent upon the City's issuance of work orders.

Table 6.3.1 Annual LED Conversion Targets

Activity	Phase I 2017 (Year 1)	Phase II 2018 (Year 2)	Phase III 2019 (Year 3)	Phase IV 2020 (Year 4)
Annual LED Conversions (meets sec 4.3.6.3)	75,000	75,000	75,000	60,000
Aggregate LED Conversions	75,000	150,000	225,000	285,000
All methods of counting LED Conversions shall adhere to "Method of Measurement" as detailed in Exhibit K: Existing Fixture Removal and LED Fixture Installation Specifications, Items 1-10.				

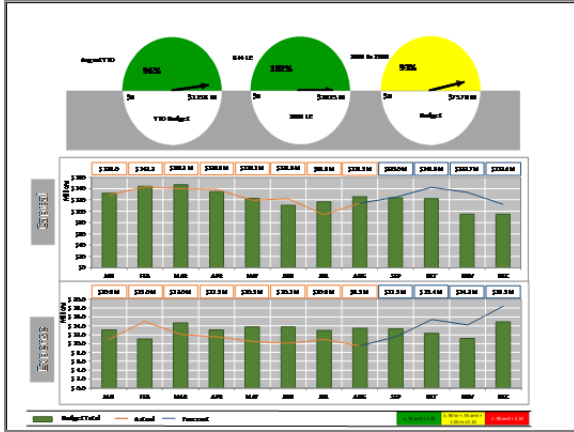
All measures of completion for the Targeted Infrastructure Stabilization Repairs will be tracked by the ComEd Team per the Method of Measurement in Exhibit L: Infrastructure Stabilization Scopes of Work and Specifications in regards for supporting completion to the City.

The Lighting Management System scope will be measured against defined project milestones and the project schedule, as agreed at the onset of the project.

6.3.2. Budget Reporting

Project and Program Managers obtain monthly forecasts of contracted labor, material, and other costs through the end of the current month and extending through the end of the year. This information is finalized by the ninth working day of the month. Portfolio level budget tracking dashboards are developed and used to show forecast to completion.

Fig. 6.3.2 Portfolio Capital and Expense Report (example)



6.3.3. Schedule Reporting

The Project Controls Scheduler develops the detailed resource loaded project schedules, which are the basis for project, program, and portfolio health reporting and monitoring. Schedules will follow ComEd's Administrative Procedure (PC-CE-9004). Schedules are built in with key milestones for each project.

Subcontractors provide the Project and Program Managers with the projected forecasts for the project costs with details regarding any significant changes from previous forecasts and an estimate of work to be performed.

Fig. 6.3.3 Portfolio Milestone Management (example)

Q1 - 2017 Shows projects with Construction Starts in Q1 2017 only

	Phase 2	Above Grade IFA	Above Grade IFC	LL Mat MR Created	Phase 3	Long Lead Mat Recd	Constr Start	Outage Start
# Completed	9/9	14/33	8/34	20/37	5/8	5/38	1/39	0/35
# On-Track	0/9	3/33	9/34	2/37	1/8	10/38	18/39	16/35
# Off-Track	0/9	16/33	17/34	15/37	2/8	23/38	20/39	19/35

The Major tasks and processes that must be accomplished through the term of the Contract to deliver the Chicago Smart Lighting Project will be provided in detail upon award.

6.4. Communication Management

The complete Portfolio communication management plan is provided in Appendix A and referenced in Section 7.7.

Responds to:
RFP Sec.
4.3.6.4 -
"Schedule
Milestones"

Responds to:
RFP Sec.
4.3.6.4
"Communication
& Coordination"

7. SECTION VII - PROGRAM MANAGEMENT

7.1. Project Management Organization

Responds to:
RFP Sec.
4.3.6.4
"Team
Structure"

The ComEd Team includes staff directly supporting the Portfolio Manager and Program Managers as well as those staff in the various functional departments within ComEd. These departments include reliability, engineering, construction and maintenance, project management, and work management, among others.

Table 7.1 – ComEd Team

Name/Org	Title	Role	Program(s)
Joe Gersna/ ComEd	Director; Projects and Contract Management	Portfolio Manager	<ul style="list-style-type: none"> LED Fixture Conversion and Targeted Infrastructure Stabilization Repairs City-Wide Lighting Management System
Michele Kadich/ ComEd	Manager; Distribution Projects	Program Manager	<ul style="list-style-type: none"> Targeted Infrastructure Stabilization Repairs LED Fixture Conversion
Carla Frieh/ ComEd	Manager; AMI Operations	Program Manager	<ul style="list-style-type: none"> City-Wide Lighting Management System
Name TBD/ ComEd	Outreach Coordinator	Outreach Coordinator	<ul style="list-style-type: none"> Public Relations and Communications
Names TBD /ComEd	Project Manager Construction Manager	Project Manager Construction Manager	<ul style="list-style-type: none"> LED Fixture Conversion and Targeted Infrastructure Stabilization Repairs City-Wide Lighting Management System
Meade	Implementation Contractor	Implementation	<ul style="list-style-type: none"> LED Fixture Conversion and Targeted Infrastructure Stabilization Repairs
The Will Group	Implementation Contractor	Implementation	<ul style="list-style-type: none"> LED Fixture Conversion and Targeted Infrastructure Stabilization Repairs City-Wide Lighting Management System

Portfolio Manager – accountable for determining the work to be accomplished in accordance with the CIT guidelines and standards, reflecting the priorities set through work orders, and assessing risks at portfolio level. The Portfolio Manager reports to the Sponsor.

Program Manager - Responsible for the overall management of assigned program's projects in accordance with existing Project Management procedures, specifically responsible for scope, schedule, and budget. Responsible for meeting program targets and resolving barriers to execution. Program Manager has the responsibility, authority, and accountability for program planning, scheduling and cost controls, and administration for implementing the program. The Program Manager reports to the Portfolio

Manager.

Project Manager - Responsible for day to day management of assigned project activities, specifically responsible for meeting daily targets and resolving barriers to execution. The Project Manager ensures that assigned Projects are safely executed on schedule, within cost limits, and to the specified quality required by the business need. The Project Manager has the responsibility, authority, and accountability for project planning, estimating, scheduling, control and administration for planning and implementing a project within the program. The Project Manager reports to Program Manager.

7.2. Scope Management

Responds to:
RFP Sec.
4.3.6.4
"Project
Management
Plan"

Each of the three major program work areas within the overall Chicago Smart Lighting Project portfolio will be managed using industry standards and ComEd's proven Project and Portfolio best practices, as detailed in Sections 7 and 8, to ensure successful execution. This management approach is consistent with Exelon's proven Project Management Process for Centrally Managed Projects (PC-ED-P010).

While this approach includes those fundamental project management activities necessary to successfully execute these programs, the timing of these activities will differ from that of a standalone project. This is true because each program consists of many similar projects that are managed collectively, yet begin and end on a rolling and overlapping basis over the course of the life of the Program. For the Chicago Smart Lighting Project portfolio in particular, one result of this differentiation between true projects and programs managed as projects is that the first two phases, Initiation and Study, have been combined resulting in the four phases.

(Details for the LED Fixture Conversion, Targeted Infrastructure Stabilization Repairs, and City-Wide Lighting Management System program areas are provided in Section 8 of this PMIP)

7.3. Project Controls

Project Controls provides the project team with the resources and procedures to facilitate accurate cost/schedule control and forecasting in order to maximize project cost efficiency.

Project Controls provides the accurate and timely production, productivity, and cost information, necessary to allow the total project team, including the Portfolio and Program Managers to be proactive towards cost and schedule control.

The Project Controls professionals are advocates for cost and schedule control through the consistent application of proven, systems, and procedures that ensure emphasis on the project budgets and schedule constraints.

7.4. Schedule Management

Milestones shall be established for all programs and corresponding projects schedules in accordance with the ComEd Phased Project Approach and aligned with the overall schedule agreed upon with the City at time of award. At minimum, the Major Milestones shall consist of ComEd's Standardized Major Milestones as defined in the Management Model Attachment PC-CE-9004-3.

Responds to:
RFP Sec. 2.2.2
Project
Phasing &
Work Order
Assignment,
3.0 Project
Scope of Work,
4.3.6 Project
Management &
Implementation
Plan

Responds to:
RFP Sec.
4.3.6.4
"Project
Management
Plan"

Adherence to the Milestones will be based on a comparison of the Major Milestone baseline dates and the actual progress. Once a Major Milestone is baselined its target completion date can only be revised with the approval of the Portfolio Manager.

Project Controls will produce the following weekly schedule reports for the ComEd Team:

- Schedule Milestone Variances
- Supply Services Status
- Ad hoc Schedule Requests
- Material Forecast Report

To monitor progress, Program Managers will conduct frequent status meetings with the project team including system engineers, coordinators, Contractors of Choice (COCs), Front Line Supervisors (FLS), and Work Management.

7.5. Budget Management

To comply with Sarbanes-Oxley requirements, Program Managers review Investment Tracking Number (ITN) actual costs for open, Centrally Managed ITN's on a monthly basis. A mechanism to document the review process has been added to ComEd's Work Planning Tool (WPT) Clarity.

ComEd's rigorous forecast process targets a five percent (5%) accuracy estimate of future expenditures on a program and project. Full project cash flows are reviewed monthly.

The Program Manager is responsible for developing the work plan summary, cost estimate, and monthly cash flow. The work plan summary and schedule provide information to develop the cost estimate and monthly cash flow, representing the budget for the project. Once the project and budget are approved, variations to this plan are compared to the baseline and future costs are forecasted.

Fig. 7.5 Budget Management (example)

Budget & Productivity Measures		Work Completion				Expenditures in \$000s Capital				Expenditures in \$000s Expense			
Period	PM	Target	Actual	Diff	% Done	Budget	Actual	Diff	% Done	Budget	Actual	Diff	% Done
September	2.19	7	8	-1	114%	\$4,300.2	\$2,239.1	\$2,061.1	52%	\$0.0	\$0.0	\$0.0	NA
Year to Date	1.24	47	58	-11	123%	\$13,745.0	\$13,643.9	\$101.0	99%	\$0.0	\$0.4	(\$0.4)	NA
Year End Projection	0.99	71	71	0	100%	\$18,806.2	\$18,991.5	(\$185.3)	101%	\$0.0	\$0.4	(\$0.4)	NA

7.6. Change Management

This section of the PMIP outlines and provides program level specific details for any changes to scope, schedule or budget for the Chicago Smart Lighting Project portfolio of programs in accordance with the guidelines for building and sustaining critical change initiatives in the project management process per the change management procedure PC-EU-0020.

- Changes in schedule will be tracked through the scheduling software (P6).
- Changes to budget will be tracked in the detail forecast file maintained by Project Controls.
- Changes to scope will be tracked at the project level by the Project Manager.

7.7. Program Communication Management

Responds to:
RFP Sec.
4.3.6.4
"Communication & Coordination"

The communication plan exists to ensure the ComEd Team provides timely, accurate, metrics-based project information vertically and horizontally to all stakeholders. The matrix below is an example of the proven communications management strategy employed by ComEd. The comprehensive, Chicago Smart Lighting Project specific communication plan provides a framework to manage and coordinate the wide variety of communications that take place during all phases of the project. The communication plan covers who will receive the communications, how the communications will be delivered, what information will be communicated, who communicates, and the frequency of the communications.

Effective external communication with residents, businesses, elected officials, and other stakeholders is a necessity for a project of this magnitude. Additional information on the external communication plan will be developed in coordination with the City upon award.

Below is an internal communication management example routinely used at ComEd. A comprehensive Chicago Smart Lighting Project Communication Plan is provided in Appendix A.

Fig. 7.7, Communication Matrix (example)

COMMUNICATION MATRIX Internal	PORTFOLIO							DATE: 01/09/2017						
	INTERNAL STAKEHOLDERS													
LEGEND	Project Management	Reliability	Capacity Planning	Design Engineering	Work Management	Work Planning	C&M	Project Controls	Contractor	OCC	DWS	AISP	Executive leadership	External Affairs
W – Weekly D - Daily														
B - Biweekly M -Monthly														
Q - Quarterly Y -Yearly														
A – As needed I - Informal														
INITIATED FROM														
Project Management		W	M		M		D	W	D	D	A	M	M	A
Reliability	M		A				A		A			A	M	A
Capacity Planning														
Design Engineering	A													
Work Management							M			D	M			
Work Planning														
C&M	D	A									W			
Project Controls	W													
Subcontractor	D	A								D				
OCC	A	A		A	I	I	D		D					
DWS	M	A					M							
AISP	M	A					M		M					
Executive leadership	A	A	A	A	A	A	A	A	A	A	A	A		A
External Affairs	A													

7.8. Quality

7.8.1. Quality Management

The Chicago Smart Lighting Project ComEd Team is firmly committed to meeting the quality requirements and expectations set forth in the applicable Construction Standards. This Quality Management section sets forth the procedures and practices to be adhered to in order to ensure this commitment is met.

7.8.2. Quality Management System

The ComEd Quality Management System (QMS) is comprised of people, processes, and tools which support ComEd's core business functions in achieving excellence. The QMS is aligned with International Organization for Standardization (ISO) 9001 and 9002 standards, ComEd specifications, standards, and practices, as well as nationally recognized quality programs.

Quality Control Approach:

Quality Control (QC) activities focus on the identification of quality issues. This is a product driven approach to quality management. At ComEd, much of the QC function is implemented through observation and inspection of completed work to verify construction meets specifications, standards, and practices set forth by ComEd. During these inspections, critical criteria (ComEd standards) are evaluated to determine if construction could affect quality.

ComEd may develop internal inspection checklists used for QC inspection of the three Program areas on an as warranted basis.

Quality Management Inspectors:

- Conduct Inspections: routine project site visits, inspecting for workmanship, deficiencies, & corrective actions assuring all work is consistent with applicable standards
- Verify materials installed are consistent with applicable standards and codes
- Verify equipment installed is consistent with applicable standards and codes
- Verify testing is done by competent authorized testing personnel or certified firms; recording results
- Verify Test Logs for each project reflecting all testing required is completed and results of each
- Provide QC and QA input for the ComEd Team project status meetings
- Act as a conduit to the QM team managers to direct the focus of inspections and assessments
- Verify re-work/corrective actions and evaluate the effectiveness of the actions taken

Quality Assurance Approach:

Quality Assurance (QA) is the system by which ComEd fulfills its responsibility to be certain the QC is functioning and the end product is realized as specified. QA is a processes driven approach which monitors and evaluates processes to ensure expectations are being met, to resolve identified problems, and prevent occurrence of potential quality issues.

Routine audits, document and record reviews, and continuous improvement initiatives will be executed to provide quality assurance. Industry standard tools and methods are used to facilitate these activities and drive continuous improvement within ComEd.

Quality Management Auditors

- Conduct audits and surveillances to ensure QC documentation and signoff, QC inspections, and quality work processes are being executed in accordance with requirements

- Verify corrective actions are completed to standard/expectation
- Interviews with staff to confirm understanding of processes and procedures
- Surveillance of work practices in field and office
- Desk reviews of documents and records

QC Inspection Sampling

- Field QC inspections and QC documentation and record reviews will be utilized on a sampling basis to improve and control construction quality.
- QC Inspection sampling rates to be employed for smart LED streetlight POC will be determined post-award.

7.9. Document/Record Management

Management of documents and records will be compliant with ISO 9001 requirements for Control of Documents and Control of Records. This will be achieved through implementation of Exelon’s existing procedures for Document and Record Retention. Document Management practices will be compliant with procedure PC-ED-2011, whereas Record Management practices will be compliant with procedure LE-AC-401.

Responds to:
RFP Sec.
4.3.6.4
"Project
Management
Plan"

7.9.1. Program File Organization

Portfolio		Programs
Chicago Smart Lighting Project		LED Light Fixture Conversion
		Targeted Infrastructure
		Stabilization Repairs
		Lighting Management System
Phase	Reserved	
I	As needed	
II		
III		
IV		
Folder 1		Folder 2
1. Initiation and Study Phase		Budget Build Execution Plans Scope Candidates Work selection criteria
2. Project Diagrams and Designs		
3. Project Schedules		
4. Work Preparation		
5. Monitoring		Daily Route Sheets Meeting Minutes Status Reports
6. Record of Work Complete		
7. Performance metrics and Reporting		
8. Closeout		Closeout Checklists Contractor Invoicing Financial Closure Lessons Learned

7.10. Contract and Procurement Management

Responds to:
RFP Sec.
4.3.6.4
"Project
Management
Plan"

ComEd's Contracts and Procurement function exists to procure contractor labor, materials, supplies, equipment and services for the Company. The Chicago Smart Lighting Project needs procurement support to reduce direct cost of materials and services for the projects and to contribute to savings. The benefits to the Chicago Smart Lighting Project that ComEd's procurement organization can provide are increased utilization, increased responsiveness to the project's needs, reduced cost of materials, increased supplies, increased equipment and services, and increased compliance with regulatory requirements. The procurement organization will also work with Project Controls organization to ensure project budgets are maintained. Procurement of contractors, services and materials is performed per procedure PC-ED-1016 and PC-ED-P014.

7.11. Health and Safety Management

Health and Safety is not just a goal, it's a culture - an entire way of doing business. ComEd is firmly committed to operating all of its facilities and projects in a safe, efficient manner.

ComEd's philosophy is not only to comply with all applicable safety, health laws, rules and regulations, but to set the standard. This is done by promoting a proactive safety culture both on and off the job. ComEd upholds safety culture in the same way that we ensure the quality of our work – by implementing rigorous controls through every phase of our projects.

Training and focus on leading indicators are the keys to preventing accidents and incidents. Our employees receive extensive training on how to perform their jobs safely, properly and in compliance with regulations.

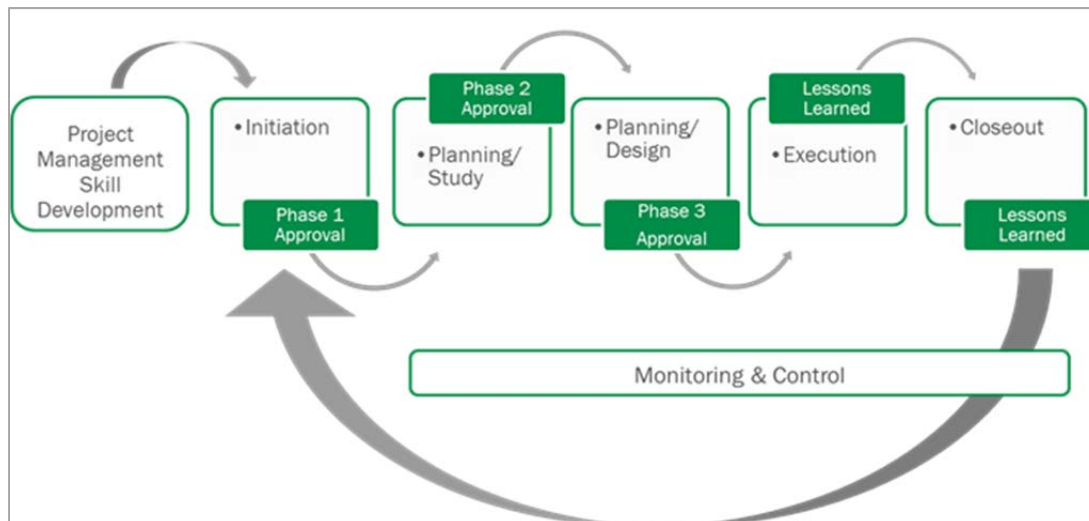
8. SECTION VIII - PROGRAMS OF WORK – SCOPE MANAGEMENT

Responds to:
RFP Sec. 3,
Project
Scope of
Work,
4.3.6.4
Project
Management
Plan &
Approach for
Performing
the Work

As referenced in Section 7, each of the three major program work areas (LED Fixture Conversion, Targeted Infrastructure Stabilization Repairs, and Citywide Lighting Management System) within the overall Chicago Smart Lighting Project will be managed using a four phase approach to ensure successful execution. This management approach is consistent with Exelon's proven Project Management Process for Centrally Managed Projects (PC-ED-P010). (Recall that the Initiation and Study phases have been combined due to the programmatic/rolling nature of the work here, as opposed to a single, discrete, project). Additional details on the three (3) Programs of work are provided in sections 5.2 to 5.4.

Each of the three major program work areas will be supported by a Program Manager and multiple Project Managers. Throughout this section 8 are the requirements of the project manager and the process description for executing the project delivery.

Fig. 8, Project Management Process (PC-EU-P030)



8.1. Project Manager Actions

- Phase 1 – Study Phase – See PC-ED-2001 for Study Phase Details
 - Establishes Project Team.
 - Initiates the Project Plan.
 - Ensures that the financial system is current with appropriate investment tracking number, Project IDs, financial data, and preliminary plant accounting information.
 - Interacts with all necessary groups to secure increased detailed information regarding Project scope, schedule and estimate.
 - Obtains initial commitments from groups responsible for land issues, environmental issues, regulatory and governmental requirements, work planning, etc.
 - Ensures development of cost estimate and schedule at a level commensurate with the available information.

Responds to:
RFP Sec.
4.3.6.4
Project
Management
Plan &
Approach for
Performing
the Work

- Prepares and presents a funding request to the PRC with the Sponsor for Phase 2 Design funding.
- Phase 2 – Design Phase - See PC-ED-2001 for Design Phase Details
 - Updates Project Plan to address the Study findings regarding scope, schedule and cost requirements.
 - Ensures environmental issues, regulatory notifications, real estate, ROW, and permit issues are resolved.
 - Ensures labor force, major material, outage schedule and operations are prepared for the Installation Phase.
 - Ensures scope, schedule and cost information are current and accurate.
 - Prepares and presents funding request to the PRC for Phase 3 Installation.
- Phase 3 – Installation – See PC-ED-2001 for Installation Details
 - Update Project Plan to address any changes to scope, schedule and cost requirements as a result of detailed design or other emergent factors.
 - Ensure that work force activities during construction are within the defined scope, schedule and cost of the Project. Any deviations from the plan are to be promptly identified and addressed.
 - Initiate and follow the change process for scope, schedule and cost. See PC-ED-2013 Project Change Control – Centrally Managed.
 - Ensure livening, testing, and equipment turnover to operations.
 - Ensure complete documentation turnover to the maintenance and operation groups.
 - Change the status of Project in the financial system to “In-Service”.
- Closeout Phase - See PC-ED-2009 for Closeout Details
 - Ensure invoices are paid, contracts closed, excess materials returned, work orders closed, mapping complete, as-builts completed, Add/Delete sheets submitted, etc.
 - Ensure lessons learned information is documented and filed.
 - Perform Project Final Report or Project Implementation Analysis, if required.
 - Update Project Plan with final as-built information regarding scope, schedule and cost.
 - Change the status in the financial system to “Closed”

8.2. LED Fixture Conversion

8.2.1. Project Initiation and Study Phase

Set Work Criteria

It is assumed that, at a minimum, the number of fixtures that are converted to LED fixtures in each Project Year meet the *Minimum Requirements for Number of LED Conversions* as set forth in the RFP. To the extent requested by the City, ComEd will work in coordination with the City, upon award, to establish and agree upon the specific work/scope criteria.

Budget build

Material requests and ordering, to include Long Lead items, will be initiated upon award.

Responds to:
RFP Sec.
4.3.6.4
Project
Management
Plan &
Approach for
Performing
the Work

Select Scope Candidates

ComEd understands the City will assign atlas pages for LED conversion by issuance of a Work Order for each Project Phase, and that the work for each Phase will be assigned by geographic area composed of regions no smaller than ten (10) contiguous Atlas Pages.

If directed to do so by the City, the ComEd Team may leverage Geographic Information System (GIS) analysis to assist the City in evaluating how LED conversions, infrastructure stabilization, and installation of Smart City features can be optimized.

Review execution plans

ComEd will hold a LED Fixture Conversion kick-off meeting and the project execution plan will be reviewed. The purpose of the kick-off meeting will be to set expectations, review roles and responsibilities, and ensure the LED Fixture Conversation Team understands milestone timeframes and targets.

8.2.2. Design Phase

Establish project schedules

The LED Fixture Conversion project schedule will be developed in a manner that most efficiently completes the work for the atlas pages assigned through the City's Work Orders. It is assumed that further refinement of the project schedule will be completed in conjunction with the City after award using available data such as the output from the Condition Assessment.

Develop designs

ComEd will provide and install LED luminaires meeting specifications of the Chicago Department of Transportation (CDOT) Division of Electrical Operations (DEO), handling all logistics from the supply of material, local assembly support and staffing of installation crews.

Plan work orders

The LED Fixture Conversion Team will perform all tasks necessary to prepare for execution of the planned work. This primarily includes requesting and acquiring all necessary permits, coordinating with other ComEd Teams, and communicating with external partners, as applicable, in advance of the conversion work. In order to ensure customer communications are structured and professional, ComEd process CM-CE-P310, Customer Job Briefs and Door Card Process, will be followed as applicable.

Review plan

LED Fixture Conversion Team meetings will be held at a frequency to be determined upon award. General scheduling issues are reviewed during regular meetings and/or conference calls amongst the team. Documents specific to a task or phase (safety procedures, maps, etc.) will be reviewed prior to field implementation.

8.2.3. Installation Phase

Physical Installation

The installation effort will be handled by a team of qualified contractors led by Meade, the largest employer of IBEW Local 9 workers, in coordination with The Will Group.

Further refinement of the project schedules and Work Order assignment will be completed in conjunction with the City upon award using available data such as the output from the Condition Assessment. Physical Installation will include mounting and electrically connecting all components, taking special care

to ensure the City's requirements are met. Any defective materials or workmanship or unsatisfactory test results will be remedied. Written documentation of defective materials and workmanship issues or unsatisfactory test results will be provided.

Update electronic records

Management of documents and records will be compliant with ISO 9001 requirements for Control of Documents and Control of Records. This will be achieved through implementation of ComEd's existing procedures for Document and Record Retention. Document Management practices will be compliant with procedure PC-ED-2011, whereas Record Management practices will be compliant with procedure LE-AC-401.

A Component Installation report will be generated containing a list of all installed components, inspections and observations, tests performed and test results over the course of component installation.

See Section 7.9 on Document and Record Management for a schedule of electronic asset records.

Monitor program progress and performance

The Program Manager is accountable for successful execution of the LED Fixture Conversion. The Project Manager is responsible for overseeing the implementation and completion of the LED Fixture Conversion. The Project Manager will have recurring meetings or teleconferences with the project team to review the program progress and status, to discuss upcoming work, to identify obstacles, and to assign action items.

As described in Section 7, the Project Manager's execution will be consistent with Exelon's proven Project Management Process for Centrally Managed Projects (PC-ED-P010).

Verify and document program results and performance

Verification and documentation of the LED Fixture Conversion will meet the requirements set forth by the City. A testing strategy and plan, and a Commissioning Plan will be provided upon award. In addition, the Project Manager will monitor program progress and conduct frequent status meetings with the project team. Program Managers will report progress to leadership on a monthly basis and provide justification when there is a variance from target.

Upon completion of LED Fixture Conversion work for a given circuit, any anomalies or changes to the circuitry information that currently exists in the City's GIS database will be noted by the project team. These anomalies or changes will be kept in a log that will be shared with the City when the associated atlas area is submitted as completed. Circuitry associations will also be incorporated into the revised asset information database to be loaded into the LMS.

8.2.4. Closeout Phase

Given the long duration of the LED Fixture Conversion program, certain close out activities will be completed on a periodic basis prior to final completion of the four year program in total. Those periodic activities will include formalized termination and acceptance, lessons learned, and certain aspects of financial closure. Upon the end of the four years there will be a comprehensive close out as well, per ComEd procedure PC-ED-2009. This section explains these periodic and program end activities in greater detail.

Formalize project termination and acceptance

The Project Manager ensures work orders are closed and will run a query to verify installation / conversion of lights. The Project Manager will consult with the project team to verify. Acceptance criteria will be further outlined upon award.

Financial closure

The specific financial closure procedure(s) will be outlined upon award based off of City and ComEd standard practices.

Financial closure will follow the ComEd PC-ED-P014. The Project Manager is responsible for validating and approving invoices for work performed. In this regard, the contractor is accountable for submitting invoices and backup spreadsheets to project management. The Project Manager will be responsible for having someone create a Contract Payment Authorization for that invoice per PC-ED-P014. The Program and Project Manager are responsible for approving invoices. This is a monthly process.

Conduct Lessons Learned

The Project Manager will conduct a semi-annual “Lessons Learned” meeting with the relevant stakeholders. The Project Manager will then compile lessons learned and closeout documentation, including feedback, from the project team, and upload it to a Lessons Learned website hosted by ComEd. Subjects to be covered include, but are not limited to, project performance and results, stakeholder communication, and obstacles encountered.

Closeout checklist

The Project Manager will complete a closeout checklist upon closure of any project ID per PC-ED-2009 and the Program Manager will verify completeness. Any actions needing to be taken before project closeout will be included in this checklist.

8.3. Targeted Infrastructure Stabilization Repairs

Responds to:
RFP Sec.
4.3.4.1,
Infrastructure
Stabilization
Submittal
Requirements

The Targeted Infrastructure Stabilization Repairs Work (Stabilization) consists primarily of two efforts: a Lighting Infrastructure Condition Assessment (Condition Assessment) and Infrastructure Stabilization Repairs (Repairs). ComEd and our partners have significant experience in assessing electrical infrastructure. ComEd owns and maintains approximately 176,000 streetlights in Chicagoland and the 72,049 poles on which Chicago alley light fixtures are installed.

8.3.1. Project Initiation and Study Phase

RFP Sec.
4.3.6.4
Project
Management
Plan &
Approach for
Performing
the Work

The Condition Assessment will involve a visual lighting assessment of every fixture listed in the CDOT lighting inventory database and the collection of the lighting condition attribute data outlined in Exhibit C. A plan will be developed, upon award, outlining an implementation schedule, approaches for data collection, and methodologies for managing and delivering the required data and any cost-saving alternatives for obtaining the data.

Set work selection criteria

For the Condition Assessment, a visual lighting assessment will be performed of every fixture listed in the CDOT lighting inventory database and the collection of the lighting condition attribute data outlined in Exhibit C.

The Condition Assessment outputs will inform the total number of repairs that need to be completed.

Budget build

Based upon the Condition Assessment outputs, the City will create a process that prioritizes the repairs that most cost effectively improves safety and increases reliability.

Select Scope Candidates

The focus will be on repairs that will have the greatest impact toward increasing light pole structural stability, reducing failure rates, and extending the useful life of existing lighting infrastructure.

Review execution plans

A Stabilization kick-off meeting will be held and the project execution plan will be reviewed with the Team and support staff. The kick-off meeting is intended to set expectations, review roles and responsibilities, and ensure the Stabilization Team understands roles, responsibilities, and initial milestone timeframes.

8.3.2. Design Phase

Establish project schedules

Based upon the Condition Assessment outputs, the City will create a process that prioritizes the repairs that most cost effectively improves safety and increases reliability. Repair prioritization will focus on work that can be performed above ground, in accordance with the RFP and Exhibit L.

ComEd understands the City will assign atlas pages for Targeted Infrastructure Stabilization Repairs by issuance of a Work Order for each Project Phase, and that the work for each Phase will be assigned by geographic area composed of regions no smaller than ten contiguous Atlas Pages. The Infrastructure Stabilization project schedule will be developed in a manner that most efficiently completes the work for the atlas pages assigned through the City's Work Orders, while balancing the need to complete such work prior to the start of LED Conversion work.

Develop designs

Any Repair or Stabilization work will meet the minimum requirements outlined by the City.

Plan work orders

The Stabilization Team will perform all tasks necessary to prepare for execution of the planned work. This primarily includes requesting and acquiring all necessary permits, coordinating with other Teams and partners, and communicating with impacted external partners, as applicable, in advance of the conversion work. In order to ensure customer communications are structured and professional, ComEd Process CM-CE-P310, Customer Job Briefs and Door Card Process, will be followed as applicable.

Review plan

Stabilization Team meetings will be held at a frequency to be determined upon award. General scheduling issues are reviewed during regular meetings and/or conference calls amongst the team. Documents specific to a task or phase (safety procedures, maps, etc.) will be reviewed prior to field implementation.

8.3.3. Installation Phase

Physical Installation

Stabilization work will conform to established construction standards.

Responds to:
RFP Sec.
4.3.4.1,
Infrastructure
Stabilization
Submittal
Requirements

RFP Sec.
4.3.6.4 Project
Management
Plan &
Approach for
Performing
the Work

Update electronic records

Management of documents and records will be compliant with ISO 9001 requirements for Control of Documents and Control of Records. This will be achieved through implementation of Exelon’s existing procedures for Document and Record Retention. Document Management practices will be compliant with procedure PC-ED-2011, whereas Record Management practices will be compliant with procedure LE-AC-401.

See Section 7.9 on Document and Record Management for a schedule of electronic asset records.

Monitor program progress and performance

The Program Manager is accountable for the successful execution of the Targeted Infrastructure Stabilization Repairs work. The Project Manager is responsible for overseeing the implementation and completion of the both the Condition Assessment and the Stabilization work. The Project Manager will have recurring meetings or teleconferences with the project team(s) to review the program progress and status, to discuss upcoming work, to identify obstacles, and to assign action items.

As described in Section 7, the Project Manager’s execution will be consistent with Exelon’s proven Project Management Process for Centrally Managed Projects (PC-ED-P010).

Verify and document program results and performance

Verification and documentation of the Condition Assessment and Stabilization will meet the requirements set forth by the City. A testing strategy and plan and a Commissioning Plan will be provided upon award. A comprehensive “Deployment Playbook” for Designing, Staging, Installing, Commissioning, Training, and Supporting Smart Lighting and Intelligent City deployments will be developed upon award.

In addition, the Project Manager will monitor program progress and conduct frequent status meetings with the project team. Program Managers will report progress to leadership on a monthly basis and provide justification when there is a variance from target.

8.3.4. Closeout Phase

Given the long duration of this program, certain close out activities will be completed on a periodic basis prior to final completion of the four year program in total. Those periodic activities will include formalized termination and acceptance, lessons learned, and certain aspects of financial closure. Upon the end of the four years there will be a comprehensive close out as well, per ComEd procedure PC-ED-2009. This section explains these periodic and program end activities in greater detail.

Formalize project termination and acceptance

The Project Manager ensures work orders are closed and will run a query to verify installation / conversion of lights. The Project Manager will consult with project team to verify. Acceptance criteria will be further outlined upon award.

Financial closure

The specific financial closure procedure(s) will be outlined upon award based off of City and ComEd standard practices and any applicable ICC tariffs or rules.

Financial closure will follow the ComEd PC-ED-P014, and any applicable tariffs and rules. The Project Manager is responsible for validating and approving invoices for work performed. In this regard, the contractor is accountable for submitting invoices and backup spreadsheets to project management. The Project Manager will be responsible for having someone create a Contract Payment Authorization for that

invoice per PC-ED-P014. The Project and Program Manager are responsible for approving invoices on a monthly basis.

Conduct Lessons Learned

The Project Manager will conduct a semi-annual “Lessons Learned” meeting with the relevant stakeholders. The Project Manager will then compile lessons learned and closeout documentation, including feedback from the project team, and upload it to a Lessons Learned website hosted by ComEd. Subjects to be covered include, but are not limited to, project performance and results, stakeholder communication, and obstacles encountered.

Closeout checklist

The Project Manager will complete a closeout checklist upon closure of any project ID per PC-ED-2009 and the Program Manager will verify completeness. Any actions needing to be taken before project closeout will be included in this checklist.

8.4. City-Wide Lighting Management System

The City-wide Lighting Management System (“LMS”) will provide for remote monitoring and control of lighting; secure and timely data transmission; a lighting asset inventory; collection of energy usage data; mobile device application(s) to be used by City staff, integration into the City’s 311 system, and development of adaptive lighting strategies. The LMS may be integrated into the City’s 911 system in the future.

It is important to note that the establishment of the Lighting Management System, including the deployment of software environments and communication network, is distinct from the activities required to provision individual field devices, or endpoints, into the LMS.

ComEd understands that the City intends to have those tasks associated with establishment of the LMS complete within the first project phase, while provisioning of devices would necessarily continue along with their deployment on new LED fixtures. The timeline for establishment of the LMS will need to be confirmed or refined after completion of the Analysis / Design phase of the project, as outlined in Attachment C to Exhibit B of the RFP.

8.4.1. Project Initiation and Study Phase

Set work selection criteria

N/A

Budget build

N/A

Select Scope Candidates

Upon award, a comprehensive project plan, or “Deployment Playbook”, for Design, Start-up, Installation, Configuration, Commissioning, Data Migration, Training and Knowledge Transfer, and Supporting all aspects of the LMS itself will be developed, with each phase containing a detailed list of milestones, accountabilities, and supporting tools like checklists and data validation.

Responds to:
RFP Sec. 3.3
Lighting
Management
System

Responds to:
RFP Sec.
4.3.5
Technology
Submittal
Requirements

RFP Sec.
4.3.6.4 Project
Management
Plan,
Approach for
Performing the
Work &
Attachment C
to Exhibit B

Responds to:
RFP Sec.
4.3.5
Technology
Submittal
Requirements

RFP Sec.
4.3.6.4
Project
Management
Plan,
Approach for
Performing the
Work &
Attachment C
to Exhibit B

Review execution plans

A Technical Operations Team kick-off meeting will be held and the project execution plan will be reviewed with the Team and support staff. The kick-off meeting will be used to set expectations, review roles and responsibilities, and ensure the Team's understanding initial milestone timeframes.

8.4.2. Design Phase

Establish project schedules

Upon award, specific schedules will be developed for each deliverable outlined in the Planning section of Attachment C to Exhibit B of the RFP. During the project and design development, a detailed schedule will be developed for the remainder of the tasks associated with establishing the LMS.

Develop designs

As outlined in the Technology Services Implementation Guidance, the design phase begins with project planning and development of a detailed requirements document. From this functional and technical designs meeting each of the defined requirements will be developed.

Plan work orders

Beyond the overarching project plan, requirements document, and design documents, the project team will develop a deployment and commissioning plan, test plan, training plan, and support plan.

Review plan

Technical Operations Team meetings will be held at a frequency to be determined upon award. General scheduling issues are reviewed during regular meetings and/or conference calls amongst the team. Documents specific to a task or phase will be reviewed prior to implementation.

8.4.3. Installation Phase

Installation

Given that the ComEd communications network that will be leveraged for the City's smart streetlights already exists, the establishment of the LMS is limited to the back office activities of building, configuring, testing and commissioning the various software environments, migrating existing data into the new environments, and conducting training and knowledge transfer activities.

The first group of activities will be performed by ComEd and SSN IT resources (with input and approval by City staff, as necessary) which culminate in the software environments being established. A more detailed commissioning plan will be provided upon award.

Migration of the City's asset information data will occur once the production software environment has passed testing. More information on the data migration is included below.

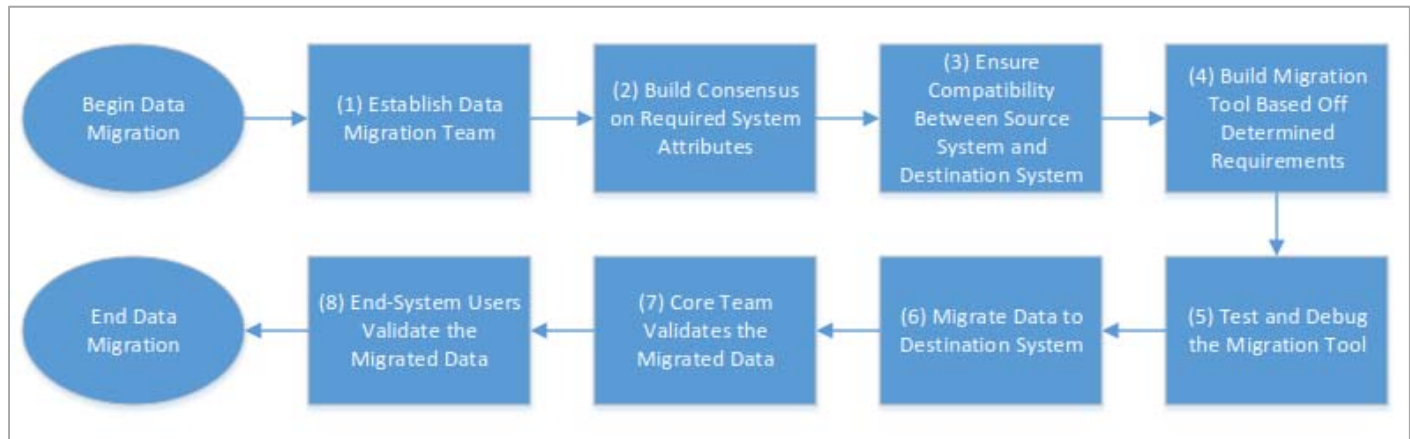
City staff will be trained on the use of the new system based on their roles in the organization. Together, SSN and ComEd will develop and deliver training to City staff once the LMS has been established. Trainings for system administrators and core LMS operators typically involve one to two days of classroom training, supported by training presentations, user guides, and other reference material.

Data Migration

The migration of data will be two-phase: An initial bulk data upload and the addition of new data as endpoints are added. Within the LMS there will be an asset management module, populated with the City's current ESRI data. The bulk migration of the initial dataset would follow the basic process laid out in

the project plan and further detailed in the flow chart below. Migration will occur after the standup of the production instance of the LMS and any updates or corrections are made to the existing dataset. As smart controls are installed in the field, devices would be provisioned into the LMS by updating the asset records with critical communication attributes specific to each individual device. Data migration policy documents, timeline, and a data migration communications plan will be drafted after the City's data has been analyzed and will be put in place prior to the bulk upload.

Fig. 8.4.3, Data Migration (corresponding annotation immediately below this diagram)



Annotated Data Migration process flow diagram – corresponds with Figure 8.4.3, above

- 1) **Establish team** - Data Migration Team should consist of representatives from ComEd and SSN, along with any City of Chicago representatives deemed appropriate by the City.
- 2) **Build consensus on the required attributes** – Build consensus on the required attributes/ data points from source records, the number of records currently in the City's ESRI database to be moved, the format of source records, etc.
- 3) **Ensure compatibility** - Ensure that the City's system and the LMS are configured to accept the same type of records, test if the destination fields match with source fields (if not the data will need to be scrubbed or manipulated to match the source fields during mapping), determine what is needed from the source records to populate the destination records, etc.
- 4) **Build, test, and debug migration tool** - After determining the acceptable error rate, develop a "Migration Tool" and test-migrate a data sample to a non-live testing environment within the LMS. From this data sample, randomly select points to verify for accuracy. From the errors found, debug the system and repeat until results are under the acceptable error level. (Note: the automated testing tool will find smaller errors that may be missed by sampling, and should allow for all errors to be addressed)
- 5) **Migrate data** - Use the migration tool to migrate the data to the production instance of the LMS. Use an automated testing tool to test 100% of the migrated data. From the errors found debug and repeat. (Note: the automated testing tool will find smaller errors that may be missed by sampling, and should allow for all errors to be addressed)
- 6) **Core team validates data** - The Data Migration Team should review the final dataset from within the LMS to ensure that all necessary information has been captured and migrated by the Migration Tool.
- 7) **End users validate data** - Allow end-users to interact with the data and ensure that their needs are met by the migrated information.
- 8) **Complete** - Turn-over the LMS system to end users and provide training on how to use system, as necessary.

City staff will be trained on the use of the new system based on their roles in the organization. Together, SSN and ComEd will develop and deliver training to City staff once the LMS has been established. Trainings for system administrators and core LMS operators typically involve one to two days of classroom training, supported by training presentations, user guides, and other reference material.

Update electronic records

ComEd's experience in previous large-scale deployments and our robust Lessons Learned process will be leveraged in the electronic records updating plan. A key lesson learned has been the importance of meticulous asset information management during deployment and effective management of technology partners in the long term to drive advances in the intelligence of the system. It is our intent from the onset of the project to ensure critical asset information is promptly and accurately provisioned through the LMS. This data will be relied upon to dispatch maintenance personnel and control lighting on roadways. A proven, combined approach using both GIS tools and a proactive quality control process will be utilized to increase accuracy and efficiency.

ComEd believe that while GPS capabilities on board the smart controls and DALI communication between the node and the fixture offer significant quality control benefits, tying the existing records (including circuitry, etc.) to newly deployed nodes requires a basic level of input from the installation crew to verify GPS location. ComEd's approach to provisioning endpoints into the LMS, and in so doing, updating asset records on an ongoing basis, utilizes efficient mobile field tools in addition to GPS and DALI to ensure each device record is accurate.

See Section 7.4 on Document and Record Management for a schedule of electronic asset records.

Monitor program progress and performance

The Program Manager is accountable for the successful execution of the Lighting Management System. The Project Manager will have recurring meetings or teleconferences with the project team(s) to review the program progress and status, to discuss upcoming work, to identify obstacles, and to assign action items.

As described in Section 7, the Project Manager's execution will be consistent with Exelon's proven Project Management Process for Centrally Managed Projects (PC-ED-P010).

Verify and document program results and performance

Verification and documentation of the Lighting Management System will meet the requirements set forth by the City. A testing strategy and plan, and a detailed Commissioning Plan will be provided upon award. In addition, the Project Manager will monitor program progress and conduct frequent status meetings with the project team. The Program Manager will report progress to leadership on a monthly basis and provide justification when there is a target variance.

8.4.4. Closeout Phase

Given the long duration of this program, certain close out activities will be completed on a periodic basis prior to final completion of the four year program in total. Most notably, the contract to establish the LMS will be closed out as soon as practicable after this has been completed. Ongoing provisioning of additional endpoints will be subject to the City's direction to do so, and will be closed out on a periodic basis. Those periodic activities will include formalized termination and acceptance, lessons learned, and certain aspects of financial closure. Upon the end of the four years there will be a comprehensive close out as well, per ComEd procedure PC-ED-2009. This section explains these periodic and program end activities in greater detail.

Formalize project termination and acceptance

The Project Manager ensures work orders are closed and will work with the Team on specific acceptance testing requirements. Acceptance criteria will be further outlined upon award.

Financial closure

The specific financial closure procedure(s) will be outlined upon award based off of City and ComEd standard practices and any applicable tariffs and rules.

In general, financial closure will follow the ComEd PC-ED-P014 and any applicable tariffs and rules. The Project Manager is responsible for validating and approving invoices for work performed. In this regard, the contractor is accountable for submitting invoices and backup spreadsheets to project management. The Project Manager will be responsible for having someone create a Contract Payment Authorization for that invoice per PC-ED-P014. The Project and Program Manager are responsible for approving invoices. This is a monthly process.

Conduct Lessons Learned

The Project Manager will conduct a semi-annual "Lessons Learned" meeting with the relevant stakeholders. The Project Manager will then compile lessons learned and closeout documentation, including feedback from the project team, and upload it to a Lessons Learned website hosted by ComEd. Subjects to be covered include, but are not limited to, project performance and results, stakeholder communication, and obstacles encountered.

Closeout checklist

The Project Manager will complete a closeout checklist upon closure of any project ID per PC-ED-2009 and the Program Manager will verify completeness. Any actions needing to be taken before project closeout will be included in this checklist.

9. SECTION IX - PUBLIC RELATIONS/OUTREACH/PROGRAMMATIC ASPECTS

Responds to:
RFP Sec.
4.3.6.4
Project
Management
Plan, &
Exhibit D

Effective communication with residents, businesses, elected officials and other stakeholders is a necessity for a project of this magnitude. ComEd's proposed Public Relations and Communications Plan is provided in Section I of our proposal.

10. SECTION X - REFERENCES

ComEd Reports and Documents

- ComEd 2014 Infrastructure Investment Plan ComEd Capital Investment Plan: Grid Resiliency Investment Portfolio 2014-2019
- QAD Audit Plan for Contractors of Choice (COCs)
- QC Inspection: Determining Sample Size

ComEd/Exelon Procedures and Processes

- AM-CE-9067 – Work Plan Prioritization Procedure
- AM-CE-P005 – Reliability Improvement Programs
- CM-CE-P336 – Assessment of Distribution Manholes and Components
- FI-ED-2001 – Authorization of Projects
- LE-AC-401 – Records and Information Management, Retention and Disposition
- PC-ED-1016 – Contract Requisition Procedure
- PC-ED-2001 – Project Implementation - Centrally Managed
- PC-ED-2007 – P&CM (Pre-Authorization) Challenge
- PC-ED-2009 – Project Closeout – Centrally Managed
- PC-ED-2011 – Document Retention for Centrally Managed Projects
- PC-ED-2012 – Project Initiation - Centrally Managed
- PC-ED-P010 – Project Management Process for Centrally Managed Projects
- PC-ED-P014 – Contract Management Process for Centrally Managed Projects
- PC-ED-P026 – Project Management - Centrally Managed Program
- WM-CE-1004 – Switching Request System Coordination and User Procedure
- WM-ED-4001 – Work Planning Procedure
- WM-ED-P010 – Work Management Process

External Documents

- BS EN ISO 9001:2008 - Quality management systems – Requirements
-

11. SECTION XI - APPENDICES

Responds to:
RFP Sec.
4.3.6.4
Project
Management
Plan,
Attachment
C to Exhibit
B, & Exhibit
D

Appendix A – Communication Plan

Appendix B – Key Personnel Resumes

APPENDIX A – COMMUNICATION PLAN

Communications Plan

Chicago Smart Lighting Project

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6. Stakeholder analysis	5

Responds to:
RFP Sec.
4.3.6.4
Project
Management
Plan,
Attachment
C to Exhibit
B, & Exhibit
D

1. INTRODUCTION

Responds to:
RFP Sec.
4.3.6.4
Project
Management
Plan,
Attachment
C to Exhibit
B, & Exhibit
D

The purpose of the communication plan is to ensure the Smart Lighting Portfolio and Program Management Team provides timely, accurate, metrics-based project information vertically and horizontally to project stakeholders

The communication plan provides a framework to manage and coordinate the wide variety of communications that take place during all phases of the project. The communication plan covers who will receive the communications, how the communications will be delivered, what information will be communicated, who communicates, and the frequency of the communications. This Communication Plan will be updated upon award, as needed.

2. COMMUNICATION OBJECTIVES

Effective and open communications is critical to the success of the Chicago Smart Lighting Project. Effective external communication with residents, businesses, elected officials and other stakeholders is a necessity for a project of this magnitude. Additional information on the external communication plan will be developed in coordination with the City upon award.

The key communication objectives for the project are:

- Establish a communication schedule
- Establish a communications structure and protocol spanning the various project teams
- Ensure consistent reporting
- Encourage use of project management best practices
- Provide accurate and timely information about each of the three major elements of the Project as well as the Program Management and Project Management Offices
- Ensure a consistent message

3. COMMUNICATION PURPOSE

The purpose of the Communication Plan is to:

- Provide a framework to coordinate and manage overall communications
- Outline what information is communicated, the communicator, the recipient stakeholders, method of delivery, and frequency of the communications. Further details will be added upon award

4. COMMUNICATION MESSAGE AND DELIVER

Responds to:
RFP Sec.
4.3.6.4
Project
Management
Plan,
Attachment
C to Exhibit
B, & Exhibit
D

The following outlines the targeted audiences, the key communication messages to be delivered, and the method for delivering the information, the communicator, and the frequency of the delivery. This section will be updated upon award, as needed.

Core Team	Role Description	Communication Deliverables	Deliverable Recipient	Method	Frequency	Detail (Action, Information)
Portfolio Management	Overview of Task development and Task deliverables / milestones	Executive Summary	City	Smart Lighting Executive Meeting	Monthly	Information
	Funding, resourcing, scope, and risk management	Executive Summary	City	Smart Lighting Executive Meeting	Monthly	Information
Program and Project Management Team	Meeting Coordination	Meeting agendas, meeting minutes, action items	Portfolio Management, all Teams	Program Delivery Team Meeting Email	Weekly	Action
	Aggregated project status report	Project Status Report	Portfolio Management, all Teams	Program Delivery Team Meeting / SharePoint / Email	Monthly	Information
	Risk Register	Metrics reports	Portfolio Management	Program Delivery Team Meeting / SharePoint / Email	Monthly	Action / Information
	Budget, milestone, and performance tracking and metrics	Metrics reports	Portfolio Management	Program Delivery Team Meeting SharePoint / email	Monthly	Information
	Coordinate reporting to Portfolio Management	Meeting agendas, meeting minutes, action items, metrics reports	Portfolio Management	Smart Lighting Executive Meeting Email	bi-weekly	Information / Action
	Coordinate reporting and briefings to City	Status and Metrics Reports	City, Portfolio Management	Smart Lighting Executive Meeting	To be determined upon award	Information
	Align and coordinate all Teams	Progress reports, status updates, meeting agenda, minutes and action items	Portfolio Management, All Teams	Program Delivery Team Meetings	Bi-Weekly	Action

Core Team	Role Description	Communication Deliverables	Deliverable Recipient	Method	Frequency	Detail (Action, Information)
Public Relations Team	Strategic Media and Marketing Plan	Strategy and tactics plan	Portfolio Management, all Teams, City	To be determined at the time of award	To be determined upon award	Action / Information
	Crisis Communication Plan	Strategy and tactics plan	Portfolio Management, all Teams, City	To be determined at the time of award	To be determined upon award	Action / Information
	Project Timeline	Timeline	Portfolio Management, all Teams, City	To be determined at the time of award	To be determined upon award	Action / Information
	Community Meeting Schedule	Schedule	Portfolio Management, all Teams, City	To be determined at the time of award	To be determined upon award	Action / Information

Core Team	Role Description	Communication Deliverables	Deliverable Recipient	Method	Frequency	Detail (Action, Information)
Technical Operations Team	<p>Overarching technical point of contact</p> <p>May include members of the LED Conversion Team, Infrastructure Stabilization Team, ComEd Lighting Controls, Network Equipment Service, Streetlight Integrator, Software Integrator, Smart City Application, and others to be added upon award</p>	Project Plan	Portfolio Management, City, all Teams	To be determined at the time of award	To be determined upon award	Information / Action
		Requirements Document	Portfolio Management, City, all Teams	To be determined at the time of award	To be determined upon award	Information / Action
		Functional Design Plan	Portfolio Management, City, all Teams	To be determined at the time of award	To be determined upon award	Information / Action
		Interfaces Plan	Portfolio Management, City, all Teams	To be determined at the time of award	To be determined upon award	Information / Action
		Background Jobs	Portfolio Management, City, all Teams	To be determined at the time of award	To be determined upon award	Information / Action
		System Documentation	Portfolio Management, City, all Teams	To be determined at the time of award	To be determined upon award	Information / Action
		Support Plan	Portfolio Management, City, all Teams	To be determined at the time of award	To be determined upon award	Information / Action
		Training / Knowledge Transfer Plan	Portfolio Management, City, all Teams	To be determined at the time of award	To be determined upon award	Information / Action
		Test Strategy and Plan	Portfolio Management, City, all Teams	To be determined at the time of award	To be determined upon award	Information / Action
		Data Migration Plan	Portfolio Management, City, all Teams	To be determined at the time of award	To be determined upon award	Information / Action

Responds to:
RFP Sec.
4.3.6.4
Project
Management
Plan,
Attachment
C to Exhibit
B, & Exhibit
D

		Configuration Plan	Portfolio Management, City, all Teams	To be determined at the time of award	To be determined upon award	Information / Action
		Component Installation Results Report (all installed components, inspections & observations, tests performed, test results, defective component, workmanship issues)	Portfolio Management, City, all Teams	To be determined at the time of award	To be determined upon award	Information / Action
		Waste Management Plan	Portfolio Management, City, all Teams	To be determined at the time of award	within 15 days of award or a mutually agreed upon date	Information / Action
		Commissioning and Deployment Plan	Portfolio Management, City, all Teams	To be determined at the time of award	To be determined upon award	Information / Action
	Technical Results Analysis	Technical Reports	Technical Ops Team, PMO, others as needed	To be determined at the time of award	To be determined upon award	Information / Action

5. COMMUNICATION MESSAGE CONTENTS

Responds to:
RFP Sec.
4.3.6.4
Project
Management
Plan,
Attachment
C to Exhibit
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The section outlines sample contents of the key communications. Detailed communication contents will be developed upon award.

Project Plans

- Current and Future Plans
- Project Risks and Issues
- Planned Project Deliverables for Next Period
- Other plans as outlined in the RFP

Status Report

- Status Summary
- Status of Schedule
- Status of Budget
- Status of Scope
- Accomplishments Achieved
- Risks/Issues
- Next Steps
- Project Team Members

Project Briefing

- Goals of Project Management
- Project Status
- Project Issues and Risks
- Project Checklist

6.0 STAKEHOLDER ANALYSIS

Target Audience Participants *(To be completed at the time of award)*

Audience	Participants	Organization	Contact

APPENDIX B - KEY PERSONNEL RESUMES

Joseph E. Svachula, Vice President

Executive

Summary biography

Firm:

ComEd

Base Location:

Oak Brook, IL

Time Allocated on Project:

20%

Years of Experience:

28

Education:

Northwestern University /
Master of Science,
Engineering Management

University of Illinois
Chicago/ Bachelor of
Science Electrical
Engineering

Civic Involvement:

Board member of Special
Olympics/Special Children
Charities Chicago

St John Athletic Board
President, Special Needs
Advocate

As Vice President of Engineering and Smart Grid, Mr. Svachula has a key strategic role directing the personnel and activities of the Distribution Planning, Reliability Programs, Equipment and Standards, and Reliability Analysis departments including the preparation of area capacity reinforcement plans and customer capacity planning. He also provides direction for Smart Grid technologies, not only at ComEd, but in collaboration across Exelon Utilities so that customers fully experience the benefits that this technology promises.

Prior to his current role Mr. Svachula served as Vice President of Distribution System Operations and Vice President of Customer Field Operations. He began his professional career at ComEd in 1988 in a variety of field engineering positions and has more than 28 years of utility industry experience, including key manager positions in Transmission & Substations, Work Management, Distribution Operations, Operational Strategy & Business Intelligence, and Customer Operations Strategies & Support.

Relevant project experience

July 2013 – present

Vice President, Engineering & Smart Grid, Oakbrook, Illinois.

- Responsible for developing and implementing operational plans for the installation of ComEd's Smart Grid projects and other related technologies
- Delivered a 600 page application to the DOE that won an award to design a microgrid controller that will cluster the first microgrids in the world
- Launching a smart LED streetlight pilot in the suburbs and a potential full scale project in the City of Chicago that will bring increasing smart grid benefits to our customers.

August 2012 – July 2013

Vice President, Distribution Operations, Oakbrook, Illinois.

- Responsible for the safe and reliable operation of the ComEd distribution system
- Led the organization to one of the best CAIDI performances on record

July 2010 – August 2012

Vice President, Field Operations, Customer Operations, Oakbrook, Illinois.

- Responsible for an organization of nearly 800 employees primarily engaged with the safe installation, maintenance, and reading of approximately 4 million meters on the ComEd system.
- Led Field Operations to their best safety performance on record in 2011 which was sustained and bettered in 2012
- Developed and implemented Visions and Values to align entire team

June 2009 – July 2010

Director, Strategies and Support, Customer Operations, Oakbrook, Illinois.

- Provided centralized strategic support to all areas of Customer Operations
- Led the development of SVP Marquez's rate case testimony
- Led a Root Cause Investigation on a Microsoft metering issue that uncovered significant problems in Customer Operations including approximately \$4M of undercharged customers
- Initiated and led "Stored Wealth Program" that collected \$4.4M of cash and revenue in the last quarter of 2009
- Co-developed a charging for pole cut initiative which has potential to generate between \$3M - \$9M of billed revenue

October 2008 – June 2009

Director, ComEd Sustainable Solutions (Now known as OSBI), Oakbrook, Illinois.

- Led CEO commissioned team that investigated improvement opportunities in Customer Operations
- Responsible for the formation of the Revenue Protection department which realized \$28M of energy delivery billings in 2010 and \$18.6M in 2009.
- Developed and executed service suspension strategy that has driven bad debt to record lows despite a difficult economy
- Benchmarked organization with other utilities including Progress Energy, FP&L, PPL, and Nicor and instituted best practices at ComEd

January 2005 – October 2008

Director, Chicago Transmission and Substations, Oakbrook, Illinois.

- Co-led Engineering Excellence Supply team that resulted in \$25M of annual savings across Supply and Services by partnering with Engineering, Operations, Planning and external Suppliers
- Negotiated "One Man Package" changing a long standing labor paradigm which allowed for increased Substation productivity in all regions and the strengthened the critical Chicago Network Hi-Rise Group
- Turned around a poor safety culture with strong leadership resulting in increased accountability with both supervision and the workforce.

Additional ComEd Assignments

8/04 - 1/05	Manager - Transmission & Substation	North Region
10/03 - 8/04	Chicago Operations Manager	Chicago Region
3/03 - 10/03	Northern Region Operations Manager	North Region
6/00 - 3/03	Chicago T&S Work Management	Chicago T&S
6/98 - 6/00	Project Manager	Willowbrook
1/96 - 6/98	Testing Supervisor	Chicago Region
1/95 - 1/96	Staff Assistant to VP Paul McCoy	T&D Staff
4/88 - 1/95	Various Testing Engineer Positions	Chicago Region

Joe Gersna, Director of Projects

Project Development

Firm:

ComEd

Base Location:

Oak Brook, IL

Time Allocated to Project:

30 %

Years of Experience:

30 Years

Education:

Valparaiso University
B.A. Electrical Engineering

Civic Involvement:

Member of the Little
Company of Mary Hospital
Auxiliary in Evergreen
Park and Beverly Arts
Center in Chicago.

Summary Biography

Joe Gersna has been the Director of Distribution Program Management since April of 2014. He has direct responsibility for key programs of work at ComEd which include the Energy Infrastructure Modernization Act portfolio of work, Grid Resiliency Investment portfolio, Summer Critical program and Public Improvement projects. Each of these programs consist of multiple projects such as URD cable replacement, Mainline cable replacement, Distribution Automation devices, LED streetlight installation and Storm Hardening projects. This portfolio of work has an estimated annual budget of \$500 million. He implemented multiple process improvements to enhance safety and execution of work such as: scope bundling, customer interface team, bid cycle time reduction and super crew strategy.

Joe has held multiple responsibilities at ComEd before his assignment in Project Management. The key leadership roles are highlighted below.

Relevant Leadership Experience

Training Director 2010 to 2014

Joe directed 5 managers to set the highest standards for the ComEd workforce. His team was responsible for learning curriculums for 2500 ComEd employees which included new hire, refresher and compliance training programs. He fostered innovation by implementing paperless text books and on call compliance training.

Manager of New Business - 2006 to 2010

Joe led six managers in connecting new customers in the Chicagoland area. He and his team conferred with customers on field conflict and proposed solutions, setup billing and service connection schedules. The mobile workforce initiative was implemented during Joe's time in New Business and a 25% improvement in new customer satisfaction occurred.

Quality Services Manager - 2005 to 2006

Joe implemented multiple enhancements to existing processes which benefitted ComEd employees such as clarifying Scope Change process, improving the Job Estimating skills and streamlining Schedule recovery process. One of the major initiatives which Joe implemented was the Work Plan Management process which aligned the budget with the work plan.

Manager of Construction - 2003 to 2005

Led a team of First Line Supervisors and 150 craft workers in safe and efficient execution of multiple scopes of work - New Customer connections, Facility Relocation projects, Summer Critical projects and Preventive and Corrective maintenance tasks and system improvement work. Implemented an employee safety program based on employee engagement - employees were allow and encouraged to take time away out of the field it solve concerns.

Michele Kadich, Manager of Projects

Project Management Technical/ Logistical

Firm:

ComEd

Base Location:

Oak Brook, IL

Time Allocated on Project:

60%

Years of Experience:

26 Years

Education:

St. Xavier University, B.A.,
Business Economics

St. Xavier University,
M.B.A., Finance

Civic Involvement:

Member of Little Company
of Mary Hospital Auxiliary,
Evergreen Park, IL

Member of Beverly Art
Center Auxiliary,
Chicago, IL

Summary Biography

Michele Kadich has been Manager of System Cable, Project Management since July 2010. System Cable manages the Energy Infrastructure Modernization Act URD, Mainline and 69kV Cable Replacement, Manhole Assess and Refurbish and Cable Diagnostic Testing programs. The Team successfully replaced over 1,100 miles of cable in 2015. This was the most cable replaced on record by ComEd. Prior execution of Energy Infrastructure Modernization (EIMA) program, Michele was the Manager of Distribution Projects. She has held a variety of positions with increasing responsibilities in project management, construction management, distribution operations and customer operation dedicating her career to construction and operations. Michele was the first female First Line Supervisor at ComEd selected to the role in 1996

Relevant Project Experience

Underground Civil Infrastructure Upgrade, Madison Ave., West of LaSalle, Chicago, Illinois (June 2015)

Led a Team who developed an engineering solution to clear the path for the CDOT Loop Link Project. The solution involved extending ComEd manhole entrance for safe access. In addition, a 29 foot-deep excavation extending 160 feet was required to rebuild the connecting duct package housing ComEd cable. All work was executed without a safety or operational incident. The project was completed in June 2015 which was 2 weeks ahead of schedule at a cost of \$1.9M.

Energy Infrastructure Modernization Act – Mainline–Manhole Program – ComEd Northern Illinois Service Territory (2012-2017)

The program was part of the legislated infrastructure upgrade to ComEd cable and manhole system. The program began in 2012 and will complete in 2017. All work was executed without a safety or operational incident. The program spend will exceed \$500M.

Washington-Wabash CTA Facility Relocation Project (March-June 2015)

Completed a major facility relocation and cable replacement to meet the needs of the Chicago Transit Authority. The CTA's Wabash Elevated Train station between Madison and Washington was scheduled to be demolished and rebuilt. The ComEd Facility Relocation and Mainline-Manhole Teams collaborated with the Chicago Department of Transportation and the CTA to successfully relocate a 20 duct package, rebuild 2 manholes, relocate a network transformer, and replace manhole roofs. Construction started in March 2015 and completed without safety or an operational incident in June 2015. All work was executed without a safety or operational incident. The total cost of the project was \$6.5M.

Manhole Rebuild at LaSalle & Washington, Chicago (December 2015)

This was the largest manhole that the ComEd Mainline-Manhole Team executed. Working together, CDOT, the Mainline-Manhole Team, Meade Electric, and HBK Engineering, developed a safe execution plan with enhanced attention to the significant amount of vehicle and pedestrian traffic. The project was staffed 24 hours per day Monday through Friday and 12 hours on Saturday and Sunday. Workers were transported by bus to and from the site to avoid unnecessary vehicles at the job site. With the collaboration and cooperation of CDOT, the rebuild was completed 2-1/2 weeks ahead of schedule without safety or operational incident.

Carla Frieh, ComEd Manager AMI Operations

Technology Deployment

Firm:

ComEd

Base Location:

Oak Brook, IL

Time Allocated on Project:

50-75 %

Years of Experience:

12

Education:

B.S. Electrical Engineering

M.B.A. Operations Management

Summary Biography

Carla Frieh is the Manager of Advanced Meter Infrastructure (AMI) Operations at Commonwealth Edison Company (ComEd). As such, Carla is responsible for the health of the smart meter system and ensuring meters are reliably communicating with the network. In addition, Carla is responsible for the successful integration of smart city applications on the AMI network; for example smart LED streetlight with smart photocell controllers which enable remote monitoring and control over the AMI network. Carla's strong leadership, innovative thinking and analytical skills have proven successful in establishing sustainable processes and procedures in an area of new developing technology.

Carla has been a member of the ComEd team since 2004 and has held a number of engineering and management positions of increasing responsibility throughout her twelve-year career at ComEd bringing with her a record of excellence and attention to detail.

Relevant Project Experience

ComEd Substation Electrical Engineering Manager, Oakbrook, IL

Carla managed a team of Substation Electrical Engineers responsible for system performance, capacity and corrective maintenance engineering at ComEd's substations. From 2014 to 2015, she also led the \$25 million Substation Resiliency investment planned for 2014 through 2019. ComEd's Substation Resiliency programs reduce the risk of a large scale substation event through projects aimed at minimizing impacts from flooding, enhancing grounding systems, installing wildlife protection, and addressing substation building structural concerns. Carla ensured all work was completed safely, utilized current engineering standards, and was on time and within budget.

ComEd Reliability Analysis Manager, Oakbrook, IL

As the manager for Reliability Analysis Carla led the analysis of ComEd's reliability performance including identifying positive and negative trends and the reliability impact of various distribution programs including identifying opportunities for improvement. This statistical analysis has been included in ComEd's long range plan and reliability goals. Carla also actively participated in industry reliability best practices discussions with peer utilities and presented on ComEd reliability programs at multiple conferences.

Fred Z. Gomos, Manager, Smart Grid Programs

Project Administration

Firm:

ComEd

Base Location:

Oak Brook, IL

Time Allocated on Project:

50%

Years of Experience:

10

Education:

Western Michigan University / B.B.A Finance

DePaul University / M.B.A Finance & Strategy

Professional Licenses/ Training, Certifications:

Project Management Certificate, Loyola University

Summary Biography

Fred Gomos is a Manager of Smart Grid Programs in the Smart Grid and Technology Group at ComEd. In this role he leads initiatives that support the Smart Grid and Technology group's mission to optimize operational and technology choices for ComEd. Fred has over 10 years of rich and diverse experience in financial and operations management, managing complex multi stakeholder projects and piloting cutting edge initiatives in manufacturing, energy services and utilities.

Currently he leads various ComEd initiatives in Microgrids and Smart Cities including 2 DOE grants on microgrids and AMI Water Metering pilot project.

Fred also serves as the Finance lead for the group and is responsible for managing the department's multi-million dollar budget and long range capital investment plans.

Previously, he served as Finance Manager at S&C electric responsible managing and evaluating the performance of over \$30 million in annual capital spend as well serving as the finance partner for the services business unit with over \$60 million in annual revenues.

Relevant Project Experience

ComEd Microgrid Integrated Solar and Storage, Chicago, IL

Project Manager for U.S. Department of Energy funded project to deploy integrated Solar Photovoltaics and Battery Energy Storage technology to increase the availability and economics of solar energy. The project will be located in proposed Bronzeville Community Microgrid.

ComEd Microgrid Master Controller, Chicago, IL

Project Manager for DOE funded project to build a first-of-its-kind Microgrid master controller that could drive the operations of clusters of Microgrids. The controller will be located in Chicago's Bronzeville neighborhood and will allow connection to the Illinois Institute of Technology's existing Microgrid.

Project Controls Software Implementation, Chicago, IL

Project Manager and Subject Matter Expert for the deployment of software and new business processes to establish enhanced project financial controls and visibility description of this project and role on the project.

ComEd Smart Cities Strategy Development, Oakbrook Terrace, IL

Project Manager for effort to develop and articulates ComEd vision and strategy for Smart Cities.

Okechukwu Chika, Senior Project Management

Administrative Management

Firm:

ComEd

Base Location:

Oak Brook, IL

Time Allocated on

Project:

30%

Years of Experience:

7

Education:

B.S. Electrical Engineering

M.B.A. Business Decision

and Decision Making

Professional Licenses/

Training, Certifications:

Engineer Intern

Summary biography

Okechukwu Chika is a Senior Project Manager at Commonwealth Edison Company (ComEd) and serves as the Program Manager for the Summer Critical program. He is responsible for ensuring our service territory is properly outfitted to support the load of our summer peaking system.

Prior to his current role, Chika served in an engineering function for ComEd. As a Capacity Planning Engineer, he forecasted system growth and addressed underserved areas to maintain system reliability. As a Design Engineer, he supported the execution of work which sought to maintain and improve the infrastructure of the electrical grid. Chika's technical background, and strong analytical and problem solving skills have proven valuable in managing a cross functional program vital to integrity of the system.

Relevant project experience

Voltage Optimization, Chicago, IL.

Engineer. This project's goal is to optimize voltage levels in an effort to reduce the voltage drop seen on the feeders. Subsequently we can then reduce customer energy consumption by lowering the voltage at the stations.

Avoided T&D Costs, Chicago, IL.

Engineer. In support of the community solar project, this project identified the value to ComEd in not installing equipment to improve the capacity of the system.

Energy Storage, Chicago, IL

Engineer. This project looked to identify the value in battery storage as a cost effective opportunity to defer significant substation upgrades to the electrical grid.

Utility of Future Initiative, Chicago, IL

Engineer. Initiative comprise of a cross functional team to identify how the utility will operate the drastically changing utility industry.

Summer Critical Program, Chicago, IL

Project Manager. Program's goal is to ensure that the electric grid is outfitted properly to support the load of our summer peaking system.

Jaime Ortega

Administrative Management

Firm:

ComEd

Base Location:

Oak Brook, IL

Time Allocated on Project:

20 %

Years of Experience:

10

Education:

Illinois Institute of Technology, Chicago, IL

Chicago State University, Chicago, IL

Summary Biography

Experienced, highly analytical, and results-oriented professional, with extensive years of progressive background in data analytics, and risk scoring with project value analysis. Adept at building networks and excel in assuring customer service, loyalty, and satisfaction.

Demonstrate excellent and effective presentation skills. Proven track record of providing effective technical solutions. Highly analytical in strategizing, organizing, and directing substantial business operations to optimize efficiency and productivity.

Relevant Project Experience

Manager of Regulatory and Reliability – Technical Services

- Develops, directs and leads personnel and activities of the Regulatory and Reliability Analysis groups consisting of cross-functional teams involving multiple engineering disciplines.
- Development of strategies to improve overall performance and maintaining a strong regulatory relationship by providing technical expertise of system performance and analytics consistently across the company to optimize operation performance.
- Develop and maintain an environment that promotes diversity and inclusion, innovativeness and high productivity.
- The teams are responsible for developing and maintaining the long range system reliability plan, setting and tracking system performance targets, support for reliability and maintenance program development, periodic executive updates, and various other functions that consist of reliability performance trend analysis and reporting.

Manager Reliability Analysis

Lead personnel and activities of the Reliability Analysis and Reporting group.

Reliability Analysis for ComEd (1998-2006) and PECO (2003-2006)

Monitor and analyze reliability, develop programs that meet service standards, and develop analytical tools.

Supply Management

- Order Procurement Specialist for Byron Nuclear Station – CTeam, Bolingbrook, IL
Receiving and shipping in Supply Management – LaSalle Nuclear Station, Marseilles, IL.

MBE/WBE Participation Plan and Commitment

ComEd has formed this team, selecting several Minority/Woman Business Enterprise (MBE/WBE) partners based on the expertise they bring and the value they can offer the City of Chicago. Our commitment to working with diverse vendors has contributed to the growth in their companies in addition to helping ComEd successfully execute against its capital plan. For example, in 2016, ComEd opened its new state-of-the-art Chicago Training Center in the Bridgeport neighborhood to train current and future workers on managing a modern electric delivery system. This facility was built using more than 90% diverse suppliers.

In 2016, ComEd achieved a best on record diverse supply chain spend of 32.8 percent — the result of focused, intentional creation of opportunities for minority, women, and veteran-owned business. With this proven track record, our team is committed to meeting the MBE and WBE participation goals for this project of 26% and 6%, respectively.



The Will Group (MBE) has been a leader in the local lighting industry for decades. As a Prime Team Member, the Will Group serves a crucial role on our team, leading the Asset Condition Assessment effort, assembling all LED fixtures installed at their local facility in the Austin neighborhood, managing the recycling effort, and serving as the primary supplier of materials for the project. The Will Group companies includes **Electrical Resource Management, Inc. (MBE)** and **Lyons View Manufacturing & Supply, Inc. (MBE)**



Taylor Electric Company (MBE) is a full service union electrical contractor MBE certified with the City of Chicago. Founded in 1922, Taylor Electric Company is a fourth generation family owned/operated business and is the oldest African American owned/operated electrical construction firm in Chicago.



City Lights (MBE/WBE) is a Certified MBE/WBE electrical company specializing in infrastructure, industrial, and commercial electrical work. City Lights' experience includes both underground and overhead installation of traffic signals, electrical duct banks, changeable message signs, closed circuit television systems, fiber optic installations, highway advisory radios, solar panels, and weather sensors; lighting for highways, airports, parking lots, commercial buildings, and subdivisions; concrete work; and ADA compliance work.



MZI Group, Inc.

Proudly headquartered in the heart of Chicago and certified as a MBE company, Illinois MZI Group, Inc. is a leader in electrical and mechanical construction, energy infrastructure, utility projects, design-build and facility services. MZI's diverse portfolio reflects the breadth and depth of their services from the public to private sector.



PMI Systems, Inc.

PMI Energy Solutions (PMIES) is an electrical construction, maintenance and technical services contracting company based in Batavia, Illinois. This certified MBE specializes in performing overhead and underground electrical distribution construction and maintenance, directional boring, fiber optics, storm restoration and technical services.



EverLights (WBE) is a local lighting supplier that also specializes in lamp recycling. Everlights passion for environmental stewardship goes beyond what is required to what is possible. Our goal is to achieve 100% recycling wherever possible, and nothing that passes through our hands ever ends up in a landfill.



AGB Investigative Services (MBE) is a full service asset protection and risk mitigation company, who will assist by providing security to our asset condition assessment crews.



Quantum Crossings (MBE) focuses on changing the way organizations can use telecommunications and related technologies to enhance business. Quantum Crossings will be available for our team for future technology work orders.



Primera (Applying for WBE certification, and not included in WBE commitment forms submitted herein, yet anticipated to provide for additional WBE participation throughout this project) has been a longstanding leader in the engineering industry, with projects ranging from schools and roadways to healthcare facilities and utility infrastructure. With more than 200 professionals from diverse and highly skilled backgrounds, Primera is committed to dynamic design, innovative technology, and superior service.

Workforce Development Hiring Plan and Commitment

Job creation in Chicago with Chicago residents is paramount to the success of this program. Our team will comply with the City's hiring requirements defined in the RFP for Asset Condition Assessment and LED conversion and Infrastructure Stabilization.

Asset Condition Assessment Hiring Requirements

At least 50% of the workers hired to perform this task will either:

- Be enrolled in or have graduated from a Career & Technical Education (CTE) Program from Chicago Public Schools high school per 2-92-335 of the Municipal Code of Chicago.
- Be enrolled in or have graduated from a construction technology training program from the City Colleges of Chicago per 2-92-335 of the Municipal Code of Chicago.
- Be currently participating in or have been part of an Ex-offender Apprenticeship Program per 2-92-336 of the Municipal Code of Chicago.

LED Conversion and Infrastructure Stabilization – City Resident Hiring Requirements

For this work, our team will:

- Comply with the minimum percentage of total work hours performed by actual eligible residents of the City of Chicago per 2-92-330 of the Municipal Code of Chicago.
- Have 50% of total work hours performed by City of Chicago residents.
- Have 10% of total work hours performed by persons residing in socioeconomically disadvantaged areas defined in the RFP as "Project Area Residents", with half performed by residents of Zone A and half performed by residents of Zone B. Work by residents of either zone may be performed throughout the City.
- Make good faith efforts to utilize qualified eligible residents of the City of Chicago in both unskilled and skilled labor positions.

LED Conversion and Infrastructure Stabilization – EEO Hiring Requirements

For this work, our team will:

- Meet 2-92-390 of the Municipal Code of Chicago for Equal Employment Opportunity goals for the employment of women and minorities, including:
 - Minority journeyworkers = 25% of construction aggregated work hours
 - Minority apprentices = 25% of construction aggregated work hours
 - Minority laborers = 40% of construction aggregated work hours
 - Women journeyworkers = 7% of construction aggregated work hours
 - Women apprentices = 7% of construction aggregated work hours
 - Women laborers = 10% of construction aggregated work hours

ComEd's commitment to developing Chicago's workforce goes well beyond the minimum requirements of the RFP. On February 19, 2016 ComEd opened its new state-of-the-art training facility in the Bridgeport neighborhood of Chicago where it will offer training for the energy workforce of the future and for Chicago Public School students. ComEd expects more than 4,000 employees will receive training at the facility annually and over 6,000 members of the public will visit the facility each year for educational tours. The center is decorated with art from Project Onward participants, a program at the Bridgeport Arts Center that supports the professional development of artists with exceptional talents and challenges, ranging from autism to mental illness. Another center feature is the Smart Energy Hub, a one-of-a kind interactive station designed to help elementary, middle high school students and adults learn about how electricity is generated and delivered, the technologies available to manage electricity usage and save money on electric bills, and how ComEd is helping to build a community of the future.



“This training and education center reflects the innovative spirit that runs throughout our organization. It also demonstrates our commitment to our people, customers and communities. This brand new facility will play an enormously important role in helping to train the workforce of the future, provide new opportunities to Chicago students and better serve our customers with innovative technologies of a modern grid.”

-Anne Pramaggiore, ComEd president and CEO

“I want to thank ComEd for building this new training center in the Bridgeport neighborhood. It will bring jobs and economic benefits for our residents and also help our workers and students learn the skills they need to succeed in the 21st century economy. This state-of-the-art training center illustrates ComEd’s commitment to helping our communities remain vibrant while also helping Chicago develop a world-class workforce to drive our economic growth far into the future.”

- Mayor Rahm Emanuel

ComEd understands the need to invest in the workforce of the future, while ensuring training is accessible to those who need it most. ComEd can leverage our existing vocational training programs to bring opportunities directly to Chicago communities and continue building upon its diverse staff.

DAWSON TECHNICAL INSTITUTE



ComEd partnered with Kennedy King Colleges (as part of Chicago City Colleges) to strengthen its relationship with the Dawson Overhead Electrical Line Workers program to train adult learners on pole climbing, electrical theory and overhead distribution construction, to provide a local pipeline to ComEd’s overhead and underground line schools. The program launched in 2007 and Dawson graduates have been hired as Overhead Helpers, Supply Helpers, Planners and Meter Readers, and have since grown within the company advancing into the roles of Overhead Electricians, Cable Splicers, Work Planners and First Line Supervisors. The job training program has been successful in hiring candidates into entry level positions with the company and giving them the tools to advance throughout ComEd.

CONSTRUCT

A program ComEd helped develop and launch, CONSTRUCT is a construction jobs training program powered by an alliance of construction and utility companies (ComEd & Nicor), social service agencies and labor unions that are committed to removing barriers for individuals interested in the construction industry. Construction crews can-and should-be reflective of the diversity present in the communities where they work. CONSTRUCT is one way to help increase the pool of qualified minority candidates for construction jobs in Illinois. While completion of the program does not guarantee a job, individuals who complete the program successfully are expected to be more qualified, knowledgeable and ready to compete for construction jobs in Illinois. CONSTRUCT will help participants develop the core competencies required in the industry, strengthen job readiness and life skills, and prepare for industry-required testing that is often a prerequisite for employment. It also includes job shadowing to give candidates an up-close look at the various career paths available. Some graduates of CONSTRUCT have become ComEd meter readers and customers services representatives.

Public Relations and Communications Plan

Overview

The Chicago Smart Lighting Project (the “Project”) is intended to improve the quality and reliability of Chicago’s street and alley lighting by enhancing public safety and quality of life for Chicago’s residents and visitors. It is critical that this very message is delivered to residents, businesses, elected officials and other stakeholders in a timely and effective manner, and by using a variety of outreach methods and channels. Strategic and coordinated outreach will include a two-pronged communications approach to ensure that the community is well aware and informed of such a large-impact Project.

An Outreach Campaign Plan (the “Plan”), which includes strategic marketing and media, crisis communication and public relations components, has been developed that outlines the various means by which the community and community leaders will be educated and engaged. The strategic marketing and media component will utilize two approaches.

First, a city-wide approach will be used to build awareness and engage the community beginning with the issuance of a press release or event announcing the program through the Project’s final deployment phase. Second, a community-based approach will be used to inform residents and businesses by utilizing messaging specific to local deployment and its impact on the community. Additionally, a crisis communication component of the Plan has also been created, including proper protocols and systems for both emergency and non-emergency scenarios. Finally, a public relations component will be used to generate media coverage for the Project. It is recommended that implementation and execution of the Plan be overseen by a newly developed Outreach Governance Committee (the “Committee”) that will be responsible for reviewing and approving all Plan-related initiatives.

General Approach

WHY COMED

ComEd has significant experience successfully developing and delivering outreach campaigns for large infrastructure projects of this scale, and is in the process of installing four (4) million smart meters throughout northern Illinois. The project is currently 71% complete, and 2.7 million smart meters have already been installed. This effort involves an ongoing communications and outreach campaign, including four (4) distinct stages that aim to: 1) create overall awareness, 2) properly inform customers, 3) educate customers of associated benefits, and 4) engage the community. These stages align with specific messaging and channels to deliver the information in a timely manner. This staged communications approach has led to a 92% rate of customer service satisfaction.

THE PROJECT

A condensed but similar approach is proposed for this Project. The strategic marketing and media portion of the Plan will include a city-wide approach that will provide a broader view through awareness and engagement, and then a community-based approach that will align with the deployment schedule. Both approaches will clearly convey the following Project goals and messages:

- enhancing public safety and quality of life in Chicago neighborhoods
- improved responsiveness to reports of streetlight outages
- improved reliability and longer life for streetlights; and
- energy efficiency savings will be promoted, through a variety of mediums

Messaging will be tailored to address specific resident and community needs associated with the Project.

The community-based approach will be developed and then replicated for each deployment area and will be driven by the deployment schedule outlined by Chicago Infrastructure Trust (“CIT”) and the City. Upon being issued a Notice to Proceed, ComEd will mobilize immediately and implement its coordinated strategy, ensuring that all messages are communicated effectively and the benefits are presented in a customer-focused manner.

Given the limited budget over the proposed four-year deployment period, ComEd intends to maximize its outreach campaign by strategically investing in web-based mediums, and community outreach and public relations that supports the two-pronged approach. ComEd will use high-impact mediums, and will rely on an engaging social media campaign, informative website – with an interactive map, printed brochures and fact sheets, aldermanic channels, community meetings, and a call center being available to respond to inquiries.

All elements of the Plan will be shared with the newly-created Committee, which will be staffed by key individuals in impacted departments (i.e. CDOT, OEMC), CIT, the Mayor's Office and ComEd representatives. The Committee will meet on a regular basis and will be responsible for reviewing and approving all Plan efforts.

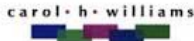
Team Members

An experienced team, including outside vendors, has been assembled to execute the Plan, with strong records of success in their respective disciplines. ComEd has successfully partnered with these firms, and each has significant experience successfully launching and executing various forms of outreach and community engagement.

The Outreach team (the "Team") will be spearheaded by the newly appointed Outreach Coordinator, a full-time position overseeing all efforts related to the successful implementation and execution of the Plan, and all corresponding components. The Team will be comprised of members from ComEd's Marketing, Communications, eChannels, and External Affairs departments, and will have a ComEd Project Executive sponsor. ComEd plans to retain firms to help execute various elements of the Plan, including:



Eire Direct (WBE) will assist with brand/logo development, the design of printed materials and the development of all web content. The messaging will be consistent – both visually and content-wise, with every medium



Carol H. Williams Advertising (M/WBE) will develop social and digital media campaigns for the African American market and will work closely with Paco Collective to ensure consistency across markets.



Paco Collective (MBE) will design and develop social and digital media campaigns for the general population, with a strong focus on the Hispanic market. The firm will coordinate all efforts with Carl H. Williams Advertising.



KUBRA will develop and maintain an interactive deployment map on the website that will indicate upcoming areas of deployment, those deployment areas that have been completed, and those that are planned. They map will be updated on a bi-weekly basis.



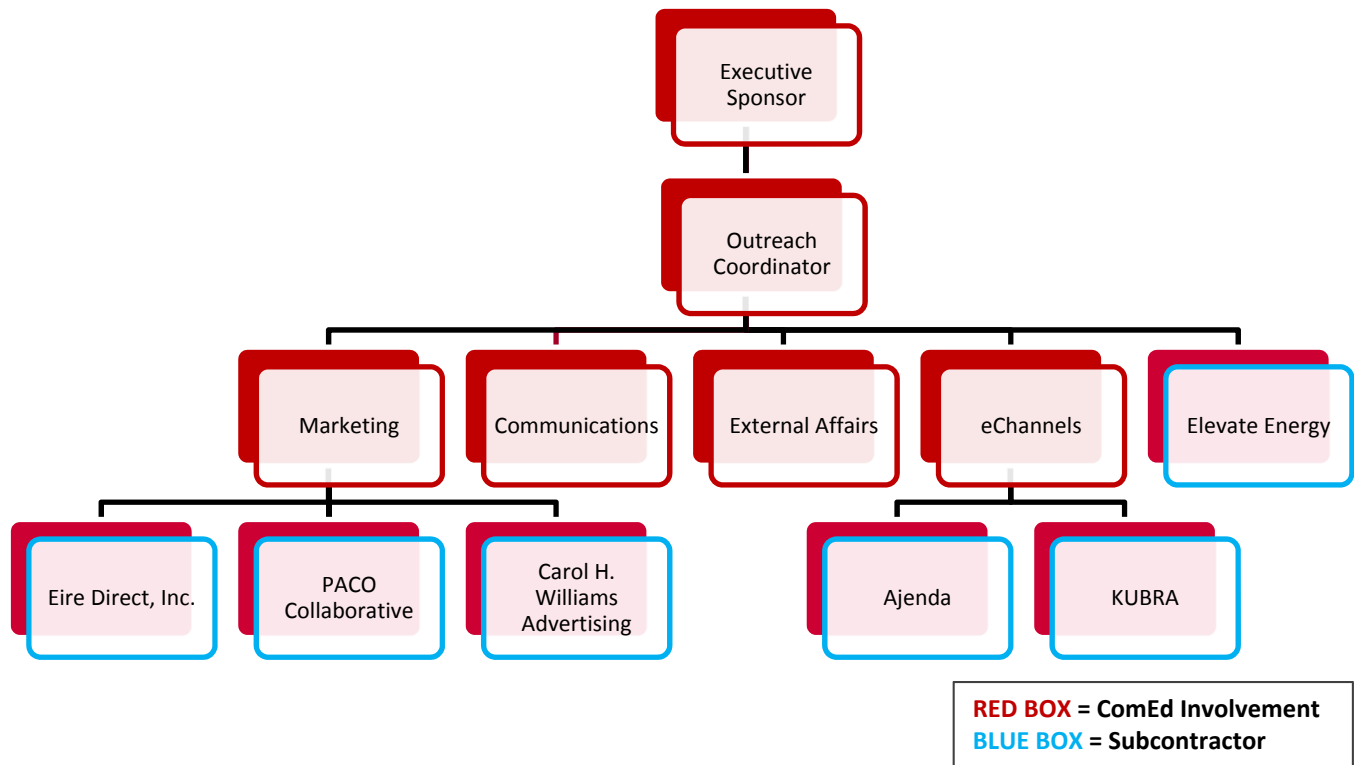
Ajenda Interactive Media will be responsible for design and development of the website, including the static page and fully operational site.



Elevate Energy will manage, staff and oversee the telephone hotline/call center operations. They will work closely with the Outreach Coordinator, and will be intimately familiar with the Crisis Communication Plan's contents.

ORGANIZATIONAL CHART

Following is an organizational chart that outlines the various ComEd departments involved and additional firms that would be retained to ensure the overall success of the Project, and will ultimately execute all elements of the Plan.



Strategic Marketing and Media Plan (the “Plan”)

The Team will work to ensure that the Project is communicated clearly, and timely – both at a city-wide level and most importantly, at a community level. The city-wide approach aims to announce the Project, generate awareness about the Project’s benefits and associated logistics, and will set forth a general timeline. The community-level approach details efforts pertaining to the deployment effort, specifically, when various communities will be impacted and associated benefits.

CITY-WIDE APPROACH

ComEd, CIT, and the City will work together to develop a joint **press announcement, message strategy and related talking points**. A series of **briefings** with elected officials will follow, beginning with those aldermen whose wards fall within the first few deployment areas, and aldermanic floor leaders. Every alderman will be briefed over the four-year period as the deployment phases ensue. The Project’s **brand/logo** will then be developed, which the Committee will review and approve. This logo will be integrated into all outreach materials including digital media, brochures and signage. Logo guidelines (if any) will be shared and discussed with the Committee, and ultimately, the logo will be the first item of the marketing toolkit to be advanced.

A **website** will be launched pre-deployment; however, the information available at that time will be very limited until actual deployment begins. The static web page will provide basic information about the Project, including its key messages, benefits and schedule, when known. This will be done to ensure that community members have a digital site to reference for background information about the Project, adding to the reliability and accessibility of information.

The site will be a sub-site housed on www.comed.com, and when fully developed, will be a highly functioning and informational tool for users. While ComEd will host the site, links will be available on CIT’s website, the City’s website (and within various department pages), as well as any other sites deemed important. The initial site will be static, offering an inquiry email address (prior to the first deployment, all inquiries will be routed to a dedicated ComEd staff person, who will be responsible for reviewing, vetting, responding to and/or sharing with the appropriate ComEd staff person). All inquiries will be responded to within 48 hours.

Concurrent with the brand/logo exercise, **printed collateral materials** such as a brochure and fact sheet will be developed. Brochures will be available and distributed throughout the duration of deployment and will be available in designated areas of the city, including City Hall, both in English and Spanish and will be available at all community meetings and in each alderman's ward office. Fact Sheets will also be developed, posted on the website, and provided to all City of Chicago department heads and aldermen. "No Parking" street signs should also be created, which will provide the call center phone number and website address, and will be posted at least two (2) days prior to the start of deployment in a particular area.

The Team would leverage the ComEd Communications department to pursue **earned media** opportunities related to this important project, taking advantage of the built-in staff and expertise of ComEd's team of communications professionals. We expect that broadcast television and radio stations, as well as print outlets, would demonstrate early interest in the project following announcement, and we also expect to pursue media opportunities with public affairs news programming such as At Issue on WBBM radio..

Finally, the **call center**, although not fully operational until deployment begins, will have its own designated phone number, which will appear on all printed materials, and will have designated staff able to field questions prior to the first deployment. Once deployment begins, the call center will be fully staffed with expanded hours.

COMMUNITY-BASED APPROACH

Once the first deployment area is identified, all efforts will be coordinated with aldermen, prior to any community outreach occurring. These **briefings** will allow the Team to work closely with their offices and to identify **key local leaders** and **community media outlets** that should be considered as part of the outreach as well as any issues that may be specific to that deployment area and would require special consideration. Community groups, delegate agencies of the city, and key leaders will be identified, and the Team will work with these groups, utilizing their newsletters, offices, and email lists to inform constituents of the Project, deployment schedules, and any impact on their neighborhood. ComEd has the capability to host **community meetings**, in coordination with local aldermen as ComEd does regularly with smart meter deployment and other pertinent issues already. While the City will assist with identifying a public venue, ComEd will lead the discussion and field any questions that might arise. ComEd will also conduct grass-roots outreach at select ward nights, local school council meetings, and other meetings or venues that would capture a large audience.

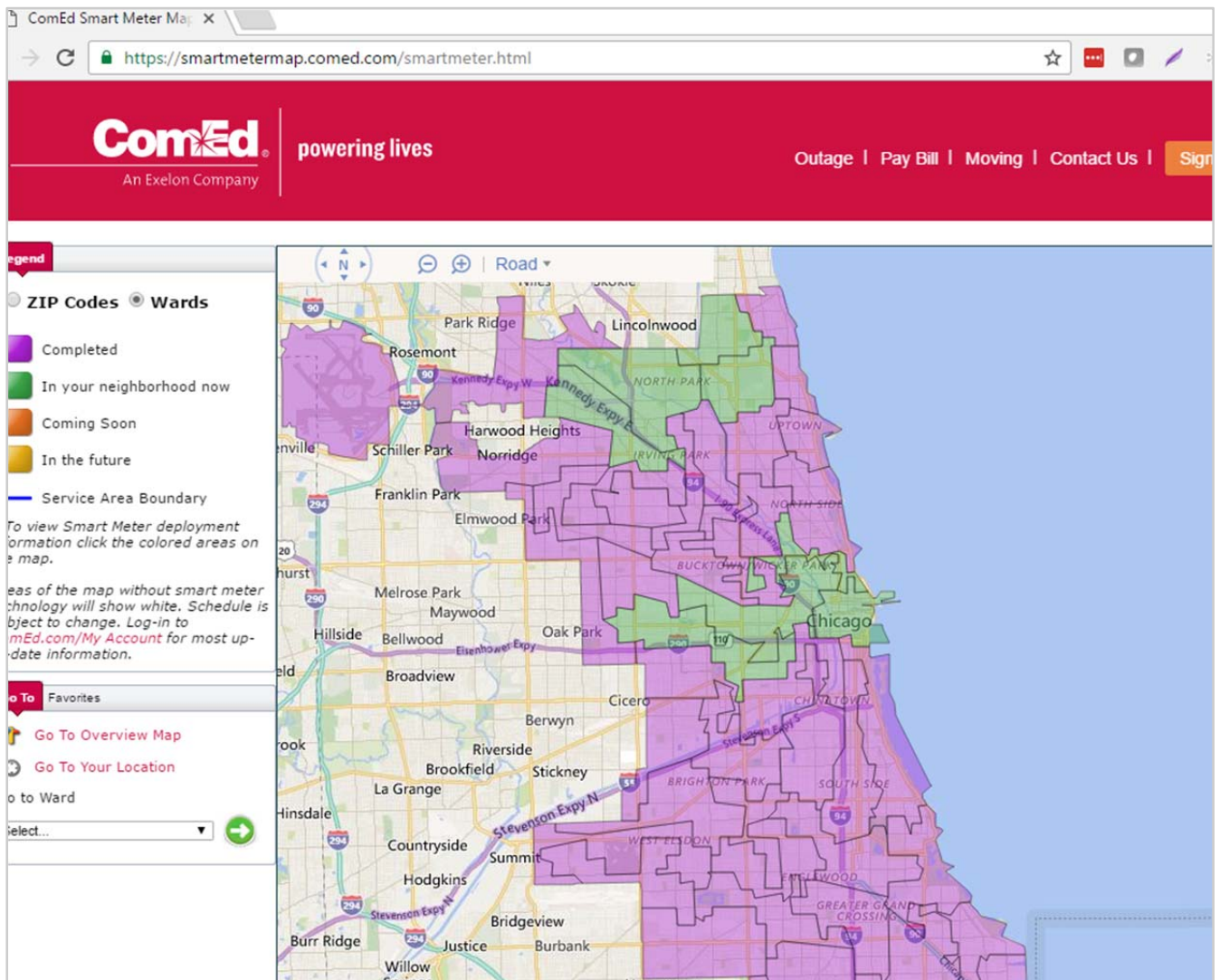
In addition to fact sheets being developed prior to these meetings, **printed materials** will be developed and distributed to key groups and aldermen, and made available at city facilities (i.e. public schools, libraries, Park District facilities, etc.).

Concurrently, the street-sweeping notification process will be adopted by placing "**No Parking**" signage on affected streetlights, forewarning residents that the area will be a no-parking zone. The signage will be placed around those poles that will need to be accessed at least two (2) days in advance. Additionally, notice will be provided using digital mediums of communication, such as social media. This will allow the bucket trucks unimpeded access to the lights, and reduces the risk of any damage to vehicles. ComEd will work with the City to identify the best execution strategy to ensure that there is minimal impact to residents and businesses. Please note that the costs associated with this effort include production of the signage itself, and do not contemplate installation costs, nor any anticipated lost revenue that might result from parking meters being inoperable.

Just prior to the deployment, the fully-operational **website** will be launched, providing the following information:

- Project description
- An interactive map detailing the deployment areas that are 1) planned, 2) underway, and 3) completed
- Deployment schedule
- FAQ section
- Inquiry page with contact information, including call center number and email address
- About Us page – sharing all team members
- Press – links to various articles and links to social media pages

The interactive map will be similar to the map generated for the AMI Smart Meter Installation program (see below) and will be updated on a regular basis to reflect the deployment schedule. Upcoming deployment areas will be highlighted, as will those that have been completed.



The website will be reviewed on a daily basis and updated on a weekly basis. KUBRA will be retained to create the interactive map (it created the map for the smart meter AMI campaign) and Ajenda will be retained to design and develop the website. Once the website is launched, ComEd will be responsible for maintaining and updating the site on a regular basis.

A month prior to the first scheduled deployment, ComEd will initiate its **social media campaign**, which will begin to be developed once the Notice to Proceed is issued. Twitter and Facebook pages will track progress and provide notification to customers of upcoming deployment areas and ensure consistent digital presence among communities. ComEd will leverage its existing social media network, which has over 137,000 Facebook followers, 26,000 Twitter followers and 113,000 LinkedIn channel followers combined. Both PACO and Carol H. Williams Advertising will help develop materials for the campaign across the city, and at various milestones of deployment.

Although the initial city-wide announcement about the Project will generate significant interest from print media, the **local community media** push will take form at a neighborhood level, targeting local publications and

aldermanic newsletters. ComEd will work with aldermen to identify different local media outlets, and place brochures in various local city facilities. ComEd will work with aldermen to identify key leaders, community organizations and other local media outlets for the dissemination of information.

The outreach approach described above will be replicated with each subsequent deployment area – and over a four-year period. ComEd will meet with every individual alderman over the deployment period, and will coordinate all public outreach with aldermen and CIT and City.

Paid media such as newspaper ads, outdoor signs, ads on bus shelters and CTA buses and trains are not recommended as part of the outreach campaign, given the budgetary constraints. The preferred approach will be primarily comprised of a combination of grass-roots methods (local community groups, aldermanic offices, and local media) online and social media campaigns, which have proven to be more effective in reaching broad audiences. In the event that additional funding is secured, PACO Collaborative and Carol H. Williams and Associates will assist with the effort to incorporate signage and ads into the strategy.

With that said, ComEd is collaborating with [Civiq Smartscapes](#) in an effort to offer digital informational kiosks in select areas of the city. Provided the timing and location of the kiosks coincide with deployment schedule, the kiosks might provide an opportunity to display information about the Project, and anticipated schedule. See Section IV: Technology Proposal for more detail.

A **call center/telephone hotline** with devoted staff for the Project will be established, which will be operational 14 hours per day, Monday through Friday and eight (8) hours a day on Saturdays and Sundays during its first year of operation. Elevate Energy will be retained to coordinate and oversee the call center operations, and has extensive experience with this type of work as it provides call center and enrollment services for ComEd's Peak Time Savings program (2014-2016), and ComEd's Bidgely Pilot program, which is currently underway. The call center will field all calls, and elevate any issues, as described in the Crisis Communication Plan below. During off-hours, the call center will direct people to call 9-1-1 in the event of an emergency and for non-emergency events, leave a message, or direct them to the website to submit an email inquiry. In either event, the person will receive a return phone call or email response within 24 hours. It is recommended that the hours are reduced for the subsequent years by providing services Monday-Friday, 9am-5pm only.

ComEd is experienced in establishing a call center and routing emergency calls, as it is utilizing a similar strategy to support its smart meter AMI implementation. Staff will be provided with talking points and FAQs and prepared to articulate that all work will be completed in the public way, and advance notification will be provided – by way of targeted local communication and street signage to ensure the community is well informed.

Public relations efforts will promote this Project and the importance of establishing the City's innovative work on a national level in terms of best industry practices and progressive urban vision. Therefore, this initiative will be presented at industry conferences and published in industry articles to demonstrate CIT and the City's commitment to innovation.

Finally, an integral part of the overall outreach strategy is the development of a crisis communication Plan (see below), which will ultimately serve as the handbook provided to various City departments, CIT, ComEd field staff, the call center, all partners, and will provide emergency response protocols, detail the flow of information both internally and externally – particularly as it relates to the press, provide a key personnel organizational chart outlining the chain of command, and outline a reporting system.

CRISIS COMMUNICATION PLAN

OVERVIEW

When a crisis occurs, it is crucial to communicate in an organized and effective manner. A well formulated Crisis Communication Plan (the “CC Plan”) can mitigate the impact and severity of such events. If a City’s delivery of its public services is disrupted, the general public will need to know if/how they are impacted. Depending on the severity of the crisis, regulators and government officials may need to be informed as well. Therefore, a crisis communication plan is a vital component of any deployment strategy and a program’s preparedness and provides the structure to respond promptly, accurately, and confidently to an emergency.

A crisis is defined as any situation which:

- Poses a significant threat to public safety, financial loss, and/or reputation loss;
- Requires immediate and coordinated action;
- Will have a significant impact on operations.

Although each crisis will require a unique response, this plan provides policies and procedures for the coordination of internal and external communications response designed to reinforce all public safety efforts in the event of a crisis.

OBJECTIVES

The objectives of the crisis communication plan are to:

- Provide accurate, factual, and timely information to affected parties
- Ensure that messages delivered during a crisis are consistent with the mission and values of the Project
- Ensure that official communications are uninterrupted, regardless of circumstances and delivered through the most effective channels
- Provide protocol for crisis communications responses and engagement with media and stakeholders

GENERAL APPROACH

The following action items have been identified and implemented in accordance with developing the CC Plan:

- Establishing Communication Goals
- Developing Key Communication Messages
- Identifying Required Materials
- Identify strategic stakeholders requiring communications during a crisis
- Audiences and Information Dissemination Channels
- Designating the Crisis Communications Response Team
- Official Emergency Response Notification Plan
- Reporting Protocol

ESTABLISHING COMMUNICATION GOALS

Clear communication goals form the foundation of an effective communication response during a crisis. The overall goals of communication are to keep people informed, anticipate and prepare appropriate responses to criticism, and gain and retain public support for the program. Responses must be:

- Timely
- Accurate
- Honest
- Credible
- Consistent
- Appropriate
- Regular

DEVELOPING KEY COMMUNICATION MESSAGES

Effective communication with the target audience and the media depends on the development of clear and concise key messages that address everyone's essential questions and concerns. Key messages are points that should be retained by the audience after communication is complete. Key messages to be delivered through the Smart Streetlight Crisis Communications response:

- We are dedicated to safety
- We are accountable to our communities and the environment
- We will remain accessible as we work toward a swift and effective resolution

IDENTIFYING REQUIRED MATERIALS

Understanding the communications needs of target audiences in advance will prevent delays in producing the proper materials needed to convey information about a crisis. Templates for the following materials will be developed and accessible:

- Press Releases
- Fact Sheets
- Brochures
- Social media content
- Background/specifications of smart streetlight system
- Visual materials (product, maps, photos, video)

The materials will be customized as needed per an incident. In keeping with environmental sensitivity, the majority of materials will be distributed in a digital capacity and physical versions will be distributed on an as-needed basis.

AUDIENCES AND INFORMATION DISSEMINATION CHANNELS

Development and dissemination of communication materials must be planned with the overarching goal of swift distribution of accurate information. It is recognized in today's digital environment, target audiences are also distribution channels, including:

- General public
- Neighborhood leaders/influencers
- City Aldermen
- Emergency responders
- Public health and safety audiences
- Emergency personnel
- Smart streetlight system installers
- Media/social media outlets
- Community service agencies
- Illinois Commerce Commission

DESIGNATING THE CRISIS COMMUNICATIONS RESPONSE TEAM

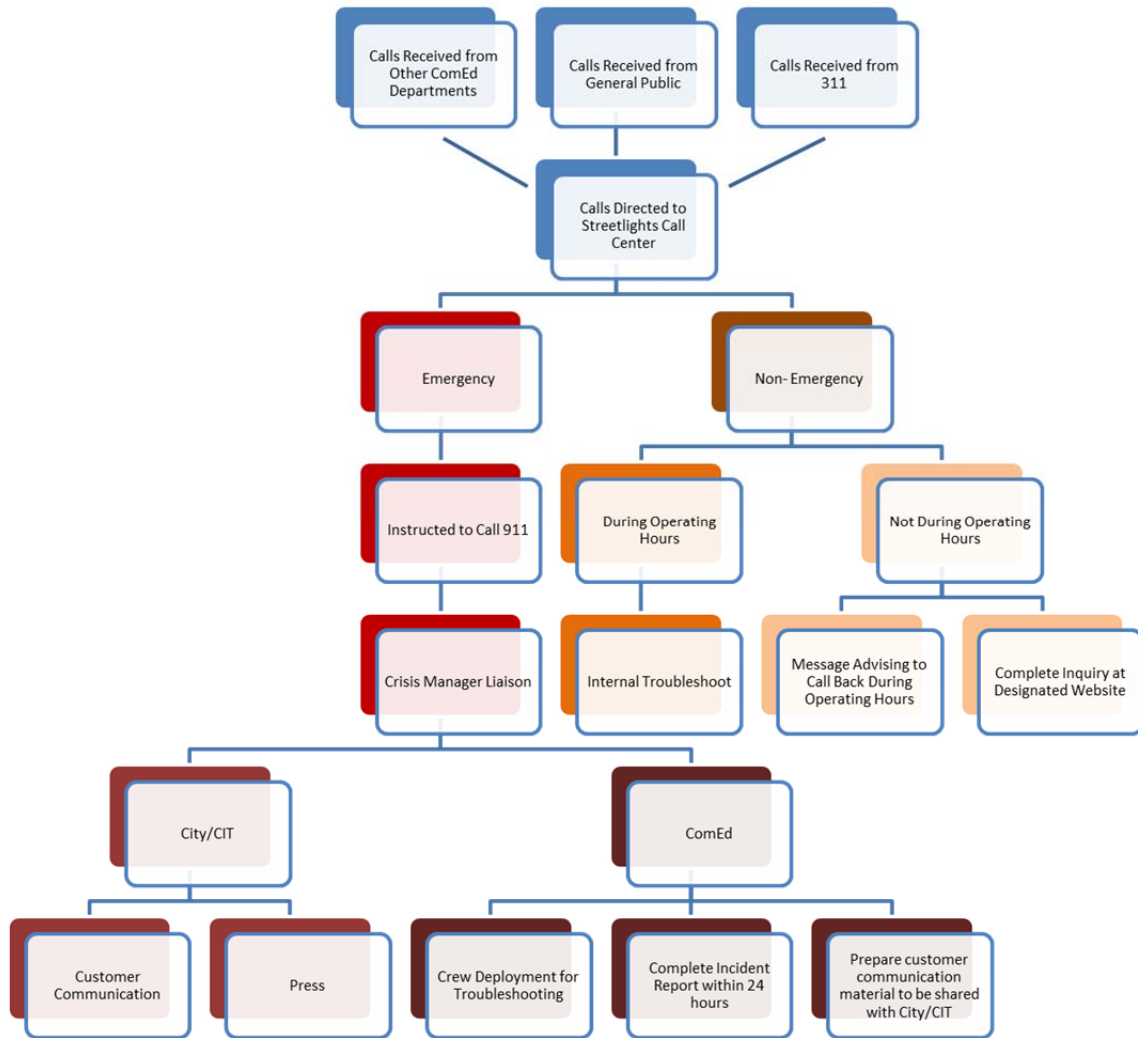
A crucial component of a crisis communication plan is identifying the internal responsibilities for a crisis response.

- **Crisis Manager Liaison:** Will coordinate communications between designated City staff, emergency response personnel, and ComEd department leads who will make decisions and direct operations to resolve a crisis. This liaison will report to the Outreach Coordinator, who will then report to the City.
- **Spokesperson:** Will coordinate all media releases and relations with the City and CIT. Will work directly with CIT and the City and its affiliated departments involved with emergency responses, (i.e. OEMC)
- **Call & E-mail Screeners:** Review and appropriately route crisis-related messages that come in to the call center, emergency phone lines or e-mail addresses, and the main switchboard.
- **On-Site Monitor:** At the actual crisis scene, works closely with physical crews, and observes and reports developments to the Crisis Manager Liaison and the City's spokesperson. Deployed on an as-needed basis depending upon the extent of the crisis, and reports directly to the Crisis Manager Liaison.

CRISIS COMMUNICATION PLAN

The following flow chart depicts the appropriate cascade to be followed as calls are received at the Streetlights call center. All calls pertaining to the streetlights work should be directed to the streetlights call center. The informational flowchart documents the appropriate protocol for both emergency and non-emergency situations.

Crisis Communication Plan Flow Chart



OFFICIAL EMERGENCY RESPONSE NOTIFICATION PLAN

In the case of a significant event, the following protocol, which reflects current practices in place at ComEd, should be used to notify the appropriate individuals and their respective agencies.

Procedure

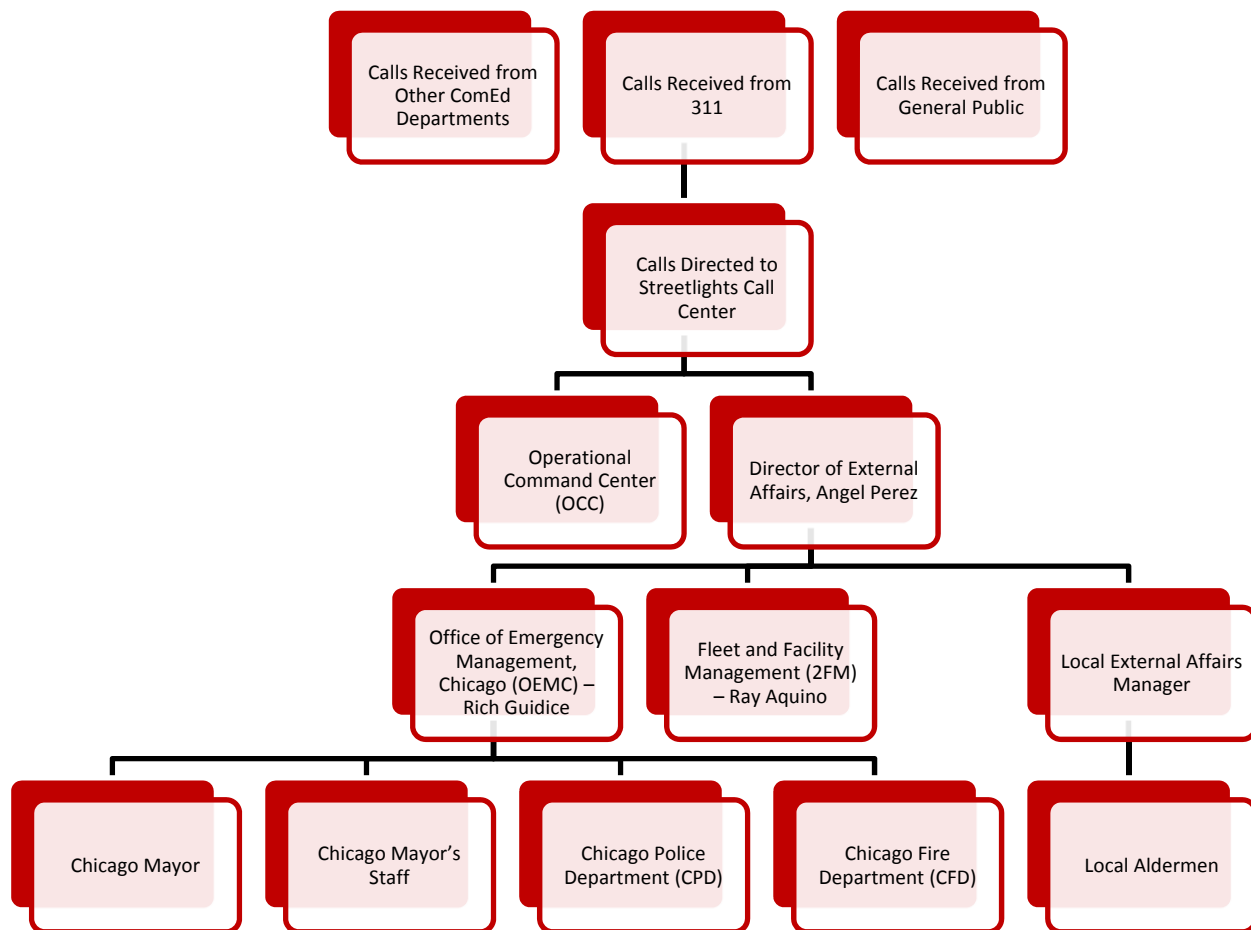
NOTIFY the following:

- Resource Management
- The LCS Duty Desk at the Operational Command Center (OCC)
- ComEd External Affairs member at the City of Chicago 911 Command Center (IF open)
- The Chicago 311 Center

- The Chicago Police Department
- The Chicago Office of Emergency Management (OEM)
- The Manager of OCC Operations or Designee
- The Director of OCC Operations
- The Vice President of Distribution System Operations
- ComEd Executive Notification via *OCC West Cust Impact* mailbox.
SEND an alphanumeric page notification to appropriate groups.

This procedure can be visualized in Figure 2 below.

Crisis Communication Plan Phone Tree



REPORTING PROTOCOL

Diligent and accurate documentation is crucial for record-keeping, data collection, and identifying trends in crises that may occur in certain areas or as the result of certain actions. Therefore, a strict reporting protocol is being implemented as a critical component of the CC Plan.

All calls received must be logged with the following information:

- Name
- Address
- Contact Information
- Time and date of call
- Summary of Issue (including impact, time of occurrence, and other relevant information)
- Resolution
- Time Needed to Resolve the Issue
- Necessary Follow-Up Information

This information will be kept in a daily call log that will be submitted to the Crisis Manager Liaison. Additionally, bi-weekly meetings will be scheduled to review the call logs and discuss any issues that have arisen during that period in order to better mitigate efforts for future crises. The Crisis Manager Liaison would provide this information on a weekly basis to the Outreach Coordinator to share with the Committee.

Strategic Marketing, Communications and Outreach Program Reporting

The ultimate strength of the outreach is reliant upon continued communication between various ComEd departments, CIT, city departments, aldermen and community groups, and the timely reporting of any issues or concerns, coordinated communication with subcontractors, city officials and the general public.

Regularly scheduled Committee meetings are critical. It is suggested that the Committee meet on a weekly basis to discuss the week's schedule, develop milestones and report any information. The Coordinator will be responsible for working with various ComEd and City departments, disseminating key information, and overseeing the outreach operation. Agendas will be prepared, meeting minutes will be taken, and weekly reports generated, which includes items completed, upcoming items to be addresses, and anticipated milestones. A summary of press-related events (print, television, radio, and social media) will be provided, a summary of calls received and/or website inquiries, the nature of the request, when the question was answered, and upon the completion of each deployment, a summary document discussing the strategy, status, and any complications that may have arisen.

Timeline / Schedule

The RFP suggests a four-phased deployment approach, with each phase spanning one year. Although the sequencing, locations and size of the individual deployment areas have not been determined at this stage, this will not impact the ultimate timeline/schedule which has considered the entirety of the work to be done when anticipating milestones and time frames.

Following is the proposed timeline, from Notice to Proceed to actual deployment. Two separate timelines have been included – one representing the city-wide approach and the other by deployment area, or locally. The city-wide campaign would begin once Notice to Proceed has been granted, through deployment. The focus then shifts to the community-level outreach, which will begin prior to the first deployment, and through the final deployment. The series of steps outlined in the community-level deployment will be replicated for each deployment area, so every ward/community area of the city is treated equally.

City-Wide Timeline (Upon Project Award Announcement)

CITY-WIDE TIMELINE	NOTICE TO PROCEED	90 DAYS OUT	60 DAYS OUT	30 DAYS OUT	DEPLOYMENT
TASKS					
Establish Outreach Governance Committee					
Conduct Aldermanic Briefings					
Develop Brand/Logo/Guidelines					
Develop/ Launch Website		NOTE 1			
Develop and Release Joint Press Kit with CIT/City					NOTE 2
Develop Printed Materials (brochures, fact sheets and street signage)					
Establish and Operate Telephone Hotline/Call Center					
Planning Stage					
Active Stage					
NOTE 1: Website will have static welcome page with basic Project information and email inquiry address 60 days prior to first deployment; fully operational website will be launched within 30 days of first deployment NOTE 2: Press announcements should be contemplated prior to first deployment, and at 50% completion and 100% completion milestones					

Community-Level Timeline (Upon Deployment)

COMMUNITY-LEVEL TIMELINE (DEPLOYMENT)	NOTICE TO PROCEED	90 DAYS OUT	60 DAYS OUT	30 DAYS OUT	DEPLOYMENT
TASKS					
Conduct Aldermanic Briefings					
Maintain Website					
Develop and Release Joint Press Kit with CIT/City					NOTE 1
Produce and Distribute Printed Materials (brochures and fact sheets)					
Develop and Execute Social Media Campaign					
Identify and Execute Local Community Media Outlets					
Identify Key Community Leaders/Groups and Host Meetings					
Planning Stage					
Active Stage					
NOTE 1: Press announcements should be contemplated prior to first deployment, and at 50% completion and 100% completion milestones					

Budget

The RFP indicated that proposers should assume a maximum \$1M budget over the four-year deployment period, and requested that elements be prioritized. With that in mind, below is a budget that details the costs of each program component noted within the proposed Outreach Campaign Plan so that the CIT and City will be able to associate cost with individual program components. Note that while these components sum to under \$1M, oversight and direction by ComEd's internal Marketing, Communications, eChannels, and External Affairs staff will be required in order to effectively manage this public relations and communications program. Labor rates have been provided for these staff in Form 14. ComEd would be pleased to discuss this plan with the CIT and the City in order to customize it to best meet the City's objectives within the allotted budget. As ComEd would be providing this service pursuant to a regulated tariff, costs would be subject to ICC approval.

RECOMMENDED BUDGET ITEMS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	TOTAL
Call Center*	\$62,000	34,000	\$34,000	\$34,000	\$164,000
Website Development	\$9,000	0	0	0	\$9,000
Website interactive Map	\$113,000	\$32,000	\$32,000	\$32,000	\$209,000
Web Content	\$2,000				\$2,000
Brand & Logo	\$15,000				\$15,000
Print: Brochures, English & Spanish (50,000/hr)	\$10,000	\$10,000	\$10,000	\$10,000	\$40,000
Print: Fact Sheets	\$4,000	0	0	0	\$4,000
Print: "No Parking" Street Signs (5,000/hr)**	\$4,000	0	\$4,000	0	\$8,000
Community Meetings (venue cost)	0	0	0	0	\$0
Community Meetings (materials)	\$2,000	0	\$2,000	0	\$4,000
Social Media Campaign	\$30,000	0	0	0	\$30,000
Part-Time Staff Person / Outreach Coordinator	\$150,000	140000	\$110,000	\$115,000	\$515,000
				TOTAL	\$1,000,000

* pricing assumes < 1,000 calls/year and reduced staffing in years 2-4

** includes production of signage only; excludes installation costs or costs associated with temporary closure of parking meters

Bios

Following are abbreviated bios for the key ComEd personnel identified in this plan:

Annette Martinez

Annette Martinez serves as the Director of Communications for ComEd, which delivers electricity to more than 3.8 million customers across Northern Illinois. She leads a team people responsible for external communications, public relations, advertising and brand management.

With more than 20 years of experience in strategic communications, Annette oversees efforts to reach and engage with ComEd's stakeholders. Prior to joining ComEd, she was the Director of External Relations for AGL Resources, the nation's largest natural gas-only distributor. Annette also served as an Assistant Commissioner of Communications for the Chicago Department of Aviation, where she led all communication initiatives for Midway and O'Hare International Airports. Annette has a BA from Columbia College

Elsie Rodriguez

Elsie M. Rodriguez is a Marketing Manager at ComEd with responsibility for the marketing of customer programs including Peak Time Savings and Hourly Pricing. With more than 15 years of experience with the organization, Elsie currently is responsible for ensuring the integration of customer engagement in all strategies, from planning and research to concept development and delivery. Elsie previously was responsible for the planning, implementation and management of all customer engagement programs supporting ComEd's Grid Modernization

Customer Outreach, which included advertising, direct mail and events designed to educate residential and business customers on programs to help them manage electricity use and save money on electric bills.

Elsie holds a Bachelor of Science in marketing from the University of Illinois at Chicago and a Master of Science in communications from Northwestern University.

Sabrina Potirala

Sabrina Potirala is the senior eChannels Program Manager for social media at ComEd. Sabrina is a subject matter expert in the fast-moving field of social media and her focus is on keeping ComEd in step with innovations and best practices, providing excellent social media customer service, and safeguarding ComEd's brand reputation in the social space. Sabrina leads ComEd social media in creating smart, engaging content in alignment with business strategies and goals, managing the 24/7 moderation of the channels, and assisting with storm duty management roles. She has a solid background in the social media and marketing arenas, with over 7 years of direct marketing experience in a variety of different roles. She holds a bachelor's degree in Journalism and Mass Communications from the University of Iowa.

Conclusion

Building on a proven model from smart meter deployment and large project execution, ComEd is poised to develop, implement, and deliver a successful outreach campaign – with high rates of customer satisfaction by informing and educating residents and businesses in all city wards, interacting with aldermen, key community leaders, and highlighting key messages through the use of an interactive website, active social media campaign, printed brochures, and hosting a variety of community meetings. As a result of these efforts, the public will be well-informed and the benefits of the Project will be well-publicized and understood.

A talented Team, with a proven track record has been assembled, with the capability to successfully implement all elements of the Plan. The Team will be prepared – through its Crisis Communication Plan, to effectively manage, report, and resolve any issues that might arise. Additionally, the call center will field all questions and concerns, and will elevate any issues to the appropriate individuals and groups. Key City stakeholders will also be involved to ensure information is timely and transparent.

The development of an Outreach Governance Committee will ensure that all parties are aligned, well-informed and approve any materials or messages that are available to the public. They will be briefed on a weekly basis, and made aware of all press-related attention and any issues that might have arisen.

The Team is dedicated to leading the outreach and engagement effort of the Chicago Smart Lighting Project, a project intended to improve the quality of life for Chicago's residents and enhance public safety by improving the quality of Chicago's outdoor lighting. Such a large-impact project requires a commitment to coordinated, effective, and efficient outreach methods in order to ensure that the affected communities are informed at all stages and have access to relevant information. By developing outreach strategies and communication plans, the Team is prepared to complement high-caliber project work with high-quality public messaging.

Form 14: Additional Project Pricing

PROJECT MANAGEMENT, PROFIT, AND OVERHEAD MARKUP²

As stated in the RFP Instructions to Proposers, the markup below shall be provided as a percent and will be applied to the anticipated costs of each Work Order assigned through the Contract, as calculated based on the quantity of each unit item assigned through the Work Order and the applicable unit price.

Notes:

- (1) **The markup shall not be applied to LED Luminaire costs.**
- (2) **Indirect/overhead markup will vary by activity. The figure provide represents the projected average across all activities**
- (3) **Overheads include management oversight and general administrative costs. This excludes consideration for regulated return.**
- (4) **The Public Relations and Communications Hourly Labor Rate include general administrative costs. As such, the Project Management, Profit, and Overhead Markup do not apply to these hourly labor rates.**

ITEM #	DESCRIPTION	UNIT	MARKUP
1	PROJECT MANAGEMENT, PROFIT, AND OVERHEAD MARKUP	%	27.0%

PUBLIC RELATIONS AND COMMUNICATIONS HOURLY LABOR RATE SCHEDULE

LABOR CATEGORY	HOURLY RATE
Oversight/Governance Committee	\$200
Outreach Coordinator	\$180
Digital/Social Media Specialist	\$161
Call Center Associate	\$108

² The costs shown in the tables are the costs that ComEd intends to use in the development of its tariffed charges, all of which are subject to review and approval by the ICC.

Local Economic Initiatives Commitment

ComEd has been making a difference in Chicago's communities for more than 100 years. Rooted in Chicago's neighborhoods, ComEd has been proud to support critical work toward a growing economy, stronger communities, education, and sustainability for Chicagoans.

A Growing Economy. ComEd has kept Chicago's lights on for over a century, **fueling the City's economic activity and growth.** ComEd is:

- A founding member of **Chicago Anchors for a Strong Economy (CASE)**, which fosters strategic relationships between anchor institutions like universities, cultural institutions, hospital, government, and businesses and small business that can supply their needs and drive economic vitality across Chicago's neighborhoods.
- A proud partner with the City and World Business Chicago on the **Data Center Express** to help streamline the startup process for data centers within the City of Chicago.
- A founding member of **Five Forward**, an initiative which enlists Chicago-area CEO's of mid- to large-sized corporations to commit to establishing or expanding business relationships with five local minority firms.

ComEd, headquartered in Chicago itself, has teamed with several firms maintaining major or primary offices in Chicago which include:

- Meade
- AECOM
- Silver Spring Networks
- Primera Engineers
- MZI Group, Inc.
- Accenture

We are committed to supporting the City's local economic development initiatives by partnering with several local Chicago businesses for the Smart Lighting Project. The following are businesses we would like to highlight that meet the City's initiatives:

The Will Group (MBE)

- Prime Team Member
- City-based manufacturer
- City-based business
- Small local business

Steve Davis


400 E Randolph Street
 Chicago, IL 60601
 (312) 233-9066

5261 W. Harrison
 Chicago, IL 60644
 (312) 263-6450



The Will Group will lead the Asset Condition Assessment effort, assemble all LED fixtures installed at their local facility in the Austin neighborhood, and serve as the primary supplier of materials for the project.

JOB CREATION BY THE WILL GROUP (MBE)

The asset condition surveys, assembly and installation of smart LED fixtures by the Will Group will create local jobs and boost Chicago's economy. Materials management, assembly and installation will be handled out of their Chicago facility at Harrison and Central, in the heart of the Austin community. There, project integrators and managers will greatly expand the existing manufacturing facility, leading to much-needed jobs in these communities. This initiative will generate approximately 50 new direct jobs at this location alone, filled by local residents and providing training, health and 401k benefits.



In addition, there will be another 50 direct union labor jobs required for field installation along with growth in supporting businesses throughout the community. Many of The Will Group’s current staff that will work on this project trained at City Colleges. The Will Group is committed to employing individuals from the community to support this project, and have a track record of local success that extends for over 30 years.

Taylor Electric Company (MBE)

- City-based business

Kendra Dinkins



7811 S. Stony Island
Chicago, IL 60649
(773) 346-5768



Taylor Electric will assist in the LED conversion effort by providing skilled labor.

MZI Group, Inc. (MBE)

- City-based business

Kim Nelson



1937 West Fulton Street
Chicago, Illinois 60612.
(312) 492-8740



MZI Group will assist in the LED conversion effort by providing skilled labor.

EverLights (WBE)

- Small local business

Kelly Gallagher

www.everlights.com

8027 N. Lawndale Avenue
Skokie, IL 60076
(877) 934-9873



EverLights will handle legacy fixture recycling and assist in the Asset Condition Survey effort.

AGB Investigative Services (WBE)

- City-based business
- Small local business

John Griffin, Jr.

www.agbinvestigative.com

2033 W. 95th Street
Chicago, IL 60643
(773) 445-4300



AGB will provide security to our Asset Condition Survey team to ensure their safety during the work.

02

LED Conversion Proposal

SECTION II – LED CONVERSION

ComEd understands the local challenges of the City and can bring energy efficient LED lighting to upgrade the outdoor lighting infrastructure of the City of Chicago. Based on our previous success implementing their products, ComEd will use GE LED products assembled by The Will Group in their Chicago Facility within the Austin neighborhood. Local assembly helps to create jobs and provide on-time shipments.

GE has developed a complete portfolio of LED fixtures with the lighting performance characteristics necessary to provide a direct replacement for the legacy High Pressure Sodium (HPS) or Metal Halide (MH) fixtures the City currently uses. GE's unique reflective technology is designed to optimize application efficiency and minimize glare on existing pole locations.

Although we are submitting on the current GE LED offering, GE is in the process of a chip upgrade that will be complete by the end of Q1, 2017. This upgrade will improve efficacy, further reducing wattage while offering enhanced photometric performance.

The current CIT lighting specification provided some unique challenges, particularly in the Residential One-Sided Application (Legacy). The average luminance requirement of 1.5 Cd/Sq.m is driving the need for higher lumens and wattages. The CIT might consider using RP-8 guidelines (IES Recommended Practice for Roadway Lighting), which calls for average luminance of 0.6 Cd/Sq.m in a similar application.

Our wattage summary table is provided on the following page. The net result of the products proposed for the "default" applications show total wattage of 380,800 BELOW the maximum wattage allowed by the CIT.

Within this section we have included the Form 4 LED Luminaire Specifications Submittal Form (Attachment G) for each lighting context and proposed luminaire. For the CIT's reference, we have also included the Product Data Sheets and Photometric Performance Data required by the City's Outdoor LED Luminaire Specifications with the electronic copies of this proposal as well as with the Product Samples we have provided to the City.



Wattage Summary Table

Lighting Context	Proposed GE Fixture Model Number	Wattage		Watts +/- Spec	Total Fixture Qty	Total Watts +/-
		Specification	Proposed			
Residential One-Sided	ERS2019G1X30AGRAYLU	Specification	130	32	64,000	2,048,000
		Proposed	162			
Residential Staggered	ERS2016G1X30AGRAYLU	Spec	120	12	20,000	240,000
		Result	132			
Residential Intersection (R&R)	ERS2019D1X30AGRAYLU	Spec	130	32	8,000	256,000
		Result	162			
Residential Intersection (R&A)	ERS2019D1X30AGRAYLU	Spec	130	32	8,000	256,000
		Result	162			
Arterial One-Sided	ERS2016E1X30AGRAYLU	Spec	180	-48	44,000	-2,112,000
		Result	132			
Arterial Staggered	ERS2019E1X30AGRAYLU	Spec	180	-18	20,000	-360,000
		Result	162			
Arterial Opposite	ERS2016E1X30AGRAYLU	Spec	180	-48	20,000	-960,000
		Result	132			
Alley	ERLH010C130AGRAYILU	Spec	80	10	64,000	640,000
		Result	90			
Park Pathway Cobrahead	ERL1002A130AGRAYILRU	Spec	100	-86	4,000	-344,000
		Result	14			
Park Pathway Area Light	EANB_A2730ADGRAYLRU	Spec	100	-56	800	-44,800
		Result	44			
					Total Watts +/- Spec	-380,800

Form 4: LED Luminaire Specifications Submittal Form

Lighting Context	Residential-Single-Sided-Default			
<i>Product Information Description</i>	<i>Product Data (Summary)</i>		<i>Submittal Reference Document</i>	
Luminaire Designation	Residential-Single-Sided-Default			
Luminaire Manufacturer	G.E.		GE Data Sheet OLP3105	
Luminaire Model Number	ERS2019G1X30AGRAYILU		GE Data Sheet OLP3105	
Luminous Flux – initial	18,300 lumens		GE Data Sheet OLP3105	
Luminaire input power—initial	162 watts		GE Data Sheet OLP3105	
Luminaire input power—maintained	162 watts		GE Data Sheet OLP3105	
Luminaire input voltage- nominal range	120-277 volts		GE Data Sheet OLP3105	
LED drive current - initial	550 milliamps		GE Data Sheet OLP3105	
LED drive current - maintained	550 milliamps		GE Data Sheet OLP3105	
CCT (correlated color temperature)	3000 kelvin		GE Data Sheet OLP3105	
CRI (color rendering index)	70 CRI		GE Data Sheet OLP3105	
EPA (effective projected area) - nominal	0.7 sq. ft.		GE Data Sheet OLP3105	
Luminaire Weight - nominal	25 lbs.		GE Data Sheet OLP3105	
Control Interface	✓ ANSI C136.41, 7-pin		GE Data Sheet OLP3105	
LED Driver – dimming capability	<input type="checkbox"/> Dimmable, 0-10V	✓ Dimmable, DALI	Data Sheet 35-225097-14	
LED driver- rated life	100,000 hours			
Electrical transient immunity ANSI C136.2 combination wave test level	<input type="checkbox"/> Basic (6kV/3kA)	✓ Enhanced (10kV / 5kA)	<input type="checkbox"/> Elevated (20kV/10kA)	Data Sheet 35-225097-14
Vibration Test-ANSI C136.31	✓ Level 2		Vibration Test Report	
Luminaire warranty period	10 years		10 Year Warranty Draft	
IES LM-80 test duration	10,000 hours		IES LM-80-15 report	
LED lumen maintenance at 36,000 hours	96.91 % @ 25C – 36,000 hrs.		TM-21 calculator	
Max. LED case temperature	82 degrees Celsius		ISTMT report	

Lighting Context	Residential-Single-Sided-Boosted			
<i>Product Information Description</i>	<i>Product Data (Summary)</i>		<i>Submittal Reference Document</i>	
Luminaire Designation	Residential-Single-Sided-Boosted			
Luminaire Manufacturer	G.E.		GE Data Sheet OLP3105	
Luminaire Model Number	ERS2023G1X30AGRAYLU		GE Data Sheet OLP3105	
Luminous Flux – initial	22,200 lumens		GE Data Sheet OLP3105	
Luminaire input power—initial	219 watts		GE Data Sheet OLP3105	
Luminaire input power—maintained	219 watts		GE Data Sheet OLP3105	
Luminaire input voltage- nominal range	120-277 volts		GE Data Sheet OLP3105	
LED drive current - initial	700 milliamps		GE Data Sheet OLP3105	
LED drive current - maintained	700 milliamps		GE Data Sheet OLP3105	
CCT (correlated color temperature)	3000 kelvin		GE Data Sheet OLP3105	
CRI (color rendering index)	70 CRI		GE Data Sheet OLP3105	
EPA (effective projected area) - nominal	0.7 sq. ft.		GE Data Sheet OLP3105	
Luminaire Weight - nominal	25 lbs.		GE Data Sheet OLP3105	
Control Interface	✓ ANSI C136.41, 7-pin		GE Data Sheet OLP3105	
LED Driver – dimming capability	<input type="checkbox"/> Dimmable, 0-10V	✓ Dimmable, DALI	Data Sheet 35-225097-14	
LED driver- rated life	100,000 hours			
Electrical transient immunity ANSI C136.2 combination wave test level	<input type="checkbox"/> Basic (6kV/3kA)	✓ Enhanced (10kV / 5kA)	<input type="checkbox"/> Elevated (20kV/10kA)	Data Sheet 35-225097-14
Vibration Test-ANSI C136.31	✓ Level 2		Vibration Test Report	
Luminaire warranty period	10 years		10 Year Warranty Draft	
IES LM-80 test duration	10,000 hours		IES LM-80-15 report	
LED lumen maintenance at 36,000 hours	96.91 % @ 25C – 36,000 hrs.		TM-21 calculator	
Max. LED case temperature	82 degrees Celsius		ISTMT report	

Lighting Context	Residential-Staggered-Default			
<i>Product Information Description</i>	<i>Product Data (Summary)</i>		<i>Submittal Reference Document</i>	
Luminaire Designation	Residential-Staggered-Default			
Luminaire Manufacturer	G.E.		GE Data Sheet OLP3105	
Luminaire Model Number	ERS2016G1X30AGRAYLU		GE Data Sheet OLP3105	
Luminous Flux – initial	15,400 lumens		GE Data Sheet OLP3105	
Luminaire input power—initial	132 watts		GE Data Sheet OLP3105	
Luminaire input power—maintained	132 watts		GE Data Sheet OLP3105	
Luminaire input voltage- nominal range	120-277 volts		GE Data Sheet OLP3105	
LED drive current - initial	450 milliamps		GE Data Sheet OLP3105	
LED drive current - maintained	450 milliamps		GE Data Sheet OLP3105	
CCT (correlated color temperature)	3000 kelvin		GE Data Sheet OLP3105	
CRI (color rendering index)	70 CRI		GE Data Sheet OLP3105	
EPA (effective projected area) - nominal	0.7 sq. ft.		GE Data Sheet OLP3105	
Luminaire Weight - nominal	25 lbs.		GE Data Sheet OLP3105	
Control Interface	✓ ANSI C136.41, 7-pin		GE Data Sheet OLP3105	
LED Driver – dimming capability	<input type="checkbox"/> Dimmable, 0-10V	✓ Dimmable, DALI	Data Sheet 35-225097-14	
LED driver- rated life	100,000 hours			
Electrical transient immunity ANSI C136.2 combination wave test level	<input type="checkbox"/> Basic (6kV/3kA)	✓ Enhanced (10kV / 5kA)	<input type="checkbox"/> Elevated (20kV/10kA)	Data Sheet 35-225097-14
Vibration Test-ANSI C136.31	✓ Level 2		Vibration Test Report	
Luminaire warranty period	10 years		10 Year Warranty Draft	
IES LM-80 test duration	10,000 hours		IES LM-80-15 report	
LED lumen maintenance at 36,000 hours	96.91 % @ 25C – 36,000 hrs.		TM-21 calculator	
Max. LED case temperature	82 degrees Celsius		ISTMT report	

Lighting Context	Residential-Staggered-Boosted			
<i>Product Information Description</i>	<i>Product Data (Summary)</i>		<i>Submittal Reference Document</i>	
Luminaire Designation	Residential-Staggered-Boosted			
Luminaire Manufacturer	G.E.		GE Data Sheet OLP3105	
Luminaire Model Number	ERS2021G1X30AGRAYLU		GE Data Sheet OLP3105	
Luminous Flux – initial	20,300 lumens		GE Data Sheet OLP3105	
Luminaire input power—initial	193 watts		GE Data Sheet OLP3105	
Luminaire input power—maintained	193 watts		GE Data Sheet OLP3105	
Luminaire input voltage- nominal range	120-277 volts		GE Data Sheet OLP3105	
LED drive current - initial	635 milliamps		GE Data Sheet OLP3105	
LED drive current - maintained	635 milliamps		GE Data Sheet OLP3105	
CCT (correlated color temperature)	3000 kelvin		GE Data Sheet OLP3105	
CRI (color rendering index)	70 CRI		GE Data Sheet OLP3105	
EPA (effective projected area) - nominal	0.7 sq. ft.		GE Data Sheet OLP3105	
Luminaire Weight - nominal	25 lbs.		GE Data Sheet OLP3105	
Control Interface	✓ ANSI C136.41, 7-pin		GE Data Sheet OLP3105	
LED Driver – dimming capability	<input type="checkbox"/> Dimmable, 0-10V	✓ Dimmable, DALI	Data Sheet 35-225097-14	
LED driver- rated life	100,000 hours			
Electrical transient immunity ANSI C136.2 combination wave test level	<input type="checkbox"/> Basic (6kV/3kA)	✓ Enhanced (10kV / 5kA)	<input type="checkbox"/> Elevated (20kV/10kA)	Data Sheet 35-225097-14
Vibration Test-ANSI C136.31	✓ Level 2		Vibration Test Report	
Luminaire warranty period	10 years		10 Year Warranty Draft	
IES LM-80 test duration	10,000 hours		IES LM-80-15 report	
LED lumen maintenance at 36,000 hours	96.91 % @ 25C – 36,000 hrs.		TM-21 calculator	
Max. LED case temperature	82 degrees Celsius		ISTMT report	

Lighting Context	Residential-Intersection-Default			
<i>Product Information Description</i>	<i>Product Data (Summary)</i>		<i>Submittal Reference Document</i>	
Luminaire Designation	Residential-Intersection-Default			
Luminaire Manufacturer	G.E.		GE Data Sheet OLP3105	
Luminaire Model Number	ERS2019D1X30AGRAYILU		GE Data Sheet OLP3105	
Luminous Flux – initial	17,900 lumens		GE Data Sheet OLP3105	
Luminaire input power—initial	162 watts		GE Data Sheet OLP3105	
Luminaire input power—maintained	162 watts		GE Data Sheet OLP3105	
Luminaire input voltage- nominal range	120-277 volts		GE Data Sheet OLP3105	
LED drive current - initial	550 milliamps		GE Data Sheet OLP3105	
LED drive current - maintained	550 milliamps		GE Data Sheet OLP3105	
CCT (correlated color temperature)	3000 kelvin		GE Data Sheet OLP3105	
CRI (color rendering index)	70 CRI		GE Data Sheet OLP3105	
EPA (effective projected area) - nominal	0.7 sq. ft.		GE Data Sheet OLP3105	
Luminaire Weight - nominal	25 lbs.		GE Data Sheet OLP3105	
Control Interface	✓ ANSI C136.41, 7-pin		GE Data Sheet OLP3105	
LED Driver – dimming capability	<input type="checkbox"/> Dimmable, 0-10V	✓ Dimmable, DALI	Data Sheet 35-225097-14	
LED driver- rated life	100,000 hours			
Electrical transient immunity ANSI C136.2 combination wave test level	<input type="checkbox"/> Basic (6kV/3kA)	✓ Enhanced (10kV / 5kA)	<input type="checkbox"/> Elevated (20kV/10kA)	Data Sheet 35-225097-14
Vibration Test-ANSI C136.31	✓ Level 2		Vibration Test Report	
Luminaire warranty period	10 years		10 Year Warranty Draft	
IES LM-80 test duration	10,000 hours		IES LM-80-15 report	
LED lumen maintenance at 36,000 hours	96.91 % @ 25C – 36,000 hrs.		TM-21 calculator	
Max. LED case temperature	82 degrees Celsius		ISTMT report	

Lighting Context	Residential-Intersection-Boosted			
<i>Product Information Description</i>	<i>Product Data (Summary)</i>		<i>Submittal Reference Document</i>	
Luminaire Designation	Residential-Intersection-Boosted			
Luminaire Manufacturer	G.E.			
Luminaire Model Number	ERS2023D1X30AGRAYLU		GE Data Sheet OLP3105	
Luminous Flux – initial	21,700 lumens		GE Data Sheet OLP3105	
Luminaire input power—initial	219 watts		GE Data Sheet OLP3105	
Luminaire input power—maintained	219 watts		GE Data Sheet OLP3105	
Luminaire input voltage- nominal range	120-277 volts		GE Data Sheet OLP3105	
LED drive current - initial	700 milliamps		GE Data Sheet OLP3105	
LED drive current - maintained	700 milliamps		GE Data Sheet OLP3105	
CCT (correlated color temperature)	3000 kelvin		GE Data Sheet OLP3105	
CRI (color rendering index)	70 CRI		GE Data Sheet OLP3105	
EPA (effective projected area) - nominal	0.7 sq. ft.		GE Data Sheet OLP3105	
Luminaire Weight - nominal	25 lbs.		GE Data Sheet OLP3105	
Control Interface	✓ ANSI C136.41, 7-pin		GE Data Sheet OLP3105	
LED Driver – dimming capability	<input type="checkbox"/> Dimmable, 0-10V	✓ Dimmable, DALI	Data Sheet 35-225097-14	
LED driver- rated life	100,000 hours			
Electrical transient immunity ANSI C136.2 combination wave test level	<input type="checkbox"/> Basic (6kV/3kA)	✓ Enhanced (10kV / 5kA)	<input type="checkbox"/> Elevated (20kV/10kA)	Data Sheet 35-225097-14
Vibration Test-ANSI C136.31	✓ Level 2		Vibration Test Report	
Luminaire warranty period	10 years		10 Year Warranty Draft	
IES LM-80 test duration	10,000 hours		IES LM-80-15 report	
LED lumen maintenance at 36,000 hours	96.91 % @ 25C – 36,000 hrs.		TM-21 calculator	
Max. LED case temperature	82 degrees Celsius		ISTMT report	

Lighting Context	Arterial-Single-Sided-Default			
<i>Product Information Description</i>	<i>Product Data (Summary)</i>		<i>Submittal Reference Document</i>	
Luminaire Designation	Arterial-Single-Sided-Default			
Luminaire Manufacturer	G.E.		GE Data Sheet OLP3105	
Luminaire Model Number	ERS2016E1X30AGRAYLU		GE Data Sheet OLP3105	
Luminous Flux – initial	15,400 lumens		GE Data Sheet OLP3105	
Luminaire input power—initial	132 watts		GE Data Sheet OLP3105	
Luminaire input power—maintained	132 watts		GE Data Sheet OLP3105	
Luminaire input voltage- nominal range	120-277 volts		GE Data Sheet OLP3105	
LED drive current - initial	450 milliamps		GE Data Sheet OLP3105	
LED drive current - maintained	450 milliamps		GE Data Sheet OLP3105	
CCT (correlated color temperature)	3000 kelvin		GE Data Sheet OLP3105	
CRI (color rendering index)	70 CRI		GE Data Sheet OLP3105	
EPA (effective projected area) - nominal	0.7 sq. ft.		GE Data Sheet OLP3105	
Luminaire Weight - nominal	25 lbs.		GE Data Sheet OLP3105	
Control Interface	✓ ANSI C136.41, 7-pin		GE Data Sheet OLP3105	
LED Driver – dimming capability	<input type="checkbox"/> Dimmable, 0-10V	✓ Dimmable, DALI	Data Sheet 35-225097-14	
LED driver- rated life	100,000 hours			
Electrical transient immunity ANSI C136.2 combination wave test level	<input type="checkbox"/> Basic (6kV/3kA)	✓ Enhanced (10kV / 5kA)	<input type="checkbox"/> Elevated (20kV/10kA)	Data Sheet 35-225097-14
Vibration Test-ANSI C136.31	✓ Level 2		Vibration Test Report	
Luminaire warranty period	10 years		10 Year Warranty Draft	
IES LM-80 test duration	10,000 hours		IES LM-80-15 report	
LED lumen maintenance at 36,000 hours	96.91 % @ 25C – 36,000 hrs.		TM-21 calculator	
Max. LED case temperature	82 degrees Celsius		ISTMT report	

Lighting Context	Arterial-Single-Sided-Boosted			
<i>Product Information Description</i>	<i>Product Data (Summary)</i>		<i>Submittal Reference Document</i>	
Luminaire Designation	Arterial-Single-Sided-Boosted			
Luminaire Manufacturer	G.E.		GE Data Sheet OLP3105	
Luminaire Model Number	ERS2023E1X30AGRAYLU		GE Data Sheet OLP3105	
Luminous Flux – initial	22,200 lumens		GE Data Sheet OLP3105	
Luminaire input power—initial	219 watts		GE Data Sheet OLP3105	
Luminaire input power—maintained	219 watts		GE Data Sheet OLP3105	
Luminaire input voltage- nominal range	120-277 volts		GE Data Sheet OLP3105	
LED drive current - initial	700 milliamps		GE Data Sheet OLP3105	
LED drive current - maintained	700 milliamps		GE Data Sheet OLP3105	
CCT (correlated color temperature)	3000 kelvin		GE Data Sheet OLP3105	
CRI (color rendering index)	70 CRI		GE Data Sheet OLP3105	
EPA (effective projected area) - nominal	0.7 sq. ft.		GE Data Sheet OLP3105	
Luminaire Weight - nominal	25 lbs.		GE Data Sheet OLP3105	
Control Interface	✓ ANSI C136.41, 7-pin		GE Data Sheet OLP3105	
LED Driver – dimming capability	<input type="checkbox"/> Dimmable, 0-10V	✓ Dimmable, DALI	Data Sheet 35-225097-14	
LED driver- rated life	100,000 hours			
Electrical transient immunity ANSI C136.2 combination wave test level	<input type="checkbox"/> Basic (6kV/3kA)	✓ Enhanced (10kV / 5kA)	<input type="checkbox"/> Elevated (20kV/10kA)	Data Sheet 35-225097-14
Vibration Test-ANSI C136.31	✓ Level 2		Vibration Test Report	
Luminaire warranty period	10 years		10 Year Warranty Draft	
IES LM-80 test duration	10,000 hours		IES LM-80-15 report	
LED lumen maintenance at 36,000 hours	96.91 % @ 25C – 36,000 hrs.		TM-21 calculator	
Max. LED case temperature	82 degrees Celsius		ISTMT report	

Lighting Context	Arterial-Opposite-Default			
<i>Product Information Description</i>	<i>Product Data (Summary)</i>		<i>Submittal Reference Document</i>	
Luminaire Designation	Arterial-Opposite-Default			
Luminaire Manufacturer	G.E.		GE Data Sheet OLP3105	
Luminaire Model Number	ERS2016E1X30AGRAYLU		GE Data Sheet OLP3105	
Luminous Flux – initial	15,400 lumens		GE Data Sheet OLP3105	
Luminaire input power—initial	132 watts		GE Data Sheet OLP3105	
Luminaire input power—maintained	132 watts		GE Data Sheet OLP3105	
Luminaire input voltage- nominal range	120-277 volts		GE Data Sheet OLP3105	
LED drive current - initial	450 milliamps		GE Data Sheet OLP3105	
LED drive current - maintained	450 milliamps		GE Data Sheet OLP3105	
CCT (correlated color temperature)	3000 K		GE Data Sheet OLP3105	
CRI (color rendering index)	70 CRI		GE Data Sheet OLP3105	
EPA (effective projected area) - nominal	0.7 sq. ft.		GE Data Sheet OLP3105	
Luminaire Weight - nominal	25 lbs.		GE Data Sheet OLP3105	
Control Interface	✓ ANSI C136.41, 7-pin		GE Data Sheet OLP3105	
LED Driver – dimming capability	<input type="checkbox"/> Dimmable, 0-10V	✓ Dimmable, DALI	Data Sheet 35-225097-14	
LED driver- rated life	100,000 hours			
Electrical transient immunity ANSI C136.2 combination wave test level	<input type="checkbox"/> Basic (6kV/3kA)	✓ Enhanced (10kV / 5kA)	<input type="checkbox"/> Elevated (20kV/10kA)	Data Sheet 35-225097-14
Vibration Test-ANSI C136.31	✓ Level 2		Vibration Test Report	
Luminaire warranty period	10 years		10 Year Warranty Draft	
IES LM-80 test duration	10,000 hours		IES LM-80-15 report	
LED lumen maintenance at 36,000 hours	96.91 % @ 25C – 36,000 hrs.		TM-21 calculator	
Max. LED case temperature	82 degrees Celsius		ISTMT report	

Lighting Context	Arterial-Opposite-Boosted			
<i>Product Information Description</i>	<i>Product Data (Summary)</i>		<i>Submittal Reference Document</i>	
Luminaire Designation	Arterial-Opposite-Boosted			
Luminaire Manufacturer	G.E.		GE Data Sheet OLP3105	
Luminaire Model Number	ERS2023E1X30AGRAYLU		GE Data Sheet OLP3105	
Luminous Flux – initial	22,200 lumens		GE Data Sheet OLP3105	
Luminaire input power—initial	219 watts		GE Data Sheet OLP3105	
Luminaire input power—maintained	219 watts		GE Data Sheet OLP3105	
Luminaire input voltage- nominal range	120-277 volts		GE Data Sheet OLP3105	
LED drive current - initial	700 milliamps		GE Data Sheet OLP3105	
LED drive current - maintained	700 milliamps		GE Data Sheet OLP3105	
CCT (correlated color temperature)	3000 K		GE Data Sheet OLP3105	
CRI (color rendering index)	70 CRI		GE Data Sheet OLP3105	
EPA (effective projected area) - nominal	0.7 sq. ft.		GE Data Sheet OLP3105	
Luminaire Weight - nominal	25 lbs.		GE Data Sheet OLP3105	
Control Interface	✓ ANSI C136.41, 7-pin		GE Data Sheet OLP3105	
LED Driver – dimming capability	<input type="checkbox"/> Dimmable, 0-10V	✓ Dimmable, DALI	Data Sheet 35-225097-14	
LED driver- rated life	100,000 hours			
Electrical transient immunity ANSI C136.2 combination wave test level	<input type="checkbox"/> Basic (6kV/3kA)	✓ Enhanced (10kV / 5kA)	<input type="checkbox"/> Elevated (20kV/10kA)	Data Sheet 35-225097-14
Vibration Test-ANSI C136.31	✓ Level 2		Vibration Test Report	
Luminaire warranty period	10 years		10 Year Warranty Draft	
IES LM-80 test duration	10,000 hours		IES LM-80-15 report	
LED lumen maintenance at 36,000 hours	96.91 % @ 25C – 36,000 hrs.		TM-21 calculator	
Max. LED case temperature	82 degrees Celsius		ISTMT report	

Lighting Context	Arterial-Staggered-Default			
<i>Product Information Description</i>	<i>Product Data (Summary)</i>			<i>Submittal Reference Document</i>
Luminaire Designation	Arterial-Staggered-Default			
Luminaire Manufacturer	G.E.			GE Data Sheet OLP3105
Luminaire Model Number	ERS2019E1X30AGRAYILU			GE Data Sheet OLP3105
Luminous Flux – initial	18,300 lumens			GE Data Sheet OLP3105
Luminaire input power—initial	162 watts			GE Data Sheet OLP3105
Luminaire input power—maintained	162 watts			GE Data Sheet OLP3105
Luminaire input voltage- nominal range	120-277 volts			GE Data Sheet OLP3105
LED drive current - initial	550 milliamps			GE Data Sheet OLP3105
LED drive current - maintained	550 milliamps			GE Data Sheet OLP3105
CCT (correlated color temperature)	3000 kelvin			GE Data Sheet OLP3105
CRI (color rendering index)	70 CRI			GE Data Sheet OLP3105
EPA (effective projected area) - nominal	0.7 sq. ft.			GE Data Sheet OLP3105
Luminaire Weight - nominal	25 lbs.			GE Data Sheet OLP3105
Control Interface	✓ ANSI C136.41, 7-pin			GE Data Sheet OLP3105
LED Driver – dimming capability	<input type="checkbox"/> Dimmable, 0-10V	✓ Dimmable, DALI		Data Sheet 35-225097-14
LED driver- rated life	100,000 hours			
Electrical transient immunity ANSI C136.2 combination wave test level	<input type="checkbox"/> Basic (6kV/3kA)	✓ Enhanced (10kV / 5kA)	<input type="checkbox"/> Elevated (20kV/10kA)	Data Sheet 35-225097-14
Vibration Test-ANSI C136.31	✓ Level 2			Vibration Test Report
Luminaire warranty period	10 years			10 Year Warranty Draft
IES LM-80 test duration	10,000 hours			IES LM-80-15 report
LED lumen maintenance at 36,000 hours	96.91 % @ 25C – 36,000 hrs.			TM-21 calculator
Max. LED case temperature	82 degrees Celsius			ISTMT report

Lighting Context	Arterial-Staggered-Boosted			
<i>Product Information Description</i>	<i>Product Data (Summary)</i>		<i>Submittal Reference Document</i>	
Luminaire Designation	Arterial-Staggered-Boosted			
Luminaire Manufacturer	G.E.		GE Data Sheet OLP3105	
Luminaire Model Number	ERS2023A1X30AGRAYLU		GE Data Sheet OLP3105	
Luminous Flux – initial	21,100 lumens		GE Data Sheet OLP3105	
Luminaire input power—initial	219 watts		GE Data Sheet OLP3105	
Luminaire input power—maintained	219 watts		GE Data Sheet OLP3105	
Luminaire input voltage- nominal range	120-277 volts		GE Data Sheet OLP3105	
LED drive current - initial	700 milliamps		GE Data Sheet OLP3105	
LED drive current - maintained	700 milliamps		GE Data Sheet OLP3105	
CCT (correlated color temperature)	3000 kelvin		GE Data Sheet OLP3105	
CRI (color rendering index)	70 CRI		GE Data Sheet OLP3105	
EPA (effective projected area) - nominal	0.7 sq. ft.		GE Data Sheet OLP3105	
Luminaire Weight - nominal	25 lbs.		GE Data Sheet OLP3105	
Control Interface	✓ ANSI C136.41, 7-pin		GE Data Sheet OLP3105	
LED Driver – dimming capability	<input type="checkbox"/> Dimmable, 0-10V	✓ Dimmable, DALI	Data Sheet 35-225097-14	
LED driver- rated life	100,000 hours			
Electrical transient immunity ANSI C136.2 combination wave test level	<input type="checkbox"/> Basic (6kV/3kA)	✓ Enhanced (10kV / 5kA)	<input type="checkbox"/> Elevated (20kV/10kA)	Data Sheet 35-225097-14
Vibration Test-ANSI C136.31	✓ Level 2		Vibration Test Report	
Luminaire warranty period	10 years		10 Year Warranty Draft	
IES LM-80 test duration	10,000 hours		IES LM-80-15 report	
LED lumen maintenance at 36,000 hours	96.91 % @ 25C – 36,000 hrs.		TM-21 calculator	
Max. LED case temperature	82 degrees Celsius		ISTMT report	

Lighting Context	Alley-One Sided-Default			
<i>Product Information Description</i>	<i>Product Data (Summary)</i>		<i>Submittal Reference Document</i>	
Luminaire Designation	Alley-One Sided-Default			
Luminaire Manufacturer	G.E.		GE Data Sheet OLP3105	
Luminaire Model Number	ERLH010C130AGRAYILU		GE Data Sheet OLP3105	
Luminous Flux – initial	9,600 lumens		GE Data Sheet OLP3105	
Luminaire input power—initial	90 watts		GE Data Sheet OLP3105	
Luminaire input power—maintained	90 watts		GE Data Sheet OLP3105	
Luminaire input voltage- nominal range	120-277 volts		GE Data Sheet OLP3105	
LED drive current - initial	590 milliamps		GE Data Sheet OLP3105	
LED drive current - maintained	590 milliamps		GE Data Sheet OLP3105	
CCT (correlated color temperature)	3000 kelvin		GE Data Sheet OLP3105	
CRI (color rendering index)	70 CRI		GE Data Sheet OLP3105	
EPA (effective projected area) - nominal	0.5 sq. ft.		GE Data Sheet OLP3105	
Luminaire Weight - nominal	15.15 lbs.		GE Data Sheet OLP3105	
Control Interface	✓ ANSI C136.41, 7-pin		GE Data Sheet OLP3105	
LED Driver – dimming capability	<input type="checkbox"/> Dimmable, 0-10V	✓ Dimmable, DALI	Data Sheet 35-225097-12	
LED driver- rated life	100,000 hours			
Electrical transient immunity ANSI C136.2 combination wave test level	<input type="checkbox"/> Basic (6kV/3kA)	✓ Enhanced (10kV / 5kA)	<input type="checkbox"/> Elevated (20kV/10kA)	Data Sheet 35-225097-12
Vibration Test-ANSI C136.31	✓ Level 2		Vibration Test Report	
Luminaire warranty period	10 years		10 Year Warranty Draft	
IES LM-80 test duration	10,000 hours		IES LM-80-15 report	
LED lumen maintenance at 36,000 hours	96.89 % @ 25C – 36,000 hrs.		TM-21 calculator	
Max. LED case temperature	78 degrees Celsius		ISTMT report	

Lighting Context	Alleys – One Sided - Boosted			
<i>Product Information Description</i>	<i>Product Data (Summary)</i>			<i>Submittal Reference Document</i>
Luminaire Designation	Alleys – One Sided - Boosted			
Luminaire Manufacturer	G.E.			GE Data Sheet OLP3105
Luminaire Model Number	ERLH010B130AGRAYILU			GE Data Sheet OLP3105
Luminous Flux – initial	9500 lumens			GE Data Sheet OLP3105
Luminaire input power—initial	90 watts			GE Data Sheet OLP3105
Luminaire input power—maintained	90 watts			GE Data Sheet OLP3105
Luminaire input voltage- nominal range	120-277 volts			GE Data Sheet OLP3105
LED drive current - initial	590 milliamps			GE Data Sheet OLP3105
LED drive current - maintained	590 milliamps			GE Data Sheet OLP3105
CCT (correlated color temperature)	3000 kelvin			GE Data Sheet OLP3105
CRI (color rendering index)	70 CRI			GE Data Sheet OLP3105
EPA (effective projected area) - nominal	0.5 sq. ft.			GE Data Sheet OLP3105
Luminaire Weight - nominal	15.15 lbs.			GE Data Sheet OLP3105
Control Interface	✓ ANSI C136.41, 7-pin			GE Data Sheet OLP3105
LED Driver – dimming capability	<input type="checkbox"/> Dimmable, 0-10V	✓ Dimmable, DALI		Data Sheet 35-225097-12
LED driver- rated life	100,000 hours			
Electrical transient immunity ANSI C136.2 combination wave test level	<input type="checkbox"/> Basic (6kV/3kA)	✓ Enhanced (10kV / 5kA)	<input type="checkbox"/> Elevated (20kV/10kA)	Data Sheet 35-225097-12
Vibration Test-ANSI C136.31	✓ Level 2			Vibration Test Report
Luminaire warranty period	10 years			10 Year Warranty Draft
IES LM-80 test duration	10,000 hours			IES LM-80-15 report
LED lumen maintenance at 36,000 hours	96.89 % @ 25C – 36,000 hrs.			TM-21 calculator
Max. LED case temperature	78 degrees Celsius			ISTMT report

Lighting Context	Viaducts			
<i>Product Information Description</i>	<i>Product Data (Summary)</i>			<i>Submittal Reference Document</i>
Luminaire Designation	Viaducts			
Luminaire Manufacturer	Maxlite			Data Sheet
Luminaire Model Number	MELT90UA240G-A2S111			Data Sheet
Luminous Flux – initial	9705 lumens			Data Sheet
Luminaire input power—initial	96 watts			Data Sheet
Luminaire input power—maintained	96 watts			Data Sheet
Luminaire input voltage- nominal range	120-277 volts			Data Sheet
LED drive current - initial	1050 milliamps			Data Sheet
LED drive current - maintained	1050 milliamps			Data Sheet
CCT (correlated color temperature)	3000 kelvin			Data Sheet
CRI (color rendering index)	70 CRI			Data Sheet
EPA (effective projected area) - nominal	sq. ft.			Data Sheet
Luminaire Weight - nominal	16 lbs.			Data Sheet
Control Interface	✓ ANSI C136.41, 7-pin			Data Sheet
LED Driver – dimming capability	<input type="checkbox"/> Dimmable, 0-10V	✓ Dimmable, DALI		Data Sheet
LED driver- rated life	100,000 hours			Data Sheet
Electrical transient immunity ANSI C136.2 combination wave test level	<input type="checkbox"/> Basic (6kV/3kA)	✓ Enhanced (10kV / 5kA)	<input type="checkbox"/> Elevated (20kV/10kA)	Data Sheet
Vibration Test-ANSI C136.31	✓ Level 2			Vibration Test
Luminaire warranty period	10 years			Letter
IES LM-80 test duration	10,000 hours			IES Report
LED lumen maintenance at 36,000 hours	93.08 – 36,000 hrs.			TM-21
Max. LED case temperature	74 degrees Celsius			ISTMT report

Lighting Context	Residential Acorns		
<i>Product Information Description</i>	<i>Product Data (Summary)</i>		<i>Submittal Reference Document</i>
Luminaire Designation	Residential Acorn		
Luminaire Manufacturer	Lyonsview		Data Sheet
Luminaire Model Number	PB36LEDEB		Data Sheet
Luminous Flux – initial	3958 lumens		Data Sheet
Luminaire input power—initial	36 watts		Data Sheet
Luminaire input power—maintained	36 watts		Data Sheet
Luminaire input voltage- nominal range	120-277 volts		Data Sheet
LED drive current - initial	1050 milliamps		Data Sheet
LED drive current - maintained	1050 milliamps		Data Sheet
CCT (correlated color temperature)	3000 kelvin		Data Sheet
CRI (color rendering index)	80 CRI		Data Sheet
EPA (effective projected area) - nominal	sq. ft.		Data Sheet
Luminaire Weight - nominal	15 lbs.		Data Sheet
Control Interface	✓ ANSI C136.41, 7-pin		Data Sheet
LED Driver – dimming capability	<input type="checkbox"/> Dimmable, 0-10V	✓ Dimmable, DALI	Data Sheet
LED driver- rated life	100,000 hours		Driver Spec
Electrical transient immunity ANSI C136.2 combination wave test level	<input type="checkbox"/> Basic (6kV/3kA)	Enhanced (10kV / 5kA)	✓ Elevated (20kV/10kA)
Vibration Test-ANSI C136.31	✓ Level 2		Vibration Test
Luminaire warranty period	10 years		Warranty
IES LM-80 test duration	10,000 hours		IES LM-80-15 report
LED lumen maintenance at 36,000 hours	93.08 – 36,000 hrs.		TM-21 calculator

Lighting Context	Arterial Acorns			
<i>Product Information Description</i>	<i>Product Data (Summary)</i>			<i>Submittal Reference Document</i>
Luminaire Designation	Arterial Acorn			
Luminaire Manufacturer	Lyonsview			Data Sheet
Luminaire Model Number	LPBA60LEDEB			Data Sheet
Luminous Flux – initial	7012 lumens			Data Sheet
Luminaire input power—initial	60 watts			Data Sheet
Luminaire input power—maintained	60 watts			Data Sheet
Luminaire input voltage- nominal range	120-277 volts			Data Sheet
LED drive current - initial	1050 milliamps			Data Sheet
LED drive current - maintained	1050 milliamps			Data Sheet
CCT (correlated color temperature)	3000 kelvin			Data Sheet
CRI (color rendering index)	80 CRI			Data Sheet
EPA (effective projected area) - nominal	sq. ft.			Data Sheet
Luminaire Weight - nominal	15 lbs.			Data Sheet
Control Interface	✓ ANSI C136.41, 7-pin			Data Sheet
LED Driver – dimming capability	<input type="checkbox"/> Dimmable, 0-10V	✓ Dimmable, DALI		Data Sheet
LED driver- rated life	100,000 hours			Data Sheet
Electrical transient immunity ANSI C136.2 combination wave test level	<input type="checkbox"/> Basic (6kV/3kA)	<input type="checkbox"/> Enhanced (10kV / 5kA)	✓ Elevated (20kV/10kA)	36KV/18KA
Vibration Test-ANSI C136.31	✓ Level 2			Vibration Test
Luminaire warranty period	10 years			Warranty Letter
IES LM-80 test duration	10,000 hours			IES LM-80-15 report
LED lumen maintenance at 36,000 hours	93.08 – 36,000 hrs.			TM-21 calculator
Max. LED case temperature	74 degrees Celsius			ISTMT report

Lighting Context	Park Pathways - Cobrahead			
<i>Product Information Description</i>	<i>Product Data (Summary)</i>		<i>Submittal Reference Document</i>	
Luminaire Designation	Park Pathways - Cobrahead			
Luminaire Manufacturer	G.E.			GE Data Sheet OLP3105
Luminaire Model Number	ERL1002A130AGRAYILRU			GE Data Sheet OLP3105
Luminous Flux – initial	1,800 lumens			GE Data Sheet OLP3105
Luminaire input power—initial	14 watts			GE Data Sheet OLP3105
Luminaire input power—maintained	14 watts			GE Data Sheet OLP3105
Luminaire input voltage- nominal range	120-277 volts			GE Data Sheet OLP3105
LED drive current - initial	125 milliamps			GE Data Sheet OLP3105
LED drive current - maintained	125 milliamps			GE Data Sheet OLP3105
CCT (correlated color temperature)	3000 kelvin			GE Data Sheet OLP3105
CRI (color rendering index)	70 CRI			GE Data Sheet OLP3105
EPA (effective projected area) - nominal	0.5 sq. ft.			GE Data Sheet OLP3105
Luminaire Weight - nominal	12.4 lbs.			GE Data Sheet OLP3105
Control Interface	✓ ANSI C136.41, 7-pin			GE Data Sheet OLP3105
LED Driver – dimming capability	<input type="checkbox"/> Dimmable, 0-10V	✓ Dimmable, DALI		Data Sheet 35-225097-11
LED driver- rated life	100,000 hours			
Electrical transient immunity ANSI C136.2 combination wave test level	<input type="checkbox"/> Basic (6kV/3kA)	✓ Enhanced (10kV / 5kA)	<input type="checkbox"/> Elevated (20kV/10kA)	Data Sheet 35-225097-11
Vibration Test-ANSI C136.31	✓ Level 2			Vibration Test Report
Luminaire warranty period	10 years			10 Year Warranty Draft
IES LM-80 test duration	10,000 hours			IES LM-80-15 report
LED lumen maintenance at 36,000 hours	96.15 % @ 25C – 36,000 hrs.			TM-21 calculator
Max. LED case temperature	49 degrees Celsius			ISTMT report

Lighting Context	Park Pathways – Shoebox			
<i>Product Information Description</i>	<i>Product Data (Summary)</i>		<i>Submittal Reference Document</i>	
Luminaire Designation	Park Pathways – Shoebox			
Luminaire Manufacturer	G.E.		GE Data Sheet OLP3118	
Luminaire Model Number	EANB0A2730ADGRAYLRU		GE Data Sheet OLP3118	
Luminous Flux – initial	4,200 lumens		GE Data Sheet OLP3118	
Luminaire input power—initial	44 watts		GE Data Sheet OLP3118	
Luminaire input power—maintained	44 watts		GE Data Sheet OLP3118	
Luminaire input voltage- nominal range	120-277 volts		GE Data Sheet OLP3118	
LED drive current - initial	525 milliamps		GE Data Sheet OLP3118	
LED drive current - maintained	525 milliamps		GE Data Sheet OLP3118	
CCT (correlated color temperature)	3000 kelvin		GE Data Sheet OLP3118	
CRI (color rendering index)	70 CRI		GE Data Sheet OLP3118	
EPA (effective projected area) - nominal	0.67sq. ft.		GE Data Sheet OLP3118	
Luminaire Weight - nominal	10.0 lbs.		GE Data Sheet OLP3118	
Control Interface	✓ ANSI C136.41, 7-pin		GE Data Sheet OLP3118	
LED Driver – dimming capability	<input type="checkbox"/> Dimmable, 0-10V	✓ Dimmable, DALI	Data Sheet 35-225097-11	
LED driver- rated life	100,000 hours			
Electrical transient immunity ANSI C136.2 combination wave test level	<input type="checkbox"/> Basic (6kV/3kA)	✓ Enhanced (10kV / 5kA)	<input type="checkbox"/> Elevated (20kV/10kA)	Data Sheet 35-225097-11
Vibration Test-ANSI C136.31	✓ Level 2		Vibration Test Report	
Luminaire warranty period	10 years		10 Year Warranty Draft	
IES LM-80 test duration	10,000 hours		IES LM-80-15 report	
LED lumen maintenance at 36,000 hours	96.15 % @ 25C – 36,000 hrs.		TM-21 calculator	
Max. LED case temperature	49 degrees Celsius		ISTMT report	

Form 5: LED Conversion Pricing Form

As ComEd will be providing this service pursuant to a regulated tariff, the costs provided in the attached Form 5 cannot be taken directly as an offer for outright sale of products or services by ComEd. These prices will be used to develop the monthly charges for the tariffed services, subject to ICC approval, and subject to adjustment as provided in ComEd's ICC approved tariffs and ICC rules.

Form 5 is included within the proposal package in electronic format as a Microsoft Excel document as required by the RFP Instructions to Proposers. It is also reproduced below so that it can be read in printed form.

Additional Pricing Notes:

- Pricing does not include posting of "No Parking Signs". ComEd assumes this will be performed by the City at no cost to ComEd.
- Warranty terms are included in the LED product submittals provided in electronic format within the proposal package.

Proposer:	ComEd
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	Luminance Capacity	Exhibit K Work Item	Fixture Conversion Unit Price (\$/Fixture)	LED Luminaire Price (\$/Fixture)	Total Price Per Conversion (\$/Fixture)	Total Phase Price
Residential Legacy (66 Foot ROW, One-Sided Light Pole Configuration)						
[INSERT LUMINAIRE NAME]	Default	Item #4	\$ 220.03	\$ 338.43	\$ 558.46	\$ 9,214,529.17
Anticipated # of Fixtures						
Phase: 16,500	Boosted		\$ 220.03	\$ 375.26	\$ 595.29	\$ 9,822,313.49
Project Total: 64,000						
Alley (New Wiring Harness)						
[INSERT LUMINAIRE NAME]	Default	Item #1	\$ 556.82	\$ 244.46	\$ 801.28	\$ 13,221,070.42
Anticipated # of Fixtures						
Phase: 16,500 (Total Alley Fixtures)	Boosted		\$ 556.82	\$ 276.27	\$ 833.08	\$ 13,745,875.90
Project Total: 64,000						
Alley (Existing Wiring Harness)						
[INSERT LUMINAIRE NAME]	Default	Item #2	\$ 220.03	\$ 247.49	\$ 467.52	\$ 7,714,061.62
Anticipated # of Fixtures						
Phase: 16,500 (Total Alley Fixtures)	Boosted		\$ 220.03	\$ 276.27	\$ 496.30	\$ 8,188,893.12
Project Total: 64,000						
Arterial (Feeder) Legacy (66 Foot ROW, One-Sided Light Pole Configuration)						
[INSERT LUMINAIRE NAME]	Default	Item #6	\$ 220.03	\$ 303.89	\$ 523.92	\$ 6,025,115.80
Anticipated # of Fixtures						
Phase: 11,500	Boosted		\$ 220.03	\$ 378.71	\$ 598.75	\$ 6,885,568.04
Project Total: 44,000						
Residential Modern (66 Foot ROW, Staggered Light Pole Configuration)						
[INSERT LUMINAIRE NAME]	Default	Item #3	\$ 220.03	\$ 318.86	\$ 538.89	\$ 2,694,437.50
Anticipated # of Fixtures						
Phase: 5,000	Boosted		\$ 220.03	\$ 344.18	\$ 564.21	\$ 2,821,059.23
Project Total: 20,000						
Arterial (Large) (100 Foot ROW, Opposite Light Pole Configuration)						
[INSERT LUMINAIRE NAME]	Default	Item #6	\$ 316.90	\$ 303.89	\$ 620.79	\$ 3,103,957.28
Anticipated # of Fixtures						
Phase: 5,000	Boosted		\$ 316.90	\$ 332.67	\$ 649.57	\$ 3,247,845.61
Project Total: 20,000						
Arterial (Medium) (80 Foot ROW, Staggered Light Pole Configuration)						
[INSERT LUMINAIRE NAME]	Default	Item #6	\$ 220.03	\$ 364.90	\$ 584.93	\$ 2,339,727.07
Anticipated # of Fixtures						
Phase: 4,000	Boosted		\$ 220.03	\$ 392.53	\$ 612.56	\$ 2,450,233.31
Project Total: 20,000						
Residential Intersection (66 Foot ROW, 45 Degree Angle)						
[INSERT LUMINAIRE NAME]	Default	Item #5	\$ 220.03	\$ 291.23	\$ 511.26	\$ 2,045,043.76
Anticipated # of Fixtures						
Phase: 4,000	Boosted		\$ 220.03	\$ 390.23	\$ 610.26	\$ 2,441,024.45
Project Total: 16,000						
Viaduct						
[INSERT LUMINAIRE NAME]	Default	Item #10	\$ 1,225.33	\$ 629.66	\$ 1,854.98	\$ 9,274,907.45
Anticipated # of Fixtures						
Phase: 5,000						
Project Total: 16,000						
Residential Coach						
[INSERT LUMINAIRE NAME]	Default	Item #8	\$ 413.77	\$ 551.38	\$ 965.15	\$ 3,860,590.93
Anticipated # of Fixtures						
Phase: 6,000						
Project Total: 24,000						
Arterial Acorn						
[INSERT LUMINAIRE NAME]	Default	Item #9	\$ 607.50	\$ 680.30	\$ 1,287.81	\$ 1,641,955.67
Anticipated # of Fixtures						
Phase: 1,275						
Project Total: 5,100						
Park Pathway Cobrahead						
[INSERT LUMINAIRE NAME]	Default	Item #7	\$ 316.90	\$ 148.49	\$ 465.39	\$ 465,392.05
Anticipated # of Fixtures						
Phase: 1,000						
Project Total: 4,000						
Park Pathway Shoebox						
[INSERT LUMINAIRE NAME]	Default	Item #7	\$ 413.77	\$ 415.55	\$ 829.32	\$ 165,863.43
Anticipated # of Fixtures						
Phase: 200						
Project Total: 800						

FOR CIT INTERNAL USE ONLY	
TOTAL PHASE 1 COSTS DEFAULT LUMINANCE CAPACITY	\$ 54,052,590.53
TOTAL PHASE 1 COSTS BOOSTED LUMINANCE CAPACITY	\$ 56,822,629.58

03

Infrastructure Stabilization Proposal

SECTION III – INFRASTRUCTURE STABILIZATION PROPOSAL

Asset Condition Assessment Plan

Overview

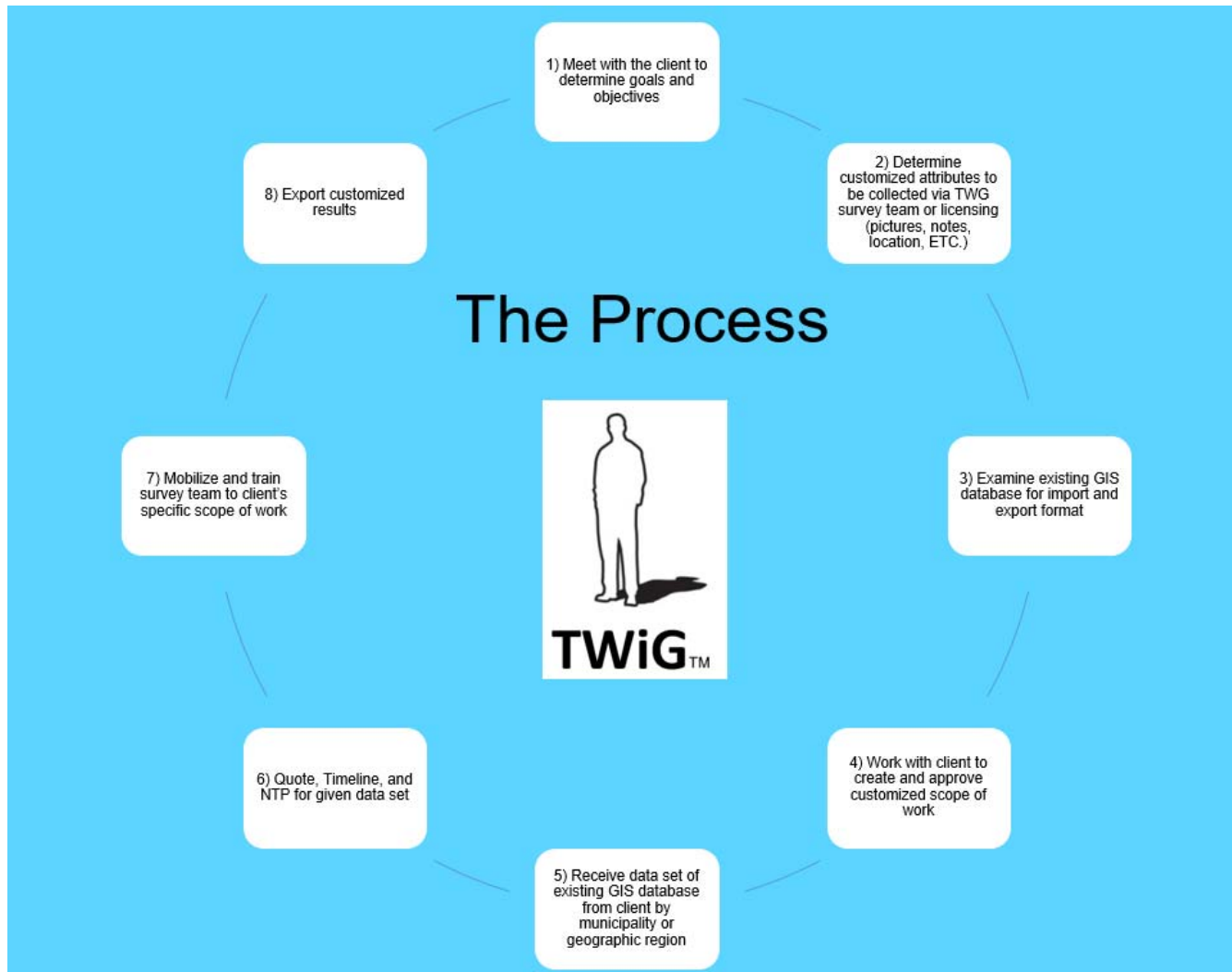
Electrical Resource Management, Inc. (ERM), one of The Will Group (TWG) Companies and a certified Minority Business Enterprise (MBE), will be responsible for performing the asset condition assessment covering every light fixture included in the CDOT lighting inventory. This team understands the importance of consistent data accuracy and detail in this regard, and will leverage its customized technology, its dedicated staff, and its proven processes to ensure this component of the smart lighting project will be well executed.

ERM has custom built a mobile platform, TWiG, for collecting lighting asset inventory information in the field, and has been using it to provide infrastructure management and condition assessment services to municipalities throughout the Chicago Metropolitan area. This platform can easily be customized further to capture those attributes specified in this RFP. ERM also excels at recruiting and retaining motivated and dedicated Chicagoans, training them to perform core tasks such as this, and managing them through project execution. The people and processes employed in this asset condition assessment will leverage the robust mobile tools proposed here to provide the City and the broader project team with the “ground truth” needed to effectively manage the overall smart lighting project.

Approach to Asset Condition Assessment Data Collection

The asset condition assessment will be completed on a ward-by-ward basis. The primary components include:

- 1) Importing the City’s existing ESRI geodatabase into the TWiG platform
- 2) Adjusting the customizable TWiG platform to match survey requirements defined by the City
- 3) Survey teams proceeding ward-by-ward, with security assigned where necessary
- 4) Exporting the collected data back into the existing ESRI geodatabase using TWiG upon completion of each ward
- 5) Real-time web-based monitoring of survey progress using the TWiG platform for continual access to the status of the effort available to the City and our project team



Overview of the TWiG approach to managing and delivering the data needed.

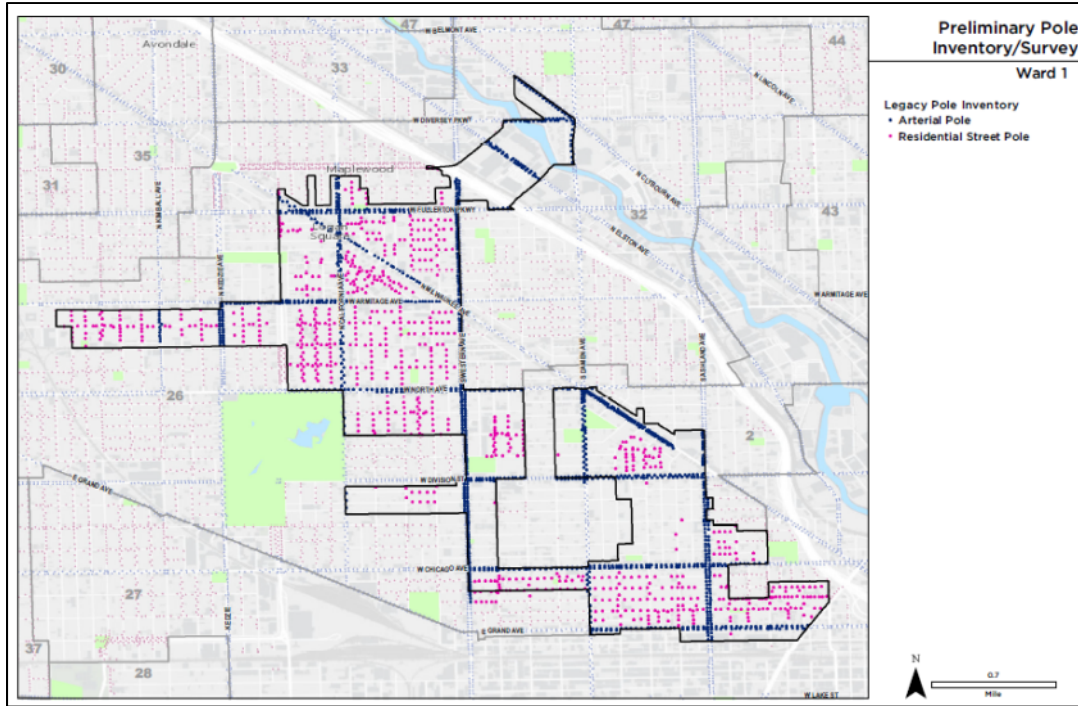
A Field Tested and Proven Approach

To understand the City’s needs to the highest level of detail, the ComEd team conducted and completed an initial condition assessment per the requirements defined by the RFP for a large sample of the City’s lighting infrastructure. In so doing, the ComEd team has already tested and proven its ability to efficiently conduct this effort, and has gained additional insight that can be applied to enhance execution for the Chicago Smart Lighting Project.

In October 2016, ComEd mobilized several field crews to perform this initial asset condition assessment. The effort was managed by ERM with ComEd field crews using the TWiG mobile platform, with technical oversight and support provided by Meade and AECOM. Within a week, **our teams completed a full condition assessment for 2500 existing legacy light poles across 25 City wards.**



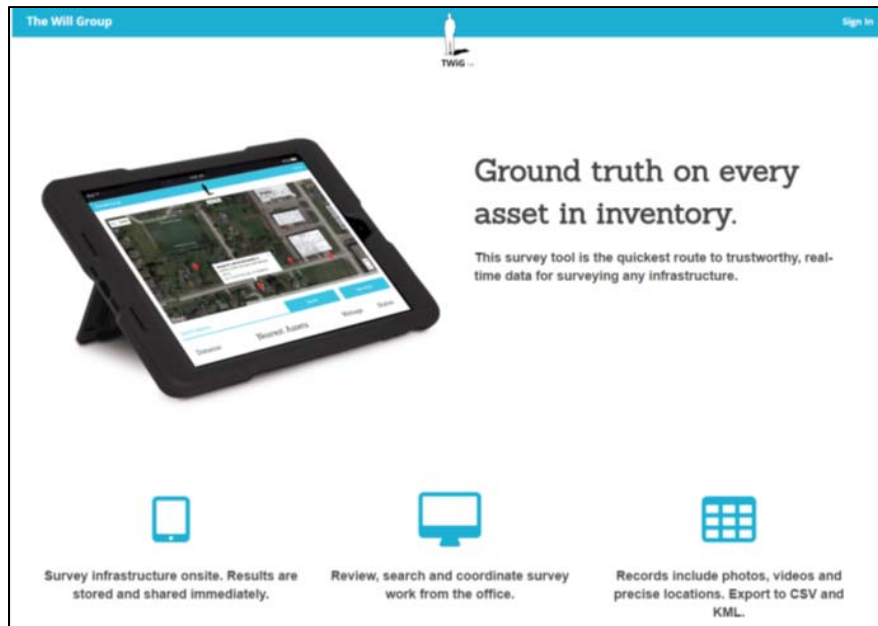
The survey effort began with the review of the City's ESRI Geodatabase by AECOM to select a representative sample of legacy pole candidates to survey. This subset of assets was then loaded into the TWiG mobile platform so that field staff could work from this base dataset, adding required attributed and verifying or correcting existing information as necessary.



Preliminary Pole Condition Survey Ward Map

Meade led the training effort to prepare field crews to identify deficiencies and assess conditions in a consistent manner. ERM made a concerted effort to streamline the assessment work and efficiency of field crews by tailoring the TWiG mobile platform directly to City assessment requirements.

The following screenshots were taken directly from the TWiG interface and demonstrate the process of entering data obtained from the field onto mobile devices.



TWiG login page

The Will Group michele.kadich@comed.com Projects Sign Out

TWIG

Choose Project

City of Chicago Asset Condition Assessment

29th Ward

31st Ward

35th Ward

37th Ward

13th Ward

17th Ward

18th Ward

6th Ward

8th Ward

The Will Group City of Chicago Asset Condition Assessment: 35th Ward michele.kadich@comed.com Projects Sign Out

TWIG

Search
New Asset

Asset	Pole ID	Status
2426 N Kimball Ave, Chicago, IL 60647, USA	101357	Complete Nov 9, 2016 2:25 pm

Pole inventory data pinpoints the specific poles needing to be surveyed for field crews

Edit Asset

Project: 35th Ward

Location

Address
3504 W Medill Ave, Chicago, IL 60647, USA Use Pin Location

* Latitude: 41.923775 * Longitude: -87.714179


Equipment

CBI_ID# 114612	Pole Material Composition Steel	Number of Mast Arms 1	Pole Height (ft) 20
Mast Arm Type Mount Mast	Mast Arm Material Steel mast	Mast Arm Length 12	Passes arm bracket visual inspection True
Pole Base Mount Type Anchor bolt	Pole Accessories No attachment	Hand hole cover inspection Pass	Wiring type Aerial temp
Number of wires Two wires			

Pole Condition

Pole leaning False	Pole corrosion 3	Pole anchor bolts Not Visible	Foundation condition Not visible
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Photos



Edit Photo Edit Photo Edit Photo

Status

Survey state
Complete

Notes

Temp Wiring Installed

You have unsaved changes. Cancel Save Changes

Data fields tailored to City needs, with the flexibility to add site photos to supplement data.



As a highly customizable platform, our clients have found many uses for TWiG. Some of these uses include;



Update existing, or create a new, GIS database.



Acquire necessary information for Infrastructure upgrades, in real-time, to create an automated bill of material.



Ensure accurate billing of inventory.



Visually assess condition of existing infrastructure at a precise location.



Guarantee complete documentation of maintenance and/or infrastructure upgrades including commissioning

A summary of the many abilities of the TWiG platform

TWiG Job Creation

ERM will not only meet the hiring requirements defined by the Chicago Smart Lighting RFP throughout the asset condition process, but expand upon those requirements as well. Our plan includes hiring:

- 3 individuals enrolled in or graduated from the Career & Technical Education program of a Chicago Public Schools high school
- 3 individuals enrolled in or graduated from a construction technology training program administered by the City Colleges of Chicago
- 3 individuals from the Ex-Offender Apprenticeship Program.

ERM is committed to exemplary hiring standards and will offer jobs above minimum wage with health benefits. **These local jobs will not be project specific for ERM, but will have long term potential with the ability to develop into a career.** Numerous surveyors of local hire are currently employed and serve as testimony to such commitment.



Implementation Schedule

With the TWiG platform already developed to City of Chicago requirements and the experience gained from conducting our preliminary condition assessment of legacy City light poles, our team is poised to meet the City's schedule of completing Year 1 assessments within 120 days of Work Order execution and the overall assessment within 300 days. We plan to complete the work within 40 total weeks, per the following schedule.

Lead: ERM Project Manager	Surveys Per Work Week	17 Week Total	40 Week Total
Existing ERM Survey Coordinator	750	12750	30000
Existing ERM Survey Manager	750	12750	30000
Existing ERM Surveyor (Meets 4.3.8.1)	465	7905	18600
Surveyor (Meets 4.3.8.1)	465	7905	18600
Surveyor (Meets 4.3.8.1)	465	7905	18600
Surveyor (Meets 4.3.8.1)	465	7905	18600
Existing ERM Survey Manager	750	12750	30000
Existing ERM Surveyor (Meets 4.3.8.1)	465	7905	18600
Surveyor (Meets 4.3.8.1)	465	7905	18600
Surveyor (Meets 4.3.8.1)	465	7905	18600
Surveyor (Meets 4.3.8.1)	465	7905	18600
Existing ERM Survey Manager (Meets 4.3.8.1)	750	12750	30000
Existing ERM Surveyor (Meets 4.3.8.1)	465	7905	18600
Surveyor (Meets 4.3.8.1)	465	7905	18600
Surveyor (Meets 4.3.8.1)	465	7905	18600
Surveyor (Meets 4.3.8.1)	465	7905	18600
Office Data Manager	0	0	0
Security	0	0	0
Total	8,115	137,955	343,200

Pricing Proposal and Cost-Saving Alternatives

Our estimated price to conduct the condition assessment survey, including training, labor, equipment, vehicle use, security, and TWiG platform customization while meeting hiring requirements defined by the City is provided in Form 6. As ComEd will be providing this service pursuant to a regulated tariff, these costs and the actual charging method for this service will be subject to ICC review and approval.

This cost involves zero learning curve as we have already applied our approach to City of Chicago lighting infrastructure. One significant cost savings we can offer is the use of data collected during our preliminary assessment of 2500 poles. If the City chooses to pursue this option approximately \$25,000 could be saved from this estimate.

Form 6: Infrastructure Stabilization Pricing Form

As ComEd will be providing this service pursuant to a regulated tariff, the costs provided in the attached Form 6 cannot be taken directly as an offer for outright sale of products or services by ComEd. These prices will be used to develop the monthly charges for the tariffed services, subject to ICC approval, and subject to adjustment as provided in ComEd's ICC approved tariffs and ICC rules.

ITEM #	DESCRIPTION	UNITS	UNIT COST
1	REMOVE & INSTALL RESIDENTIAL POLE WIRE WITH GROUND	EACH	\$ 480.12
2	REMOVE & INSTALL ARTERIAL POLE WIRE WITH GROUND	EACH	\$ 480.12
3	REMOVE & INSTALL CABLE, ALUMINUM, AERIAL, 3 1/C #8, WITH MESSENGER	PER FOOT	\$ 13.38
4	REMOVE & INSTALL ELECTRIC CABLE, AERIAL, 1/C # 6	PER FOOT	\$ 10.03
5	REMOVE & INSTALL ELECTRIC CABLE IN CONDUIT, TRIPLEX 2 1/C NO.6,1/C NO.8	PER FOOT	\$ 14.99
6	REMOVE RESIDENTIAL LEGACY POLE & MAST ARM, INSTALL RESIDENTIAL 20' POLE & 12' MAST ARM ALUMINUM,	EACH	\$ 3,674.07
7	REMOVE ARTERIAL LEGACY POLE & INSTALL ARTERIAL STEEL, ANCHOR BASE, 15" B.C., 34' 6"	EACH	\$ 6,968.08
8	REMOVE & INSTALL MAST ARM, STEEL, 8 FOOT	EACH	\$ 588.52
9	REMOVE & INSTALL MAST ARM, STEEL, 12 FOOT	EACH	\$ 588.52
10	REMOVE & INSTALL MAST ARM, STEEL, 15 FOOT	EACH	\$ 710.54
11	PLASTIC POLE DOORS	EACH	\$ 70.84
12	REMOVE & INSTALL ALLEY LUMINAIRE WIRE WITH IN-LINE FUSE	EACH	\$ 432.11
13	PAINT BOTTOM 5' OF EXISTING POLE TO INHIBIT RUST CORROSION	EACH	\$ 550.45
14	PAINT EXISTING 20' RESIDENTIAL POLE	EACH	\$ 857.34
15	PAINT EXISTING 30' ARTERIAL POLE	EACH	\$ 1,105.18
16	PAINT EXISTING 8' MAST ARM	EACH	\$ 452.06
17	PAINT EXISTING 12' OR 15' MAST ARM	EACH	\$ 508.27
18	VIADUCT / UNDERPASS CONDUIT REPLACEMENT"	PER FOOT	\$ 104.24
19	VIADUCT / UNDERPASS WIRING REPLACEMENT	PER FOOT	\$ 5.10

ITEM #	DESCRIPTION	TOTAL COST
1	COMPREHENSIVE ASSET CONDITION ASSESSMENT	\$ 2,261,106

04

Technology Proposal

SECTION IV – TECHNOLOGY PROPOSAL

Technology Solution Overview

Project Understanding

ComEd is pleased to offer the City a premier smart lighting service that leverages our recent smart grid investments and existing technological capabilities to bring additional value to the citizens of Chicago. We are proposing a comprehensive technology solution that exceeds the core requirements requested by the City, and does so in the most efficient manner possible.

Specifically, ComEd proposes to deploy a lighting management system utilizing the existing ComEd smart meter communications network, ComEd's preferred lighting control devices, and Silver Spring Networks' Streetlight.Vision LMS platform. With this solution, the City would be selecting an end-to-end system that is proven and capable of performing at scale. Key aspects of this proposal are:

Network

- The City will be leveraging ComEd's existing Chicago-wide Advanced Metering Infrastructure (AMI) communications network as the backbone for the smart lighting system, extracting additional value from existing systems to significantly reduce project cost and risk to deliver this project successfully. The network is operational and reliable today, and business processes are already in place and efficient. The City will have connectivity anywhere in the City on day one (pervasive connectivity), giving more flexibility in how to deploy the light fixtures.
- ComEd's fully managed solution ensures consistent network performance for the City without the need to establish and maintain a separate, dedicated network support team. ComEd will continue to own and operate this existing network on behalf of the City, and will manage the solution with our team of local ComEd solution experts, backed by two 7x24 Network Operations Centers with redundant secure datacenters. We understand what it takes to operate and maintain such a network and believe the City would benefit appreciably from this synergy.
- This 4th generation Smart Grid-based technology has been tested and proven with over 25 million devices in service. Unlike other network options, this technology has the capability to provide light/power "last-gasp" communication. This capability allows operators to more efficiently distinguish power issues from communications, fixture, and control issues so that the right crew can be mobilized first, reducing maintenance cost and improving up-time and safety.
- Note: ComEd's communication network will not support backhaul for very high bandwidth applications such as video streaming. Also certain limitations may be temporarily imposed during storm restoration efforts or during planned network maintenance events.

Central Lighting Management System

- ComEd will be offering Streetlight.Vision, the only LMS platform that has been proven at the scale required by Chicago. Examples around the world include Paris, Florida Power & Light's 500,000 streetlight deployment, and Copenhagen's city-wide network. With this extensive and growing track record, this LMS is poised to be the system of choice for large-scale Smart City implementations.
- Through the straightforward thin-client model, Streetlight.Vision LMS can be accessed through a secure HTTPS browser, either in the office or by using a mobile device.

Controllers and Sensors

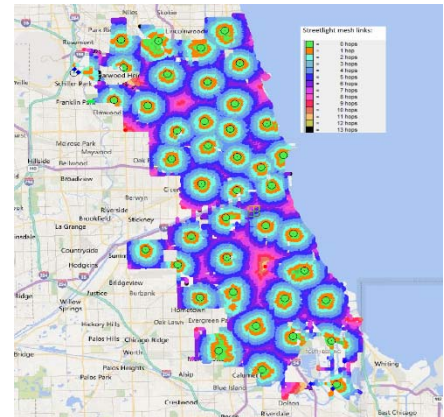
- SELC controllers with embedded communications modules are being proposed as ComEd's preferred smart lighting control devices given their proven reliability, adaptability, and value.

- Our engineers agree that these devices have been designed with unique critical-to-quality features that effectively account for the long-term impacts of LED switching.
- Given that these devices are designed for long service lives, we affirm that we would continue to deliver technological advancements through our team's integrated firmware development, testing, and deployment lifecycle, allowing for updates to be pushed over the air to the Chicago lighting inventory for years to come.
- ComEd offers a hybrid solution to monitor and control lights. We believe this best fulfills the objective of minimizing total cost of ownership by reducing hardware and installation cost while ensuring sufficient monitoring capability to realize maintenance efficiencies. Specifically, pole level control will be utilized at pole locations where Residential Coach or Arterial Acorns fixtures are "piggy backed" to a main, "cobra head" style street light fixture. For pole locations with more than one "cobra head" style fixture, each "cobra head" style fixture will be monitored and controlled individually to provide for more granular dimming/scheduling and more precise maintenance intelligence. For Viaduct/Underpass Light fixtures, individual control will be utilized.
- Should the City ultimately desire to utilize the control nodes installed through this smart lighting project as electricity metering points, ComEd would be best suited to ensure that the ICC requirements for performing this function will be met. By selecting ComEd to deliver this project, the City would be able to seamlessly transition to such a rate in the future.

Through this high-value, low-cost, and low-risk solution, Chicago will realize its project goals of improving public safety through lighting, providing more reliable and responsive streetlight service, and establishing a platform with the flexibility to grow as the City's needs change. To respond specifically to the City's goals as outlined in Section 2 of Exhibit B, relevant capabilities of the ComEd LMS are highlighted below.

Remote Monitoring and Control of Lighting

- The LMS is powered by ComEd's IPv6 based, 900Mhz mesh communication network based on the Wi-Sun standards alliance. This network technology has been proven in many major cities in the United States including Chicago, Washington DC, Miami, San Francisco and New York City.
- Unlike tower-based systems that have difficulty reaching around buildings, this meshing technology has been perfected over the past decade to provide unparalleled connectivity for critical infrastructure assets in dense urban environments.
- The SELC photo control allows for on/off/dim through a programmed schedule or an onboard photo sensor.
- Each node can issue an alert when it detects a luminaire issue, such as a dayburner, power quality issue, or device failure. Each device is able to issue an alert on pole power failure because of the inclusion of on-board super-capacitors that provide "last gasp" communication in the absence of power.
- Each smart streetlight controller is configured for +/- 2% accuracy for energy monitoring by default, and can be further calibrated to 0.5% as an optional feature. Data can be captured on a specified interval (e.g. 15 minutes, 30 minutes, one hour, etc.) for attributes such as power, energy, voltage, current, power factor, lumens, and temperature.



Secure Timely Data Transmission

- Aligned with ComEd's focus with security and reliability, Silver Spring has engineered a solution to adhere to the rigorous requirements of NIST 7628 Smart Grid Cybersecurity. This includes end-to-end encryption with AES-256 bit keying, Public/Private PKI keys with the private key on the node stored in a dedicated hardware security module on the Silver Spring 4th generation System on Chip (SOC).

- In addition, ComEd employs 3rd party security penetration testing firms to consistently test and verify the integrity of the system.

Lighting Asset Inventory

- The Streetlight.Vision (SLV6) LMS provides full asset management tracking; tracking items in the communications, luminaire and electrical systems. Lights can be uniquely identified with a naming convention and the system tracks all aspects of the asset including commissioning and warranty information. The lighting assets can be assigned to groups (i.e. geozones) that are hierarchical to aid in efficient management of such a large inventory.

Mobile Device Application

- The SLV6 application has been optimized for mobile use allowing field staff to stay connected on the go.
- Note that ComEd will be utilizing The Will Group's mobile application, TWiG, to ensure all data collected during the initial condition assessment is accurate. This lays the foundation for provisioning of accurate information into the LMS for each endpoint device.

3-1-1 & 9-1-1 (future) System Integrations

- ComEd will partner with Accenture, a proven leader in IT services and smart city applications, for any system integrations needed.
- We recommend a phased implementation approach beginning with requirements gathering/confirmation and agreement on system design and costs.

Additional Sensors and Devices

- ComEd is working with its technology partners to identify opportunities to deploy smart city sensors and devices in a financially viable manner. While the GE LED fixtures proposed offer significant energy and maintenance savings, they are also designed to be field upgradable (future proof) with electrical and mechanical interfaces. This allows the coupling of incremental sensors and communications equipment in an aesthetically pleasing solution to help the city meet its needs today and in the future.

Adaptive Lighting

- ComEd is committed to staying abreast of industry best practices and innovative technologies. While opportunities for adaptive lighting may be limited from a purely economic standpoint, we stand ready to support the City in developing, testing, and deploying adaptive control strategies as this area of research develops.

Functional, Logical and Technical Requirements

ComEd has reviewed the detailed functional, logical, and technical requirements outlined in Form 7, and has populated the Form 7 Excel template as requested to define the capabilities of the ComEd proposed solution. We are pleased to report that our solution meets the CIT's core requirements, and a vast majority of all requirements, "out of the box". The narrative that follows in this subsection highlights the capabilities of our solution with respect to the three major categories of requirements: Lighting Management System, Network, and Controllers and Sensors.

1. Lighting Management System

The initial version of this LMS would be Streetlight.Vision 6 (SLV6). Features include asset inventory, advanced alarming, reporting, data analytics, scheduling and real time control, among others.

Other highlights of the SLV6 software:

- SLV is the only open TALQ-ready LMS on the Streetlight Control Market: it controls and monitors more than 60 different models of devices from 40 different vendors, making it an open platform to



allow customers to connect and manage a wider range of products and technologies.

- SLV is the product of 10 years of expertise in developing Streetlight Control and Monitoring software and supporting projects world-wide.
- Currently, 500 projects in 15 countries including Oslo, Dublin, Miami, Paris, Lyon, Barcelona, Jakarta, Guangzhou, Dongguan, and Sydney use this technology.
- Hundreds of features to configure, control, monitor, operate, update and manage your entire streetlight network, developed with cities during the last 10 years.
- The de-facto standard Central Management Software on the Smart Streetlight market.

The table below describes key features of SLV6:

Feature	Specifications
Web Application Server	<ul style="list-style-type: none"> • Based on TOMCAT web services • MySQL database engine • Automatic data retention mechanism, differentiated for each attribute, to enable longer retention of energy, lamp running hours and other long term data • Database hot backup processes • Nagios server real time monitoring processes • Java Enterprise based add-on modules
Open software platform	<ul style="list-style-type: none"> • Supports 20 control technologies, 60 models of devices from 40 different vendors • Integration can be completed through web services commands
Web user interface	<ul style="list-style-type: none"> • No thick-clients required • iPhone, iPad, Android, Windows mobile user-interfaces based on HTML5 and access through a secured VPN
Automatic data collect	<ul style="list-style-type: none"> • Synchronous or asynchronous data collect mechanism scalable to 500,000 devices. • Automatic data aggregation for energy and lamp burning hours • Many dynamic attributes can be collected for each light point including light level, power, voltage, current, power factor, ambient light, lamp running hours, energy, lamp failure, ballast failure, high/low power, high/low voltage, low power factor, high temperature, etc.
Asset Management/ Inventory	<ul style="list-style-type: none"> • Equipment Inventory to position, create, move, delete and operate various types of devices/objects with flexible lists of attributes • Supports Light Point Controllers, Streetlight Segment Controllers, Electrical Vehicle Charging Stations, Environmental Sensors, Parking Place, Waste Containers and more • Export/import of inventory, reports, data • Multiple online mapping systems (WMS) including Google, Bing, Nokia and ESRI Geographical Information Servers with either map/satellite or hybrid with full zooming. • Exports for viewing in Google Earth
System configuration and commissioning	<ul style="list-style-type: none"> • Light point controller commissioning • Segment control commissioning • Scheduler and calendar commissioning; time-based, sensor based or both • No soft-limits to the number of schedule events with unlimited ability to assign schedules to lights on a daily, weekly, monthly or one-time occurrence. • Constant Light Output (CLO) and Maintenance factor • Over-the-air firmware/software updates
User management and	<ul style="list-style-type: none"> • User and user profile management and roll-based/access rights

security:	<p>management to limit access to relevant WebApps, groups of devices and geographies</p> <ul style="list-style-type: none"> • Customizable web desktop per user profile • “Look&Feel” and dictionary per user profile • Supports 16 languages including right-to-left languages • User login screen with customized timeout
Control, Command and Monitoring	<ul style="list-style-type: none"> • Individual and group light point real time control, command and monitoring • Scheduling and programming group command • Stepless dimming schedulers and exception days in calendars • User-friendly configuration of the ON/OFF/DIM programs and calendars for cabinet switching and groups of light points • Control center feature to monitor all sites in a loop on large screens in control rooms
Alarm Management	<ul style="list-style-type: none"> • Real-time alerts • Collect any types of failure and events detected by Light Point Controllers and other types of devices • Complex alarm types configurable by end-user, including geographical analysis, cabinet alarms, non-communication alarms (e.g. wire theft detection) • Data analytics to trigger alarm conditions • Alarm viewer with alarm priority
Failure analysis	<ul style="list-style-type: none"> • Failure report triggered by end-user or scheduled to be automatically sent by email • Failure analysis on map • Analysis of data history of any metered value, including power, current, voltage, power factor, temperature, ambient light, lamp level, command level, etc. • Export any historical data and reports
Energy analysis	<ul style="list-style-type: none"> • Energy report triggered by the end-user or scheduled to be automatically sent by email • Energy saving estimation per geographical zone • CO2 equivalent savings estimation per geographical zone
Lamp age analysis	<ul style="list-style-type: none"> • Analyze lamp age and identify “old” lamps to replace them before they actually fail • Track LED luminaire warranty based on failures
Reporting	<ul style="list-style-type: none"> • Custom and pre-defined reports scheduled to be sent to the right user at the right time (e.g. day-burners, loss of communication, out lights) • Save and rerun queries • Reports based on specified groups of lights sent to email/FTP on specified interval.

Extended Support for Smart City Devices

SLV6 now supports an expanded range of smart city devices, such as electrical vehicle charging stations, environmental sensors, information panels and more. SLV6 also supports many protocols – including the new Open Smart City Protocol – to enable manufacturers of smart city devices to connect, control, monitor and command them through this new version of the SLV software and provide them to existing SLV customers. As ComEd and our technology partners continue to develop new and innovative technology applications, we see SLV emerging as a powerful and flexible platform for management of smart city devices.

For greater detail surrounding the specific capabilities of the SLV6 software, please refer to Form 7.

2. The ComEd AMI Network

ComEd proposes use of its existing advanced metering infrastructure (AMI) communications network to support core smart streetlight communications. This provides the City of Chicago with a network solution that is already in place and proven throughout Chicago. As such, ComEd has already established the maintenance and support systems, processes, and the organization needed to ensure the City's requirements are met, which allows the City to benefit from ComEd's experience while avoiding the risk and costs associated with building those capabilities from scratch. Further, where building a stand-alone network solely for streetlight and smart City sensor applications would require dedicated systems and staff, the proposed shared-network approach better utilizes existing resources bringing cost efficiencies to the project.

The ComEd AMI network is built using Silver Spring's open-standard (IPv6), flexible, scalable, and secure technology. It utilizes a mesh communications architecture where endpoints on the network relay messages through to Access Points for backhaul. The Communication Modules integrated into each of the endpoints, such as smart streetlight controllers and smart meters, enable this networking capability. The standards-based IEEE 802.15.4g radio on these communication modules operate on the unlicensed 900 MHz band using Frequency Hopping Spread Spectrum (FHSS) technology. The Access Points (APs) and Relays also utilize the FHSS technology to relay data from endpoints to the back office.

When an LMS operator sends a command, communications flow from the lighting management system hosted in Silver Spring's data centers through cellular backhaul APs over the sub-gigahertz NAN network to the endpoints. In this manner, the LMS has a direct IPv6 conversation with the endpoints with the APs providing an IPv6 routing function in addition to providing a WAN to NAN interface.

The architecture of the ComEd AMI network ensures uniform operation across disparate deployment environments, from dense urban environments to more sparse areas. The radios that make up this network can reach devices over relatively long distances, potentially up to several miles away, and innovative software techniques are used to ensure highly reliable operation in dense deployments.

A mesh communications architecture is fundamental to a smart city solution that must scale to support many devices, each with modest bandwidth requirements (only a few kilobytes of data per day) but with a wide range of latency requirements. For example, this peer-to-peer design accommodates a mix of paths, with varying latency characteristics, which is a very economical approach. However, a meshed architecture is much more robust operationally and can accommodate the inevitable changes that will occur during the long life of a smart city deployment.

In contrast, deploying a point-to-point network across an entire city would present an extremely challenging initial design as well as burden the city with constant redesign and adjustments to address ongoing environmental changes such as foliage growth, new construction, or billboard construction. ComEd's mesh network automatically adapts and routes around these kinds of obstacles with support for cellular communications as needed. Further, ComEd's network operators actively monitor and manage network performance to ensure continued reliability.

Below is a recap of the benefits of leveraging ComEd's AMI network:

- Each Communication Module (streetlight control node, meter, etc.) added to the AMI strengthens the resiliency of the overall network
- ComEd's network management tools continuously optimize network performance
- ComEd's network was built with expansion capability for continued growth
- As a key component of ComEd's business, this network will receive continued investment
- ComEd's operations team has established policies, procedures, and staff to ensure optimum network reliability at a lower cost than building a new network.

Note: ComEd's communication network will not support backhaul for very high bandwidth applications such as video streaming. Also certain limitations may be temporarily imposed during storm restoration efforts or during planned network maintenance events.

3. Controllers and Sensors

The smart streetlight controller (Control Node or Node) makes a typical streetlight luminaire “smart.” At a high level, this is similar to a standard photo control device, except that it has more advanced processing capabilities and includes an integrated communications module. ComEd proposes to utilize SELC control nodes with embedded, GPS enabled, Silver Spring communications modules.

The control node switches the luminaire to an ON, OFF, or dimmed state (stepless dimming) through a DALI interface to the LED driver. On the monitoring side, the node identifies lamp and electrical issues by constantly measuring and regularly sending lamp level (%), lamp command (%), cumulated energy consumption (kWh), active power (W), mains voltage (V), mains current (mA), power factor and temperature through the AMI Network. Each node can be programmed to operate on a locally stored schedule based on fixed time commands, commands relative to an astronomical clock, or via the photo sensor. Failover mechanisms are embedded to avoid “day burners”.

Unlike many smart streetlight control products, the ComEd proposed node can provide “last gasp” communication upon loss of power. Other error types such as lamp or fixture failure can also be flagged as events and sent to the LMS on demand or as a part of the system-wide read of device data.

Key features of the ComEd proposed Control Node:

Solution Components	Silver Spring Networks
SELC / Silver Spring Streetlight Controllers	<p>Integrated smart photocell with LED Luminaires using a 5 or 7-pin ANSI C136.41 Socket</p> <ul style="list-style-type: none"> • Wi-Sun compliant mesh radio based on IEEE 802.15.4g, 1 Watt broadcast power, 900MHz frequency-hop spread spectrum • Smart-Grid caliber security (end-to-end AES-256, X.509 certificates, secure bootloader) • Last Gasp Communication • luminaire event notification • Full energy and luminaire metric tracking (Power, Energy, Volt, Current, Power Factor) with 2% or better accuracy at configurable intervals • Other metrics – Burn Hours, Temperature, Lux Level. • Fully-weatherized units: IP-67 enclosure, -40C to 70C, • Built to long-life photo control standards (ANSI 136.10) • Power: 120-277v • Dimming through DALI driver through ANSI 136.41 socket • Integrated GPS • On/Off/Dim through on-board photocell or astroclock • Warranty: 1,5,10 year available. • Schedule based on on-board sensor, time or both • Time-stamped Event logs • Autonomous behavior (i.e. smart controllers will operate and collect/retain data even if network is disconnected)

While ComEd can accommodate other control node vendors’ technologies, we have selected SELC devices through a rigorous evaluation of available smart lighting control devices. This evaluation included documentation reviews, lab tests, and field trials. Considerations regarding cost, product quality/reliability, technical support, supplier diversity, and vendor technology roadmap were carefully considered. One of the distinguishing factors driving the decision to propose SELC devices was that these devices have been designed with unique critical-to-quality features which account for the long term impacts of LED switching more effectively than the competition. For example, these devices include both a solid state and mechanical switching device in order to manage the

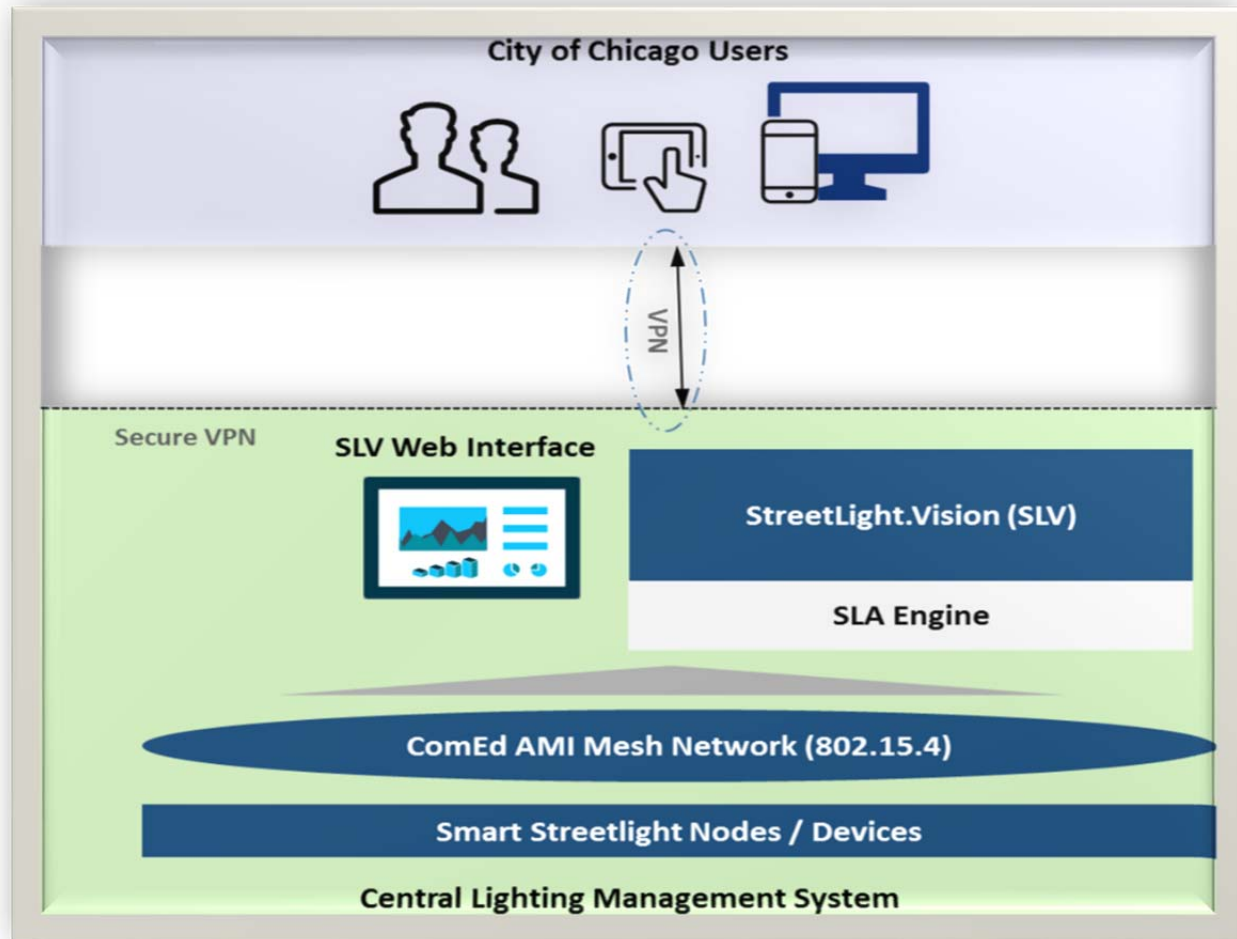
high in-rush current of LED switching while reducing heat buildup which would otherwise lead to premature failure.

Given that these devices are designed for long service lives our ability to continue to deliver technological advancements through our team's integrated firmware development, testing, and deployment lifecycle is critical to the success of the project. At the beginning of this lifecycle, the ComEd team works closely with our technology partners to identify opportunities for new or enhanced features, which feeds into product firmware roadmaps. As new product features become available, we test them in order to qualify them for deployment in the production environment. We also manage the deployment of new firmware in a phase manner to ensure successful implementation. This process will allow for updates to be pushed over the air to the Chicago lighting inventory for years to come.

As mentioned earlier, ComEd offers a hybrid solution to control each light fixture to realize the maximum control of efficiency and fixture granularity. A pole level control will be utilized at pole locations where Residential Coach and Arterial Acorns fixtures are piggy backed with the main street light fixtures. For Viaduct/Underpass Light fixtures, individual control will be utilized.

System Architecture

The following diagram depicts the proposed architecture of the lighting management system.



Integrations & Interfaces

Overview

ComEd will partner with Accenture for any system integrations needed. System integrations will be further discussed upon award. ComEd and Accenture envision a phased implementation approach beginning with project planning, requirements gathering, and design activities. The result of this initial work will be a detailed implementation plan, including cost, which will be reviewed and approved by the City.

Reporting & Analytics

SLV6 provides several functions for reporting and alerting, including:

- The Report Manager WebApp provides a robust and expanding list of pre-defined reports that allow for periodic reporting on various aspects of systems performance (e.g. electrical, failure, energy reporting). Reports can be defined against a set of lights of interest, a given timeframe or periodicity, and recipient

distribution information (e.g. email). Certain reports also have configurable parameters relevant to the report.

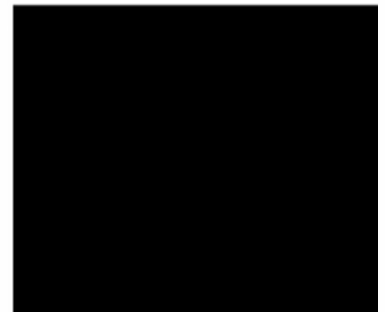
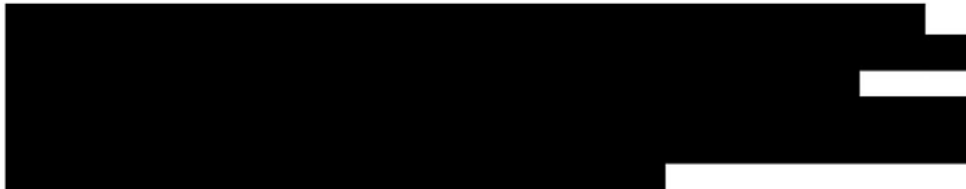
- The Data History function allows for collection of any of the recorded data (e.g. energy) on a particular luminaire on a configurable interval. The data can be filtered, viewed graphically or exported to a CSV.

Additional Functionality

The core ComEd network platform used for lighting control provides a city-wide extensible RF network IP (Internet Protocol) “dial-tone” that can support additional Project Objectives. ComEd will be an active partner with the City to bring in other smart-city applications to the network.

Research and Development:

- We have also partnered closely with the Illinois Institute of Technology (IIT) on our CSMART project to develop new applications leveraging this networking technology. These student-led projects include a smartphone security application for location aware streetlight flashing for personal emergencies, Electric Vehicle charger integration, network-coupled pedestrian counters for retail and advertising data.
- In partnership with ComEd, Silver Spring launched A Smart Energy Future (<http://www.asmartenergyfuture.com/>), a free curriculum for educators to teach students about smart energy, smart cities, and career opportunities in green fields.



CIVIQ Citizen Mobility Experience

ComEd and CIVIQ SmartScapes are working together to offer the City the CIVIQ Mobility Experience (CME), which will engage with the citizens of Chicago, provide new smart city services, and enhance the smart lighting offering.

The CIVIQ solution connects everyone to the Smart City through “Waypoints”, which are life-size interactive digital displays placed strategically throughout the City. By connecting devices, people, and services, this solution responds to city issues and allows for a new experience across services / agencies.

While the capabilities of the Waypoints can be customized based on City preferences, common features include high speed Wi-Fi service for citizens, the ability to push content, alerts, and City announcements to the displays (safety, transportation, etc.), way-finding support with maps and search capability, the ability to access 311 and 911 services, and USB



charging, to name a few. This platform would need to be supported by an alternative high bandwidth network communication system.

The ability to push revenue-generating content to the Waypoints provides a funding opportunity for this technology venture.

Third Party Products

As this is a ComEd hosted solution. There are no additional hardware devices required.

The integration of SLV6 may require an adaption or integration layer between SLV6 and the 3-1-1/9-1-1 system. Specifications for which will be proposed after scoping of detailed requirements with the City.

Hosting & Environments

Software-as-Service Overview

ComEd is proposing a Software-as-a-Service hosting solution utilizing the Silver Spring utility-grade hosting facilities for the deployment. In a Software-as-a-Service deployment model, Silver Spring builds, owns, and manages the back office application at a Silver Spring secure datacenter. The SaaS solution provides a secure web interface allowing access to Streetlight.Vision (SL.V).

By leveraging existing infrastructure at the Silver Spring datacenters, client environments can come online rapidly, significantly reducing one of the largest operational risks in any smart cities deployment. Security is assured through Silver Spring's operation and maintenance best practices and SSAE SOC 1 Type II, N+1 redundant data centers. A shared infrastructure (routers, storage, database, servers, backups, etc.) allows the City to avoid additional costs and delays associated with acquiring dedicated hardware without sacrificing data integrity and security. All SaaS environments are managed and monitored by the team's 24x7 operations center. We also offer intrusion detection services and regular third-party penetration testing services.

Silver Spring Hosting and Datacenter Security

With the SaaS model, security is assured through Silver Spring's operation and maintenance best practices and SSAE 16 SOC 1 Type II certified datacenter. Silver Spring internal security controls are based on security industry best practices derived from ISO 27002. These controls include physical and environmental security, operational security, security of third parties, system security, virus and malicious code protection, network security management, media handling, backups, monitoring, access control, vulnerability and patch management, and incident management.

An intrusion detection system monitors network traffic for suspicious activity. Servers and networks are continuously monitored by Silver Spring's NOC 24x7x365 for performance issues and any unusual activities that would be indicative of a security issue. Logs are maintained for audit purposes. Suspicious activities are reported to Silver Spring InfoSEC (Information Security), who investigate and determine if a security incident has occurred. If the suspicious activity has been identified as an incident, INFOSEC will follow a documented security incident response procedure to investigate, handle, and remediate the incident.

Dedicated application servers are used to access customer data that is maintained in separate and secured database tables on shared database servers, leveraging shared network infrastructure at the Silver Spring datacenter. Access to the customer in the Silver Spring AMI applications environment is via secure LAN-to-LAN (L2L), Business-to-Business (B2B) Virtual Private Network (VPN) using IPsec technology. Access to the application is implemented by employing SSL encryption for session privacy for the Silver Spring AMI applications' web based user interface.

Datacenter Security - Silver Spring's datacentre is located in a region free from most known natural disasters. The datacenter has SSAE 16 SOC 1 Type II audits to ensure protections against physical and cyber threats. Additionally, Silver Spring maintains a business continuity plan (BCP).

Facility Security and Integrity - The facility is monitored by closed circuit television (CCTV) surveillance cameras located at facility entrances. Physical access to the building and specific areas within the building is controlled, restricted, and monitored by a central proximity card access and biometric hand scan system.

Datacenter Access - The datacenter is designed as a secure location to protect the hardware for the infrastructure. There is no direct outside entry into the datacenters. The datacenter is located within a restricted area. Physical intrusion detection systems or alarms are in place to detect break-ins. Physical security and access controls address system hardware, wiring used to connect elements of the system, supporting services such as electrical power or telecommunications areas, backup media, and any other elements required for the system's operations.

Network Security - Logical access to any third-party networks is restricted by physical demarcation. All third-party network access requires a physical cross-connect between the customer cage and the facility's "network Point of Presence". No other third-party data networks are accessible from the customer cage.

Environmental Controls - The datacentres are equipped with the following environmental protection equipment:

- Power generators and UPS to provide power to critical servers and infrastructure devices
- Redundant heating ventilation and air conditioning (HVAC) systems to maintain temperatures and humidity within manufacturers' specifications
- Heat and smoke detection and fire suppression systems to provide for notification of fire conditions

Backup & Recovery

Overview

Silver Spring has established formal policies and procedures to ensure that all key processes within the company have the requisite internal controls in place including a business continuity plan, geographically diverse data centers, and key support resources.

Hardware failure is typically covered by redundant data center infrastructure deployed to help support either full, in-rack redundancy of networking and server gear, or tools for fast recovery (DataGuard, VMware etc.)

The primary Silver Spring data center is hosted in Las Vegas NV. The secondary data center hosting site is in San Diego CA.

Capabilities

To meet RTO and RPO requirements Silver Spring offers a High Availability (HA) solution for the Silver Spring platform that is achieved using a number of replication, virtualization and business continuity tools. Because the system stores data at multiple points (in photocells, at the head end, etc.), the network as a whole is designed to be resilient to individual component failure.

The server component is designed and deployed in an "Active-Passive" configuration with a warm spare server immediately available for manual failover. The database component is designed and deployed in an "Active-Passive" configuration using Oracle DataGuard for local and remote data replication and a manual failover process to activate the backup database server.

Silver Spring's applications are designed to achieve very high levels of availability using optimal configuration, operation and monitoring of the systems and applications that are performed according to our internal best practices.

Security & Accessibility

Security Overview

Through the safeguards put in place by Exelon IT security and our technology partners, the City can be assured that the smart streetlight system will be well protected.

From the start, Silver Spring recognized that networks such as smart grid and smart city applications might be the target of malicious activity and understood the vulnerabilities presented by interconnecting millions of remote devices that have an operational life of 15 to 20 years. Consequently, the company has taken an architectural approach to security and embedded it throughout the hardware, software, and transactions running on its Platform. In addition, Silver Spring leverages standard IP-based security technologies, which have been developed collectively by the best security minds across the globe, proven to be highly scalable, and hardened over decades of worldwide use against a broad range of attacks.

Silver Spring employs the strictest security standards throughout the proposed Streetlight solution, including ISO 27001/2 and NIST 800-53. Thanks to security mechanisms such as authentication, authorization, and encryption, Silver Spring endpoints and supporting infrastructure are capable of detecting and alerting the network management system of attempts at unauthorized actions as well as preventing security breaches.

The architecture of the Silver Spring security system permits each component within the system to securely and uniquely identify itself to every other relevant component of the system using a cryptographic certificate hierarchy. The identity of an entity not only includes MAC addresses, but also the role the entity plays within the system (e.g., meter, Access Point, Repeater, etc.) and who assigned them the role (e.g., manufacturer, operator/utility, field services unit). No communication within the system can occur without identity confirmations; any node can refuse to communicate with any other entity. Trust is established in stages, and authorization policies are changed to allow increasing participation in the network as a device is placed into higher trust.

The Silver Spring system uses keyed-HMAC for mutual authentication between any two entities in the system - not only at the application layer but also at other layers (e.g., routing in data link layer). The common cryptographic suite for the Silver Spring system is as follows:

- Elliptic Curve Digital Signature Algorithm (ECDSA) over the NIST P-256 curve
- Advanced Encryption Standard (AES), either 128 or 256 bits
- Secure Hash Algorithm (SHA) – SHA256 variation
- Diffie-Hellman (DH) Key Agreement and Elliptic Curve Diffie-Hellman (ECDH)
- Rivest-Shamir-Adelman (RSA) Public Key Cryptography Standard (PKCS) #1 – 2048 bit signatures
- True Random Number Generator (RNG) based on a noise or entropy source, can be combined with a Pseudo-Random Number Generator (PRNG) where the RNG seeds the PRNG

Silver Spring solutions employ Internet Protocol (IP)-based security protocols over the wide area network (WAN) to ensure data integrity and measure against any number of potential security issues in managing an Advanced Metering Infrastructure (AMI) network. These include deploying IP Security (IPsec) in transport mode between the back-office (Silver Spring applications) and the Access Point (AP)/MicroAP across the WAN. The payload of the IP packet is authenticated and encrypted in the current transport mode. The authentication algorithm used is Hash-based Message Authentication Code-Secure Hash Algorithm (HMAC-SHA1) for integrity protection and the AES Cipher Algorithm in Cipher Block Chaining (CBC) Mode with 128 bit key size for encryption (AES CBC-128).

The Silver Spring solution specifically conforms to Federal Information Processing Standard (FIPS) 186-2 (for digital signatures), FIPS 197 (for encryption), FIPS 140-2 Security Level 2 and 3 (for specific hardware security modules), and FIPS PUB 198 (for cryptographic hash functions).

The back-office has standard firewalls and security compartments, and three-tier architecture with:

- Highly restricted port connectivity (access methods) between tiers
- Encrypted channels between tiers
- Encrypted channel, authentication/authorization for both UI (SSL) and programmatic APIs

- Support for customer password rotation/aging policies
- MD5 hash* of passwords at rest in database, data encrypted when archived

The connection between the Silver Spring SLV application and any back-office server (e.g., database) is a Transport Layer Security (TLS) or Secure Socket Layer (SSL) connection. Both ends of the connection may be authenticated – e.g., both server and clients present a digital certificate. It is recommended that the key pair used at each end to establish the TLS connection be stored in a Hardware Security Module (HSM) local to the device. This prevents insider attacks where passwords are shared. Only connections attempted with the correct client certificates will be permitted. TLS provides confidentiality, authentication and integrity protection of the connection.

Silver Spring interfaces include a WSDL API (Web Services Definition Language), a JMS (Java Message Service) API, both are available and commonly leveraged by both System Integrators and utility customers. The same web services used by Silver Spring AMI applications' User Interface are exposed to enterprise back-office systems.

Logging & Audit Trails

Logging and audit trails are maintained to provide accountability for specific activities on Silver Spring hosted systems and applications. Silver Spring integrates multiple data sources such as system logs, firewall and router logs, anti-virus, vulnerability management, VPN user activities, security events generated from NIDS and next generation threat prevention systems into a Security Information and Event Management (SIEM) platform. The SIEM platform provides real-time event monitoring and cross-correlation to detect and alert on critical offenses and security incidents. Further, Silver Spring leverages an outside managed SOC providing 24 x 7 security monitoring and response services.

Secure Access

The SLV system provides the functionality for ComEd to create roles for the City of Chicago and assign privileges according to the business process policies. Application components require the proper roles and policies, enforced via digital certificates (X.509 format), to be presented to the controller to allow them to run specific operations (e.g. configure, disconnect, firmware upgrade, reads, etc.) Only the highest privilege is allowed to change policy mappings on the system. The system also enforces a role-based access for users with privileges being granted to only the appropriate user role.

Security Testing

Silver Spring goes beyond the industry-leading “secure by design” technologies and employs a “trust, but verify” security policy. We request independent third-party companies to perform a rigorous set of penetration testing each year. Over the last five years, Silver Spring and our customers have leveraged the cyber-security expertise of companies including Accuvant, Inguardians, Core Security, Harris, and Lofty Perch to perform these tests.

The security assessment tests cover a wide spectrum of Silver Spring products, including, but not limited to, the following hardware and software: SilverLink Applications (Streetlight Vision, Advanced Metering Manager, Firmware Upgrader, Meter Program Configurator, Demand Response Manager, Network Center, and Outage Detection System); other software such as CustomerIQ, the JMS message bus, CAAS, and the DR installer portal; SilverLinkOS firmware on Communications Modules, Access Points, Relays, Bridges, and Field Service Units (FSU); and Critical Operations Protector and KeySafe.

The vulnerability testing includes:

- **Network and application penetration testing** – utilize common testing and attack methodologies to detect known vulnerabilities and attack vectors. Typical methodologies tested include denial of service, authentication/authorization deficiencies, buffer overflows, key management, injection/man-in-the-middle attacks, web services and XML content attacks.
- **Binary and source code analysis for firmware** – Review more than one million lines of source code in the Silver Spring SilverLinkOS firmware to identify any dangerous function calls, application logic flaws, and authentication bypass vectors.
- **Hardware analysis and tampering attacks** – Validate hardware tamper-resistance, including access to all serial ports, I/O pins and JTAG test interfaces and the ability to extract firmware.

- **Communication protocol analysis** – Enumerate communication process and integrity of hardware messages and client-server communications, certificate management and trust relationships.

Performed at least once a year, and taking three to four months to complete, the rigorous process involves four key phases:

1. **Testing** – Silver Spring and ComEd finalize the suite of products that will be tested and agree on a test plan. Then the third-party test team performs the testing in a lab environment that includes all the necessary hardware, software, and test systems.
2. **Review/Validation** – Once the test team completes the testing, it generates a report containing the results and findings and reviews it with Silver Spring to validate the findings.
3. **Remediation/Tracking** – Should any vulnerability emerge, the Silver Spring InfoSEC team works with the appropriate product management and engineering resources to submit/track prioritized defects for remediation in future product releases.
4. **Confirmation** – the Silver Spring engineering and QA teams perform testing to validate any resulting defect resolution.

In addition to the annual product testing described above, which benefits all our customers, Silver Spring also performs rigorous testing of the back-office infrastructure – including servers, operating system/RHEL, hypervisor/VMware – for our hosted customers. This testing includes regular review and patching of key infrastructure such as SilverLinkOS, real-time vulnerability scanning and intrusion detection, security information and event management, and a 24x7 Security Operations Center (SOC) to respond to critical events.

Information and Communications Technology Security Standards

Silver Spring complies with [ISO/IEC 13335](#), the five-part series of standards titled *Information technology – Security techniques – Management of information and communications technology security*. ISO/IEC 13335 most clearly and comprehensively defines the effective security areas and controls necessary to meet most regulatory compliance and standards, including those in the NIST *Guidelines for Smart Grid Cyber Security, Vol. 3, Supportive Analyses and References* ([NISTIR 7628](#)).

Silver Spring's Smart Energy Platform architecture and security policies reflect the best practice controls recommended in ISO/IEC 13335 and NISTIR 7628, especially in the areas of asset management (including all assets in the field), access control (at every device), and physical and environmental security (in the datacentres that host our back-office servers). ISO/IEC 13335 consists of the following:

- **ISO/IEC 13335-1 Part 1:** Concepts and models for information and communications technology security management is the first in the series.
- **ISO/IEC 13335 parts 2-5,** under the general title, Information technology – Guidelines for the management of IT Security, are subtitled as follows:
 - ISO/IEC 13335-2: Part 2: Managing and planning IT Security
 - ISO/IEC 13335-3: Part 3: Techniques for the management of IT Security
 - ISO/IEC 13335-4: Part 4: Technical Report (TR) – Selection of safeguards
 - ISO/IEC TR 13335-5: Part 5: Management guidance on network security

Maintenance & Support

Maintenance Approach

ComEd is proposing a “Software as a Service” (SaaS) delivery model where Silver Spring assumes all of hosting and software maintenance operations for the solution. Silver Spring will also be responsible for on-going maintenance to meet contractually guaranteed network and platform performance metrics.

The matrix following demonstrates the uniqueness of the ComEd SaaS model and the offerings that are fully included relative to a licensed ownership and operating model:

Scope Item Responsibility	SaaS	Licensed
Professional and System Integration	ComEd/SSN	ComEd/SSN
Software Releases, Maintenance & Support	ComEd/SSN	ComEd/SSN
Field Network Monitoring	ComEd/SSN	Chicago
Service Management	ComEd/SSN	Chicago
System Monitoring	ComEd/SSN	Chicago
Datacenter and Network Operations Services	ComEd/SSN	Chicago
Security Audits and Incident Management	ComEd/SSN	Chicago
Firmware Releases, Upgrades and Maintenance	ComEd/SSN	Chicago
Backhaul Operations (if applicable)	ComEd/SSN	Chicago
IT Hardware Build, Install & Maintenance	ComEd/SSN	Chicago
Software and Network Upgrades	ComEd/SSN	Chicago

Professional and System Integration Services

ComEd will provide a Technical Account Manager, Project Manager and Solution Architect to oversee the implementation and customization of the control platform to suit the City of Chicago's business requirements. ComEd's Technical Account Manager will be responsible for coordinating the efforts of various ComEd and Silver Spring teams, providing a single point of contact for the City. The City of Chicago should similarly expect to provide a Project Manager who will coordinate efforts within various City of Chicago departments and provide a unified voice for the ongoing business conversation with ComEd and Silver Spring.

Software Releases, Maintenance & Support

Software upgrades, patches and bug fixes are included in the software maintenance program in the SaaS model. Implementation (i.e. installing the software on the servers) of the upgrades, patches and bug fixes are also included during the SaaS model term as part of the ongoing operations and maintenance of the streetlight control platform. Software upgrades and maintenance will be handled by existing processes in place between ComEd and Silver Springs Networks. City would be notified of any planned software maintenance involving application outages.

Firmware Releases and Maintenance

Firmware upgrades and maintenance will also be handled through existing processes in place between ComEd and Silver Springs Networks. ComEd has access to Firmware updates, patches and bug fixes through the SaaS model. In addition, Silver Spring will manage the over-the-air upgrade of firmware on Silver Spring NICs and photocells. Upgrade activities, like all operational changes, will be coordinated and subject to the appropriate change controls.

Field Network Monitoring & Management

For the SaaS option, ComEd will provide proactive monitoring of the health of the network including backbone (Access Point) as well as gathering and analysis of operational statistics and trends. Silver Spring will also monitor the VPN connection from the WAN backhaul to the LMS System. Silver Spring will respond to alerts,

notify ComEd, track the issue, troubleshoot problems, and escalate to Silver Spring subject matter experts or third party vendors as needed.

Service Management

Silver Spring strictly follows the Information Technology Infrastructure Library (ITIL) processes for change management, incident management, and problem management. ITIL is a set of practices for IT service management (ITSM) that focuses on aligning IT services with the needs of business. In keeping with those practices, Silver Spring provides ComEd documentation and approval-control of required changes to the environment. Silver Spring will include ComEd on all Remedy ticket communications regarding schedule, approval, implementation, and completion status. Silver Spring holds regularly scheduled meetings (normally weekly) with ComEd to review and discuss all open tickets and issues.

System Monitoring

As part of the SaaS model, Silver Spring and ComEd already actively monitor and maintain the ComEd AMI network communications canopy that would serve as the backbone for the streetlight network. This includes the network components that exist within the service territory: Access Points and Relays. As the network serves a critical infrastructure, it is designed and managed with resiliency, redundancy and stability, already delivering industry leading communications reliability and will only improve with additional streetlight nodes are added to the system.

Security Audits and Incident Management

With Silver Spring's SaaS model, security is assured through Silver Spring's operation and maintenance best practices and certified Datacenters. Silver Spring internal security controls are based on security industry best practices derived from ISO 27002. These controls include physical and environmental security, operational security, security of third parties, system security, virus and malicious code protection, network security management, media handling, backups, monitoring, access control, vulnerability and patch management, and incident management.

Security event monitoring is maintained 24/7 to provide accountability for specific activities on Silver Spring systems and applications. To detect attacks and intrusions in the back office, security events and logging feeds are piped into a Security Information and Event Manager (SIEM). That device helps automate event aggregation, correlation, filtering, monitoring, and alerting. Inputs into the SIEM / security infrastructure include operating systems (authentication, privilege), network devices (switches, routers, firewalls), AAA systems, SecurID, vulnerability scanners, network intrusion detection systems (NIDS), web server and applications, database table modification and access, and various other logs and events from the back office and smart grid.

IT Hardware Build, Install & Maintenance

Silver Spring will provide IT Hardware Build, Installation, & Maintenance for the LMS within Silver Spring's data center. This includes the setup and on-going management of the LMS performed by Silver Spring and ComEd. With the SaaS model, the City of Chicago avoids having to make investments to purchase, own, and host the hardware and software at its datacenter.

Network Operations Services

Network performance will be managed by ComEd's network operations staff, supported by first line monitoring carried out via Silver Spring's Network Operations Center (NOC). Network devices (APs/Relays) that are detected as having an adverse impact to communications are prioritized for investigation on an urgent basis.

Silver Spring will maintain a high degree of vigilance over the ComEd network with a dedicated team of professionals that monitor and manage the performance of the network, many of whom are based in Chicago's Willis Tower. Silver Spring maintains Network Operations facilities staffed 24x7 in Chicago and San Jose, California, which will have primary responsibility in ensuring the systems maintain all service levels. The NOC will identify, troubleshoot and resolve any incidents. If necessary, the NOC will escalate field maintenance issues to local SSN or ComEd staff, as appropriate. When required, the NOC will perform firmware upgrades to all endpoints and/or network infrastructure to resolve issues or enable new application features.

Performance Standards & Service Level Agreements

For illustrative purposes, Silver Spring Networks' most recent performance standards are shown in the table below. Note that ComEd fits into the 2M-6M category:

Customer Size:	2M-6M	2M-6M	500K-1M	500K-1M	500K-1M	100K-200K	10K-100K
SW Uptime	100.00%	100.00%	99.92%	99.94%	100.00%	98.78%	100.00%
EP Reachability	99.80%	99.94%	98.16%	99.69%	99.98%	99.24%	99.94%
SLA Compliance	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Warranties

General Warranty Information

Hardware will be 10 years for the Communication Nodes and Access Points. Software will be one (1) year + 90 days from the date that product is shipped. During the warranty period, ComEd will repair or replace any product which does not conform to its specifications.

Form 7: Technology Services Functional, Logical, and Technical Requirements

Form 7 is attached within the proposal package in electronic format as a Microsoft Excel document as required by the RFP Instructions to Proposers. It is also reproduced below so that it can be read in printed form.

Chicago Smart Lighting Technology Requirements**Form 7: Functional, Logical, and Technical Requirements**

Instructions: For each requirement, please insert an "YES" if the requirement will be met with no customization. Insert a "CU" if customization will be necessary to meet the requirement. Insert a "TP" if third party software will be needed to meet the requirement. Insert an "NA" if the functionality is not part of this Proposal.

Lighting Management System		Optional	Response	Comments
1.1	<i>The Lighting Management System is a software as a service solution or hosted solution.</i>			Will be a SaaS Solution
1.2	<i>Authentication and authorization</i>			
1.2.1	Users must securely authenticate into the system to gain access.		YES	Full username and password with password strength requirements
1.2.2	The system supports integration with Active Directory.	Optional	NA	Access will be controlled through an Active Directory aware secure VPN connection.
1.2.3	System access levels are role-based, limiting access to change schedules or other settings within the system.		YES	Configurable user-profile that allows highlevel LMS function access as well as fine-grained action blocking
1.2.4	A login page will identify the application and provide a means for the user to access the system.		YES	
1.2.5	If authentication is not successful, the Login page is re-displayed with appropriate messaging.		YES	
1.2.6	The system supports session timeout at a configurable frequency.		YES	
1.2.7	Users are able to log out of the system.		YES	
1.3	<i>The Lighting Management System shall be capable storing asset, component, schedules, manual overrides, alarm triggers, burning hours, voltages, failures, maintenance, energy consumption data.</i>		YES	
1.4	<i>The System will allow users to search, view, and edit lighting system data via a map-based interface.</i>		YES	
1.4.1	The system provides both street and satellite image basemaps.		YES	Bing, Google supported
1.4.2	The system allows users to toggle between different basemaps.		YES	
1.4.3	The system integrates with Google Street View.	Optional	YES	
1.4.4	Users can adjust zoom level.		YES	
1.4.5	Users can pan in any direction.		YES	
1.4.6	Users may zoom to a point or a group.		YES	

Lighting Management System		Optional	Response	Comments
1.4.7	The system allows users to view different point-based or boundary-based geographies.		YES	Hierarchical Geozones allow for segregation of deployment (i.e. wards, atlas)
1.4.8	The system allows users to view Control Point locations.		YES	High magnification show individual lights. When viewing large geographic areas, light points are summarized into cluster icons indicating count in clusters
1.4.9	The system allows users to view attributes of each Control Point, including, luminaire type and/or sensor type.		YES	Asset View or real-time view
1.4.10	The system allows users to view the status of each controller (i.e., online, online reporting error, offline)		YES	Status and history of status alarms
1.4.11	If applicable, the system allows users to view Gateway status (i.e., online, online reporting error, offline) if applicable		YES	
1.4.12	The system allows users to view Luminaire status (On, Off, Dimmed State, Boosted State, etc.)		YES	Through Real-time control
1.4.13	The system allows users to view power quality requirements (current requirement, peak requirement).		YES	Real-time control provides current luminaire status with allmonitored channels
1.4.14	The system enables users to view the peak requirement in a prescribed time period (e.g., last 24 hours).		YES	Real-time control provides current luminaire status with allmonitored channels
1.4.15	The system allows users to view lighting system energy consumption (Daily over last prescribed time period – e.g., Daily for last 7 days).		YES	Real-time, historical or lifetime
1.4.16	Users may search around a radius from a point in either miles or feet. Users should be able to set distance.		CU	
1.4.17	Users may search within a predefined boundary.		YES	Through Geozones
1.4.18	Users may draw/define their own boundaries and search around or within that custom boundary or point: Around a single point, In a rectangle, Within a free-form polygon, Around and along a route.	Optional	CU	
1.4.19	Users may search within more than one polygon simultaneously.	Optional	YES	Geozones are hierarchical allow for multi-zone searching
1.4.20	Users may query multiple data types at one time.	Optional	YES	Advance search allows for ad hoc query
1.4.21	Users may add one or more query filters per data type based on the schema for each data type, and using standard operators (e.g., show me all lights that are out in a particular district)		YES	Through advance search or reports
1.4.22	Users may select and run a saved query.		YES	
1.4.23	Users may name and save queries that are run regularly.	Optional	YES	

Lighting Management System		Optional	Response	Comments
1.4.24	Controller or sensor data elements display an information window with data elements on hover over or on click for each point.		YES	
1.4.25	Users may generate a PDF of the map and all data points with a dynamic legend.		YES	
1.5	<i>The System shall enable users to configure the following via the Graphical User Interface:</i>			
1.5.2	Users may configure the reporting frequency of online Control Point parameters for A SINGLE Control Point or groups of Control Points.		N/A	Network operations staff would configure the reporting frequency.
1.5.3	The Lighting Management System shall be capable of defining Luminaire groups, including "Atlas" boundaries designations provided by the city.		YES	Through Geozones
1.5.4	Users may modify the ON/OFF, DIMMED, or BOOSTED state of a single Luminaire or group of Luminaires.		YES	
1.5.5	Users may configure and modify a predefined schedule for the ON/OFF and DIMMED or BOOSTED state of a single Luminaire or a group of Luminaires.		YES	
1.5.6	The Lighting Management System does not limit the number of times/events per day that may be scheduled.		YES	
1.5.7	Schedules may be either time-based, whereby Controllers modify Luminaire operation when a specific time in the schedule occurs, or event-based, whereby Controllers modify Luminaire operation when the next event in the schedule occurs.		YES	
1.5.8	The Lighting Management System shall be capable of creating programs for time-based Scheduled Control that are defined: On a daily recurring basis, by specific day types, for special events, and the scheduling should allow exception days, for instance holidays.		YES	
1.5.9	Event-based Scheduled Controls are defined according to inputs from sensors or commands from the Lighting Management System.		YES	Through onboard sensors or real-time control through the UI or RESTful API call

Lighting Management System		Optional	Response	Comments
1.5.10	The Lighting Management System is capable of Dynamic Control, whereby the ON/OFF, DIMMED, or BOOSTED state of a single Luminaire or a group of Luminaires is modified in response to dynamic inputs from sensors or commands from the Lighting Management System.		YES	
1.5.11	The Lighting Management System is capable of Prioritized Control, whereby the Scheduled Control of individual Luminaires or groups of Luminaires is modified according to input from sensors or commands from the Lighting Management System.		YES	
1.5.12	The Lighting Management System is capable of True Input Power Control, whereby the Luminaire DIMMED or BOOSTED state is actuated to achieve to a desired true input power (percent relative watts). Please describe any Luminaire features that are required to meet this, and whether this would be done via manual or automated processes.		YES	Capable with DALI
1.5.13	The Lighting Management System is capable of Light Output Control, whereby the Luminaire DIMMED or BOOSTED state is actuated to achieve a desired light output (percent relative lumens). Please describe any Luminaire features that are required to meet this, and whether this would be done via manual or automated processes.		CU	Would need to configure system based on the light output to power curves specific to the installed luminaries.
1.5.14	The Lighting Management System is capable of Constant Light Output Control, whereby the Luminaire DIMMED or BOOSTED state is automatically actuated to achieve a maintained constant light output (lumens) over time by compensating for Luminaire lumen depreciation. Please describe any Luminaire features that are required to meet this.		YES	Would need to configure system based on the light output to power curves specific to the installed luminaries.
1.5.15	The Lighting Management System can ensure that a maximum Luminaire true input power (watts) is never exceeded.		YES	
1.6	<i>User Administration</i>			
1.6.1	Allows administrators to add users to the system.		YES	
1.6.2	Allows administrators to assign roles to users within the system.		YES	
1.7	<i>Notifications and Alerts</i>			

	Lighting Management System	Optional	Response	Comments
1.7.1	The Lighting Management System shall be capable generating outage or alert Notifications related to system components, which are specified (pre-defined and/or customized). Notifications should be automatically sent to assigned users and/or user groups via email or SMS.		YES	Alarm manager allows for complex alarm creation with support of messages that provide additional. Configurable contextual information. Alarms can be sent to email, SMS or northbound API call
1.7.2	The Lighting Management System shall be capable of detecting and reporting wire or cable theft through use of an algorithm that identifies when the following conditions exist: 1. A user-defined number of Controllers report a loss of electrical service 2. The loss of electrical service occurs within a user-defined time window 3. The Controllers are physically located consecutively along a roadway		YES	Predefined alarm type with configurable parameters
1.7.3	The Lighting Management System shall be capable of comparing all reported Control Point parameters with optional pre-defined maximum and minimum thresholds, and generating error messages in real-time (based on reported data availability) for any condition that violates a specified threshold a specified number (1 or more) of times.		YES	
1.8	<i>Work Order & Asset Management</i>			
1.8	<i>The CLMS should interface with 311/the City's primary work order system to enable users to conduct common work order and dispatch activities from the Lighting Management System application/GUI. The CLMS should not be the work order management system of record, but should provide the primary application for field staff to receive assignments and make updates. The CLMS will be the primary asset management system for streetlight components.</i>		CU	For the Work Order & Asset Management requirements, we recommend a phased implementation approach beginning with requirements gathering/confirmation and agreement on system design. As such, we have not included an estimate of this integration cost in our proposal pricing. Our team is fully capable of developing integrations such as this, and would be able to support requirements gathering and design efforts once the final system of record is identified. Integration work would be subject to negotiation during the post-award period based on agreeable system designs.

Lighting Management System		Optional	Response	Comments
1.8.1	The LMS shall be capable of integrating with the City's primary work order system to manage service outages, route and dispatch crews for surveying and maintenance.		CU	See 1.8.
1.8.2	The LMS shall be capable of integrating with the City's primary work order system and allows a dispatcher to assign maintenance work to crews or contractors.		CU	See 1.8.
1.8.3	The LMS shall be mobile-friendly, allowing field personnel to receive and manage their work via GPS-enabled mobile devices that include to make edits to the inventory via form and/or map interfaces.		CU	See 1.8.
1.8.4	Any changes to the work order status based on the updates made in the field shall be transmitted to the City's 311/primary work order management system via integration to ensure transparency to residents and call takers.		CU	SLV and 311 both support REST and JSON which will be used to exchange data
1.8.5	The LMS shall contain an asset management system that maintains information about each lighting structure and its associated features, including type, model, and wattages; installation, maintenance, removal and disposal dates, and warranty information.		YES	
1.8.6	The LMS shall contain an asset management system that maintains information about each light and its associated circuitry, controller, and power feed.		YES	
1.8.7	The LMS shall enable notification to ComEd, through established FTP data exchange processes, of changes to the city's lighting infrastructure that affect energy usage for billing purposes.		YES	
1.9	<i>Reporting</i>			
1.9.1	The Lighting Management System shall be capable of creating Remote Monitoring reports based on the generation of an error message or on a schedule.		YES	
1.9.2	The Lighting Management System shall be capable of creating pre-defined Remote Monitoring reports containing:		YES	
1.9.3	Instances of communication loss between Field Devices and the Lighting Management System		YES	

Lighting Management System		Optional	Response	Comments
1.9.4	Control Points with error conditions, sorted by error type and/or Electrical Service Point location		YES	
1.9.5	Energy Consumption Data for individual Luminaires and/or groups of Luminaires		YES	
1.9.6	Logs of work assigned, dispatched and completion from the work order dispatch system		CU	See 1.8. This would be part of the Work Order requirements/Integration.
1.9.7	The Lighting Management System shall be capable of creating customized Remote Monitoring reports.		YES	
1.9.7.1	The Lighting Management System shall be capable of creating pre-defined asset reports.		YES	
1.9.7.2	The Lighting Management System shall be capable of creating customized asset reports.		YES	
1.9.8	Administrators or Network Operations Staff may configure the reporting frequency of online Control Point parameters for all Control Points.		YES	
1.9.9	Administrators or Network Operations Staff Network Operations Staff may configure the reporting frequency of online Control Point parameters for a single control point or groups of control points.		YES	
1.10	<i>Application Programming Interfaces</i>			
1.10.1	The Lighting Management System shall have an API capable of supporting integration through web services (e.g. SOAP, Restful).		YES	The SLV API Conforms to the design principles of REST and supports the XML/JSON data formats
1.10.2	The Lighting Management System's Scheduled Control interface should provide an interface protocol (e.g., REST, SOAP, XML) to allow third party systems to create programs for alternative schedules to be automated into the LMS Schedule Control.		YES	The SLV API Conforms to the design principles of REST and supports the XML/JSON data formats
1.10.3	The API supports programmatically modifying or overriding the ON/OFF, DIMMED, or BOOSTED state of a single Luminaire or group of Luminaires (i.e., when a traffic incident is reported via 911, the light levels of the lights in the surrounding area will be raised automatically).		YES	

Lighting Management System		Optional	Response	Comments
1.10.4	The API supports getting/retrieving information about individual controllers/luminaires that may then be imported into another system or used in a program to kick-off an event in a third-party system (i.e., if a light is out, a ticket is opened in 311 via the Open311 API).		YES	
1.11	<i>System Documentation</i>			
1.11.1	The System shall provide users with searchable end user help documentation that provides step-by-step instructions for common tasks.		YES	
1.11.2	The System help information should be accessible from the GUI.		YES	
1.12	<i>Interoperability and Interchangeability</i>			
1.12.1	The Lighting Management System shall be certified as compliant with the TALQ v1.0.1 standard, and Interoperable with TALQ certified Field Devices or Field Device networks.		YES	
1.12.2	The Lighting Management System shall be Interoperable with the Backhaul Communication Network(s).		YES	
1.12.3	The Lighting Management System shall be Interoperable with the Field Devices.		YES	
1.12.4	The Lighting Management System shall be Interoperable with the Sensor(s).		YES	
1.13	<i>Availability- As the system supports emergency response, the system must be available 24 by 7, 365 days a year with a 99.9% uptime to accommodate scheduled maintenance activities.</i>		NA	Addressed under the managed service model.
1.14	<i>Capacity- The system must support 500 simultaneous users.</i>		YES	
1.15	<i>Compliance with City IT and IS Policies and Standards- The system must comply with City of Chicago Information Technology and Security Policies.</i>		YES	
1.16	<i>Logging/Audit - All administrator and user operations are logged in the system and may be accessed via report.</i>		YES	
1.17	<i>Mobility - The application shall be usable on small glass/mobile devices.</i>		YES	

Lighting Management System	Optional	Response	Comments
<i>Web Browsers Minimum Requirements</i>			
- Apple Safari latest version			
- Google Chrome latest version		YES	
- Internet Explorer latest version			
1.18 - Mozilla Firefox latest version			

Form 8: Interrogatories

In this section, ComEd provides full and complete responses to each interrogatory question posed in the RFP.

1. Customer Service

1.1 Describe your customer support venues (e.g., web, phone and email), periods of coverage, and expected response times.

As part of ComEd's managed service approach in partnership with Silver Spring, ComEd will provide a Technical Account Manager as a single point of contact with City of Chicago concerning the Street Light Management system. ComEd's AMI Operation and IT Smart Grid and Network Teams will be responsible for ongoing support and investigation of any operational issues. As tier 3 support, Silver Spring has Customer Support Centers in San Jose and Melbourne (Australia) and Network Operation Centers (NOCs) in San Jose and Chicago that provide around-the-clock support coverage to our customers. Support is handled in accordance with ITIL service management processes including prioritization, response, and resolution.

The Silver Spring Customer Support Team provides support on the following:

- Break-Fix issues
- Product Education
- All Core Silver Spring Applications

1.2 Describe your customer support model. For example, would you accept support requests from any City staff member, or only from designated representatives? Do you provide a primary contact(s) for a given customer account, or do you provide support by geographic region, or by area of functional specialty?

As part of ComEd's managed service approach, ComEd will provide a Technology Account Manager as a single point of contact with City of Chicago concerning the Street Light Management system. ComEd's AMI Operations and IT Smart Grid and Network Teams will be responsible for ongoing support and investigation of any operational issues. As a tier 3 support, Silver Spring supports ComEd in addressing any issues requiring additional technical support. We expect that the City would appoint internal staff that can act as front line support, and answer questions or handle typical, routine, or administrative tasks (e.g., password resets). We ask that requests from infrequent users of the system be directed to this team of authorized customer support representatives or "power users." Any issues that the power users are not able to address should be escalated to ComEd's Technology Account Manager by email and/or phone

1.3 Describe any customer community activities you sponsor or support, such as online or in person venues to allow customers to share ideas and solutions related to your products.

ComEd and Silver Spring have engaged in a number of community activities, and are particularly proud of consumer outreach and school-age education program that builds awareness of clean energy technologies and the CSMART partnership between ComEd, Silver Spring, West Monroe Partners and the Illinois Institute of Technology (IIT).

Community Outreach through Power Over Energy

Educating, engaging and empowering consumers in energy transformation is critical to realizing the full potential of smart technologies. In examining successful smart grid and smart city modernization projects, proactive, sustained consumer communication and engagement is an essential component to the project's success. Silver Spring has taken a proactive approach to educating all stakeholders on the value of its technology and engaging with them for feedback. Silver Spring works closely with municipal and utility customers on their consumer engagement and education programs, bringing innovative and proven education and engagement strategies to the conversation. Silver Spring's philosophy is to partner closely with the municipality or utility from the start to ensure a smooth communications roll-out of new technology solutions. Specifically, at ComEd, AEP Ohio and BGE, Silver Spring worked closely with their executives to develop their consumer education and engagement strategies and plans. Silver Spring also collaborated with ComEd on the Press Kick-off with the Mayor's office in January 2012, garnering local, state and national coverage. Silver Spring developed and executed the consumer

education strategy and plan for the Maui Smart Grid Project, working closely with multiple stakeholder groups. As part of these efforts, Silver Spring provided classroom materials that helped teachers explain the impact of clean technologies, and how little changes in behavior could make a significant impact on the environment. Examples of this curricula, which ComEd and Silver Spring would be happy to share with the City of Chicago and its schools, are available at <http://www.asmartenergyfuture.com>.

Silver Spring is also a core member of Power Over Energy (POE), a social media energy literacy campaign created by a coalition of energy and environmental groups to educate and engage consumers about energy challenges and motivate them to take action.

The program has three primary goals:

1. Generate awareness about energy and technology challenges
2. Educate consumers about energy efficiency and benefits of renewables, smart grid, and smart city applications
3. Engage consumers in the energy conversation



As a result of the efforts with POE to raise awareness of energy challenges and solutions, we have generated the following benefits:

1. **Generated awareness** about our energy challenges
 - Reached over **96.6 million consumers** worldwide
 - Organic reach 28.4 million, Paid advertising 68.2 million
 -
2. **Educated consumers** about energy efficiency and benefits of renewables and the smart grid
 - Over **505,000 Facebook Likes**
 - Over **295,000 YouTube Views**
 - Over **1,400 Twitter followers**
3. **Engaged consumers** in the conversation
 - Engagement Rate: **4.5%** (Facebook average: 0.75%)



CSMART



The Center for Smart Grid Applications and Research, or CSMART, was established in 2014 at the Illinois Institute of Technology (“IIT”). The collaborative lab is dedicated to researching, testing, and analyzing the latest smart grid technology innovations in a real-world environment. IIT, ComEd, Silver Spring Networks, and West Monroe Partners formed CSMART as a partnership to bring smart grid visibility to professors, students, and visitors at IIT. To date, many smart grid applications have been introduced, tested, and

further developed on campus. Currently, CSMART is in the midst of working with facilities management to bring smart controls to the campus lighting system. As the campus lighting is retrofitted with LED lights, smart photocells are being deployed to provide facilities management better insight into the lighting operations. Students have developed with a range of projects to create utility and smart city applications, including:

- A public safety application that ties connects campus lighting to “blue button” campus safety infrastructure that allows lights to be boosted or flash to guide first responders
- Integration with digital advertising solutions, including targeting based on Bluetooth location
- EV charging integration, monitoring, and demand response capabilities
- Dynamic lighting demonstration for pathway lighting
- Load disaggregation to identify consumption from individual appliances

As a result of this program, students have learned new energy economy skills, developed applications that can be commercialized in the future, and authored whitepapers.

1.4 Describe the product enhancement process and the role that customers play in determining and prioritizing new features and enhancements. Describe any changes or updates you have made to your solutions in the past year as a direct result of customer feedback.

ComEd's partner, Silver Spring, relies heavily on customer feedback in both validating and prioritizing features and products for its roadmap. As a user of this LMS for our own streetlights, ComEd actively provides feedback to Silver Spring regarding enhancements we see as valuable from an end customer perspective

Silver Spring has a customer-driven Streetlight User Group that meets monthly and provides regular feedback to Silver Spring. Recent session topics have included: use of pins 6 and 7 for sensor inputs, dynamic lighting, metering accuracy specifications, and the commissioning process. Outside of this forum every customer has the ability to submit product feature requests via an online portal or through Silver Spring employees such as the assigned Project Manager, Solution Architect, Smart Grid Engineer or directly to the Product Manager. Silver Spring conducts regular roadmap reviews with customers either through webinar or as part of a Quarterly Business Review, which leads to another opportunity for feedback. Finally, Silver Spring Product Managers often solicit customers directly for feedback on product features, including performing design reviews with select customers on a given a product release.

Customer feedback plays a major role in shaping Silver Spring's roadmap. Development of a mobile installation tool, integration with video cameras for people and traffic counting, auto-commissioning functionality, and failure reporting user interface have all been keyed from feedback from lead customers (including Florida Power and Light, Halifax Regional Municipality, Oklahoma Gas and Electric, Urban Control and their customers Bristol and Westminster).

1.5 Describe the content and delivery method (i.e., context-sensitive, online, knowledgebase, etc.) of administrative and end-user documentation sets, as well as the frequency of documentation updates. Also, describe the availability of user-authored content, such as community wikis.

ComEd's partner, Silver Spring, provides a world class Support Portal to its customers, which includes Knowledge Management, Ticket Management, Software Download and Community.

1.6. Describe the support (including documentation and online forum) provided for APIs and/or web services that enable the customer to extend system functionality.

SLV6 now provides the SLV6 software developer kit (SDK) for developers and integrators to add their own smart city apps and widgets on the SLV platform.

2 Data Migration

2.1 As noted in the RFP, the City will need to migrate data from its streetlights database to the new system. Describe a recommended or typical data migration timeline for an organization such as the City.

See Section 8.4.3 of the PMIP for detail on ComEd's proposed data migration plan.

2.3 Describe the data migration services you offer.

With ComEd's internal IT organization overseeing our expert team of contracted IT resource partners, we offer a complete and customizable suite of data migration services. We propose to develop and implement a data migration plan agreeable to the City. An initial workshop with the City and our team would be needed in order to ensure alignment on requirements and set the overarching data migration plan.

3. Architecture

3.1 Describe how, where, and by whom your solution is hosted, and the platforms that are used: hardware and operating system platforms and database management system. Is the product on a stand-alone server? Is it on multiple servers? Is it on dedicated or shared server(s)?

Hosting

In a Software-as-a-Service deployment model, Silver Spring builds, owns, and manages the primary back office application at their Silver Spring secure datacenters in Las Vegas and San Diego.

The SaaS solution provides a secure web interface allowing access to the Streetlight.Vision (SL.V).

By leveraging existing infrastructure at the Silver Spring datacenters, client environments can come online rapidly, significantly reducing one of the largest operational risks in any smart cities deployment. Security is assured through Silver Spring's operation and maintenance best practices and SSAE SOC 1 Type II, N+1 redundant datacenters. A shared infrastructure (routers, storage, database, servers, backups, etc.) allows CIT to avoid additional costs and delays associated with acquiring dedicated hardware without sacrificing data integrity and security. Silver Spring also optionally offers staging/test environments for upgrade/patch validation. Upgrades/changes to all environments are coordinated with clients using standard change management procedures. All SaaS environments are managed and monitored by Silver Spring's 24x7 operations center and staff. Silver Spring assures customers peace of mind by offering intrusion detection services and regular third-party penetration testing services.

ComEd proposes to deploy Production, Test, and Development environments to ensure software availability and performance requirements can be met.

Silver Spring also offers a Hybrid SaaS solution which enables CIT to capitalize the cost of software licenses, while still taking advantage of the Silver Spring managed services.

Silver Spring Hosting and Datacenter Security

Refer to Section 4 Hosting and Environments specifically titled "**Silver Spring Hosting and Datacenter Security**

3.2 Describe any initial configuration or implementation decisions that cannot later be changed, or altered only with great effort or expense.

Under ComEd's Managed Service proposal this would not be applicable.

3.3 Describe any interfaces and APIs that are available to support integrations/interoperability.

Refer to Section 4 Integration and Interfaces

3.4 The City desires the ability to roll out upgrades, features enhancements, updates and fixes for the solution quickly and easily. Describe how the solution meets this goal.

As part ComEd's Managed Service proposal, all firmware, software and endpoint hardware upgrades will be managed by ComEd in partnership with Silver Spring.

3.5 Describe the use of all clients, cookies, plug-ins, extensions, third-party software, and/or embedded applications required for all product functionality.

With ComEd's Managed Service model, all functions are accessible through standards-based HTML5 browsers that support secure connections.

3.6 What Lighting Management System functions that are available via the desktop are NOT available on tablet, mobile and/or other handheld devices?

As the LMS is a Server-based Web application utilizing HTML5, it is accessible on smartphones, tablets and PCs.

3.7 What are your recommended bandwidth requirements per user for Internet connectivity and for WAN/LAN delivery of Lighting Management System services to users? Explain your recommendations.

LMS Web access requires consumer-grade Internet speed of 1Mbps or greater.

3.8 Please describe the difference in your proposed approach between circuit-level controls and light-level controls.

ComEd offers a hybrid solution to control each light fixture to realize the maximum control of efficiency and fixture granularity. A pole level control will be utilized at pole locations where Residential Coach and Arterial Acorns fixtures are piggy backed with the main street light fixtures.

Circuit-level controls typically consist of a smart control node at the circuit cabinet to provide on/off functionality as well as an in-line smart electric meter to provide energy metering. Circuit-level controls are able to provide circuit-level on/off, light failure indication at the circuit level and energy consumption at the circuit level but are not able to provide luminaire-level dimming, fault detection or energy monitoring.

4. System/Software/Firmware Updates

4.1 How do you communicate plans and arrangements for scheduled maintenance? How much downtime is required for maintenance? How far in advance would we be warned of scheduled maintenance and scheduled system unavailability? What tools are available to continue core functions during down time? How are jobs that are scheduled to run during down times handled?

ComEd generally schedules a weekly maintenance window. The window is not always used, but the timeslot is reserved in the event that a maintenance activity is required. Typical uses of the maintenance window include database retention, application of patches, configuration changes, and upgrades. ComEd will notify the City if the maintenance activity will require application downtime. Outside of normal maintenance windows, the City would be notified as soon as practicable of any planned maintenance requiring application downtime.

If there is an application outage, the field network continues to operate. Dynamic lighting, schedules, data collection, and photocell operation would perform without any requirement on the LMS.

Firmware upgrades can be completed with limited impact to the system. Silver Spring utilizes a “seed and flip” approach, where the latest firmware image is distributed to a small number of devices, who then transfer it to their neighbors in the mesh network. Once a firmware image is downloaded to the device, it can be scheduled for an upgrade, where the new image becomes the primary, while the previous image is retained for a potential rollback. The streetlight controllers are able to operate as normal except during the “flip” process, which is scheduled for a non-critical (e.g., daylight) operation.

4.2 Describe the frequency of both major and minor releases and patches. Describe the impact these changes.

ComEd evaluates firmware / software releases and typically performs upgrades on a yearly basis. The timing of deployments is non-deterministic as ComEd employs a feature-based rather than time-based upgrade cycle.

4.3 What is the impact to the overall system during Upgrades? Complete downtime? If so, for how long? What other impacts to the system have been experienced by other customers as result of these upgrades?

During a firmware upgrade of the network and controllers, the system remains available and functional while the new firmware is deployed to all of the controllers. A brief (less than 1 minute) outage occurs on each controller as it reboots and comes up on the new version of the firmware. Depending on the size of the mesh network, it may take another 1 to 4 hours for the network to stabilize with optimal mesh routing from controllers to Access Points.

Typical maintenance windows are four hours, but major maintenance activities may require longer outages. After maintenance activities, the ComEd & Silver Spring Operations team will complete a post-upgrade validation which confirms all functionality prior to making the system available.

5. SLA/Availability

5.1 Describe how the solution minimizes business disruption and maximizes system availability especially during normal business hours. What are the biggest risks to the solution, in terms of availability (e.g., power outages, network outages, data corruption, software bugs, reliance on external power), and how are these risks mitigated? Provide any examples you can of large outages that have occurred, how long they have lasted, and how you resolved them.

ComEd, in partnership with Silver Spring, will provide LMS management and hosting as part of our SaaS deployment option. The team will perform any ongoing upgrades and patch installation as well as 24x7 monitoring of the application. Also refer to Section 4 under “Backup and Recovery” for additional information.

5.2 Describe what kind of scheduled down time the solution requires, noting the frequency, duration and purpose. What tools are available to continue core functions during down times? How are jobs that are scheduled to run during down times handled?

ComEd generally schedules a weekly maintenance window. The window is not always used, but the timeslot is reserved in the event that a maintenance activity is required. Typical uses of the maintenance window include database retention, application of patches, configuration changes, and upgrades. ComEd will notify the City if the maintenance activity will require application downtime.

6. Scalability & Performance

6.1 Describe how the solution manages peaks and spikes in usage or data transmission over varying periods of time, including seconds, minutes and hours.

Application-Level Prioritization: The Silver Spring head end system is the main arbiter of all jobs and has functionality to prioritize one job over another.

Packet and Network Level Prioritization: The Silver Spring mesh network supports RF prioritization for differentiated traffic types. Beyond the various bandwidth efficiency mechanisms implemented in the network, contention management has been implemented in every network device in order to differentiate traffic on an end-to-end basis and ensure that high priority traffic is delivered reliably, and ahead of lower priority traffic.

6.2 Describe the largest live implementation of the proposed solution, as well as details about the performance of that solution.

Silver Spring is currently deploying over 500,000 streetlight controllers and its SLV platform at Florida Power & Light. Currently, 325,000 streetlights controllers have been installed to date. This project represents the largest smart streetlight deployment in North America.

6.3 If a City staff member located at 30 N. LaSalle wants to know how much power a node is consuming in the South Shore community; how long will that staff member have to wait to obtain/view that data via the LMS?

Node data is read daily and updated on a daily basis. Assuming the City staff member has the appropriate access to the South Shore community devices, the power consumption data can be viewed by going to the Data History application in the LMS.

7. Security & Accessibility

7.1 Describe how your solution complies with standards (such as ISO 27001) and any organizational information technology audits that have been completed.

Silver Spring policies are based on security industry best practices derived from ISO 27001/2. The security measures associated with the written policies include physical and environmental security, operational security,

security of third parties, system security, virus and malicious code protection, network security management, media handling, backups, security and operational monitoring, access control, vulnerability and patch management, and incident management. Silver Spring's hosting facilities perform yearly SSAE 16 Type II type audits and results can be provided to the customer. Silver Spring performs yearly security penetration test on the product and infrastructure.

7.2 Describe plans for disaster recovery and operations and what would occur in the in case of a major disaster?

Silver Spring has established formal policies and procedures to ensure that all key processes within the company have the requisite internal controls in place. This includes a business continuity plan so that all critical operations will have appropriate redundancy, failover, and restoration capabilities. This includes geographically diverse data centers, and key resources to support the service.

Hardware failure is typically covered by redundant data center infrastructure deployed to help support either full, in rack redundancy of networking and server gear, or tools for fast recovery (DataGuard, VMware etc.)

The primary Silver Spring data center is hosted in Las Vegas NV. The secondary data center hosting site is in San Diego CA.

7.3 Describe the solution's use of and support for secure protocols to safeguard data in transit and at rest.

Refer to Section 4 titled "Security and Accessibility"

7.4 Describe the solution's support for encryption in backups and in replica sets.

Encryption is provided for data-at-rest backups and replica sets.

7.5 Describe how your solution handles data recovery or the ability to roll back in the event of human or system error. Is the recovery process a self-service mechanism or, must the vendor perform the recovery? Are there any costs associated with this service?

End-user configuration settings are persisted in the SLV database and are preserved during product upgrades. The Silver Spring Network Operations Center (NOC) maintains configuration settings through various property files. During an upgrade, the configuration property files are carried forward to the new version. In the event of an error, configurations can be rolled back automatically within a SaaS environment. Worst case, a previous backup of the database can be restored to the system.

7.6 What protocols have been established for dealing with unauthorized access to or disclosure of confidential data?

ComEd And Silver Spring is very committed to protecting customer information, including privacy. All customer data is considered confidential and will not be shared or disclosed to any outside parties. Silver Spring has a formal Global Privacy Policy available on request, which covers how Silver Spring collects, uses, discloses, transfers, and stores customer information.

Silver Spring has a formally documented security incident response plan that includes a formal escalation process. When Silver Spring suspects or has been notified of a possible security incident or compromise, Silver Spring investigates to determine if a) a breach or compromise has actually occurred, or b) the suspicious activity is the result of a system anomaly. If a breach or compromise is confirmed, Silver Spring locks down the affected systems. Silver Spring senior management then notifies ComEd management of the breach or compromise and works with the ComEd to further investigate and remediate the issue.

Quarterly User Access reviews will be conducted by ComEd with the City to ensure city personnel have appropriate user rights and access level.

7.7 Describe what data validation the solution performs on records as they are created or edited and indicate whether this is different for batch jobs as compared to single records.

The solution does not perform validation, editing, or estimation to data collected.

7.8 Describe how the solution tracks changes to records. Is there an audit trail for edits? Is it possible to revert to previous versions of a record?

Logging and audit trails are maintained to provide accountability for specific activities on Silver Spring hosted systems and applications. Database backups can be used to revert to previous versions of a record.

7.9 Describe the extent to which the solution has been designed to comply with laws and regulations governing the storage and use of "protected" user data (see Exhibit 8 section A35: Data Protection Policy with Contractors.).

Silver Spring's InfoSEC team has reviewed Exhibit 8 section A35 and concluded that these policies do not apply to the data which is stored in the LMS or within a controller. ComEd and Silver Spring is happy to discuss this topic further with the City.

7.10 Describe how your data storage practices and procedures adhere and or deviate from the policies outlined in Data Protection Policy with Contractors outlined in Volume II of the RFP.

Silver Spring's InfoSEC team has reviewed Exhibit 8 section A35 and concluded that these policies do not apply to the data which is stored in the LMS or within a controller. ComEd and Silver Spring is happy to discuss this topic further with the City.

8. Identity Management

8.1 Describe how administrative rights are assigned within the solution. Can administrative rights be assigned to identities stored in external identity stores, such as Active Directory? Can administrative rights be assigned to groups, as well as users?

The system provides the functionality for ComEd to create roles and assign privileges according to the business process policies. Application components require the proper roles and policies, enforced via digital certificates (X.509 format), to be presented to the controller to allow them to run specific operations (e.g. configure, disconnect, firmware upgrade, reads, etc.) Only the highest privilege is allowed to change policy mappings on the system. The system also enforces a role-based access for users with privileges being granted to only the appropriate user role.

ComEd proposal does not include assignment of user rights to identities stored in external identity stores.

8.2 Describe how your solution addresses group-based permissions. Also describe any differences in what permissions and privileges can be managed for a group vs. an individual account.

User groups, called user profiles in the SLV LMS, can be created with customizable access rights. Each user profile has its own skin (i.e. look and feel of the SLV CMS Web User Interface), language, top-level geo-zone, and user access rights and restrictions. Each user account inherits access rights from its user profile. Any permission that can be managed at the user account level can also be managed at the user profile level, and vice versa.

8.3 Describe the level of granularity of access controls for staff functions (principle of least privileges). For example, can certain data elements be made read-only for some staff and read-write for others?

Please refer to the response to 8.2.

9. Integration and Extensibility

9.2 Describe how the solution exposes data through documented web services and APIs, including supported data operations (read, write, update, delete, and so on).

With ComEd's Managed Service solution, any web service or API integration would require further discussion on requirements and design needs.

9.4 For all major reporting, updating, importing and exporting functions, describe the level of staff expertise needed to perform the operation. In particular, identify which functions require the intervention of a database administrator or Systems/IT personnel as opposed to functions that staff can perform on their own. In each case, include the specific technology or platform in which the technical function must be performed.

The LMS application (SLV) includes the following applications which enable the end user (staff level) to generate reports, alarms and export data:

- The "Report Manager" WebApp enables users to create reports that are automatically computed and sent by the Streetlight.Vision LMS Web Server to selected users. Below is the list of the reports available in the Streetlight.Vision LMS Web Server:

Type	Description
Citigis report	Uploads a file in a format specific to the CITIGIS software to an FTP server
Day burner report	Generates a report listing all devices that consumed more than 20 watts. This report is to be scheduled during the day, ideally after the switch OFF at sunrise.
Failures HTML report	Generates a report containing the list of failures detected in the selected geozone
Failures report	Uploads a text file listing the failures detected in the selected geozone to an FTP server for use by a third party software
Generic device last values	Generates a report containing the latest value of selected attributes for all the devices belonging to the selected geozone and sends it via email and/or uploads it to an FTP server
Generic device values	Generates a report containing all the values collected for the selected attributes for all the devices belonging to the selected geozone since the last time the report was generated and sends it via email and/or uploads it to an FTP server
Latency report	Generates a report containing the time difference between the moment a command was sent to a device and the moment the device applied that command
Lifetime report	Generates a report compiling the percentage of expected lamp lifetime for all Streetlights belonging to the selected geozone
Low power factor report	Generates a report listing the devices with a power factor lower than 0.6. To change this configurable value, please change this report's config.xml file on the server
No data ever received	Generates a report listing the devices that never sent any data to the SLV CMS software
OnOff Segment report	Generates a report containing the switch on and off times of the mains supply inside the street lighting cabinet for all Controllers belonging to the selected geozone
Over 140V voltage report	Generates a report listing the devices with a mains voltage above 140 Volts. To change this configurable value, please change this report's config.xml file on the server
Over voltage report	Generates a report listing the devices with a mains voltage above 245 Volts. To change this configurable value, please change this report's config.xml file on the server
Over wattage report	Generates a report listing the devices with a consumed power above 125% of their lamp's wattage. To change this configurable value, please change this report's config.xml file on the server
Symology report	Uploads a file containing the list of failures detected in the selected geozone and written in a format specific to the SYMOLOGY maintenance software to an FTP server

Type	Description
UMSUG report	Generates a file following ELEXON's Unmetered Supplies User Group (UMSUG) specification in the United Kingdom and uploads it to an FTP server. The Streetlight.Vision CMS passed the UMSUG certification in conjunction with certain LPCs. This file contains the time at which the LPCs executed ON, OFF and dimming commands, along with the list of failed LPCs and lamps in the selected geozone
Under 110V voltage report	Generates a report listing the devices with a mains voltage below 110 Volts. To change this configurable value, please change this report's config.xml file on the server
Under voltage report	Generates a report listing the devices with a mains voltage below 210 Volts. To change this configurable value, please change this report's config.xml file on the server
Under wattage report	Generates a report listing the devices with a consumed power below 20% of the lamp wattage. To change this configurable value, please change this report's config.xml file on the server
Weekly Energy Report	Generates a report providing the energy consumption and energy savings for the selected geozone and its sub-geozones for the past week

- The "Alarm Manager" WebApp enables you to manage alarm definitions on the Streetlight.Vision LMS Web Server. Alarms can be defined based on several types of conditions (or "triggers") and against different types of equipment. Below is the list of all alarm types available in the Streetlight.Vision LMS Web Server:

Alarm type	Description
Controller alarm: comparison between two/three/four I/Os	Checks whether certain logical conditions on the state of the Digital Inputs and/or Outputs of a specified Controller are verified (e.g. Is the state of DO1 different from DI1?)
Controller alarm: last known state of an I/O	Checks whether the last known state of a Digital Input or Output of a Controller equals a specified value
Controller alarm: no data received	Checks whether data has been received from a specified Controller within a certain period
Controller alarm: ON/OFF at dusk/dawn	Checks whether a Controller's Digital Input or Output was switched ON (or OFF) within a specified time around sunrise (or sunset)
Controller alarm: ON/OFF times versus previous day	Checks whether the time at which a specified Controller's Digital Input or Output has been switched on (or off) today is different from that time on the day before
Controller alarm: state of the I/Os in the last hours	Checks whether the state of a Digital Input or Output of a Controller was at a specified value in the past N hours
Device alarm: critical failure or warning on a single device	Checks whether a critical failure or warning condition has been detected on the selected device

Alarm type	Description
Device alarm: data analysis vs. previous day / (fixed time)	Checks whether a specified attribute of a device has significantly deviated from its behavior on the previous day
Device alarm: failure ratio in a group	Checks whether any of the specified failures has been detected on more than a specified ratio of devices
Device alarm: multiple failures on multiple devices	Checks whether any of the specified failures has been detected on any of the specified devices
Device alarm: no data received	Checks whether data has been received from a device within a certain period
Device alarm: single failure on multiple devices	Checks whether any of the specified failures has been detected on more than a specified number of devices
Device alarm: too many failures in an area	Checks whether any of the specified failures has been detected on more than a specified number of devices within a circular area
Generic alarm: multiple triggered alarms	Checks whether more than a certain number of specified alarms are currently triggered at the same time

10. Testing

10.1 How can City staff test changes, updates, etc. before making changes to the production environment?

Under the managed service model, ComEd would be responsible for testing in advance of any upgrades or patch deployments. For clarity, ComEd's testing would be performed first in lower level environments starting with the Development environment. Once an upgrade or patch is proven in the Development environment, it can be applied for more rigorous testing in the Test environment. Once approved in Test, it can then be applied to the Production environment. ComEd proposes to assess software and firmware versions released by our technology partners in order to develop a recommended software and firmware roadmap. ComEd would then test any upgrades or patches in accordance with this roadmap to validate their performance prior to release in the production environment.

11. Solution Administration

11.1 Describe how does a City staff member accesses the solution?

Silver Spring's SL.V interface is based on HTML5 and is easy to navigate via "point and click" mechanisms and help screens, and supports current versions of the following browsers:

- Apple Safari latest version
- Google Chrome latest version
- Internet Explorer latest version
- Mozilla Firefox latest version

11.2 Who will administer the solution components?

As a ComEd Managed Service in partnership with SSN, ComEd will install and maintain solution components.

11.2 Describe how user access control is delegated. Who sets permissions?

ComEd will have "admin" privileges in the LMS to set up new accounts with the necessary privileges.

11.3 How many users may administer the solution component?

There is no hard limit to the number of administrators.

11.4 Where are logins displayed?

The user login screen is on the landing page of LMS and is accessible through the Web-Browser.

11.5 Does the solution identify users by login within reports? If so, what reports?

Because ComEd is offering the solution as a managed service, ComEd will be managing these reports. The Log Viewer WebApp provides a report for all user actions over the specified time range.

Form 9: Technology Specifications and Services Pricing Form

As ComEd will be providing this service pursuant to a regulated tariff, the costs provided in the attached Form 9 cannot be taken directly as an offer for outright sale of products or services by ComEd. These prices will be used to develop the monthly charges for the tariffed services, subject to ICC approval, and subject to adjustment as stipulated in ComEd's ICC approved Tariffs.

Form 9 is attached within the proposal package in electronic format as a Microsoft Excel document as required by the RFP Instructions to Proposers. It is also reproduced below so that it can be read in printed form.

Form 9 – Technology Specifications and Services Pricing Form

Instructions to Respondent:

- 1 Complete the Cost Summary below, which shall be a roll-up of all subsequent Cost Detail sections. Cost Summary shall represent the full cost of hardware, software, implementation, and other services over the first five (5) years.
- 2 The Total Cost should include all hardware, software, and services costs necessary to deliver the proposed solution at a fixed fee. The timing of all costs should match Respondent's implementation plan.
- 3 The Proposal should provide costs for deploying the solution at individual-light-level, pole-level and circuit-levels. If costs are based on quantity discounts, please indicate such and provide details.
- 4 Complete the Cost Detail sections on subsequent pages, which shall include unit pricing and total costs as applicable. In case of a discrepancy between the unit and total pricing, the unit price(s) shall govern. Use additional pages as necessary to provide the City with a detailed understanding of all associated costs. In the Field Devices section, please propose three different quantity options for the optional occupancy or other sensors (100, 500, 2000).
- 5 Cost Detail sections indicate anticipated cost items. Please add items as needed/proposed.
- 6 All costs should be in US dollars.
- 7 Indicate payment terms if an early payment discount is offered, including the percentage discount and when the payment is due. Payment Terms shall address specified Component (material), installation, training and start-up, and commissioning costs. Also indicate any other special discounts or programs that you feel could benefit the City. The Total Cost in the Cost Summary shall not reflect any such discounts.
- 8 Provide any proposed optional hardware, software, and implementation services on additional pages.
- 9 The submittal shall include a list of user-replaceable Components and their unit costs.
- 10 The submittal shall include pricing for a single-source written Hardware Component replacement warranty covering material and workmanship for EXTENDED periods, beyond the requirement specified. Pricing shall be provided for 10 years.

COST SUMMARY																				
ITEM	Unit Cost	Number of Units	IMPLEMENTATIO N PHASE COSTS (Light-level implementation)	IMPLEMENTATIO N PHASE COSTS (Pole-level implementation)	IMPLEMENTATIO N PHASE COSTS (Circuit-level implementation)	COST Year 2 (Light- level implementation)	COST Year 2 (Pole- level implementation)	COST Year 2 (Circuit-level implementation)	COST Year 3 (Light- level implementation)	COST Year 3 (Pole- level implementation)	COST Year 3 (Circuit-level implementation)	COST Year 4 (Light- level implementation)	COST Year 4 (Pole- level implementation)	COST Year 4 (Circuit-level implementation)	COST Year 5 (Light- level implementation)	COST Year 5 (Pole- level implementation)	COST Year 5 (Circuit-level implementation)	TOTAL (Light-Level Implementation)	TOTAL (Pole-Level Implementation)	TOTAL (Circuit-Level Implementation)
1 Lighting Management System Licensing Costs (including any extended warranty and/or maintenance)			N/A	\$ 3,509.27	N/A	N/A	\$ 1,061.45	N/A	N/A	\$ 1,061.45	N/A	N/A	\$ 1,061.45	N/A	N/A	\$ 1,091.53	N/A	\$ -	\$ 7,785.15	\$ -
2 Network			N/A	\$ 179.30	N/A	N/A	\$ 210.51	N/A	N/A	\$ 165.95	N/A	N/A	\$ 169.05	N/A	N/A	\$ 19.78	N/A	\$ -	\$ 744.58	\$ -
3 Field Devices			N/A	\$ 9,167.25	N/A	N/A	\$ 8,860.10	N/A	N/A	\$ 8,826.34	N/A	N/A	\$ 8,802.54	N/A	N/A	\$ -	N/A	\$ -	\$ 35,656.23	\$ -
4 Implementation Services Costs			N/A	\$ 5,487.48	N/A													\$ -	\$ 5,487.48	\$ -
5 Training Costs			N/A	\$ 24.72	N/A													\$ -	\$ 24.72	\$ -
6 Other Costs (provide details) <i>(add more lines as necessary)</i>			N/A	\$ 2,370.96	N/A	N/A	\$ 4,176.23	N/A	N/A	\$ 3,390.64	N/A	N/A	\$ 3,663.03	N/A	N/A	\$ 1,827.74	N/A	\$ -	\$ 15,428.60	\$ -
TOTAL			\$ -	\$ 20,738.98	\$ -	\$ -	\$ 14,308.28	\$ -	\$ -	\$ 13,444.39	\$ -	\$ -	\$ 13,696.07	\$ -	\$ -	\$ 2,939.05	\$ -	\$ -	\$ 65,126.77	\$ -

1 SYSTEM AND LICENSING COSTS DETAIL																				
ITEM	Unit Cost	Number of Units	IMPLEMENTATIO N PHASE COSTS (Light-level implementation)	IMPLEMENTATIO N PHASE COSTS (Pole-level implementation)	IMPLEMENTATIO N PHASE COSTS (Circuit-level implementation)	COST Year 2 (Light- level implementation)	COST Year 2 (Pole- level implementation)	COST Year 2 (Circuit-level implementation)	COST Year 3 (Light- level implementation)	COST Year 3 (Pole- level implementation)	COST Year 3 (Circuit-level implementation)	COST Year 4 (Light- level implementation)	COST Year 4 (Pole- level implementation)	COST Year 4 (Circuit-level implementation)	COST Year 5 (Light- level implementation)	COST Year 5 (Pole- level implementation)	COST Year 5 (Circuit-level implementation)	TOTAL (Light-Level Implementation)	TOTAL (Pole-Level Implementation)	TOTAL (Circuit-Level Implementation)
a LMS Software Licenses	\$ 8.90	275,000	n/a	\$ 2,447.82	n/a	n/a	\$ -	n/a	n/a	\$ -	n/a	n/a	\$ -	n/a	n/a	\$ -	n/a	\$ -	\$ 2,447.82	\$ -
b LMS Software Hosting	\$ 9.72	275,000	n/a	\$ 524.63	n/a	n/a	\$ 524.63	n/a	n/a	\$ 524.63	n/a	n/a	\$ 524.63	n/a	n/a	\$ 575.31	n/a	\$ -	\$ 2,673.85	\$ -
c Third Party Software - 311 Integration Hosting			n/a	\$ -	n/a	n/a	\$ -	n/a	n/a	\$ -	n/a	n/a	\$ -	n/a	n/a	\$ -	n/a	\$ -	\$ -	\$ -
d Third Party Software - Endpoint Provisioning Integration Hosting			n/a	\$ 20.60	n/a	n/a	\$ 20.60	n/a	n/a	\$ 20.60	n/a	n/a	\$ 20.60	n/a	n/a	\$ -	n/a	\$ -	\$ 82.40	\$ -
e Other System Costs - Software Maintenance/Support	\$ 8.24	275,000	n/a	\$ 453.18	n/a	n/a	\$ 453.18	n/a	n/a	\$ 453.18	n/a	n/a	\$ 453.18	n/a	n/a	\$ 453.18	n/a	\$ -	\$ 2,665.89	\$ -
f Firmware Maintenance/Support	\$ 1.15	275,000	n/a	\$ 63.04	n/a	n/a	\$ 63.04	n/a	n/a	\$ 63.04	n/a	n/a	\$ 63.04	n/a	n/a	\$ 63.04	n/a	\$ -	\$ 315.18	\$ -
TOTAL			\$ -	\$ 3,509.27	\$ -	\$ -	\$ 1,061.45	\$ -	\$ -	\$ 1,061.45	\$ -	\$ -	\$ 1,061.45	\$ -	\$ -	\$ 1,091.53	\$ -	\$ -	\$ 7,785.15	\$ -

2 NETWORK COST DETAIL																				
ITEM	Unit Cost	Number of Units	IMPLEMENTATIO N PHASE COSTS (Light-level implementation)	IMPLEMENTATIO N PHASE COSTS (Pole-level implementation)	IMPLEMENTATIO N PHASE COSTS (Circuit-level implementation)	COST Year 2 (Light- level implementation)	COST Year 2 (Pole- level implementation)	COST Year 2 (Circuit-level implementation)	COST Year 3 (Light- level implementation)	COST Year 3 (Pole- level implementation)	COST Year 3 (Circuit-level implementation)	COST Year 4 (Light- level implementation)	COST Year 4 (Pole- level implementation)	COST Year 4 (Circuit-level implementation)	COST Year 5 (Light- level implementation)	COST Year 5 (Pole- level implementation)	COST Year 5 (Circuit-level implementation)	TOTAL (Light-Level Implementation)	TOTAL (Pole-Level Implementation)	TOTAL (Circuit-Level Implementation)
a Network Build-Out	\$ 9,061.38	7	n/a	\$ 15.86	n/a	n/a	\$ 47.57	n/a	n/a	\$ -	n/a	n/a	\$ -	n/a	n/a	\$ -	n/a	\$ -	\$ 63.43	\$ -
b Network Maintenance & Support	N/A	N/A	n/a	\$ 163.44	n/a	n/a	\$ 162.93	n/a	n/a	\$ 165.95	n/a	n/a	\$ 169.05	n/a	n/a	\$ 19.78	n/a	\$ -	\$ 681.15	\$ -
c Other Costs																		\$ -	\$ -	\$ -
TOTAL			\$ -	\$ 179.30	\$ -	\$ -	\$ 210.51	\$ -	\$ -	\$ 165.95	\$ -	\$ -	\$ 169.05	\$ -	\$ -	\$ 19.78	\$ -	\$ -	\$ 744.58	\$ -

3 FIELD DEVICES COST DETAIL

ITEM	Unit Cost	Number of Units	IMPLEMENTATION PHASE COSTS (Light-level implementation)	IMPLEMENTATION PHASE COSTS (Pole-level implementation)	IMPLEMENTATION PHASE COSTS (Circuit-level implementation)	COST Year 2 (Light-level implementation)	COST Year 2 (Pole-level implementation)	COST Year 2 (Circuit-level implementation)	COST Year 3 (Light-level implementation)	COST Year 3 (Pole-level implementation)	COST Year 3 (Circuit-level implementation)	COST Year 4 (Light-level implementation)	COST Year 4 (Pole-level implementation)	COST Year 4 (Circuit-level implementation)	COST Year 5 (Light-level implementation)	COST Year 5 (Pole-level implementation)	COST Year 5 (Circuit-level implementation)	TOTAL (Light-Level Implementation)	TOTAL (Pole-Level Implementation)	TOTAL (Circuit-Level Implementation)	
a Controllers	\$ 92.67	275,000	n/a	\$ 6,570.85	n/a	n/a	\$ 6,335.15	n/a	n/a	\$ 6,301.39	n/a	n/a	\$ 6,277.59	n/a	n/a	\$ -	n/a	\$ -	\$ -	\$ 25,484.98	\$ -
b Controller Provisioning	\$ 20.60	275,000	n/a	\$ 1,447.15	n/a	n/a	\$ 1,405.95	n/a	n/a	\$ 1,405.95	n/a	n/a	\$ 1,405.95	n/a	n/a	\$ -	n/a	\$ -	\$ -	\$ 5,665.00	\$ -
c Existing Controller Bypass	\$ 360.50	12,500	n/a	\$ 1,149.25	n/a	n/a	\$ 1,119.00	n/a	n/a	\$ 1,119.00	n/a	n/a	\$ 1,119.00	n/a	n/a	\$ -	n/a	\$ -	\$ -	\$ -	\$ -
Occupancy Sensors (optional)																		\$ -	\$ -	\$ -	\$ -
<i>(add more lines as necessary)</i>																		\$ -	\$ -	\$ -	\$ -
Other Device Costs																		\$ -	\$ -	\$ -	\$ -
<i>(add more lines as necessary)</i>																		\$ -	\$ -	\$ -	\$ -
TOTAL			\$ -	\$ 9,167.25	\$ -	\$ -	\$ 8,860.10	\$ -	\$ -	\$ 8,826.34	\$ -	\$ -	\$ 8,802.54	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 31,149.98	\$ -

4 IMPLEMENTATION SERVICES COSTS DETAIL

ITEM	Unit Cost	Number of Units	Light-level implementation	Pole-level implementation	Circuit-level implementation	NOTES
a Business Analysis and Related Services			n/a	\$ 1,863.27	n/a	
b System Integration Development			n/a	\$ 2,587.34	n/a	
c Configuration, Testing and Acceptance			n/a	\$ 457.04	n/a	
d Data Migration			n/a	\$ -	n/a	
g Project Management			n/a	\$ 579.83	n/a	
h Other Implementation Services Costs						
TOTAL			\$ -	\$ 5,487.48	\$ -	

5 TRAINING COSTS DETAIL - Detail all classes available including different levels of user training and administrator training if available.

ITEM	QUANTITY (if applicable)	UNIT COST	TOTAL	NOTES
a Delivery of User Training	n/a	24.72	24.72	
TOTAL		\$ 24.72	\$ 24.72	

6 ADDITIONAL SERVICE FEES

ITEM	IMPLEMENTATION PHASE COSTS (Light-level implementation)	IMPLEMENTATION PHASE COSTS (Pole-level implementation)	IMPLEMENTATION PHASE COSTS (Circuit-level implementation)	COST Year 2 (Light-level implementation)	COST Year 2 (Pole-level implementation)	COST Year 2 (Circuit-level implementation)	COST Year 3 (Light-level implementation)	COST Year 3 (Pole-level implementation)	COST Year 3 (Circuit-level implementation)	COST Year 4 (Light-level implementation)	COST Year 4 (Pole-level implementation)	COST Year 4 (Circuit-level implementation)	COST Year 5 (Light-level implementation)	COST Year 5 (Pole-level implementation)	COST Year 5 (Circuit-level implementation)	TOTAL (Light-Level Implementation)	TOTAL (Pole-Level Implementation)	TOTAL (Circuit-Level Implementation)
a Business Process Improvement/Transformation (continued)	n/a	(included on row 57)	n/a	n/a	\$ 1,266.22	n/a	n/a	\$ 653.34	n/a	n/a	\$ 669.68	n/a	n/a	\$ 170.54	n/a	\$ -	\$ 2,759.79	\$ -
b Deployment Project Management and Technical Support	n/a	\$ 1,224.09	n/a	n/a	\$ 1,291.41	n/a	n/a	\$ 1,079.43	n/a	n/a	\$ 1,089.23	n/a	n/a	\$ 154.40	n/a	\$ -	\$ 4,838.55	\$ -
c Asset/Billing Record Updates	n/a	\$ 233.33	n/a	n/a	\$ 238.00	n/a	n/a	\$ 242.76	n/a	n/a	\$ 247.61	n/a	n/a	\$ 62.83	n/a	\$ -	\$ 1,024.53	\$ -
d Application Support/Cyber Security	n/a	\$ 310.93	n/a	n/a	\$ 566.84	n/a	n/a	\$ 581.02	n/a	n/a	\$ 595.54	n/a	n/a	\$ 352.49	n/a	\$ -	\$ 2,406.82	\$ -
e Technical Account Manager	n/a	\$ 220.00	n/a	n/a	\$ 225.50	n/a	n/a	\$ 231.14	n/a	n/a	\$ 236.92	n/a	n/a	\$ 242.84	n/a	\$ -	\$ 1,156.40	\$ -
f Endpoint Monitoring and Triage	n/a	\$ 382.61	n/a	n/a	\$ 588.26	n/a	n/a	\$ 602.96	n/a	n/a	\$ 824.05	n/a	n/a	\$ 844.65	n/a	\$ -	\$ 3,242.52	\$ -
TOTAL			\$ -	\$ 2,370.96	\$ -	\$ -	\$ 4,176.23	\$ -	\$ -	\$ 3,390.64	\$ -	\$ -	\$ 3,663.03	\$ -	\$ -	\$ -	\$ 15,428.60	\$ -

7 PRICING ASSUMPTIONS AND ADDITIONAL NOTES:

05

Administrative Submittals

SECTION V – ADMINISTRATIVE SUBMITTAL

RFP Submittal Administrative Checklist

Section I - Required Content

- Proposal Letter
- Executive Summary
- Project Management & Implementation Plan
 - Implementation Overview
 - Team Structure
 - Approach to Project Phasing
 - Schedule Milestones
 - Approach for Performing the Work
 - Project Management Plan
 - Communication and Coordination
 - Quality Management Plan
- MBE/WBE Participation Plan and Commitment
- Workforce Development Hiring Plan and Commitment
- Public Relations and Communications Plan
- Form 14: Additional Project Pricing
- Local Economic Initiatives Commitment (if applicable)

Section II - Required Content

- Form 4: LED Luminaire Specifications Submittal Form (Microsoft Excel Format)
- Form 5: LED Conversion Pricing Form (as amended by Addendum #2)
- LED Luminaire Product Samples (to be delivered separate from Proposal content)

Section III - Required Content

- Asset Condition Assessment Plan
- Form 6: Infrastructure Stabilization Pricing Form (as amended by Addendum #2)

Section IV - Required Content

- Technology Solution Overview
- System Architecture
- Integrations & Interfaces
- Reporting & Analytics
- Additional Functionality
- Third Party Products

- Hostings & Environments
- Backup & Recovery
- Security & Accessibility
- Maintenance & Support
- Performance Standards & Service Level Agreements
- Warranties
- Form 7: Technology Services Functional, Logical, and Technical Requirements (Microsoft Excel Format)
- Form 8: Interrogatories
- Form 9: Technology Specifications and Services Pricing Form (Microsoft Excel Format) (as amended by Addendum #2)

Section V – Required Content

- Form 1: RFP Response Checklist
- Proposal Security
- Exceptions
- Form 3: Project Experience Form
- Form 11: Project Reference Form
- Applicable M/WBE Participation Plan Submittals from Form 10
 - SCHEDULE B: MBE/WBE Affidavit of Joint Venture (NOT APPLICABLE)
 - SCHEDULE C: MBE/WBE Letter of Intent to Perform as a 2nd Tier Subcontractor to the Prime Contractor
 - SCHEDULE C (Construction): MBE/WBE Letter of Intent to Perform as a SUPPLIER
 - SCHEDULE D: Compliance Plan Regarding
 - SCHEDULE F: Report of Subcontractor Solicitations for Construction Contracts
 - SCHEDULE H: Documentation of Good Faith Efforts to Utilize MBEs and WBEs On Construction Contracts (NOT APPLICABLE)
- Form 12: Proposer's Affidavit Regarding Identification of All Waste and Material Handling and Disposal Facilities
- Form 13: Proposer's Commitment to Minority and Female Employee Utilization Goals

Proposal Security

Exhibit I: Form of Proposal Security Bond



BID BOND

For use when bidding on City of Chicago projects. See instructions following.

PRINCIPAL (Legal name and business address)

COMMONWEALTH EDISON COMPANY
440 South La Salle Street
Chicago, IL 60605

State of incorporation or organization: Illinois

SURETY (Legal name and business address)

LIBERTY MUTUAL INSURANCE COMPANY
1001 4th Avenue, Suite 1700
Seattle, WA 98154

State of incorporation: Massachusetts

BID IDENTIFICATION

BID OPENING DATE: January 9, 2017

SPECIFICATION NUMBER:

SPECIFICATION TITLE (AND PROJECT NUMBER IF AVAILABLE):



Chicago Smart Lighting Project

PENAL SUM OF BOND

One Million and No/100 (\$1,000,000.00) Dollars

~~XXX~~

~~PERCENT OF BASE BID~~

ATTORNEY-IN-FACT SIGNATURE		
ATTORNEY-IN-FACT NAME	Elizabeth P. Cervini, Attorney-in-Fact	
DATE	January 9, 2017	

NOTARY

STATE OF PENNSYLVANIA, COUNTY OF MONTGOMERY

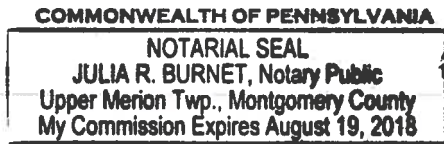
I, Julia R. Burnet, a Notary Public in the County and State aforesaid, do hereby certify that Elizabeth P. Cervini of the

Liberty Mutual Insurance Company who is personally known to be the same person whose name ~~he~~/she subscribed in the foregoing instrument as such Attorney-in-Fact, appeared before me this day in person and acknowledged that ~~he~~/she signed, sealed, and delivered the said instrument of writing as ~~his~~/her free and voluntary act, and as the free and voluntary act of the said Liberty Mutual Insurance Company for the uses and purposes therein set forth, and caused the corporate seal of said company to be thereto attached.

GIVEN UNDER MY HAND AND NOTARIAL SEAL THIS 9th DAY OF January, 20 17



NOTARY PUBLIC



Notary Seal

The signature of the Surety's attorney-in-fact must be notarized, and an original power of attorney granting him or her authority to sign this document must be attached to this document.

THIS POWER OF ATTORNEY IS NOT VALID UNLESS IT IS PRINTED ON RED BACKGROUND.

This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

Certificate No. 7453074

American Fire and Casualty Company
The Ohio Casualty Insurance Company

Liberty Mutual Insurance Company
West American Insurance Company

POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS: That American Fire & Casualty Company and The Ohio Casualty Insurance Company are corporations duly organized under the laws of the State of New Hampshire, that Liberty Mutual Insurance Company is a corporation duly organized under the laws of the State of Massachusetts, and West American Insurance Company is a corporation duly organized under the laws of the State of Indiana (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, David C. Rosenberg, Harry C. Rosenberg, Matthew J. Rosenberg, David A. Johnson, Sherri L. Feeney, Julia R. Burnet, Denise M. Bruno, Michelle G. Higgins, Jonathan F. Black, Christine M. Hrusovsky, Joyce M. Houghton, Elizabeth P. Cervini

all of the city of King of Prussia, state of PA each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 17th day of August, 2016.



American Fire and Casualty Company
The Ohio Casualty Insurance Company
Liberty Mutual Insurance Company
West American Insurance Company

By: David M. Carey
David M. Carey, Assistant Secretary

State of Pennsylvania ss
County of Montgomery

On this 17th day of August, 2016, before me personally appeared Gregory W. Davenport, who acknowledged himself to be the Assistant Secretary of American Fire and Casualty Company, Liberty Mutual Insurance Company, The Ohio Casualty Company, and West American Insurance Company, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at Seattle, Washington, on the day and year first above written.



COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Teresa Pastella, Notary Public
Plymouth Twp., Montgomery County
My Commission Expires March 28, 2017
Member, Pennsylvania Association of Notaries

By: Teresa Pastella
Teresa Pastella, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-laws and Authorizations of American Fire and Casualty Company, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company which resolutions are now in full force and effect reading as follows:

ARTICLE IV – OFFICERS – Section 12. Power of Attorney. Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and execution of any such instruments and to attach thereto the seal of the Corporation. When so executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

ARTICLE XIII – Execution of Contracts – SECTION 5. Surety Bonds and Undertakings. Any officer of the Company authorized for that purpose in writing by the chairman or the president, and subject to such limitations as the chairman or the president may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Company by their signature and execution of any such instruments and to attach thereto the seal of the Company. When so executed such instruments shall be as binding as if signed by the president and attested by the secretary.

Certificate of Designation – The President of the Company, acting pursuant to the Bylaws of the Company, authorizes Gregory W. Davenport, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

Authorization – By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Gregory W. Davenport, the undersigned, Assistant Secretary, of American Fire and Casualty Company, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 9th day of January, 2017.



By: Gregory W. Davenport
Gregory W. Davenport, Assistant Secretary

Not valid for mortgage, note, loan, letter of credit, currency rate, interest rate or residual value guarantees.

To confirm the validity of this Power of Attorney call 1-610-832-8240 between 9:00 am and 4:30 pm EST on any business day.

Exceptions

The Commonwealth Edison (“ComEd”) team members have reviewed the RF materials and the proposed Agreement for the Chicago Smart Lighting Project. Based on our review, we take exception to the following provisions and contract terms. Capitalized terms used but not defined herein have the meanings ascribed to them in the Agreement for Chicago Smart Lighting Project.

Exceptions related to Chicago Street lighting RFP – Volume I

- **ComEd Takes Exception to Committing to Sell any Facilities or Provide any Services at the Prices Listed in Forms 5, 6 and 9.**

ComEd is a regulated public utility. As such, all of ComEd’s services are provided pursuant to tariffs that are subject to the ICC’s review, approval and continued oversight. ComEd is offering to provide the City a smart LED streetlight service pursuant to a tariff that operates, at least in general principle, similarly to how ComEd currently provides an LED streetlight service to many other municipalities in northern Illinois. Those tariffs provide for monthly charges for the services provided based on the cost of the facilities provided, labor costs and a regulated return.

ComEd is not offering to sell any LED fixtures or provide any services at the prices listed in the various forms attached to this Response. Instead, ComEd intends that the pricing information provided in those forms would be used to determine the monthly charges from tariff revisions that ComEd develops to provide the requested services, or from a new tariff filing. That tariff revision or a newly developed tariff would then need to be filed with the ICC for approval. It is the pricing that results from that ICC tariff approval process, and any subsequent revisions approved or ordered by the ICC, that ComEd is offering to the City. ComEd is not proposing to provide the fixtures or services in any other way or with any other pricing structure. Therefore, ComEd takes exception to any requirement that it commit to sell the City the fixtures at the prices listed in the forms.

- **ComEd takes exception to the Insurance Requirement listed in Exhibit E:**

ComEd takes exception to the following sections of the Insurance Requirement listed in Exhibit E for the following reasons:

- Section A.1: Workmen’s Compensation and Employers Liability: ComEd is self insured for workmen’s compensation in IL
- Section A.2: Commercial General Liability: ComEd is self insured up to \$10,000,000 for Liability coverage. ComEd has the equivalent of a general commercial liability policy, but it is not the exact policy as referenced in the RFP. Also, ComEd takes exception to the following language from Section A.2:
~~The City and CIT must be named as additional insureds under the policy. Such additional insured coverage shall be provided on a form acceptable to City and CIT. The additional insured coverage must not have any limiting endorsements or language under the policy such as but not limited to, Proposers sole negligence or the additional insureds vicarious liability.~~ Proposers’ liability insurance shall be primary without right of contribution by any other insurance or self-insurance maintained by or available to the City and CIT.
- Section A.3: Auto Liability: ComEd is self-insured for auto liability in IL
- Section A.4: Excess Umbrella Liability: ComEd’s liability insurance is written on an excess basis. ComEd is self-insured up to our \$10,000,000 self-insured retention then the excess liability policies are available. There is at least \$5,000,000 excess liability insurance available. Also, ComEd takes exception to the following from Section A.4:
Excess/Umbrella Liability
 Excess/Umbrella Liability Insurance must be maintained with limits of not less than \$5,000,000 million per occurrence and aggregate. ~~The policy must provide the same coverages/follow form as the underlying Commercial General Liability, Automobile Liability, Employers Liability and Completed Operations coverage and expressly provide that the excess or umbrella policy will drop down over a reduced or exhausted aggregate limit of the underlying insurance.~~

- **ComEd takes exception section to the duration of software implementation phase stated in subsection 4.3.6.3**

iii. Lighting Management System Implementation Guidance

All core functionality associated with the implementation of the System, as outlined in attachment C to Exhibit B and further detailed in the Exhibit B, Technology Specifications, must be available at the conclusion of the initial Project Phase, with respect to any LED fixtures installed during that Project Phase. Such availability will be a requirement for Final Acceptance of such Work. All LED fixtures installed in subsequent Project Phases must be incorporated into the System's functionality by the conclusion of the respective Project Phase in which they are installed.

Understanding the City would like to target a 12 month duration for the software implementation portion of the project, that timeline will need to be confirmed after completion of the Analysis / Design phase of the project.

- **ComEd takes exception to Form 2: Form of Proposal Letter**

As mentioned throughout this Proposal, ComEd does not agree to enter into an Agreement for the Project in substantially the form of (Volume II) Contract Terms and Conditions. Accordingly, ComEd takes exception to paragraph 12 of the Form of Proposal Letter and will replace paragraph 12 in its entirety with the following in its Proposal:

“If selected by the CIT and the City of Chicago, Commonwealth Edison Company agrees to negotiate in good faith for the Chicago Smart Lighting Project with the City of Chicago, in conformance with the exceptions stated in this response to the RFP.”

Exceptions related to Chicago Street lighting RFP – Volume II

The Commonwealth Edison (“ComEd”) team members have reviewed the Agreement for Chicago Smart Lighting Project. Based on our review, we take exception to the following contract terms. Capitalized terms used but not defined herein have the meanings ascribed to them in the Agreement for Chicago Smart Lighting Project.

Section/Issue	Agreement	ComEd Comment
<p>General Comment</p>	<p>ComEd is the only pre-qualified respondent that is a public utility. We believe this is a significant benefit to the City and Park District. ComEd’s regulated structure provides a transparent framework for large-scale infrastructure modernization. As a public utility, ComEd is subject to oversight by the Illinois Commerce Commission (ICC), which provides a ready accountability structure that supplements the City’s monitoring and oversight. As a regulated public utility and as we describe further below, any contractual agreement with the City will need to be structured consistent with our regulatory obligations and authority.</p> <p>Pursuant to the Public Utilities Act (“Act”) and the rules and regulations of the ICC, ComEd has been providing streetlight service in northern Illinois for many years under the terms of its Rate RDS – Retail Delivery Service (copy attached). The City has been taking service under that tariff as a Dusk to Dawn Lighting customer for some time. Under that same tariff, ComEd has also been providing a Fixture-Included Lighting service to many municipalities in its service territory. Among other choices, this latter service includes LED lighting. Supplementing the terms of service for streetlighting that are contained in Rate RDS are ComEd’s General Terms and Conditions (copy attached).</p> <p>Taken together, these two tariffs fairly comprehensively provide for the terms and conditions under which ComEd currently offers a LED Fixture-Included streetlight service. Under the PUA (220 ILCS 5/9-102, 9-104), ComEd cannot provide service pursuant to any terms and conditions other than what are contained in its filed tariffs. While ComEd is open to discussing potential revisions to these tariffs, or even developing an entirely new tariff, to accommodate the City’s request, the terms and conditions of such a service would need to substantially mirror the existing terms and conditions, since ComEd cannot discriminate in its service offerings (220 ILCS 5/9-241).</p> <p>In addition to ComEd’s tariffs, the ICC has enacted various rules governing the terms under which a utility can provide service. Of particular import is 83 IL Admin. Code Part 280 – Procedures for Gas, Electric, Water and Sanitary Sewer Utilities Governing Eligibility for Service, Deposits, Billing, Payments, Refunds and Disconnection of Service. It is this rule which would need to govern all of the various billing, payment and termination of service provisions related to the service.</p> <p>Thus, ComEd could not execute a document substantially in the form of the Contract Terms and Conditions contained in Volume II. ComEd takes exception to the terms and conditions proposed in that document. Instead, all discussions concerning the terms and conditions for providing the smart LED streetlight service that the City seeks in its RFP must start with ComEd’s existing tariffs, as described above, and the relevant ICC rules and regulations.</p> <p>In addition to the Contract Terms and Conditions being inconsistent and incompatible with the PUA, the ICC’s rules</p>	

Section/Issue	Agreement	ComEd Comment	
	and ComEd's proposed tariffed approach to providing these services, ComEd also takes exception to certain terms for the additional reasons listed below.		
Article 3. General Terms and Conditions			
§ § 3.1.3.1.; 3.1.3.4. Assignment	No assignment by Contractor without prior written consent from Commissioner; City may assign without consent of Contractor	We believe that the anti-assignment provision should be reciprocal	
§ 3.1.4.3 Cooperation by Parties and Between Contractors	Contractor is not entitled to any damages or compensation from the City and will not be reimbursed for any loss or expense on account of any delay resulting from the actions of third-party contractors working within or adjacent to the project site.	We think that Contractor should be compensated for damages resulting from third party contractors, particularly where such delays, damages and losses were unforeseeable. The City is in the best position to manage (and assume) the risk of multiple contractors on the same work site.	
	The Contractor agrees to implement such measures as may be necessary to ensure that its Subcontractors will be bound by the provisions of the Contract	Initial discussions with subcontractors have suggested that certain subcontractors have significant issues with the terms of the proposed Contract and may not be willing (and in some instances able) to comply with all of the terms contained therein	
§ 3.1.4.6. Authority	Contractor has authority to enter into the Contract	ComEd would not have authority to enter into this contract as drafted to the extent its terms and conditions are inconsistent with the terms and conditions of ComEd's ICC-approved tariffs. ComEd stands ready to assist the CIT in developing specific contractual language related to our status as a public utility.	
		We think that this representation should be mutual such that both Contractor and City have authority to enter into and perform under the agreement	
§ 3.1.4.10. No Waiver of Legal Rights	Language is one-way such that no actions of the City will operate as a waiver	We think that this right should be mutual	
§ 3.1.4.11. Non-appropriation of funds	Provides that if no funds or insufficient funds are appropriated and budgeted in any fiscal period of the City for payments to be made under the Contract, then the Contract will terminate and no payments will be made to the Contractor beyond those amounts appropriated and budgeted by the City to fund the Contract	We believe that the lighting services provided under the Contract are emergency services and therefore should not be subject to budget allocations. Accordingly, we respectfully request that the City remove this section. Alternatively, ComEd requests: <ul style="list-style-type: none"> ▪ that the City should covenant to include the Contract in its budget requests and make efforts to secure appropriations sufficient to cover the Contract ▪ If City becomes aware of non-appropriation event, City will provide notice to Contractor, will work 	

Section/Issue	Agreement	ComEd Comment	
		<p>with Contractor to propose solutions</p> <ul style="list-style-type: none"> ▪ In event Contract is terminated because insufficient funds are appropriated, City should be required to pay costs incurred by Contractor in its performance of the Work prior to notification of a non-appropriation event <p>Contractor should also be granted the right to terminate the contract without damages if the non-appropriation clause is invoked</p>	
<p>§ 3.1.4.12. Joint Purchasing Agreement</p>	<p>Contractor will make pricing set forth in the Contract available to the City’s sister agencies (Chicago Park District, Chicago Public Schools, Chicago Board of Education, City Colleges, etc.)</p>	<p>ComEd’s Proposal is based on specific factors, including credit rating, payment terms and the terms of the proposed contract. ComEd cannot commit to this pricing for the City’s sister agencies without understanding the terms of such sale. As such, ComEd takes exception to this provision</p>	
<p>§ 3.1.5. Confidentiality</p>	<p>Contractor cannot allow Deliverables to be made available to any other individual or organization without prior written consent of the City. In addition, Contractor must implement measures to keep confidential information confidential</p>	<p>The confidentiality obligations in this section should be mutual, such that the City has obligations to keep Contractors and Subcontractors confidential information confidential and implement measures necessary to ensure the same. The Contract should also contain a carve out for sharing Deliverables with Subcontractors.</p>	
<p>§ 3.1.6. Indemnity</p>	<p>Contractor must indemnify the City from and against any losses arising out of or being in any way connected with the Contractor’s performance under the Contract. Notably, there are no time or dollar limitations on the indemnity.</p>	<p>The indemnity provisions expose Contractor to significant liability. We think that the indemnity provisions should more-closely resemble typical indemnities under commercial contracts of this nature:</p> <ul style="list-style-type: none"> ▪ Contractor’s liability should be limited to amounts paid under the Contract ▪ Indemnity should survive for a period of one year after the termination of the agreement (in accordance with the one-year warranty period under § 4.17) ▪ Limit scope of indemnity: <ul style="list-style-type: none"> ○ No breach of contract indemnity ○ Indemnity only for (i) third-party claims for injury/death to a person or damage to property resulting from willful misconduct or negligent act/omission, (ii) intellectual property infringement claims from third parties and (iii) breaches of 	

Section/Issue	Agreement	ComEd Comment	
		<ul style="list-style-type: none"> ○ confidentiality obligations ○ Intellectual property indemnification should be sole and exclusive remedy for claims that products or services provided under the contract infringe a third party's intellectual property rights ▪ Neither party should be liable for special, consequential, indirect or punitive damages ▪ Indemnity should be mutual 	
	The City has the right to require Contractor to provide the City with a separate defense of any suit	We think that a single defense sufficiently protects the City	
§ 3.1.8. Force Majeure	Neither party shall be liable for any damages, delays or failure in performance under the Contract caused by acts or conditions beyond its reasonable control...	We think non-appropriation events should be specifically carved out of the force majeure provision; in addition, obligations to make payments to the other party under the agreement should be carved out of the excuse of performance. See § 3.1.4.11. (Non-appropriation of funds)	
§ 3.2.1. Price Adjustment	<p>Limits this provision only to unit prices for Infrastructure Stabilization Work and LED Conversion Work (excluding the luminaires)</p> <p>No annual price increases will exceed 3% of the unit price for Infrastructure Stabilization Work or LED Conversion Work</p>	ComEd takes exceptions to this provision.	
§ 3.2.3. Payment for Stored Material	Payment for material stored on the job site will be 100% of a valid invoice	This is not necessarily applicable to this project. Also, given the scope of the work, we are not certain what constitutes the "the job site"	
§ 3.2.4. Retainage	City to retain 10% of each approved periodic payment estimate of each work order for the first 50% of the approved Contract value	In our experience 5% is the industry standard for Engineering, Procurement and Construction contracts; please consider revising accordingly Silver Spring does not offer retainage	
§ 3.2.5. Payments Withheld	States that Commissioner may decline a request for payment if, in the Commissioner's <i>sole opinion</i> , the request for payment is not adequately supported	We think this gives far too much discretion to the Commissioner and the standard should be changed from a subjective standard to an objective standard, e.g., the Commissioner may decline a request for payment if the request is not adequately supported	
	The Commissioner may decline to process any payment <i>or may rescind in whole or in part</i> any approval previously made to the extent that may be necessary <i>in</i>	Commissioner's approval of payment should not be rescinded under any circumstances (absent fraud); see comment above regarding objective standard	

Section/Issue	Agreement	ComEd Comment	
	<i>his or her sole opinion</i> because of any failure to perform any obligation under the Contract		
	Contractor waives, on behalf of itself and the subcontractors, all rights to file or maintain liens	We do not think that the Contractor should be required to waive its right, and Subcontractors rights, to file liens; Contractor is required to provide partial waivers of lien as a condition to payment which should be sufficient to protect the City	
§ 3.2.6. Payment for Changes	Upon written request of the Commissioner, Contractor will pay the costs related to the Work that are the responsibility of the City. Contractor will be reimbursed for the actual amounts paid out	This language is overly broad and could expose Contractor to significant outlays; ComEd requests that the City strike this provision. Alternatively, there should be a limit on such costs	
§ 3.2.9. Liquidated Damages	Liquidated damages for failure to complete the LED Conversion Work of \$8,000 per calendar day for failure to reach Substantial Completion of the LED conversion work within the time specified under any Work Order	We do not think that liquidated damages of \$8,000 per day corresponds to the loss suffered by the City for failure to complete the project on time; arguably, the City does not suffer significant loss if the project is behind schedule because the old lights remain operational.	
§ 3.2.10.3. Payment	City to process payment within 60 calendar days after receipt of invoices and all supporting documentation	ComEd respectfully requests that the City process payment within 30 days Silver Spring will invoice for: (i) equipment, upon delivery; (ii) licensed software, on the date the software is made available to customer; (iii) SaaS or managed services, monthly in advance, and (iv) other services, as rendered or as otherwise provided in an applicable PO or SOW. Buyer pays shipping. Performance is deemed accepted within 5 days of delivery. Payment terms are Net 30 from invoice date.	
§ 3.2.12. City Right to Offset	The City may offset against any invoice from Contractor any costs incurred by the City as a result of event of default by Contractor	Right to offset should be reciprocal such that Contractor can offset amounts owed to City	
§ 3.2.14. Audit	Grants City the right to audit Contractor and Subcontractors	We request that reasonable and customary audit protections be included in the contract, including reasonably prior notice, no undue interference with business operations, protection of confidential information, etc.	
§ 3.2.15. Subcontractor Payment Reports	If Subcontractor has satisfactorily performed in accordance with the requirements of <i>the Contract</i> , Contractor must pay Subcontractor within 7 days	We think that the reference to “the Contract” should be changed to Contractor’s subcontract; Contractor should not have the obligation to pay Subcontractors unless such Subcontractors comply with the terms of the subcontract	
§ 3.2.16.2 Payments to Subcontractors within	The Contractor must make payment to its Subcontractors within 7 days of receipt of payment from the City for	ComEd would prefer to negotiate directly with subcontractors regarding payment provisions in the	

Section/Issue	Agreement	ComEd Comment	
Seven Days	each invoice	subcontracts	
§ 3.2.16.3. Liquidated Damages for Failure to Promptly Pay	City may assess liquidated damages against Contractor who fails to meet prompt payment requirements	Liquidated damages amount is not set forth in the contract; consider eliminating this requirement as failure to pay is an event of default under the Contract	
§ 3.2.17. General Price Reduction	If Contractor makes general reduction in price of any goods, services or work covered by the Contract to its customers, must provide same to City	Practically speaking, this would be a very difficult provision for ComEd to comply with. It is very difficult to monitor and control the prices at which subs charge other customers, and no two projects are the same.	
§ 3.3 Compliance With All Laws	Contract does not contemplate that Contractor's performance under the Contract is subject to rules and regulations governing regulated entities	See "General Comment" and comments to §3.1.4.6, above.	
§ 3.3.2. Certification of Compliance with Laws	This provision is a certification that the contractor, its principals and subcontractors are in compliance with all local, state and federal laws and have not been debarred, suspended or otherwise disciplined "to the best of [the contractor's] knowledge and belief" and immediately disclose noncompliance to the City.	Initial discussions with subcontractors have suggested potential issues with this requirement with respect to their ability to comply with this requirement. At the very least, we request that the certification be qualified by a materiality threshold.	
§ 3.3.3. Federal Affirmative Action through §3.3.13. Compliance with Environmental Laws and Related Matters	Require compliance with numerous federal, state and local regulations	Numerous federal, state and local regulations are under review by ComEd and subcontractors to determine applicability to this Contract; ComEd would like to reserve the right to negotiate this language with the City after thorough review of the pertinent regulations (including review by, and discussion with, subcontractors)	
§ 3.3.13.3 Compliance with Environmental Laws	Noncompliance by Contractor or any Subcontractor with any Environmental Law during the Contract term is an event of default under the contract, <i>regardless of whether the noncompliance relates to the performance of this Contract</i>	This language is overly broad; ComEd's failure to comply with Environmental Laws outside of this Contract should not trigger an event of default	
§ 3.3.13.3 Proof of Noncompliance	Any citation issued against a Contractor or Subcontractor by any government agency alleging a violation of any Environmental Law is sufficient proof of noncompliance if citation is accompanied by any evidence to support a reasonable conclusion that such a violation has occurred	Proof of noncompliance language is overly broad; consider limiting to objective standard such as a final, non-appealable adjudication	
§ 3.4. Contract Disputes	The contract has a complex contract dispute resolution process that requires the contractor to raise any claim first with the project manager, then the commissioner and finally with the Chief Procurement Officer who will then make a final administrative decision that can be judicially reviewed. The timelines are also expedited	Please consider longer periods to raise disputes and/or authority to raise disputes immediately with the Chief Procurement Officer	

Section/Issue	Agreement	ComEd Comment	
	(e.g., claims must be raised in writing to the project manager within 14 days)		
§ 3.4.1. General	Contractor must perform under the Contract while its claim is pending, including claims pending in court	ComEd would like to place parameters around its performance obligations while a claim is pending, e.g., Contractor should not be required to perform if payment from the City is overdue by a certain number of days	
§ 3.5.1. Events of Default	Events of default are scattered throughout the Contract, and include, in addition to those listed in § 3.5.1: Failure to pay Subcontractors within 7 days of Contractor receiving payment from the City (§ 3.2.15); Retaliatory action against Subcontractor for reporting non-payments (§ 3.2.16.2.2); Failure to notify City of a General Price Reduction (§ 3.2.17) within 10 days; Failure to pay all taxes and obtain all licenses, certificates and other authorizations required in performing the Contract, and failing to require all Subcontractors to do so (§ 3.3.1); Failure to update Economic Disclosure Statement (§ 3.3.7); Knowing failure to report corrupt activity (§ 3.3.11.7); Noncompliance with any Environmental Law (whether related to the Contract or not) (§ 3.3.13.3); Any violation of the “Waste Sections” of the Code (§ 3.3.13.10)	The agreement contains very broad default language, and almost any misstep by the Contractor can trigger an event of default, allowing the City to terminate the agreement, withhold compensation and seek monetary damages; We request that the City significantly limit the number and type of events that can trigger an event of default	
	Includes failure to perform the Services in a manner reasonably satisfactory to the Commissioner or the CPO and failure to comply with “any other term of the Contract” as events of default	ComEd should not be in default under the agreement if it performs the Services in an objectively satisfactory manner, but the services fail to satisfy the Commissioner or CPO in their sole discretion; moreover, failures to comply with minor provisions of the agreement that do not have a material adverse effect on the City should not trigger an event of default	
	No event of default for actions/inactions by the City	Certain actions/inactions by the city should result in City’s default under the agreement, including (i) failure to make timely payments under the Contract; (ii) City’s credit rating is downgraded; (iii) City’s bankruptcy; (iv) City fails to pass a budget; and (v) City breaches fundamental representations and warranties or breaches certain covenants (e.g., failure to qualify as emergency service)	
§ 3.5.2. Cure or Notice Default	Whether to issue a Default Notice is within the sole discretion of the Commissioner, and neither the decision to issue such notice nor the factual basis for such notice	The decision to issue a Default Notice and the factual basis for same should not be within the sole discretion of the Commissioner, and it should be subject to review or	

Section/Issue	Agreement	ComEd Comment	
	is subject to review or challenge under the Disputes provision of the contract	challenge under the Disputes provision; Accordingly, we respectfully request that the City remove this sentence	
§ 3.5.3. Remedies	City may invoke remedies after giving Default Notice	Contractor must have opportunity to Cure and fail to do so before City can invoke its remedies. See comments to § 3.5.2 above	
	One of the City's remedies is to take over the project, step into Contractor's shoes, and work with the Subcontractors through completion	Initial discussions with subcontractors suggest that they may not be amenable to this remedy	
§ 3.5.6. Early Termination	Termination at any time for City's convenience; no costs incurred after the effective date of the termination are permitted	If City insists on a termination for convenience right, we think Contractor should have right to recover payment for all Work executed and for loss, costs and expenses in connection with the work (including demobilization costs) plus reasonable overhead and profit on work not performed. In addition, we request that the City provide at least 30 days written notice of intent to terminate for convenience.	
	If City terminates Contract for default, and a court determines such termination was wrongful, such termination should be deemed an early termination (i.e., termination for City's convenience)	We think that this provision is not even-handed; if City wrongfully terminates the agreement, it should be held to its obligations under the agreement and not have such an escape hatch	
Article 4. Terms for Professional Services with Work			
§ 4.2.1.1 Satisfactory Performance	Contractor must at all times act in the best interest of the City in performance of the Services under the contract, consistent with the professional and fiduciary obligations assumed by it in entering into the Contract	Contractor should not be a fiduciary and should not owe fiduciary duties to the City. The covenant requiring ComEd to always act in the City's best interests is overbroad and should be limited to the performance of the services under the Contract (see also § 4.11)	
§ 4.2.1.4 Compatibility and Integration	Contractor is responsible for ensuring that the Services and Deliverables are compatible with City Resources	In order for the Contractor to ensure that the Services and Deliverables are compatible with City Resources, it must understand such resources. Accordingly, we request that the City Resources be listed in each specification. From a process perspective, we think that Contractor should have the ability to survey the resources, and then develop a technical specification that is compatible with City Resources. ComEd requests that the City provide accurate, comprehensive compatibility requirements.	
§ 4.3 Deliverables	Defines "Deliverables" broadly to include all work product produced by Contractor.	We would like to carve out of Deliverables any ComEd pre-existing material here and/or in Copyright Ownership section (§ 4.9).	

Section/Issue	Agreement	ComEd Comment	
		<p>Replace the second paragraph in 4.9 with a paragraph such as the following:</p> <p>“For the avoidance of doubt, pre-existing content, reports, data, drawings, computer programs, and other material existing as of Effective Date and provided by Contractor (the “Contractor Content”) shall be and remain, as between the City and Contractor, the sole and exclusive property of Contractor, and all rights related thereto, including, without limitation, copyrights, patents, and other intellectual property rights, are hereby exclusively reserved by Contractor. It is expressly understood that the Deliverables do not include any Contractor Content. Contractor hereby grants the City a worldwide, non-exclusive, transferable, perpetual license to use the Contractor Content contained in any work product delivered by Contractor under this Contract as reasonably necessary for the use of the Deliverables.”</p> <p>Also, a related change to the last sentence of the first paragraph of Section 4.9 (bold is new language):</p> <p>“Notwithstanding the foregoing, and regardless of whether Deliverables qualify as a "work made for hire" or Contractor instead irrevocably assigns all intellectual property embodied in or pertaining to the Deliverables, Contractor shall retain all rights to its standard details and specifications and proprietary software and other pre-existing Contractor Content (as defined below), and nothing in this section shall be construed as a transfer of rights [delete comma] which are not owned by Contractor or any rights owned by Contractor prior to the Effective Date.”</p>	
<p>§ 4.5 Timeliness of Performance</p>	<p>States that neither Contractor nor Subcontractors are entitled to damages from the City incurred by reason of delays or hindrances in the performance of the Services, whether or not caused by the City</p>	<p>This language is overbroad; Contractor and Subcontractors should have ability to recover costs for delays caused by the City</p>	
<p>§ 4.6. Suspension</p>	<p>City can suspend Services by giving 15 days’ notice (or</p>	<p>We think there should be limits to the City’s ability to</p>	

Section/Issue	Agreement	ComEd Comment	
	upon no notice in event of emergency); no costs incurred after effective date of suspension allowed	suspend, e.g., City can only suspend one time per year. Moreover, in event City suspends for convenience, Contractor should be permitted to recover costs. The City should also have a notice obligation in event it suspends for emergency.	
	Suspension lasting longer than 45 days is early termination	Suspension lasting longer than 45 days should not result in early termination, but should either result in termination for cause or termination for convenience	
§ 4.9 Copyright Ownership and other Intellectual Property	All Deliverables are deemed works made for hire and City is the sole copyright owner. Carve-out exists for Contractor's standard details and specifications and proprietary software and there is some acknowledgement that materials that existed prior to the Contract are not considered Deliverables to be produced by Contractor at the City's instance and expensed under the Contract.	We recommend striking the work made for hire language and instead assigning or licensing copyright (and other limited relevant IP) rights to City. In either case—whether Deliverables are treated as works made for hire or rights are assigned or licensed by ComEd—this section should more explicitly and broadly carve out rights in ComEd pre-existing materials from rights transferred.	
§ 4.9 Copyright Ownership and other Intellectual Property	Various Contractor warranties to City regarding ownership of IP in Deliverables.	We would like to narrow the warranty statements. For example: “Contractor will not assign any copyrights and will not grant any licenses, exclusive or nonexclusive, to any other party.” This statement should be limited to assignments of rights in Deliverables only. In addition, we propose amending the language as follows: "(b) Contractor will have the legal rights to fully assign the copyrights in the Deliverables ; (c) Contractor will not assign any copyrights in the Deliverables and will not grant any licenses in the Deliverables , exclusive or nonexclusive, to any other party except pursuant to (3) below" Note: Item (3) is missing from the agreement	
§ 4.9.1 Patents	Contractor must perpetually and irrevocably license to the city at no cost, the patent in any invention, improvement, or discovery developed under the Contract and any patent rights to which the Contractor purchases ownership with funds provided to it under the Contract	We prefer to strike this requirement. Initial discussions with subcontractors suggest that they have numerous concerns with these requirements and would unlikely agree to them. In addition, there is a potential timing issue here. If ComEd will work with subcontractors who will need to review and agree to this TBD language when the City presents it, timing/sequencing for reconciling terms and agreements may be of concern.	

Section/Issue	Agreement	ComEd Comment	
§ 4.9.2 Indemnity	Contractor's indemnification of City for IP and privacy related "violations." No Exception for liability arising out of wrongful acts of employees or agents of City or Federal Government.	We would like to add an exception for liability arising out of negligent, willful or wrongful acts of employees or agents of City or Federal Government	
§ 4.11 Cooperation	Contractor must cooperate full; act in City's best interests and "make every effort" to assure an orderly transition if the contract is terminated for any reason.	The covenant requiring ComEd to always act in the City's best interests is overbroad and should be limited to the performance of the services under the Contract.	
§ 4.15. Quality of Materials and Inspection	Non-compliant materials, components, or Services may be rejected by the City and must be replaced or re-performed by the Contractor at no cost to the City	<p>We think that this section should be deleted entirely. Contractor's warranty under § 4.16 is broad enough to adequately protect the city in event "non-compliant" materials are delivered.</p> <p>At the very least, we think that the City's right to require the Contractor to remove and replace non-compliant materials should terminate upon the City's final acceptance of the work. Moreover, If the city rejects non-compliant materials and Contractor is obligated to replace such materials, the parties should agree to cooperate to propose a mutually-agreeable schedule for such work. Please strike the 7-day requirement, as the deadline for Contractor to correct or replace non-conforming goods will be subject to a mutually-agreeable schedule determined by the parties.</p>	
§ 4.17. Contractor's Warranties	If at any time beyond the one-year Contractor's Warranty period, a latent defect in the work is discovered, the Contractor shall be responsible for re-performance, payment of damages, or such other remedy as deemed appropriate by the City	<p>Please define "latent defect in the work" so that we can understand the scope of the warranty.</p> <p>In addition, the City's remedies should be limited to re-performance or payment of damages, and should not extend to "such other remedy as deemed appropriate by the Cityz.</p> <p>ComEd will only warrant that the goods will comply with the applicable specifications. Such warranty will be the exclusive warranty and seller will make no other warranty, express or implied, with respect to the goods.</p>	
§ 4.17.3. Delay	Contractor waives rights to damages or compensation from City on account of delays caused by the City	Contractor should be able to recover increased costs due to delays caused by the City. In addition, the completion date should be adjusted in the event the City delays or suspends the work of the Contractor or expands the scope of work or if the parties agree to a change order that extends the schedule	

Section/Issue	Agreement	ComEd Comment	
§ 4.19.5. Care of Existing Structures and Property	Before doing any Work adjacent to or on the site of any buildings or other structures adjoining or in the line of the Work to be performed under the Contract, Contractor must supply written notice of it to the owner or owners that the Work is to be done	An alternative notice mechanism agreeable to the parties will be set forth in the marketing and outreach plan submitted by ComEd	
§ 4.19.17. Health, Safety and Sanitation	Contractor must remove snow and ice on the Work Site	This is not applicable to the scope of work under the Agreement; the Contractor should not be responsible for shoveling the street when its obligation under the contract is to replace streetlights	
§ 4.22. Representations and Covenants	The City makes no representations or covenants	<p>City should make limited representations to the Contractor, including:</p> <ul style="list-style-type: none"> ▪ Requisite power and authority to execute and deliver the Contract and to do all acts and things thereunder ▪ The Contract has been duly authorized ▪ No actions, suits, proceedings, litigation, etc. pending or threatened against the City which would challenge the City's authority to execute and perform the Contract ▪ City awarded the Contract to Contractor using a competitive procurement process that is in compliance with CIT's Bylaws and any other applicable law <p>See also comments to § 3.1.4.11. regarding non-appropriation of funds and suggested covenants</p>	
Article 5. Scope of Work and Detailed Specifications			
§ 5.2. Authorized Dealer	Contractor must be the manufacturer of, or the authorized dealer or distributor of luminaires and nodes supplied under the Contract	This requirement is not applicable; we respectfully request that it be removed	
§ 5.5.2. Method of Payment	City to process payment within 60 days after receipt of invoices and supporting documentation	We respectfully request payment within 30 days of receipt of invoices and supporting documentation	
§ 5.5.3. Criteria for Payment	Reasonableness of expenses are determined by the Commissioner in its <i>sole</i> discretion	Change from subjective standard to objective standard; we think this gives far too much discretion to the Commissioner and the standard should be changed from a subjective standard to an objective standard	
§ 5.7.1 Procedure for Initiating Work Orders	For LED Conversion Work Orders, Contractor must provide a minimum of three competitive Cost Estimates (includes LED Luminaires beyond year 1)	In ComEd's Draft RFP Feedback entitled "Alternative Fixture Solicitation Approach per the CIT's Response to Feedback on Draft RFP Sections 1 and 2" we recommended	

Section/Issue	Agreement	ComEd Comment	
		that the respondents provide pricing schedules within their proposals that reflect a range of price reductions in years 2-4 with annual specification and design reviews. ComEd thinks that the City can obtain long-term pricing reductions, capture technological advancements over time and provide uniform, aesthetically pleasing fixtures by partnering with a single manufacturer for the duration of the project. We recommend that the CIT conduct an annual review of the manufacturer to address specification and design changes based on improved efficiencies. The City can reserve the right to require Contractor to select an alternate manufacturer in the event it determines that the manufacturer is unable to meet specification requirements. Accordingly, we think that the Contract should be amended to reflect this approach.	
Change Orders	Agreement only contemplates changes at the direction of City. City may order changes in work by issuing a revised Work Order Notice to Proceed, and Contractor must begin the changed work upon receipt of same. Contractor is required to submit a written request for adjustment of the contract price for the revised work within 14 days of receiving the revised Work Order Notice to Proceed	Contractor should also have the ability to propose changes to the work. In addition, the parties should agree on the changed work, and the adjustment in contract price, before Contractor is required to commence the changed work	
Risk of Loss	Risk of loss for Work does not shift to City until, among other requirements, Contractor completes all punch list work	Completion of punch list work should not be condition to risk of loss shifting to City	
§ 5.7.4. LED Luminaire Pricing and Lighting Specifications for Future Project Phases	In event that lighting specifications provided by the City for any luminaire are materially different (as determined by the City) to the specifications of a luminaire used in the preceding project phase for the same lighting context, the contractor may provide a written request to the city for the opportunity to negotiate an agreed upon price for any luminaire	Determination of whether luminaires are materially different as compared to the specifications for luminaires in the preceding project phase should not be determined solely by the City, but rather should be held to an objective standard	
	[City has right to solicit technical and pricing submittals from third parties or to require the Contractor to follow the first option procedures in the event that the City believes that the pricing submittals provided through option 2 or 3 do not reflect competitive market pricing. In the event City procures third party submittals that	We take exception to this provision in accordance with the exception we have taken to item 5.7.1	

Section/Issue	Agreement	ComEd Comment	
	represent pricing of at least 10% less than Contractor's submittal, Contractor must either match the pricing, or procure luminaires from such third party]		
§ 5.8. Task Orders.	Upon the written approval of the Commissioner and/or CIO, the Department will issue a Task Order Request ("TOR") specifically referencing the Contract, identifying the project, and setting forth the Services to be performed pursuant to a Task Order and a desired completion date	We think that the agreement should contemplate a partnership/working relationship with the City. We think that the City would benefit from having the Contractor help develop the technology scope of work rather than have it issued to them	
§ 5.11. Performance Bond	Contractor must furnish \$50 million Performance Bond within 7 days of receipt of notice from city	Contractor will need more than 7 days to procure a \$50 million surety bond. In addition, it is not clear that a \$50 million bond is required, as the penalty amount should correspond with dollar amounts under the Contract which have not yet been determined	
§ 5.12. Tax Benefits Disclaimer	Contractor is providing services and cannot take a tax position that is inconsistent with being a contractor who provides services; the Contractor agrees not to take any depreciation or amortization, investment tax credit, or deduction for any payment as rent with respect to the Project	ComEd's proposal seeks to provide the services under tariff; as such, ComEd takes exception to this provision.	
Article 6. Special Conditions Regarding MBE and WBE			
Article 6, § II(B)	Schedule H (Documentation of Good Faith Efforts)	Is there a Schedule H form on the City's website?	
Article 6, § IV	When does an MBE perform a Commercially Useful Function?	We would like clarification and guidance regarding what constitutes a "Commercially Useful Function" as a "manufacturer" and/or performing in ones "Area of Specialty."	
Article 7. Insurance Requirements			
A.&B. Insurance Coverage Required	Sets forth the insurance requirements under the Contract	Please amend to permit equivalent self-insurance for Workers Compensation and Employers Liability, CGL and Auto. We do not think that Property Installation Insurance or Technology E&O policies should be required, the former because ComEd carries property insurance, and the latter because ComEd does not currently carry Technology E&O insurance and thinks that such coverage may only be available at a significant cost. In addition, we think Contractor should only be required to provide 30 (not 60) days prior written notice to the City in event coverage is changed.	

Section/Issue	Agreement	ComEd Comment	
Exhibit 7: Data Protection			
Section 1.1 General	Sets forth the data protection requirements for contractors, vendors and third parties	ComEd currently complies with a robust cyber and information security policy, and requires its contractors and subcontractors to comply with this policy as well. Given the fact that this policy is already in place, we recommend replacing Exhibit 7 with ComEd’s cyber security policy, a copy of which will be submitted with this document Due to concerns about personally identifiable information (“PII”), please advise whether Contractor would receive PII	

Form 3: Project Experience Form

Major Program Element #1: LED Conversions

#	Project Name	Project Overview, Scope & Scale	Key Dates & Status	Role
1	Suburban LED Smart-Ready Streetlight Installation ComEd	Installing 10,000 LED fixtures with standard long life photocells in up to 43 Chicago-area municipalities	Project Start: February 2016 Completion: May 2016	Prime
2	CDOT Residential Roadway Lighting Improvement The Will Group / GE	Providing GE LED fixtures for 500 residential blocks (\$21MM).	Project Start: 2015 Completion: In Progress	Lighting Design / Material Supply
3	CDA Light Pole and LED Fixture Upgrade The Will Group / GE	Providing GE LED fixtures for the program (\$10MM)	Project Start: 2014 Completion: In Progress	Lighting Design/ Material Supply
4	Chicago Alley Project Meade	Upgrading the City of Chicago's Alley Lights from HPS to Cosmo Metal Halide, about 11000 fixtures between all 50 Wards	Project Start: September 2010 Completion: August 2011	Prime

Major Program Element #2: Infrastructure Stabilization

#	Project Name	Project Overview, Scope & Scale	Key Dates & Status	Role
1	100, 120, & 200 Block Roadway Lighting Meade	Upgrading about 300 blocks of Chicago residential streets with new street lighting.	Project Start: July 2007 Completion: August 2008	Prime
2	Energy Infrastructure Modernization Act (EIMA) – Mainline Cable Replacement & Manhole Refurbishment ComEd	The Mainline Cable Assessment and Replacement Program consists of cable replacement, manhole assessments and manhole refurbishment of about 8,300 miles of underground cable in service across the ComEd distribution system.	Project Start: 2012 Completion: In Progress	Prime

Major Program Element #3: Lighting Management Systems

#	Project Name	Project Overview, Scope & Scale	Key Dates & Status	Role
1	Florida Power and Light (FPL) Silver Springs Network (SSN)	In this project, FPL is using SSN's existing wireless mesh networking technology and management and control software to connect and control 500,000 street lights. SSN will provide network hardware, CMS and professional services for the advanced metering infrastructure, distribution automation and streetlight deployment.	Project Start: 2014 Completion: In Progress	Prime
2	Smart LED Streetlight Proof of Concept: Village of Lombard ComEd The Will Group Meade	This Proof of Concept project installed 340 highly efficient LED lighting with smart photocell controllers for remote monitoring and control.	Project Start: January 2015 Completion: December 2015	Prime
3	Smart LED Streetlight Proof of Concept: Village of Bensenville ComEd The Will Group Meade	This Proof of Concept project installed 395 highly efficient LED lighting with smart photocell controllers for remote monitoring and control.	Project Start: January 2015 Completion: December 2015	Prime

Major Program Element #1: LED Conversions

Form 11: Suburban LED Smart-Ready Streetlight Installation

Project Description: Install 10,000 LED fixtures with standard long life photocells in as many as 43 municipalities.

Date of Performance: 2/18/16 first install started

Date of Completion: 5/31/16

Project Location: Various Chicago-area municipalities throughout Com Ed's service territory

Scale of the Project: Install 10,000 LED fixtures with standard long life photocells in as many as 43 municipalities while utilizing a diverse work force composed of both ComEd and contractor labor. Looking forward, this project is expected to expand significantly, leveraging the developments from our Smart LED Streetlight Proof of Concept project (detailed separately, below) and the solution built by this proposal team.

Respondent's Involvement in Project: ComEd owns and operates approximately 176,000 streetlights outside the City of Chicago. ComEd's responsibilities included overseeing and executing all management aspects of program. This includes, but is not limited to: material planning and distribution coordination, risk management, contractor coordination, interactions with municipalities, contract training, status reporting, metric reporting for municipalities, coordinating and resolving client concerns, budgeting, contract developing, pay request reviews, work package developments, IDOT permitting review and permitting request, quality control, coordinating and monitoring salvage and environmental disposal of old equipment, addressing maintenance issues identified during installation, and project closeout.

Key Personnel Involved and Role in Project:

- *Joseph Gersna, Dir. Project and Contract Management.* Provides oversight, direction regarding key project decisions.
- *Denise Munoz, Mgr. Project Management.* Manage and oversee key project personnel and all aspects of the project scope, budget and schedule.
- *Robert Edelman, PE, PMP, Senior Project Manager.* Manage day to day project scope, schedule and budget.

Key Issues Faced and Innovative Solutions Used: Instituted the following actions to achieve an aggressive schedule:

- Developed strategic material distribution network unifying purchasing, manufacturing, storage facilities, retail sites and contractors
- Utilized state of the art mapping software to create targeted municipality Work Packages for use by contractors. Work packages streamlined the installation process, thus reducing project costs and expediting schedule,
- Created specific cost codes and accounting strings to independently manage materials and control labor and back office costs per municipality. This increased cost savings and expedited project closeout efforts.
- Instituted a process flow chart to streamline activities, reducing project costs and accelerating performance of work.
- Chaired weekly meetings to address concerns and open issues. Delegated action items to respective parties and pushed follow up efforts until closeout.
- Prepared monthly metric reports for Senior Management

Project Outcomes: Installation of estimated 10,000 LED fixtures

Client References:

Name: Joseph Svachula

Title: Vice President

Address: One Financial Place, 33rd Floor, 440 South LaSalle Street, Chicago, IL 60605

Form 11: CDOT Residential Roadway Lighting Improvement

Project Description: Citywide improvement and LED lighting upgrade

Date of Performance: 2015 – Present

Date of Completion: Ongoing

Project Location: Chicago Residential Blocks

Scale of Project: 500 blocks, \$21.0MM (includes labor)

Respondent's Involvement in Project: Lighting Design / Material Supply / Project Management

Key Personnel Involved and Role in Project: Stephen Davis, Project Executive, The Will Group / Joe Siddens, Senior Project Manager, The Will Group / Gary Steinberg, Engineering Support, GE / RJ Darling, Roadway General Manager, GE / Stephen E. West, Regional Sales Manager, GE

Key Issues Faced and Innovative Solutions Used: Maintain and / or improve existing light levels and public perception of new LED technology. Inventory and stage material in Chicago for each release to meet Aldermanic timelines.

Project Outcomes: Continue to meet schedules and control costs to remain within budget guidelines per bid requirements. GE and The Will Group worked with CDOT engineering and Alderman to deliver significant energy savings, enhance safety and public satisfaction. Fixtures include the unique ability to upgrade and incorporate sensors including video cameras and microphones and feature functionality such as gun-shot detection, parking availability and enforcement.

Client References:

Name: Dan Burke

Title: Chief Engineer/Deputy Commissioner, Department of Transportation

Address: 30 North LaSalle St, Chicago IL

Form 11: CDA Light Pole and LED Fixture Upgrade

Project Description: LED lighting upgrade for O'Hare International Airport

Date of Performance: 2014 – Present

Date of Completion: Ongoing

Project Location: O'Hare International Airport

Scale of Project: \$10.0MM

Respondent's Involvement in Project: Site Survey / Lighting Design / Material Supply / Project Management

Key Personnel Involved and Role in Project: Stephen Davis, Project Executive, The Will Group / Joe Siddens, Senior Project Manager, The Will Group / Kerry Hayden, Project Manager, The Will Group / Gary Steinberg, Engineering Support, GE / Stephen E. West, Regional Sales Manager, GE

Key Issues Faced and Innovative Solutions Used: Due to FAA regulations, existing pole locations and mounting heights were highly irregular. Navigated through a challenging site survey and lighting design process to deliver optimum results while still complying with FAA regulations. The GE LED solution was able to meet the lighting photometric requirements due to GE's unique reflective technology.

Project Outcomes: Continue to meet schedules and control costs to remain within budget guidelines per bid requirements. Conducted energy analysis and delivered approximately \$180,000 in rebates. Fixtures include the unique ability to upgrade and incorporate sensors including video cameras and microphones and feature functionality such as gun-shot detection, parking availability and enforcement.

Client References:

Name: John Antonacci

Title: General Manager of Facilities/Skilled Trades, Department of Aviation

Address: 11601 West Touhy Avenue, Chicago, IL
[REDACTED]

Form 11: Chicago Alley Project

Project Description: Upgrading the City of Chicago's Alley Lights from HPS to Cosmo Metal Halide, White Light. Totalling about 11000 fixtures between all 50 Wards

Date of Performance: 9/2010 through 4/2011

Date of Completion: August 2011

Project Location: Chicago, IL

Scale of Project: \$4,324,067.30

Respondent's Involvement in Project: Installation of fixtures

Key Personnel Involved and Role in Project: Joe Bridges, Superintendent, Meade / Al Srajer, General Foreman, Meade / Bryan Knutson, Project Manager, Meade

Key Issues Faced and Innovative Solutions Used: Installing a large quantity of fixtures across the entire City of Chicago, encompassing all 50 wards. Meade simultaneously managed the work of crews in multiple areas.

Project Outcomes: Project milestones achieved successfully with no injuries or accidents.

Client References:

Name: Robert Myers

Title: Deputy Commissioner, CDOT Division of Electric Operations

Address: 2451 South Ashland Ave., Chicago, IL 60608
[REDACTED]

Major Program Element #2: Infrastructure Stabilization

Form 11: 100, 120, & 200 Block Roadway Lighting

Project Description: Upgrading the City of Chicago's residential streets with complete new street lighting, including Foundations, Conduit, Wire, Handholes, Controllers, Street Light poles, and luminaires. Approximately 300 Blocks, broken down between a 100 Block Contract and a 200 Block Contract.

Date of Performance: 7/2007 through 8/2008

Date of Completion: August 2008

Project Location: Chicago, IL

Scale of Project: \$11,443,547.85

Respondent's Involvement in Project: Upgraded 300 residential City of Chicago blocks with new street lighting, working in all 50 wards.

Key Personnel Involved and Role in Project: Joe Bridges, Superintendent, Meade / Al Srajer, General Foreman, Meade / Bryan Knutson, Project Manager, Meade

Key Issues Faced and Innovative Solutions Used: Working in all 50 wards mobilizing from ward to ward effectively. This was a coordination heavy job that Meade was able to do with good communication from the top down.

Project Outcomes: Project milestones achieved successfully with no injuries or accidents.

Client References:

Name: Robert Myers

Title: Deputy Commissioner, CDOT Division of Electric Operations

Address: 2451 South Ashland Ave., Chicago, IL 60608

Form 11: Energy Infrastructure Modernization Act (EIMA) – Mainline Cable Replacement & Manhole Refurbishment

Project Description:

The Mainline Cable Assessment and Replacement Program consist of cable replacement, manhole assessments and manhole refurbishment. There are about 8,300 miles of mainline underground cable in service across the ComEd distribution system. The cable is installed in both conduit/manholes and direct buried. Cable inside Chicago is typically installed in manhole/conduit systems while cable outside Chicago is installed in manhole/conduit and direct buried. The EIMA scope is intended to make a “step change” improvement in reliability by replacing 5 to 10 times the feet of cable typically replaced as part of the recent annual programs. It is also intended to make improvements to the distribution system infrastructure through manhole refurbishments.

Date of Performance: January 2012

Date of Completion: In progress (ending in 2017)

Project Location: ComEd Service Territory including the City of Chicago and Suburban ComEd Service Areas

Scale of the Project: Replace 676 miles of mainline cable, assess and refurbish approximately 32,026 manholes. Annual Basis: Replaced 176 miles of cable and refurbished nearly 6,000 manholes in peak years.

Respondent's Involvement in Project:

ComEd owns and maintains all underground high voltage distribution cable and manholes associated with providing electric service to approximately 3.8 million customers. Cable Replacement and Manhole refurbishments are included in the scope of this project. ComEd coordinates this work with its customers, municipalities, and other regulatory bodies to obtain access and permits to execute the scope of work. ComEd manages all aspects of the project -- from reliability analysis, scheduling scope, planning, execution, and managing material to successfully meet the annual targets.

Key Personnel Involved and Role in Project:

- *Michele Kadich, Manager of System Cable:* Michele has served as an original contributor developing execution strategy at the conception of the project in 2011. Her responsibilities now include managing the team of Project Managers, Engineers, Construction Managers and Project Control Analyst who support the program.
- *Michael Boss, Principal Project Manager:* Mike serves as the Lead Project Manager for execution and coordination of the mainline cable replacement. His responsibilities include scheduling all scope, tracking performance metrics, resolving electrical configuration and managing daily operations.
- *Daniel Barabas, Principal Engineer – Reliability Programs:* Dan develops work priorities, analyzes electric circuit performance and assesses the program results. His responsibilities include determining scope priority, managing the ranking of circuits, assessing the metrics, and assuring compliance.

Key Issues Faced and Innovative Solutions Used

Overall, the ComEd Project Management team manages through complex transmission, substation and distribution projects consisting of cross-functional teams involving multiple engineering disciplines and multiple construction areas including construction projects. The team utilizes a five-phase approach in alignment with PMBOK to successfully execute projects and address key issue that may introduce a variance to the project schedule. The team leverages lessons learned and bundles projects to innovatively bring projects to the close out phase. Team Members innovated and designed a device to isolate and insulation workers performing above ground repairs/replacements to manhole frame and covers. The device has been recognized at ComEd, Exelon and the Chicago Innovation Awards as a safety innovation. It increases enhances safety and increases productivity of the crews executing civil work scope.

Specific to the Mainline and Manhole programs, key issues that are addressed daily are: safety of workers working in confined space with energized cable; coordination with municipalities to minimize utility conflicts; meeting budget allocations; completing annual targets and complying with the legislation established by the State of Illinois.

Project Outcomes: ComEd's System Cable project team successfully met and/or exceeded the targets for meeting the scope of the EIMA Programs. They have replaced over 450 miles of cable and refurbished 22,000 manholes from January 2012 through March 2016. The results have contributed to enhanced reliability of the ComEd system by reducing the number of cable faults and the number of customers impacted by them.

Client References:

Name: Frank A. Lizzadro

Title: Vice President, Meade

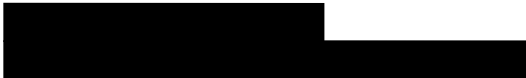
Address: 9550 W 55th St # A, Countryside, IL 60525



Name: Eric Bergstrom

Title: Vice President, HBK Engineering

Address: 921 W Van Buren St., Chicago, IL 60607



Name: Daniel Galovich

Title: Vice President, Aldridge Electric

Address: 844 E Rockland Rd, Libertyville, IL 60048



Major Program Element #3: Lighting Management Systems

Form 11: Florida Power and Light (FPL)

Project Description: FPL selected Silver Spring for North America's largest networked street light deployment to date. FPL will use Silver Spring existing wireless IPv6 mesh networking technology and management and control software to connect and control 500,000 street lights.

Date of Performance: 2014 - Present

Date of Completion: Ongoing

Project Location: Florida, United States

Scale of the Project: 395 Streetlight Fixtures

Respondent's Involvement in Project: Silver Spring is responsible for providing hardware, software, and professional services for the AMI and streetlight deployment.

Key Personnel Involved and Role in Project:

- *Mary Jo Pennino:* Silver Spring project manager
- *Steve Leblanc:* Silver Spring Software Architect for IT integration
- *Dan Evans and Christophe Orceau:* Product Management experts to advise FPL during the deployment and coordinate Silver Spring and SLV teams

Key Issues Faced and Innovative Solutions Used:

FPL's service territory included extreme weather conditions (humidity, storms, salt fog) and difficult terrain (swamps, dense urban areas). To successfully address these challenges, Silver Spring deployed numerous innovative solutions including custom equipment enclosures, submersible network gear, and devices for hard-to-hear locations.

Project Outcomes: First deployment of Luminaire Controllers occurred in 2014.

- Streetlight.Vision CMS software is installed on FPL's servers, managed by Silver Spring networks certified employees.
- Phase 1: 75,000 luminaire controllers
- Phase 2: 425,000 additional luminaire controllers (end of 2016)
- Independent security audit and penetration test conformance
- Integration of SLV CMS web service API in FPL's IT environment
- No change in agreed budget on CMS following RFP process

Client References:

Name: Joe Hancock

Title: Principal Engineer and Streetlight leader at Florida Power and Light Company

Form 11: Smart LED Streetlight Proof of Concept: Village of Lombard

Project Description: ComEd, working with Current, Powered by GE, The Will Group, and Meade recently completed a Smart LED Streetlight Proof of Concept project Lombard, IL. This project brought together 340 highly efficient LED lighting units with smart photocell controllers for remote monitoring and control. Communication for this solution was enabled by our expanding Advanced Metering Infrastructure (AMI) network.

Date of Performance: January 2015

Date of Completion: December 2015

Project Location: Lombard, IL

Scale of the Project: 340 Streetlight Fixtures

Respondent's Involvement in Project: ComEd owns and maintains the fixtures that were included in the scope of this project. As such, ComEd coordinated with the Village of Lombard to agree to conversion of the existing high pressure sodium and mercury vapor streetlights to smart LED streetlights. ComEd managed all aspects of the project, from product selection through field deployment, software and network commissioning, and post-installation performance evaluation.

Key Personnel Involved and Role in Project:

- *Patrick Graves, Sr. Project Manager, Smart Grid & Technology:* Patrick served as Project Manager for Intelligent Controls, managing the selection, integration, and deployment of the smart control hardware and software solutions.
- *William Burns, Sr. Engineer, Energy Efficiency Services:* Bill served as Lead Engineer for LED technology, managing the selection, testing, and evaluation of the LED fixtures before, during, and after deployment.
- *Brandon Bauer, Sr. Project Manager, Distribution Project Management:* Brandon served as Project Manager for Field Execution, with responsibility for the scope, schedule, and budget of the project.

Key Issues Faced and Innovative Solutions Used: Instituted the following actions to achieve an aggressive schedule:

- Developed strategic material distribution network unifying purchasing, manufacturing, storage facilities, retail sites and contractors
- Utilized state of the art mapping software to create targeted municipality Work Packages for use by contractors. Work packages streamlined the installation process, thus reducing project costs and expediting schedule,
- Created specific cost codes and accounting strings to independently manage materials and control labor and back office costs per municipality. This increased cost savings and expedited project closeout efforts.
- Instituted a process flow chart to streamline activities, reducing project costs and accelerating performance of work.
- Chaired weekly meetings to address concerns and open issues. Delegated action items to respective parties and pushed follow up efforts until closeout.
- Prepared monthly metric reports for Senior Management

Project Outcomes: The project successfully established a real world network of 340 smart LED streetlights, monitored and controlled over our existing AMI network via either of two established central management systems. This experience provided an excellent opportunity for ComEd to advance its technology offerings as the POC team integrated and deployed this solution, managed the operations of the network, triaged issues and made technology improvements, tested and discussed expected organizational and business process impacts, and gathered feedback from our POC partner municipalities. Through this project, particular depth of understanding was achieved with respect to the technical, financial, and implementation considerations for any smart LED streetlight deployment.

Client References:

Name: Carl Goldsmith

Title: Director of Public Works, Village of Lombard

Address: 255 E Wilson Ave. Lombard, IL 60148



Form 11: Smart LED Streetlight Proof of Concept: Village of Bensenville

Project Description: ComEd, working with Current, Powered by GE, The Will Group and Meade recently completed a Smart LED Streetlight Proof of Concept project in Bensenville, IL. This project brought together 395 highly efficient LED lighting with smart photocell controllers for remote monitoring and control. Communication for this solution was enabled by our expanding Advanced Metering Infrastructure (AMI) network.

Date of Performance: January 2015

Date of Completion: December 2015

Project Location: Bensenville, IL

Scale of the Project: 395 Streetlight Fixtures

Respondent's Involvement in Project: ComEd owns and maintains the fixtures that were included in the scope of this project. As such, ComEd coordinated with the Village of Bensenville to agree to the conversion of the existing high pressure sodium and mercury vapor streetlights to smart LED streetlights. ComEd managed all aspects of the project, from product selection through to field deployment, software and network commissioning, and post-installation performance evaluation.

Key Personnel Involved and Role in Project:

- *Patrick Graves, Sr. Project Manager, Smart Grid & Technology:* Patrick served as Project Manager for Intelligent Controls, managing the selection, integration, and deployment of the smart control hardware and software solutions.
- *William Burns, Sr. Engineer, Energy Efficiency Services:* Bill served as Lead Engineer for LED technology, managing the selection, testing, and evaluation of the LED fixtures before, during, and after deployment.
- *Brandon Bauer, Sr. Project Manager, Distribution Project Management:* Brandon served as Project Manager for Field Execution, with responsibility for the scope, schedule, and budget of the project.

Key Issues Faced and Innovative Solutions Used: Instituted the following actions to achieve an aggressive schedule:

- Developed strategic material distribution network unifying purchasing, manufacturing, storage facilities, retail sites and contractors
- Utilized state of the art mapping software to create targeted municipality Work Packages for use by contractors. Work packages streamlined the installation process, thus reducing project costs and expediting schedule,
- Created specific cost codes and accounting strings to independently manage materials and control labor and back office costs per municipality. This increased cost savings and expedited project closeout efforts.
- Instituted a process flow chart to streamline activities, reducing project costs and accelerating performance of work.
- Chaired weekly meetings to address concerns and open issues. Delegated action items to respective parties and pushed follow up efforts until closeout.
- Prepared monthly metric reports for Senior Management

Project Outcomes: Successfully established a real world network of 395 smart LED streetlights, monitored and controlled over our existing AMI network via either of two established central management systems. This experience provided an excellent opportunity for ComEd to advance its technology offerings as the POC team integrated and deployed this solution, managed the operations of the network, triaged issues and made technology improvements, tested and discussed expected organizational and business process impacts, and gathered feedback from our POC partner municipalities. Through this project, particular depth of understanding was achieved with respect to the technical, financial, and implementation considerations for any smart LED streetlight deployment.

Client References:

Name: Joseph Caracci

Title: Director of Public Works, Bensenville

Address: 717 E. Jefferson Street, Bensenville. IL 60106



Applicable M/WBE Participation Plan Submittals from Form 10

SCHEDULE C: MBE/WBE Letter of Intent to Perform as a Subcontractor to the Prime Contractor

SCHEDULE C: MBE/WBE Letter of Intent to Perform as a 2nd Tier Subcontractor to the Prime Contractor

SCHEDULE C (Construction): MBE/WBE Letter of Intent to Perform as a SUPPLIER

SCHEDULE D: Compliance Plan Regarding MBE & WBE Utilization Affidavit of Prime Contractor

SCHEDULE F: Report of Subcontractor Solicitations for Construction Contracts



**SCHEDULE C: MBE/WBE Letter of Intent to Perform
as a Subcontractor to the Prime Contractor**

**FOR
CONSTRUCTION
PROJECTS ONLY**

NOTICE: THIS SCHEDULE MUST BE AUTHORIZED AND SIGNED BY THE MBE/WBE SUBCONTRACTOR FIRM. FAILURE TO COMPLY MAY RESULT IN THE BID BEING REJECTED AS NON-RESPONSIVE.

Project Name: CHICAGO SMART LIGHTING PROJECT Specification No.: _____

From: ELECTRICAL RESOURCE MANAGEMENT, INC
(Name of MBE/WBE Firm)

To: COMMONWEALTH EDISON COMPANY and the City of Chicago.
(Name of Prime Contractor)

The MBE or WBE status of the undersigned is confirmed by the attached City of Chicago or Cook County Certification Letter. 100% MBE or WBE participation is credited for the use of a MBE or WBE "manufacturer." 60% participation is credited for the use of a MBE or WBE "regular dealer."

The undersigned is prepared to perform the following services in connection with the above named project/contract. If more space is required to fully describe the MBE or WBE proposed scope of work and/or payment schedule, attach additional sheets as necessary. The description must establish that the undersigned is performing a commercially useful function:

ASSET CONDITION ASSESSMENT

The above described performance is offered for the following price and described terms of payment:

Pay Item No./Description	Quantity/Unit Price	Total
ASSET CONDITION ASSESSMENT	1 /LS	2,072,500

Subtotal: \$ 2,072,500

Total @ 100%: \$ 2,072,500

Total @ 60% (if the undersigned is performing work as a regular dealer): \$ SEE SUPPLIER SCHEDULE C

NOTICE: THIS SCHEDULE AND ATTACHMENTS REQUIRE ORIGINAL SIGNATURES ON EACH PAGE.

(If not the undersigned, signature of person who filled out this Schedule C) (Date)

(Name/Title-Please Print) (Company Name-Please Print)

(Signature of President/Owner/CEO or Authorized Agent of MBE/WBE) (Date)

STEPHEN L. DAVIS / PRESIDENT
(Name/Title-Please Print)

Schedule C: MBE/WBE Letter of Intent to Perform as a Subcontractor to the Prime Contractor

Partial Pay Items

For any of the above items that are partial pay items, specifically describe the work and subcontract dollar amount(s):

Pay Item No./Description	Quantity/Unit Price	Total

Subtotal: \$ _____

Total @ 100%: \$ _____

Total @ 60% (if the undersigned is performing work as a regular dealer): \$ _____

SUB-SUBCONTRACTING LEVELS

A zero (0) must be shown in each blank if the MBE or WBE will not be subcontracting any of the work listed or attached to this schedule.

_____ % of the dollar value of the MBE or WBE subcontract that will be subcontracted to non MBE/WBE contractors.

_____ % of the dollar value of the MBE or WBE subcontract that will be subcontracted to MBE or WBE contractors.

NOTICE: If any of the MBE or WBE scope of work will be subcontracted, list the name of the vendor and attach a brief explanation, description and pay item number of the work that will be subcontracted. MBE/WBE credit will not be given for work subcontracted to Non-MBE/WBE contractors, except for as allowed in the Special Conditions Regarding Minority Business Enterprise Commitment and Women Business Enterprise Commitment in Construction Contracts.

The undersigned will enter into a formal written agreement for the above work with you as a Prime Contractor, conditioned upon your execution of a contract with the City of Chicago, within three (3) business days of your receipt of a signed contract from the City of Chicago.

The undersigned has entered into a formal written mentor protégé agreement as a subcontractor/protégé with you as a Prime Contractor/mentor. () Yes () No

NOTICE: THIS SCHEDULE AND ATTACHMENTS REQUIRE ORIGINAL SIGNATURES ON EACH PAGE.

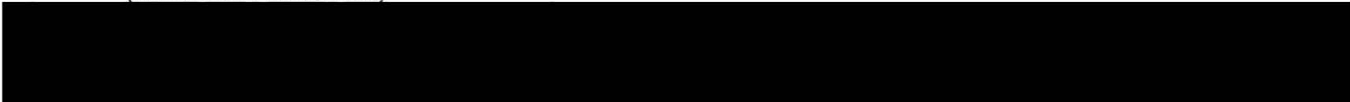
(If not the undersigned, signature of person who filled out this Schedule C) (Date)

(Name/Title-Please Print) (Company Name-Please Print)

(Email & Phone Number)

(Signature of President/Owner/CEO or Authorized Agent of MBE/WBE) 1 6 17 (Date)

STEPHEN L. DAVIS / PRESIDENT
(Name/Title-Please Print)



SCHEDULE C (Construction): MBE/WBE Letter of Intent to Perform as a SUPPLIER

Project Name: CHICAGO SMART LIGHTING PROJECT Specification Number: _____

From: ELECTRICAL RESOURCE MANAGEMENT, INC.
(Name of MBE or WBE Firm)

To: _____ and the City of Chicago:
(Name of Prime Contractor)

The MBE or WBE status of the undersigned is confirmed by the attached City of Chicago or Cook County Certification Letter. 100% MBE or WBE participation is credited for the use of a MBE or WBE "manufacturer". 60% participation is credited for the use of a MBE or WBE "regular dealer".

The undersigned is prepared to supply the following goods in connection with the above named project/contract. On a separate sheet, fully describe the MBE or WBE proposed scope of work and/or payment schedule, including a description of the commercially useful function being performed. Attach additional sheets as necessary:

Pay Item No. / Description	Quantity / Unit Price	Total
<u>MATERIAL SUPPLY FOR INFRASTRUCTURE STABILIZATION</u>	<u>TBD</u>	<u>TBD</u>

Line 1: Sub Total: \$ _____

Line 2: Total @ 100%: \$ SEE SUBCONTRACTOR SCHEDULE C

Line 3: Total @ 60%: \$ 7,244,900 (est)

Partial Pay Items.

For any of the above items that are partial pay items, specifically describe the work and subcontract dollar amount(s):

Pay Item No. / Description	Quantity / Unit Price	Total
_____	_____	_____
_____	_____	_____

Line 1: Sub Total: \$ _____

Line 2: Total @ 100%: \$ _____

Line 3: Total @ 60%: \$ _____

SUB-SUBCONTRACTING LEVELS - A zero (0) must be shown in each blank if the MBE or WBE will not be subcontracting any of the work listed or attached to this schedule.

_____ % of the dollar value of the MBE or WBE subcontract that will be subcontracted to non-MBE/WBE contractors.

_____ % of the dollar value of the MBE or WBE subcontract that will be subcontracted to MBE or WBE contractors.

NOTICE: If any of the MBE or WBE scope of work will be subcontracted, list the name of the vendor and attach a brief explanation, description and pay item number of the work that will be subcontracted. MBE/WBE credit will not be given for work subcontracted to non-MBE/WBE contractors, except for as allowed in the Special Conditions Regarding Minority Business Enterprise Commitment and Women Business Enterprise Commitment in Construction Contracts.

The undersigned will enter into a formal written agreement for the above work with you as a Prime Contractor, conditioned upon your execution of a contract with the City of Chicago, within three (3) business days of your receipt of a signed contract from the City of Chicago.

The undersigned has entered into a formal written mentor protégé agreement as a subcontractor/protégé with you as a Prime Contractor/mentor: () Yes () No

NOTICE: THIS SCHEDULE AND ATTACHMENTS REQUIRE ORIGINAL SIGNATURES.

Signature of Owner, President or Authorized Agent of MBE or WBE Date _____
STEPHEN L. DAVIS / PRESIDENT

Name (Title (Print))

SCHEDULE C (Construction): MBE/WBE Letter of Intent to Perform as a SUPPLIER

Project Name: CHICAGO SMART LIGHTING PROJECT Specification Number: _____

From: Lynn's View Manufacturing and Supply
(Name of MBE or WBE Firm)

To: _____ and the City of Chicago:
(Name of Prime Contractor)

The MBE or WBE status of the undersigned is confirmed by the attached City of Chicago or Cook County Certification Letter. 100% MBE or WBE participation is credited for the use of a MBE or WBE "manufacturer". 60% participation is credited for the use of a MBE or WBE "regular dealer".

The undersigned is prepared to supply the following goods in connection with the above named project/contract. On a separate sheet, fully describe the MBE or WBE proposed scope of work and/or payment schedule, including a description of the commercially useful function being performed. Attach additional sheets as necessary:

Pay Item No. / Description	Quantity / Unit Price	Total
<u>MANUFACTURE / ASSEMBLY OF LED FIXTURES</u>	<u>297,900 UNITS</u>	<u>95,886,200</u>
Line 1: Sub Total:		\$ <u>95,886,200</u>
Line 2: Total @ 100%:		\$ <u>95,886,200</u>
Line 3: Total @ 60%:		\$ _____

Partial Pay Items.

For any of the above items that are partial pay items, specifically describe the work and subcontract dollar amount(s):

Pay Item No. / Description	Quantity / Unit Price	Total
_____	_____	_____
_____	_____	_____
_____	_____	_____
Line 1: Sub Total:		\$ _____
Line 2: Total @ 100%:		\$ _____
Line 3: Total @ 60%:		\$ _____

SUB-SUBCONTRACTING LEVELS - A zero (0) must be shown in each blank if the MBE or WBE will not be subcontracting any of the work listed or attached to this schedule.

_____ % of the dollar value of the MBE or WBE subcontract that will be subcontracted to non-MBE/WBE contractors.

_____ % of the dollar value of the MBE or WBE subcontract that will be subcontracted to MBE or WBE contractors.

NOTICE: If any of the MBE or WBE scope of work will be subcontracted, list the name of the vendor and attach a brief explanation, description and pay item number of the work that will be subcontracted. MBE/WBE credit will not be given for work subcontracted to non-MBE/WBE contractors, except for as allowed in the Special Conditions Regarding Minority Business Enterprise Commitment and Women Business Enterprise Commitment in Construction Contracts.

The undersigned will enter into a formal written agreement for the above work with you as a Prime Contractor, conditioned upon your execution of a contract with the City of Chicago, within three (3) business days of your receipt of a signed contract from the City of Chicago.

The undersigned has entered into a formal written mentor protégé agreement as a subcontractor/protégé with you as a Prime Contractor/mentor: () Yes () No

NOTICE: THIS SC ATTACHMENTS REQUIRE ORIGINAL SIGNATURES.

Signa _____ or, President or Authorized Agent of MBE or WBE Date _____

Joshua Davis, president
Name /Title (Print)





FOR
CONSTRUCTION
PROJECTS ONLY

**SCHEDULE C: MBE/WBE Letter of Intent to Perform as a
2nd Tier Subcontractor to the Prime Contractor**

**NOTICE: THIS SCHEDULE MUST BE AUTHORIZED AND SIGNED BY THE MBE/WBE SUBCONTRACTOR FIRM.
FAILURE TO COMPLY MAY RESULT IN THE BID BEING REJECTED AS NON-RESPONSIVE.**

Project Name: CHICAGO SMART LIGHTING PROJECT Specification No.: _____

From: PNI ENERGY SOLUTIONS, LLC 1890 SUNCAST LN. BATAVIA, IL 60510
(Name of MBE/WBE Firm)

To: Meade, Inc.
(Name of 1st Tier Contractor)

To: MEADE as 1st Tier Contractor under ComEd as Prime Contractor and the City of Chicago.
(Name of Prime Contractor)

The MBE or WBE status of the undersigned is confirmed by the attached City of Chicago or Cook County Certification Letter. 100% MBE or WBE participation is credited for the use of a MBE or WBE "manufacturer." 60% participation is credited for the use of a MBE or WBE "regular dealer."

The undersigned is prepared to perform the following services in connection with the above named project/contract. If more space is required to fully describe the MBE or WBE proposed scope of work and/or payment schedule, attach additional sheets as necessary. The description must establish that the undersigned is performing a commercially useful function:

Removal and installation of luminaires

The above described performance is offered for the following price and described terms of payment:

<u>Pay Item No./Description</u>	<u>Quantity/Unit Price</u>	<u>Total</u>
Remove and install residential legacy luminaires	21,300 / \$120.00	2,556,000.00

Subtotal: \$ 2,556,000.00

Total @ 100%: \$ 2,556,000.00

Total @ 60% (if the undersigned is performing work as a regular dealer): \$ _____

NOTICE: THIS SCHEDULE AND ATTACHMENTS REQUIRE ORIGINAL SIGNATURES ON EACH PAGE.

(If not the undersigned, signature of person who filled out this Schedule C) (Date)

(Name/Title-Please Print) (Company Name-Please Print)

Kelvin D Owens NOVEMBER 28 2016
(Signature of President/Owner/CEO or Authorized Agent of MBE/WBE) (Date)

KELVIN D OWENS - CHIEF OF STAFF
(Name/Title-Please Print)

Schedule C: MBE/WBE Letter of Intent to Perform as a Subcontractor to the Prime Contractor

Partial Pay Items

For any of the above items that are partial pay items, specifically describe the work and subcontract dollar amount(s):

Pay Item No./Description	Quantity/Unit Price	Total

Subtotal: \$ _____

Total @ 100%: \$ _____

Total @ 60% (if the undersigned is performing work as a regular dealer): \$ _____

SUB-SUBCONTRACTING LEVELS

A zero (0) must be shown in each blank if the MBE or WBE will not be subcontracting any of the work listed or attached to this schedule.

_____ % of the dollar value of the MBE or WBE subcontract that will be subcontracted to non MBE/WBE contractors.

_____ % of the dollar value of the MBE or WBE subcontract that will be subcontracted to MBE or WBE contractors.

NOTICE: If any of the MBE or WBE scope of work will be subcontracted, list the name of the vendor and attach a brief explanation, description and pay item number of the work that will be subcontracted. MBE/WBE credit will not be given for work subcontracted to Non-MBE/WBE contractors, except for as allowed in the Special Conditions Regarding Minority Business Enterprise Commitment and Women Business Enterprise Commitment in Construction Contracts.

The undersigned will enter into a formal written agreement for the above work with you as a Prime Contractor, conditioned upon your execution of a contract with the City of Chicago, within three (3) business days of your receipt of a signed contract from the City of Chicago.

The undersigned has entered into a formal written mentor protégé agreement as a subcontractor/protégé with you as a Prime Contractor/mentor. () Yes () No

NOTICE: THIS SCHEDULE AND ATTACHMENTS REQUIRE ORIGINAL SIGNATURES ON EACH PAGE.

(If not the undersigned, signature of person who filled out this Schedule C) (Date)

(Name/Title-Please Print) (Company Name-Please Print)

(Email & Phone Number)

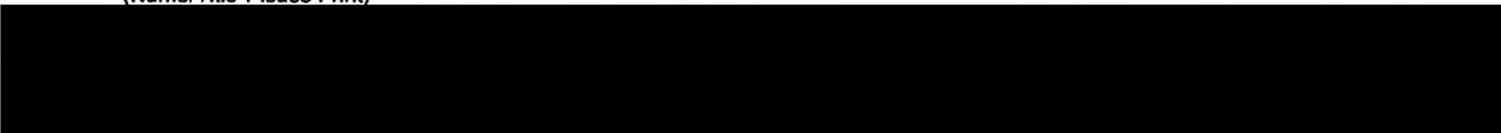
Kevin D Owens

NOVEMBER 28 2016

(Signature of President/Owner/CEO or Authorized Agent of MBE/WBE) (Date)

KELVIN D OWENS - CHIEF OF STAFF

(Name/Title-Please Print)





SCHEDULE C: MBE/WBE Letter of Intent to Perform as a 2nd Tier Subcontractor to the Prime Contractor

**FOR
CONSTRUCTION
PROJECTS ONLY**

NOTICE: THIS SCHEDULE MUST BE AUTHORIZED AND SIGNED BY THE MBE/WBE SUBCONTRACTOR FIRM. FAILURE TO COMPLY MAY RESULT IN THE BID BEING REJECTED AS NON-RESPONSIVE.

Project Name: Chicago Infrastructure Smart Lighting Project Specification No.: _____

From: MZI Group, Inc.
(Name of MBE/WBE Firm)

To: Meade, Inc.
(Name of 1st Tier Contractor)

To: ComEd and the City of Chicago.
(Name of Prime Contractor)

The MBE or WBE status of the undersigned is confirmed by the attached City of Chicago or Cook County Certification Letter. 100% MBE or WBE participation is credited for the use of a MBE or WBE "manufacturer." 60% participation is credited for the use of a MBE or WBE "regular dealer."

The undersigned is prepared to perform the following services in connection with the above named project/contract. If more space is required to fully describe the MBE or WBE proposed scope of work and/or payment schedule, attach additional sheets as necessary. The description must establish that the undersigned is performing a commercially useful function:

Removal and installation of luminaires

The above described performance is offered for the following price and described terms of payment:

<u>Pay Item No./Description</u>	<u>Quantity/Unit Price</u>	<u>Total</u>
Remove & install residential legacy LED luminaires	21,300/ \$120 ea	\$2,556,000

Subtotal: \$ \$2,556,000

Total @ 100%: \$ \$2,556,000

Total @ 60% (if the undersigned is performing work as a regular dealer): \$ _____

NOTICE: THIS SCHEDULE AND ATTACHMENTS REQUIRE ORIGINAL SIGNATURES ON EACH PAGE.

(If not the undersigned, signature of person who filled out this Schedule C) (Date)

(Name/Title-Please Print) (Company Name-Please Print)

Arthur Miller 1/4/2017
(Signature of President/Owner/CEO or Authorized Agent of MBE/WBE) (Date)

(Name/Title-Please Print)

Schedule C: MBE/WBE Letter of Intent to Perform as a 2nd Tier Subcontractor to the Prime Contractor

Partial Pay Items

For any of the above items that are partial pay items, specifically describe the work and subcontract dollar amount(s):

<u>Pay Item No./Description</u>	<u>Quantity/Unit Price</u>	<u>Total</u>

Subtotal: \$ _____

Total @ 100%: \$ _____

Total @ 60% (if the undersigned is performing work as a regular dealer): \$ _____

SUB-SUBCONTRACTING LEVELS

A zero (0) must be shown in each blank if the MBE or WBE will not be subcontracting any of the work listed or attached to this schedule.

 0 % of the dollar value of the MBE or WBE subcontract that will be subcontracted to non MBE/WBE contractors.
 0 % of the dollar value of the MBE or WBE subcontract that will be subcontracted to MBE or WBE contractors.

NOTICE: If any of the MBE or WBE scope of work will be subcontracted, list the name of the vendor and attach a brief explanation, description and pay item number of the work that will be subcontracted. MBE/WBE credit will not be given for work subcontracted to Non-MBE/WBE contractors, except for as allowed in the Special Conditions Regarding Minority Business Enterprise Commitment and Women Business Enterprise Commitment in Construction Contracts.

The undersigned will enter into a formal written agreement for the above work with you as a Prime Contractor, conditioned upon your execution of a contract with the City of Chicago, within three (3) business days of your receipt of a signed contract from the City of Chicago.

The undersigned has entered into a formal written mentor protégé agreement as a subcontractor/protégé with you as a Prime Contractor/mentor: () Yes (X) No

NOTICE: THIS SCHEDULE AND ATTACHMENTS REQUIRE ORIGINAL SIGNATURES ON EACH PAGE.

 (If not the undersigned, signature of person who filled out this Schedule C) (Date)

WBE SUBCON

 (Name/Title-Please Print) (Company Name-Please Print)

 (Email & Phone Number)

1/4/2017

 (Signature of President/Owner/CEO or Authorized Agent of MBE/WBE) (Date)

Arthur Miller President
 (Name/Title-Please Print)

amiller@mzigroup.com 312-492-8740
 (Email & Phone Number)



**FOR
CONSTRUCTION
PROJECTS ONLY**

**SCHEDULE C: MBE/WBE Letter of Intent to Perform as a
2nd Tier Subcontractor to the Prime Contractor**

**NOTICE: THIS SCHEDULE MUST BE AUTHORIZED AND SIGNED BY THE MBE/WBE SUBCONTRACTOR FIRM.
FAILURE TO COMPLY MAY RESULT IN THE BID BEING REJECTED AS NON-RESPONSIVE.**

Project Name: Chiscago Infrastructure Tust LED RFP Specification No.: _____

From: Taylor Electric Company, Inc.
(Name of MBE/WBE Firm)

To: Meade, Inc.
(Name of 1st Tier Contractor)

To: Com ED and the City of Chicago.
(Name of Prime Contractor)

The MBE or WBE status of the undersigned is confirmed by the attached City of Chicago or Cook County Certification Letter. 100% MBE or WBE participation is credited for the use of a MBE or WBE "manufacturer." 60% participation is credited for the use of a MBE or WBE "regular dealer."

The undersigned is prepared to perform the following services in connection with the above named project/contract. If more space is required to fully describe the MBE or WBE proposed scope of work and/or payment schedule, attach additional sheets as necessary. The description must establish that the undersigned is performing a commercially useful function:
Perform power center modifications for lighting management system

The above described performance is offered for the following price and described terms of payment:

<u>Pay Item No./Description</u>	<u>Quantity/Unit Price</u>	<u>Total</u>
Power Center Modifications	TBD	\$2,000,000.00

Subtotal: \$2,000,000.00

Total @ 100%: \$ 2,000,000.00

Total @ 60% (if the undersigned is performing work as a regular dealer): \$ _____

NOTICE: THIS SCHEDULE AND ATTACHMENTS REQUIRE ORIGINAL SIGNATURES ON EACH PAGE.

(If not the undersigned, signature of person who filled out this Schedule C) (Date)

(Name/Title-Please Print) (Company Name-Please Print)

Taylor Electric Company, Inc.

(Signature of President/Owner/CEO or Authorized Agent of MBE/WBE) (Date)

Karen Michele Dinkins, Executive vice President 11/30/2016

(Name/Title-Please Print)

Schedule C: MBE/WBE Letter of Intent to Perform as a 2nd Tier Subcontractor to the Prime Contractor

Partial Pay Items

For any of the above items that are partial pay items, specifically describe the work and subcontract dollar amount(s):

<u>Pay Item No./Description</u>	<u>Quantity/Unit Price</u>	<u>Total</u>

Subtotal: \$ _____

Total @ 100%: \$ _____

Total @ 60% (if the undersigned is performing work as a regular dealer): \$ _____

SUB-SUBCONTRACTING LEVELS

A zero (0) must be shown in each blank if the MBE or WBE will not be subcontracting any of the work listed or attached to this schedule.

- 0 % of the dollar value of the MBE or WBE subcontract that will be subcontracted to non MBE/WBE contractors.
- 0 % of the dollar value of the MBE or WBE subcontract that will be subcontracted to MBE or WBE contractors.

NOTICE: If any of the MBE or WBE scope of work will be subcontracted, list the name of the vendor and attach a brief explanation, description and pay item number of the work that will be subcontracted. MBE/WBE credit will not be given for work subcontracted to Non-MBE/WBE contractors, except for as allowed in the Special Conditions Regarding Minority Business Enterprise Commitment and Women Business Enterprise Commitment in Construction Contracts.

The undersigned will enter into a formal written agreement for the above work with you as a Prime Contractor, conditioned upon your execution of a contract with the City of Chicago, within three (3) business days of your receipt of a signed contract from the City of Chicago.

The undersigned has entered into a formal written mentor protégé agreement as a subcontractor/protégé with you as a Prime Contractor/mentor: () Yes (X) No

NOTICE: THIS SCHEDULE AND ATTACHMENTS REQUIRE ORIGINAL SIGNATURES ON EACH PAGE.

(If not the undersigned, signature of person who filled out this Schedule C) (Date)

(Name/Title-Please Print) (Company Name-Please Print)

(Email & Phone Number)

Karen Michele Dinkins

(Signature of President/Owner/CEO or Authorized Agent of MBE/WBE)

(Date)

Karen Michele Dinkins, Executive Vice President

11/30/2016

(Name/Title-Please Print)





**FOR
CONSTRUCTION
PROJECTS ONLY**

**SCHEDULE C: MBE/WBE Letter of Intent to Perform as a
2nd Tier Subcontractor to the Prime Contractor**

**NOTICE: THIS SCHEDULE MUST BE AUTHORIZED AND SIGNED BY THE MBE/WBE SUBCONTRACTOR FIRM.
FAILURE TO COMPLY MAY RESULT IN THE BID BEING REJECTED AS NON-RESPONSIVE.**

Project Name: CHICAGO SMART LIGHTING PROJECT Specification No.: _____

From: AGB Investigative Services, Inc.
(Name of MBE/WBE Firm)

To: ELECTRICAL RESOURCE MANAGEMENT, INC.
(Name of 1st Tier Contractor)

To: COMMONWEALTH EDISON COMPANY and the City of Chicago.
(Name of Prime Contractor)

The MBE or WBE status of the undersigned is confirmed by the attached City of Chicago or Cook County Certification Letter. 100% MBE or WBE participation is credited for the use of a MBE or WBE "manufacturer." 60% participation is credited for the use of a MBE or WBE "regular dealer."

The undersigned is prepared to perform the following services in connection with the above named project/contract. If more space is required to fully describe the MBE or WBE proposed scope of work and/or payment schedule, attach additional sheets as necessary. The description must establish that the undersigned is performing a commercially useful function:
ASSET CONDITION ASSESSMENT SUPPORT

The above described performance is offered for the following price and described terms of payment:

Pay Item No./Description	Quantity/Unit Price	Total
ASSET CONDITION ASSESSMENT SUPPORT	1 / LS	20,000

Subtotal: \$ 20,000

Total @ 100%: \$ 20,000

Total @ 60% (If the undersigned is performing work as a regular dealer): \$ _____

NOTICE: THIS SCHEDULE AND ATTACHMENTS REQUIRE ORIGINAL SIGNATURES ON EACH PAGE.

Rajah Welcome 11/28/16
(If not the undersigned, signature of person who filled out this Schedule C) (Date)

Rajah Welcome - Contract Compliance AGB Investigative Services
(Name/Title-Please Print) (Company Name-Please Print)

[Signature] 11/28/16
(Signature of President/Owner/CEO or Authorized Agent of MBE/WBE) (Date)

John Griffin Jr.
(Name/Title-Please Print)

Schedule C: MBE/WBE Letter of Intent to Perform as a 2nd Tier Subcontractor to the Prime Contractor

Partial Pay Items

For any of the above items that are partial pay items, specifically describe the work and subcontract dollar amount(s):

<u>Pay Item No./Description</u>	<u>Quantity/Unit Price</u>	<u>Total</u>

Subtotal: \$ _____

Total @ 100%: \$ _____

Total @ 60% (if the undersigned is performing work as a regular dealer): \$ _____

SUB-SUBCONTRACTING LEVELS

A zero (0) must be shown in each blank if the MBE or WBE will not be subcontracting any of the work listed or attached to this schedule.

_____ % of the dollar value of the MBE or WBE subcontract that will be subcontracted to non MBE/WBE contractors.

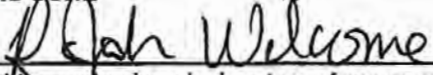
_____ % of the dollar value of the MBE or WBE subcontract that will be subcontracted to MBE or WBE contractors.

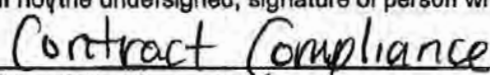
NOTICE: If any of the MBE or WBE scope of work will be subcontracted, list the name of the vendor and attach a brief explanation, description and pay item number of the work that will be subcontracted. MBE/WBE credit will not be given for work subcontracted to Non-MBE/WBE contractors, except for as allowed in the Special Conditions Regarding Minority Business Enterprise Commitment and Women Business Enterprise Commitment In Construction Contracts.

The undersigned will enter into a formal written agreement for the above work with you as a Prime Contractor, conditioned upon your execution of a contract with the City of Chicago, within three (3) business days of your receipt of a signed contract from the City of Chicago.

The undersigned has entered into a formal written mentor protégé agreement as a subcontractor/protégé with you as a Prime Contractor/mentor: () Yes () No


NOTICE: THIS SCHEDULE AND ATT. CHMENTS REQUIRE ORIGINAL SIGNATURES ON EACH PAGE.


11/28/16

 (If not the undersigned, signature of person who filled out this Schedule C) (Date)

AGB Investigative Services

 (Name/Title-Please Print) (Company Name-Please Print)




11/28/16

 (Signature of President/Owner/CEO or Authorized Agent of MBE/WBE) (Date)





**FOR
CONSTRUCTION
PROJECTS ONLY**

**SCHEDULE C: MBE/WBE Letter of Intent to Perform as a
2nd Tier Subcontractor to the Prime Contractor**

**NOTICE: THIS SCHEDULE MUST BE AUTHORIZED AND SIGNED BY THE MBE/WBE SUBCONTRACTOR FIRM.
FAILURE TO COMPLY MAY RESULT IN THE BID BEING REJECTED AS NON-RESPONSIVE.**

Project Name: Chicago Smart Lighting Project Specification No.: _____

From: City Lights LTD
(Name of MBE/WBE Firm)

To: Meade, Inc.
(Name of 1st Tier Contractor)

To: ComEd and the City of Chicago.
(Name of Prime Contractor)

The MBE or WBE status of the undersigned is confirmed by the attached City of Chicago or Cook County Certification Letter. 100% MBE or WBE participation is credited for the use of a MBE or WBE "manufacturer." 60% participation is credited for the use of a MBE or WBE "regular dealer."

The undersigned is prepared to perform the following services in connection with the above named project/contract. If more space is required to fully describe the MBE or WBE proposed scope of work and/or payment schedule, attach additional sheets as necessary. The description must establish that the undersigned is performing a commercially useful function:

Electrical Construction, Fixture Change Out, Technology Service Installation
Infrastructure stabilization

The above described performance is offered for the following price and described terms of payment:

<u>Pay Item No./Description</u>	<u>Quantity/Unit Price</u>	<u>Total</u>
REM & INSTALL ARTERIAL FEEDER LEGACY	44,000 / \$123.00	5,412,000.00
REM & RE-INSTALL LED UP VIADUCT LUM	16,000 / \$805.00	12,880,000.00
INFRASTRUCTURE STABILIZATION	TBD	2,708,000.00

Subtotal: \$ 21,000,000.00

Total @ 100%: \$ 21,000,000.00

Total @ 60% (if the undersigned is performing work as a regular dealer): \$ _____

NOTICE: THIS SCHEDULE AND ATTACHMENTS REQUIRE ORIGINAL SIGNATURES ON EACH PAGE.

(If not the undersigned, signature of person who filled out this Schedule C) (Date)

(Name/Title-Please Print) (Company Name-Please Print)

11-28-16
(Signature of President/Owner/CEO or Authorized Agent of MBE/WBE) (Date)

Jacqueline Hoffman, President
(Name/Title-Please Print)

Schedule C: MBE/WBE Letter of Intent to Perform as a 2nd Tier Subcontractor to the Prime Contractor

Partial Pay Items

For any of the above items that are partial pay items, specifically describe the work and subcontract dollar amount(s):

<u>Pay Item No./Description</u>	<u>Quantity/Unit Price</u>	<u>Total</u>

Subtotal: \$ _____

Total @ 100%: \$ _____

Total @ 60% (if the undersigned is performing work as a regular dealer): \$ _____

SUB-SUBCONTRACTING LEVELS

A zero (0) must be shown in each blank if the MBE or WBE will not be subcontracting any of the work listed or attached to this schedule.

 0 % of the dollar value of the MBE or WBE subcontract that will be subcontracted to non MBE/WBE contractors.
 0 % of the dollar value of the MBE or WBE subcontract that will be subcontracted to MBE or WBE contractors.

NOTICE: If any of the MBE or WBE scope of work will be subcontracted, list the name of the vendor and attach a brief explanation, description and pay item number of the work that will be subcontracted. MBE/WBE credit will not be given for work subcontracted to Non-MBE/WBE contractors, except for as allowed in the Special Conditions Regarding Minority Business Enterprise Commitment and Women Business Enterprise Commitment in Construction Contracts.

The undersigned will enter into a formal written agreement for the above work with you as a Prime Contractor, conditioned upon your execution of a contract with the City of Chicago, within three (3) business days of your receipt of a signed contract from the City of Chicago.

The undersigned has entered into a formal written mentor protégé agreement as a subcontractor/protégé with you as a Prime Contractor/mentor: () Yes (XX) No

NOTICE: THIS SCHEDULE AND ATTACHMENTS REQUIRE ORIGINAL SIGNATURES ON EACH PAGE.

 (If not the undersigned, signature of person who filled out this Schedule C) (Date)

 (Name/Title-Please Print) (Company Name-Please Print)

 (Email & Phone Number)

 (Signature of President/Owner/CEO or Authorized Agent of MBE/WBE) 11-28-2016
 (Date)

Jacqueline Hoffman, President
 (Name/Title-Please Print)



FOR
CONSTRUCTION
PROJECTS ONLY

SCHEDULE C: MBE/WBE Letter of Intent to Perform as a 2nd Tier Subcontractor to the Prime Contractor

**NOTICE: THIS SCHEDULE MUST BE AUTHORIZED AND SIGNED BY THE MBE/WBE SUBCONTRACTOR FIRM.
FAILURE TO COMPLY MAY RESULT IN THE BID BEING REJECTED AS NON-RESPONSIVE.**

Project Name: CHICAGO SMART LIGHTING PROJECT Specification No.: _____

From: EverLights, Inc.

(Name of MBE/WBE Firm)

To: ELECTRICAL RESOURCE MANAGEMENT, INC.

(Name of 1st Tier Contractor)

To: COMMONWEALTH EDISON COMPANY and the City of Chicago.

(Name of Prime Contractor)

The MBE or WBE status of the undersigned is confirmed by the attached City of Chicago or Cook County Certification Letter. 100% MBE or WBE participation is credited for the use of a MBE or WBE "manufacturer." 60% participation is credited for the use of a MBE or WBE "regular dealer."

The undersigned is prepared to perform the following services in connection with the above named project/contract. If more space is required to fully describe the MBE or WBE proposed scope of work and/or payment schedule, attach additional sheets as necessary. The description must establish that the undersigned is performing a commercially useful function:

SALVAGE / RECYCLE LEGACY EQUIPMENT

The above described performance is offered for the following price and described terms of payment:

<u>Pay Item No./Description</u>	<u>Quantity/Unit Price</u>	<u>Total</u>
<u>SALVAGE / RECYCLE LEGACY EQUIPMENT</u>	<u>TBD</u>	<u>TBD</u>

Subtotal: \$ _____

Total @ 100%: \$ TBD

Total @ 60% (if the undersigned is performing work as a regular dealer): \$ _____

NOTICE: THIS SCHEDULE AND ATTACHMENTS REQUIRE ORIGINAL SIGNATURES ON EACH PAGE.

(If not the undersigned, signature of person who filled out this Schedule C) (Date)

EverLights, Inc.

(Name/Title-Please Print)

(Company Name-Please Print)

11/29/2016

(Signature of President/Owner/CEO or Authorized Agent of MBE/WBE)

(Date)

Kelly Gallagher/President

(Name/Title-Please Print)

Schedule C: MBE/WBE Letter of Intent to Perform as a 2nd Tier Subcontractor to the Prime Contractor

Partial Pay Items

For any of the above items that are partial pay items, specifically describe the work and subcontract dollar amount(s):

<u>Pay Item No./Description</u>	<u>Quantity/Unit Price</u>	<u>Total</u>

Subtotal: \$ _____

Total @ 100%: \$ _____

Total @ 60% (if the undersigned is performing work as a regular dealer): \$ _____

SUB-SUBCONTRACTING LEVELS

A zero (0) must be shown in each blank if the MBE or WBE will not be subcontracting any of the work listed or attached to this schedule.

 0 % of the dollar value of the MBE or WBE subcontract that will be subcontracted to non MBE/WBE contractors.
 0 % of the dollar value of the MBE or WBE subcontract that will be subcontracted to MBE or WBE contractors.

NOTICE: If any of the MBE or WBE scope of work will be subcontracted, list the name of the vendor and attach a brief explanation, description and pay item number of the work that will be subcontracted. MBE/WBE credit will not be given for work subcontracted to Non-MBE/WBE contractors, except for as allowed in the Special Conditions Regarding Minority Business Enterprise Commitment and Women Business Enterprise Commitment in Construction Contracts.

The undersigned will enter into a formal written agreement for the above work with you as a Prime Contractor, conditioned upon your execution of a contract with the City of Chicago, within three (3) business days of your receipt of a signed contract from the City of Chicago.

The undersigned has entered into a formal written mentor protégé agreement as a subcontractor/protégé with you as a Prime Contractor/mentor: () Yes (X) No

NOTICE: THIS SCHEDULE AND ATTACHMENTS REQUIRE ORIGINAL SIGNATURES ON EACH PAGE.

 (If not the undersigned, signature of person who filled out this Schedule C) (Date)

 (Name/Title-Please Print) (Company Name-Please Print)

 (Email & Phone Number) 11/29/2016

 (Signature of President/Owner/CEO or Authorized Agent of MBE/WBE) (Date)

Kelly Gallagher/President
 (Name/Title-Please Print)



**SCHEDULE D: Compliance Plan Regarding
MBE & WBE Utilization Affidavit of Prime Contractor**

**FOR
CONSTRUCTION
PROJECTS ONLY**

**MUST BE SUBMITTED WITH THE BID. FAILURE TO SUBMIT THE SCHEDULE D WILL CAUSE
THE BID TO BE REJECTED. DUPLICATE AS NEEDED.**

Project Name: Chicago Smart Lighting

Specification No.: N/A

In connection with the above captioned contract, I HEREBY DECLARE AND AFFIRM that I am the
President & CEO and a duly authorized representative of
(Title of Affiant)

Commonwealth Edison Company
(Name of Prime Contractor)

and that I have personally reviewed the material and facts set forth in the attached Schedule Cs regarding Minority Business Enterprise and Women Business Enterprise (MBE/WBE) to perform as subcontractor, Joint Venture Agreement, and Schedule B (if applicable). All MBEs and WBEs must be certified with the City of Chicago or Cook County in the area(s) of specialty listed.

<u>Name of MBE</u>	<u>Type of Work to be Performed in accordance with Schedule Cs</u>	<u>Total MBE Participation in dollars</u>	<u>MBE Participation in percentage</u>	<u>Mentor Protégé Program Credit Claimed</u>	<u>Total MBE Participation in percentage</u>
Electrical Resource Management, inc.	Material supply and asset condition assessment	\$9,317,400	2.74%	%	2.74%
Lyons View Manufacturing and Supply, Inc.	Fixture manufacturing and material supply	\$95,886,200	28.20%	%	28.20%
PMI Energy Solutions	Electrical installation labor	\$2,556,000	0.75%	%	0.75%
MZI Group, Inc.	Electrical installation labor	\$2,556,000	0.75%	%	0.75%
Taylor Electric Company	Electrical installation labor	\$2,000,000	0.59%	%	0.59%
AGB Investigative Services, Inc.	Security for field crews	\$20,000	0.01%	%	0.01%
		\$	%	%	%
		\$	%	%	%
		\$	%	%	%
		\$	%	%	%

<u>Name of WBE</u>	<u>Type of Work to be Performed in accordance with Schedule Cs</u>	<u>Total WBE Participation in dollars</u>	<u>WBE Participation in percentage</u>	<u>Mentor Protégé Program Credit Claimed</u>	<u>Total WBE Participation in percentage</u>
City Lights, Ltd.	Electrical installation labor	\$21,000,000	6.18%	%	6.18%
EverLights, Inc.	Fixture recycling and asset condition assessment support	\$0*	0%	%	0%
		\$	%	%	%
		\$	%	%	%
		\$	%	%	%

* Paid through salvage and recycling of material

Check here if the following is applicable: The Prime Contractor intends to enter into mentor protégé agreements with certain MBEs/WBEs listed above as indicated by entries in the "Mentor Protégé Program Credit Claimed" column. Copies of each proposed mentoring program, executed by authorized representatives of the Prime Contractor and respective subcontractor, are attached to this Schedule D. The Prime Contractor may claim an additional 0.333 percent participation credit (up to a maximum of five (5) percent) for every one (1) percent of the value of the contract performed by the MBE/WBE protégé firm.

Total MBE Participation \$ 112,335,600

Total MBE Participation % (including any Mentor Protégé Program credit) 33.04%

Total WBE Participation \$ 21,000,000

Total WBE Participation % (including any Mentor Protégé Program credit) 6.18%

Total Bid \$ 340,000,000

To the best of my knowledge, information and belief the facts and representations contained in the aforementioned attached Schedules are true, and no material facts have been omitted.

The Prime Contractor designates the following person as its MBE/WBE Liaison Officer:

Joe Svachula

(630) 576-6108

(Name- Please Print or Type)

(Phone)

I DO SOLEMNLY DECLARE AND AFFIRM UNDER PENALTIES OF PERJURY THAT THE CONTENTS OF THE FOREGOING DOCUMENT ARE TRUE AND CORRECT, AND THAT I AM AUTHORIZED ON BEHALF OF THE PRIME CONTRACTOR TO MAKE THIS AFFIDAVIT.

Commonwealth Edison Company State of: Illinois
(Name of Prime Contractor - Print or Type)

Anne R. Pramaggiore County of: Cook
(Signature)

Anne Pramaggiore / President & CEO
(Name/Title of Affiant Print or Type)

1/6/2017
(Date)

On this 6th day of January, 2017, the above signed officer Anne R. Pramaggiore
(Name of Affiant)

personally appeared and, known by me to be the person described in the foregoing Affidavit, acknowledged that (s)he executed the same in the capacity stated therein and for the purposes therein contained. IN WITNESS WHEREOF, I hereunto set my hand and seal.

Sharon Brookins
(Notary Public Signature)

Commission Expires: 11/21/2018

SEAL:



SCHEDULE F: REPORT OF SUBCONTRACTOR SOLICITATIONS FOR CONSTRUCTION CONTRACTS

Submit Schedule F with the bid. Failure to submit the Schedule F may cause the bid to be rejected.

Duplicate sheets as needed.

Project Name: Chicago Smart Lighting

Specification #: N/A

I, Ame R. Pranggiore on behalf of Commonwealth Edison Company
(Name of reporter) (Prime contractor)

(A) have either personally solicited, or permitted a duly authorized representative of this firm to solicit, work for this contract from the following subcontractors which comprise all MBE/WBE and non-MBE/WBE subcontractors who bid or quoted price information on this contract

Company Name Electrical Resource Management, Inc. (a Will Group Company)
Business Address 5261 West Harrison Street, Chicago, IL 60644
Contact Person Matthew O'Brien
Date of contact 11/29/16
Method of contact Meeting
Response to solicitation Accepted
Type of Work Solicited Material supply, asset condition assessment
Please circle classification: MBE Certified WBE Certified MBE & WBE Certified Non- Certified

Company Name Lyons View Manufacturing & Supply, Inc. (a Will Group Company)
Business Address 5261 West Harrison Street, Chicago, IL 60644
Contact Person Joshua Davis
Date of contact 11/29/16
Method of contact Meeting
Response to solicitation Accepted
Type of Work Solicited Fixture Manufacture and Material supply
Please circle classification: MBE Certified WBE Certified MBE & WBE Certified Non- Certified

Company Name PMI Energy Solutions
Business Address 1890 Suncast Lane
Contact Person George Williams
Date of contact 5/16/16
Method of contact Call
Response to solicitation Accepted
Type of Work Solicited Electrical installation labor
Please circle classification: MBE Certified WBE Certified MBE & WBE Certified Non- Certified

Company Name MZI Group, Inc.
Business Address 1937 West Fulton Street
Contact Person Kim Nelson
Date of contact 12/5/16
Method of contact Call
Response to solicitation Accepted
Type of Work Solicited Electrical installation labor
Please circle classification: MBE Certified WBE Certified MBE & WBE Certified Non- Certified

Company Name Taylor Electric Company
Business Address 7811 South Stony Island, Chicago, IL 60649
Contact Person Kendra Dinkins
Date of contact 11/29/16
Method of contact Call
Response to solicitation Accepted
Type of Work Solicited Electrical installation labor
Please circle classification: MBE Certified WBE Certified MBE & WBE Certified Non- Certified

Company Name AGB Investigative Services, Inc.
Business Address 2033 West 95th Street, Chicago, IL 60643
Contact Person John Griffin, Jr.
Date of contact 11/29/16
Method of contact Call
Response to solicitation Accepted
Type of Work Solicited Security for field crews
Please circle classification: MBE Certified WBE Certified MBE & WBE Certified Non- Certified

Company Name Quantum Crossings, LLC
Business Address 111 East Wacker Drive, Suite 990, Chicago, IL 60601
Contact Person Roger Martinez
Date of contact 5/16/16
Method of contact Call
Response to solicitation Pending future work orders
Type of Work Solicited Technology support
Please circle classification: MBE Certified WBE Certified MBE & WBE Certified Non- Certified

Company Name City Lights, Ltd.
Business Address 9993 Virginia Avenue, Chicago Ridge, IL 60415
Contact Person Jacqueline Hoffman
Date of contact 11/29/16
Method of contact Call
Response to solicitation Accepted
Type of Work Solicited Electrical installation labor
Please circle classification: MBE Certified WBE Certified MBE & WBE Certified Non- Certified

Company Name Everlights, Inc.
Business Address 8027 North Lawndale Avenue, Skokie, IL 60076
Contact Person Kelly Gallagher
Date of contact 11/29/16
Method of contact Call
Response to solicitation Accepted
Type of Work Solicited Fixture recycling and asset condition assessment support
Please circle classification: MBE Certified WBE Certified MBE & WBE Certified Non- Certified

I DO SOLEMNLY DECLARE AND AFFIRM UNDER PENALTIES OF PERJURY THAT THE CONTENTS OF THE FOREGOING DOCUMENT ARE TRUE AND CORRECT, AND THAT I AM AUTHORIZED ON BEHALF OF THE PRIME CONTRACTOR TO MAKE THIS AFFIDAVIT.

Commonwealth Edison Company
(Name of Prime Contractor - Print or Type)
Anne R. Pramaggiore
(Signature)
Anne R. Pramaggiore / President & CEO
(Name/Title of Affiant) - Print or Type
1/6/2017
(Date)

On this 6th day of January, 2017,
the above signed officer, Anne R. Pramaggiore
(Name of Affiant)

personally appeared and, known by me to be the person described in the foregoing Affidavit, acknowledged that (s)he executed the same in the capacity stated therein and for the purposes therein contained.

IN WITNESS WHEREOF, I hereunto set my hand and seal.

Sharon Brookins
Notary Public Signature

Commission Expires: 11/21/2018



Form 12: Proposer’s Affidavit Regarding Identification of All Waste and Material Handling and Disposal Facilities

Proposer to show here the name and location of the waste and material recovery facilities he/she is proposing to use for the Project. Complete one page per facility:

SPECIFY THE TYPE OF MATERIALS TO BE DISPOSED OF:

Fixture includes

Cast Aluminum Housing / Lens Frame / Door Frame / Reflector

HID Ballast / Glass or Acrylic Lens

Lamp

LEGAL NAME OF WASTE AND MATERIAL RECOVERY FACILITY:

United Scrap / Universal Scrap Metals / Alpha Metals / Everlights

(The Contractor will provide to the City copies of all dump tickets, manifests, etc.)

LOCATION ADDRESS: 5261 W. Harrison Street, Chicago, IL 60644

PHONE: [REDACTED]

CONTACT PERSON: Joe Siddens

If requested by the Chief Procurement Officer, the Contractor must submit copies of all contractual agreements, permits and/or licenses for those waste and material recovery facilities proposed by the Contractor.

Proposer to show here the name and location of the waste and material recovery facilities he/she is proposing to use for the Project. Complete one page per facility:

SPECIFY THE TYPE OF MATERIALS TO BE DISPOSED OF:

LEGAL NAME OF WASTE AND MATERIAL RECOVERY FACILITY:

(The Contractor will provide to the City copies of all dump tickets, manifests, etc.)

LOCATION ADDRESS:

PHONE: () _____

CONTACT PERSON: _____

If requested by the Chief Procurement Officer, the Contractor must submit copies of all contractual agreements, permits and/or licenses for those waste and material recovery facilities proposed by the Contractor.

Form 13: Proposer's Commitment to Minority and Female Employee Utilization Goals

In accordance with Chapter 2-92 of the Municipal Code of Chicago, and in order to promote equality of opportunity for minority and female personnel on this project, each Proposer is invited to propose the minority and female employee utilization goals for the project, as percentages of the journeyworker and apprentice and laborer hours to be expended in the construction of the project.

Actual amounts of minority and female work will be measured for the total hours of construction workers employed on the projects within each of the categories of journeyworkers, apprentice, laborers by the contractor and all of the worksite subcontractors.

This commitment will apply only to the LED conversion and infrastructure stabilization work. Proposer must fill out the following chart to indicate its utilization goals with respect to the LED conversion and infrastructure stabilization portions of this Project.

Line 1	Percentage of the total journeyworker hours that the Proposer proposes to be worked by minority Journeyworkers during construction of the Project.	<u>5</u> %
Line 2	Percentage of the total Apprentice hours that the Proposer proposes to be worked by minority Apprentices during construction of the project.	<u>50</u> %
Line 3	Percentage of the total Laborer hours that the Proposer proposes to be worked by minority Laborers during construction of the project.	<u>N/A</u> %
Line 4	Percentage of the total Journeyworker hours that the Proposer proposes to be worked by female Journeyworkers during construction of the project.	<u>1</u> %
Line 5	Percentage of the total Apprentice hours that the Proposer proposes to be worked by female Apprentices during construction of the project.	<u>3</u> %
Line 6	Percentage of the total Laborer hours that the Proposer proposes to be worked by female Laborers during construction of the project.	<u>N/A</u> %

The Proposer is obligated to meet the total commitment made in each category, subject to liquidated damages as described below for noncompliance. The Proposer hereby consents and agrees that, in the event of failure to comply with each of the minimum commitments submitted with the proposal on Lines 1 through 6 above, covering Journeyworkers, Apprentices, and Laborers, respectively, the following shall apply to determine a monetary sum to be withheld from the final payment to the Proposer.

In calculating the aggregated work hours toward the utilization goal for construction Journeyworkers, Apprentices, or Laborers under this chart, the Proposer shall be given 150% credit for every work hour performed by a minority or woman worker residing within a socio-economically disadvantaged area. The criteria for designation of an area as socio-economically disadvantaged, which include but are not limited to the median family income of an area, is set forth in rules promulgated by the Commissioner of Planning and Development. Areas designated as socio-economically disadvantaged at the time of this procurement are shown on the map attached in Exhibit G of the ITP.

Liquidated Damages

Liquidated damages will be assessed based on the Selected Proposer's failure to meet its utilization goals for the LED conversion and infrastructure stabilization portion of this Project. Utilization goals will be calculated on a Project Phase by Project Phase basis. The value of the LED conversion and infrastructure stabilization work to which this commitment will apply is the total amount spent on LED conversion and infrastructure stabilization in each given Project Phase ("**Phase Value**").

For each one percent (1%) deficiency of minority journeyworkers not utilized toward the goal (Line 1), four cents for each hundred dollars of the Phase Value, calculated as follows:

Phase Value	X	.04
100		

Each one percent (1%) deficiency of shortfall toward the goal line (Line 4) for female Journeyworkers shall be computed in the same way.

For each one percent (1%) deficiency of minority Apprentices not utilized toward the goal (Line 2), three cents per each hundred dollars of the Phase Value, calculated as follows:

Phase Value	X	.03
100		

Each one percent (1%) of shortfall toward the goal (Line 5) for female Apprentices shall be computed in the same way.

For each one percent (1%) deficiency of minority Laborers not utilized towards the goal (Line 3), one cent per each hundred dollars of the Phase Value, calculated as follows:

Phase Value	X	.01
100		

Each one percent shortfall toward the goal (Line 6) for female Laborers shall be computed in the same way.

Reporting

The Contractor shall submit to the City on a timely basis a completed weekly certified payroll, (U.S. Department of Labor Form WH-347, Illinois Department of Transportation Form RE-48, or equivalent) with race and gender of employees clearly named or coded each week. The Contractor is responsible for forwarding every worksite Subcontractor’s weekly certified payroll. Supportive information regarding an employee’s race, gender or work classification of such is required by the City. Failure to report fully all required workforce information will subject the contractor to the maximum possible liquidated damages per the formulas above.

In the weekly payroll reports, the following ethnic categories should be used to indicate minority personnel for purposes of calculating progress toward the above utilization goals:

Black	—	Persons having origins in any of the Black racial groups of Africa.
Hispanic	—	Persons of Mexican, Puerto Rican, Cuban, Central American, or other Spanish culture or origin, regardless of race.
Native American	—	Persons who are American Indians, Eskimos, Aleuts or Native Hawaiians.
Asian Pacific	—	Persons whose origins are from Japan, China, Taiwan, Korea, Vietnam, Laos, Cambodia, the Philippines, Samoa, Guam, the U.S. Trust Territories or the Northern Marianas.
Asian Indian	—	Persons whose origins are from India, Pakistan, or Bangladesh.

Included as “Journeyworkers” are the construction site Journeyworkers from the major trades including, without limitation, truck drivers, electrical groundsmen, and elevator construction helpers. Other “Helpers,” watchmen, custodial workers, clerical workers, and salaried superintendents are not creditable. Hourly wage “Foremen” and “General Foremen” will be counted as journeyworkers.

Included as “Apprentices” are only bona fide Apprentices currently in a training program certified by the U.S. Department of Labor — Bureau of Apprenticeship and Training, and for the hours employed at the construction site. Other categories of trainees are not creditable. Individual workers who are both minority and female will have their hours counted towards both a minority goal and any female goal.