

STATE OF ILLINOIS

CONTRACT

Central Management Services

Smart Street Lighting

CMS802850C

The Parties to this contract are the State of Illinois acting through the undersigned Agency (collectively the State) and the Vendor. This contract, consisting of the signature page and numbered sections listed below and any attachments referenced in this contract, constitute the entire contract between the Parties concerning the subject matter of the contract, and in signing the contract, the Contractor affirms that the Certifications and if applicable the Financial Disclosures and Conflicts of Interest attached hereto are true and accurate as of the date of the Contractor's execution of the contract. This contract supersedes all prior proposals, contracts and understandings between the Parties concerning the subject matter of the contract. This contract can be signed in multiple counterparts upon agreement of the Parties.

Contract includes BidBuy Purchase Order? (The Agency answers this question prior to contract filing.)

Yes

No

Contract uses Illinois Procurement Gateway Certifications and Disclosures?

Yes (IPG Certifications and Disclosures including FORMS B)

No

1. **DESCRIPTION OF SUPPLIES AND SERVICES**
2. **PRICING**
3. **TERM AND TERMINATION**
4. **STANDARD BUSINESS TERMS AND CONDITIONS**
5. **SUPPLEMENTAL PROVISIONS**
6. **STANDARD CERTIFICATIONS**
7. **FINANCIAL DISCLOSURES AND CONFLICTS OF INTEREST (IF APPLICABLE)**
8. **CONTRACT SPECIFIC CERTIFICATIONS AND DISCLOSURES – “FORMS B” (IF APPLICABLE)**
9. **PURCHASE ORDER FROM BIDBUY (IF APPLICABLE)**

In consideration of the mutual covenants and agreements contained in this contract, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties agree to the terms and conditions set forth herein and have caused this contract to be executed by their duly authorized representatives on the dates shown on the following CONTRACT SIGNATURES page.

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VENDOR

Vendor Name: TEN Connected Solutions, Inc.	Address: 1501 Reedsdale St., Suite 401, Pittsburgh, PA 15233
Signature: 	Phone: 412-429-8888 ext. 102
Printed Name: Robert G. Campbell	Fax: 412-429-8889
Title: President	Email: rob.campbell@tensaves.com
Date: 5/24/2018	

STATE OF ILLINOIS

Procuring Agency: Central Management Services	Phone: 217.557.5695
Street Address: 401 S. Spring	Fax: 217.782.5187
City, State ZIP: Springfield, IL 62706	
Official Signature: 	Date: 6-29-18
Printed Name: Tim McDevitt	By:
Official's Title: Acting Director	Title:
Legal Signature:	Date:
Legal Printed Name:	
Legal Title:	
Fiscal Signature:	Date:
Fiscal's Printed Name:	
Fiscal's Title:	

AGENCY USE ONLY

NOT PART OF CONTRACTUAL PROVISIONS

- Agency Reference #: 17-102850
- Project Title: Smart Street Lighting
- Contract #: CMS802850C – Tertiary Vendor
- Procurement Method (IFB, RFP, Small Purchase, etc.): RFP
- IPB Reference #: 22040067
- IPB Publication Date: 1/23/2017
- Award Code: B
- Subcontractor Utilization? Yes No Subcontractor Disclosure? Yes No
- Funding Source:
- Obligation #:
- Small Business Set-Aside? Yes No Percentage:
- Minority Owned Business? Yes No Percentage:
- Female Owned Business? Yes No Percentage:
- Persons with Disabilities Owned Business? Yes No Percentage:
- Veteran Owned Small Business? Yes No Percentage:
- Other Preferences?

1. DESCRIPTION OF SUPPLIES AND SERVICES

1.1. SUPPLIES AND/OR SERVICES REQUIRED:

The State has provided this master contract to facilitate lighting upgrades in municipalities across Illinois. State agencies and any unit of local government qualified under the Illinois joint purchasing program, will be eligible to utilize this Contract. Agency, unit of government or municipality will be interchangeable for purposes of this Contract. Each entity will enter into an individual contract with the Vendor to determine the exact equipment and services requested from this Contract.

This tertiary vendor may have an option to provide a project conference to any municipality interested in a street lighting upgrade. A municipality is allowed to utilize this vendor if previously ranked vendors become unavailable or do not meet the municipality's needs.

The Vendor will provide turnkey services for street light upgrades to light emitting diode (LED) luminaries with implementation and financing options, luminaires and adaptive controls for Illinois municipalities across the State. These services and products may be individually orderable (i.e. a municipality may order the luminaires and perform their own installation, may only require the photometric design service, etc.).

The mandatory requirements must be maintained:

1.1.1 The vendor must be able to provide the following materials and services to Illinois municipalities throughout the full geographic area of the State:

- Inventory audit services
- Photometric design services
- Energy savings analysis
- LED luminaire procurement or manufacture, installation and commissioning services for luminaires on the approved qualified product list
- Adaptive control procurement or manufacture, installation and commissioning services which include Central Management System, Backhaul Communication Network and Field Devices
- Operations and maintenance services for the LED luminaires
- Operations and maintenance services for the Adaptive Controls
- Energy performance contracting
- Infrastructure stabilization (i.e. pole, cable replacement)

1.1.2 Luminaires proposed to municipalities shall be on the qualified product list at <http://www.designlights.org>. This is required to participate in the Illinois Energy Now incentive program.

1.1.3 Vendor will maintain at least the last five consecutive years' experience with the installation of LED street light fixtures and must have completed at least three (3) municipal or governmental turnkey projects, converting a minimum of 5,000 High Pressure Sodium (HPS), metal halide (MH)

or mercury vapor (MV) luminaires per project to LED luminaires. Each turnkey project must have included the following work items:

- Inventory Audit Services
- Photometric Design Services
- Energy Savings Analysis
- Procure or manufacture, install and commissioning of LED Luminaires

1.1.4 Vendor must have implemented an Energy Performance contract for Smart Street Lighting for at least two municipalities or governments in the US.

1.1.5 Vendor must provide final project reporting documentation to the municipal Project Manager upon completion of the project.

1.1.6 The Luminaire manufacturer shall have a minimum of 5 years' experience manufacturing LED roadway luminaires and at least 5,000 total LED roadway luminaires installed all within the U.S.A.

1.1.7 The specifications herein are intended to be a minimum baseline for smart street lighting conversion.

1.1.8 Any deviation from the specifications must be agreed upon between the Vendor, municipality and utility (as needed) given the cost savings, advancement of technologies, and changing product lines while providing the highest level of service and product quality to all Parties involved.

1.1.9 The Vendor will provide the State with a change management process. A change management process will enable the State to update the material specifications and will allow the Vendor to submit new materials that either replace, are a deviation or are in addition to the Vendor proposed materials. The change management process will be in writing to the State's contract administration along with the manufacturer's specification sheets.

1.1.10 It is implied and accepted that any updates or changes to State and Federal standards (e.g. ANSI, OSHA, RoHS, etc.) will prevail over any specifications identified within this Contract.

1.2 SUPPLIES AND/OR SERVICES DESIRED:

Turnkey Services – Value Add and Smart City

1.2.1 Infrastructure and adaptive controls are the foundation for Value Add and Smart City applications which may include, but are not limited to (i) vehicle and pedestrian occupancy sensors (ii) cameras (iii) environmental sensors (iv) 4G/5G small cell antennas (v) audio speakers and (vi) smart parking.

1.2.2 Sample areas, using short listed products can also be provide to each municipality for purposes of visual inspection and comparison in furtherance of final product selection.

1.2.3 The Vendor will remain neutral regarding LED fixture and controls manufacturers, Smart City and Smart Media platform providers in order to achieve the most beneficial systems to each municipality.

Turnkey Services – Inventory Audit

- 1.2.4 Inventory Audit Services enabling the municipality to have detailed and accurate inventory of its street light infrastructure. Vendor will conduct a municipality-wide sample photometric field survey and audit at street-level, delivered to each municipality sortable by asset, street, neighborhood, district and by roadway type. The audit will verify compliance with existing regulations and lighting standards, address any deficiencies in the current street lighting systems, and will address any over-lit or under-lit areas of each municipality.
- 1.2.5 The inventory audit will provide minimally the following information with each fixture and stored in a geographic information system (GIS) and an Environmental Systems Research Institute Shapefile (ESRI SHP) standard GIS format and in excel format:
- Geographic location
 - Road width and classification as local, collector, arterial or other
 - Pedestrian activity level (high, medium, low)
 - Road geometry (number and types of lanes, lane width, medians, etc.)
 - Sidewalk width and location
 - Pole height and arm length
 - Pole spacing (average and maximum)
 - Luminaire style (cobra-head, floodlight, shoebox, decorative, or other)
 - Luminaire wattage
 - Ownership: municipality or utility
 - Illuminance, luminance and uniformity
 - Infrastructure stabilization recommended, including upgrade or replacement of the street light pole and/or cabling
- 1.2.6 The Vendor may propose to undertake the verification survey/audit simultaneously with the installation of the projects, as appropriate.

Turnkey Services – Photometric Design

- 1.2.7 Vendor will detail and verify lighting levels and discrepancies in uniformity of existing installation, and will identify any areas requiring corrective action to ensure that, municipality-wide, the lighting system will be consistent with nationally recommended lighting level standards. Vendor will have thorough knowledge of the Illinois Department of Transportation's (IDOT) lighting policies and procedures and use the Highway Standards Manual.
- 1.2.8 The Vendor will work with each municipality to incorporate an appropriate analysis of data points that can be used when developing the final lighting retrofit design using an LED Fixture Performance Characteristics Matrix.
- 1.2.9 The Vendor may offer to engage the municipality in a pilot process, which will not result in additional installation costs. The Vendor will work with the lighting manufacturers and distributors to negotiate free samples.
- 1.2.10 The Vendor will comply with Illuminating Engineering Society (IES) RP-8-14 for Roadway Lighting at a minimum. Vendor may utilize design methodologies that will best deliver adequate lighting for the expected product life cycle while at the same time supporting each municipality's specific goals for the project.

Turnkey Services – Energy Savings Analysis

1.2.11 The Vendor will conduct a baseline analysis using the following items:

- Develop required paperwork to reconcile street light billing records and confirm State and Federal rebate eligibility
- Prepare detailed pricing estimate(s) representing all project options under consideration by the municipality
- Develop energy (kWh), Greenhouse Gas (GHG) and energy cost savings models to ensure results and cost-effectiveness of project options
- Discuss and confirm recommendations with the municipality to finalize project details and amend Scope of Work
- Conduct final review of all energy savings and construction cost estimates with the municipality to ensure accuracy and compliance
- Provide the energy savings based on upgrade to LED lights and implementation of the photometric design, as required by the municipality, including any and all relevant Federal and/or State rebates
- State additional energy saving that accrue from use of adaptive controls/dimming including any and all relevant Federal and/or State rebates

1.2.12 The Vendor will extrapolate the Total kWh using kWh per lamp divided by the number of days in the billing cycle as stated in the utility bills. Vendor will estimate the wattage that the utility uses to determine monthly costs based on the kWh/lamp x number of lamps. This will help determine the yearly consumption. This analysis forms the basis for baseline energy consumption. By taking the post installation wattages for each existing lamp type, and estimate for savings may be calculated. Between the existing yearly consumption and estimated savings, an energy balance will determine and ensure the estimated savings are correct.

1.2.13 The Vendor will consider the following parameters:

- Number of street lights being replaced and installed
- Service life of LED luminaires
- Appropriate discount rate
- Capital cost of LED luminaires
- Use of municipal staff or contractors
- Installation costs (including cost of roadway closures if required)
- Project timeline
- Maintenance costs of replacing luminaire components (including warranty agreements)
- Estimated energy costs throughout the service life of LED
- Energy efficiency incentives and rebates
- Financing options
- Non-economic benefits (e.g. safety)

Turnkey Services – Installation

1.2.14 The Vendor will support the following work items:

- Purchase luminaires.

- Manage deliveries and staging of material to site including any secured storage considerations.
- Provide Traffic Control plans based on municipal requirements.
- Participate in the development and implementation of community outreach and notification plans to ensure project awareness and minimize traffic impact.
- Review installation schedule, work safety, public safety, and waste material handling procedures and requirements with municipality.
- During installation, comply with all requirements to ensure replacement luminaires receive utility rebates if eligible and LED electric rate schedule. Ensure compliance with all Department of Commerce and Economic Opportunity (DCEO) requirements for rebates.
- Vendor will follow municipal, county and IDOT guidelines, as required for the upgrade project.
- Examine all luminaires delivered to the jobsite prior to installation to ensure all specification requirements have been incorporated by the Manufacturer. Deficient luminaires shall not be installed and the municipality shall be notified immediately.
- Luminaires shall be adjusted with the use of a level placed along the fixture housing or other means approved by the manufacturer to make sure they are installed with their optics set to deliver optimum designed light levels on the roadway.
- Any dirt or film on LEDs and/or the optical assembly shall be thoroughly removed using cleaning methods approved by the manufacturer.
- If municipality requires, the Vendor shall ensure removal/disposal of existing luminaires.
- Vendor should provide documentation of a disposal and recycle plan associated with the removal and disposal of the municipalities' existing street light assets which are replaced by the new LED light fixtures.
- Accurately populate the municipal conversion worksheet for street lights, showing street light install progress and providing daily updates.
- Ensure each newly installed luminaire has been tagged/recorded with the correct wattage sticker consistent with American National Standard for Roadway and Area Lighting Equipment, American National Standards Institute (ANSI) C136.15 – Luminaire Field Identification.
- Provide accurate digital GIS data for all luminaires using GPS technology, including existing LED street lights.
- Vendor will schedule and attend weekly progress meetings with municipal staff to discuss ongoing implementation progress and other issues arising due to the conversion program.
- Vendor will test the luminaires to ensure that they work as specified.
- Vendor to inspect final work with municipality and correct any outstanding punch list items or deficiencies identified by both the municipality and the Vendor.
- Vendor will recommend cleaning schedule to maintain lumen output.
- Vendor will coordinate with the municipality's existing street lighting maintenance contractor.
- Vendor will warrant all labor for a period of two years from the date of project acceptance.
- Vendor will warrant all luminaires for a period of 10 years from the date of project acceptance.

1.2.15 Vendor will provide an Investment Grade Audit to each municipality, detailing the scope of work to be completed. Additionally, once construction begins, Vendor will manage and maintain daily progress information and track quantities, contractor payments, and change orders. Vendor will prepare and recommend for approval, period installation quantities satisfactory to each municipality.

- 1.2.16 Vendor will develop, monitor and maintain a master project schedule for the entire project to integrate and coordinate the activities of the various ongoing design and construction activities and contracts.
- 1.2.17 Vendor will adhere to the required installation schedule unless otherwise agreed upon by the municipality and to change the timeframe for installation based on the number of fixtures and smart cities technologies to be installed.
- 1.2.18 Vendor utilizes in-house design, engineering and construction management to ensure quality control.
- 1.2.19 Vendor will conduct spot inspections, final inspection and semi-final inspection, if directed by the municipality.

Turnkey Services – Installation/Construction Safety

- 1.2.20 Vendor will review the timeliness of safety and accident prevention procedures on the project and review and accept Contractor Safety Programs. In the event certain individuals are found to be in violation of safety requirements, direct the subcontractor to remove the individual employee, or to invoke any other contractual remedy deemed appropriate.
- 1.2.21 Vendor will observe and monitor subcontractor compliance with OSHA, each municipality, and local and State laws and regulations.
- 1.2.22 Vendor will periodically attend Foremen's "tool box" safety meetings and evaluate effectiveness.
- 1.2.23 Vendor will review and accept subcontractor emergency and safety plans and procedures.
- 1.2.24 Vendor will organize and participate in monthly site inspections and report on findings.
- 1.2.25 Vendor will continually coordinate the municipality's general and specific safety concerns with the Project.
- 1.2.26 Vendor's involvement in the safety of the project shall in no way relieve or decrease the Contractor's obligation for safety.
- 1.2.27 Vendor will conduct bi-weekly on-site job progress meetings for the project with Project Management representation in attendance as needed. Vendor will attend/facilitate pre-job and preconstruction conferences and all job-related meetings. Vendor will discuss issues and actions to be taken with all responsible parties, and dates by which issues are to be resolved. Vendor will review and negotiate costs for additional extra work.
- 1.2.28 Vendor's team can provide detailed engineer's cost estimates, and project managers will document the contractor's work force for any extra work that may be required or requested.
- 1.2.29 Vendor will provide daily management while the project is on-going. Vendor's project managers will be available to coordinate with contractors, utilities, and individual municipality operations personnel to evaluate progress and activity daily. Vendor's project managers will also provide regular emailed progress reports and updates from the construction management program.

- 1.2.30 Vendor will deliver a custom Operations and Maintenance (O&M) manual for luminaires and controls systems.
- 1.2.31 Vendor will evaluate the operating procedures and characteristics so that the luminaires, controls, and ancillary equipment have the most appropriate maintenance plan.

Turnkey Services – Installation/Construction Material Disposal

- 1.2.32 Vendor will develop the strategy, identify vendors, and manage the overall process.
- 1.2.33 Collected materials will be gathered including but not limited to capacitors, mercury containing devices, drums, bulbs, and ballasts and placed in an accumulation area.
- 1.2.34 For each project, accumulation sea containers will be stored at strategic locations for ease of disposal. These locations, when selected, will provide several advantages; most notably the fact that it is a covered and relatively sealed environment.
- 1.2.35 Hazardous products will be kept in the original containers unless they are not re-sealable.
- 1.2.36 The original material safety data sheets (MSDS) will be retained and available for review by each municipality.
- 1.2.37 If surplus product must be disposed, disposal requirements set forth by the local, State, and Federal regulations will be followed as applicable.
- 1.2.38 During the collection of materials, the selected recycling and disposal management vendor will ensure and certify that the integrity of the equipment or containers is sound. If the integrity is compromised, the vendor will immediately re-pack the containers or equipment. Temporary containment, if required, will be constructed of polyurethane sheeting and oil socks. The sheeting will be placed under the affected areas and oil socks will be placed around the perimeter of the sheeting.

Turnkey Services – Installation Contractors

- 1.2.39 Vendor will work with each municipality for the installation of street lighting systems. Vendor will assist in the review of all bid documents to confirm that each specification is addressed and met by the respondents.
- 1.2.40 Vendor will provide a full commissioning of fixtures not simply a spot-check to determine if installation procedures are followed.
- 1.2.41 Vendor's specifications for Installation and Maintenance Contractors will include, but not limited to, the following:
- Description of Work;
 - Required Installation Schedule;
 - Order of Streets or Areas to be Converted;
 - References;
 - Submittals;
 - Quality Assurance;

- Commissioning Assistance;
- Warranty;
- Installation Plan;
- Field Quality Control;
- Adjusting & Cleaning;
- Disposal;
- Availability of Maintenance Services; and,
- Safety Record

1.2.42 In addition to the language listed above, Vendor will also include language relating to platform training for any project management software, fixture recycling, traffic control and flagging, obtaining permits, or any other goals required of the municipality, such as Minority/Women/Disabled-Owned Business Enterprise participation goals.

1.2.43 After working with each municipality to determine the minimum requirements for installation and maintenance contractor(s), and after Invitations for Bids (IFB) have been issued by Vendor, on behalf of each municipality, Vendor will review each bid to confirm which vendors have met the minimum criteria, and will deliver to each Illinois municipality a concise summary of those bids for purposes of evaluating desired services and selecting and approving subcontractors.

1.2.44 All subcontractors will perform their work under the direction of Vendor's in-house construction project management and will be required to report progress to Vendor (for project progress reporting) that will enable the municipality, and the Vendor's project team, to receive daily installation updates. The Vendor's project management team also will be responsible for training, preparing customized O&M manuals, and overseeing project commissioning.

1.2.45 Vendor will conduct spot inspections, a final inspection, and semi-final inspection if directed, and generate a punch list of work to be completed for each contract. Vendor will monitor the punch list until it is complete. Vendor will provide written notice to each municipality's project manager when all project work is complete and recommend project acceptance.

Turnkey Services - Operations & Maintenance

1.2.46 Vendor will provide records of all newly installed LED street lights in the form of electronic GIS records [SHP format] including all wattages, pole numbers, locations and other associated information. Information will include at least the following:

- Geographic location
- Road width and classification as local, collector, arterial or other
- Pedestrian activity level (high, medium, low)
- Road geometry (number and types of lanes, lane width, medians, etc.)
- Sidewalk width and location
- Pole height and arm length
- Pole spacing (average and maximum)
- Luminaire style as cobra-head, floodlight, shoebox, decorative, or other
- Luminaire wattage
- Ownership: municipality or utility
- Illuminance, luminance and uniformity

- 1.2.47 Vendor will provide a detailed O&M manual covering luminaires and control systems and will include:
- Change management procedures
 - Incident management procedures
 - Procedures to resolve critical system issues
 - Emergency and 24/7 support options
 - Policy regarding future enhancements and upgrades
 - Frequency of software updates and new software releases
 - Availability of tiered support options to handle potential escalations
 - Description of period of scheduled maintenance and system availability during such scheduled maintenance periods
 - Other operational and maintenance services not otherwise identified
- 1.2.48 Minimal maintenance is required considering 20-year fixture life and extremely low failure rates of LEDs (i.e. less than 1%). Vendor recommends maintenance on a time and materials basis and the availability of "attic stock" provided by Vendor as part of the project.
- 1.2.49 The development of the maintenance plan starts during the Audit phase of the project. Vendor will evaluate operating procedures and characteristics so that the luminaires, controls, and ancillary equipment have the most appropriate maintenance plan in order for the system to operate at the highest efficiency.
- 1.2.50 The warranties will be well - documented in the project-specific O&M operating manuals and the Vendor stands ready to assist the municipality on any warranty issues. Vendor will train municipality staff whenever possible, to understand and address operation and maintenance issues.
- 1.2.51 Alternatively, Vendor will offer to undertake a maintenance protocol which also provides a labor warranty directly to each municipality's PM, and Vendor would then administer the materials warranty provided by the fixture manufacturer on behalf of the municipality.
- 1.2.52 In order to guarantee efficient functioning of all installed equipment, and the energy management goals of the municipality, a customized preventive operations and maintenance plan (PM Plan) will be delivered by the Vendor after project completion.
- 1.2.53 The PM Plan will consist of a checklist of tasks that are performed at manufacturer-recommended intervals (usually measured in hours of equipment run time). This checklist will be kept in the form of a log and updated manually when tasks are performed. The PM Plan would include the following fundamental information, gathered during the audit:
- Installed Equipment;
 - Manufacturer's name;
 - Vendor's name and contact information;
 - Date installed;
 - Warranty information;
 - Recommended Parts Lists;
 - Vendor Maintenance;
 - Municipal Maintenance;

- Maintenance Checklist;
- Training;
- Municipality -wide lighting and lighting controls Layouts and As Built Lighting and Lighting Controls Layouts.

1.2.54 In general, a comprehensive maintenance program should include:

- Fail alert system details
- Luminaire cleaning plan (less heat is generated on lenses by LEDs than HID lamps so less dust historically adheres and fuses to the lens on outdoor luminaires)
- Unit, power supply and photocontrol replacement plans (Note that today's power supplies are rated for 100,000-hour life and the expectation is that replacements will be very rare (<1%).

Turnkey Services - System Updates

1.2.55 Central Management System (CMS) updates are included in the SaaS or License fees and maintenance and support agreement. Software quality updates are available via email and/or web access with auto notification of new releases.

1.2.56 A Major Release significantly adds to or changes the functionality of the CMS and is customarily designated by an increment to the number appearing to the left of any initial decimal (i.e., 1.0 to 2.0). This typically occurs at 12-month intervals.

1.2.57 A Minor Release improves but does not significantly change the functionality of the CMS and is customarily designated by an increment to a number appearing to the right of any initial decimal (i.e., 1.1 to 1.2). This typically occurs at 3-6-month intervals.

1.2.58 A Quality Update is required to correct a service-affecting design fault, discrepancy or defect in the CMS and is customarily designated by an increment to a number appearing to the right of the second decimal (i.e., 1.1.6 to 1.1.7). These updates are slipstreamed as needed.

1.2.59 CMS manufacturers/software companies are responsible for the support and maintenance of their own products. When a reported problem from a municipality or the State can be aided or facilitated by a coordinated service interaction or if it is uncertain which product is the source or cause of the reported problem, then CMS companies will work together to provide a timely and successful solution to the reported problem.

1.2.60 Coordinated Support will consist of the following:

Initial response to a support request, entitlement verification, perform initial solution level triage and identify issue root cause provide support, track issues, engage resolutions.

1.2.61 Severity Level Descriptions: resources will be committed as determined by the impact on the system.

Severity 1: An existing solution system is down or there is a critical impact to operations.

Severity 2: Operation of the existing solution system is severely degraded or significant aspects of operations are negatively impacted by unacceptable solution performance.

Severity 3: Operational performance of the solution system is impaired, although most operations remain functional.

Severity 4: Customer requires information or assistance on Hardware or Software capabilities, installation, or configuration. There is little or no impact to municipality's business operation.

- 1.2.62 Scheduled maintenance is done off hours. During such maintenance, system unavailability is kept to a minimum.

Luminaire - General Specifications

- 1.2.63 Vendor will supply quick connect/disconnect plugs between the discrete electrical components within the luminaire such as the driver, surge protection device, and optical assembly for easy removal. The quick connect/disconnect plugs will be operable without the use of tools and while wearing insulated gloves.
- 1.2.64 The Vendor will provide luminaires that are in compliance with ANSI C136.37 and the LED light source(s) and driver(s) comply with the material requirements of the Restriction of Hazardous Substances (EU RoHS 2) Directive 2011/65/EU. Vendor utilizes products which are produced to ANSI standards. These standards include but are not limited to ANSI: C136.2, C136.10, C136.14, C136.15, C136.31, C136.37, C78.377. Luminaires are to be tested in a National Voluntary Laboratory Accreditation Program (NVLAP) certified lab.
- 1.2.65 Vendor guarantees that luminaires and controls go through a series of interoperability testing to ensure compatibility with municipalities lighting fixtures and wireless controls.
- 1.2.66 Vendor identifies that any proposed luminaires have a 100,000 Life Time on the LED well above L70 and a driver life of 100,000 Hours at 25 Deg C ambient.
- 1.2.67 Vendor uses a Global Positioning System ("GPS") where requested by municipality will be affixed to or embedded into each fixture, the street lights are able to identify themselves and network instantly ("real time"). This approach reduces the cost of programming each fixture and eliminates on-site commissioning.

If the municipality's street lighting configuration resides on its Geographic Information System ("GIS"), various types of lights including traffic signals, decorative, park lights, and distinct types of decorative lighting can be combined with the existing street lights ("layered GIS").

Luminaire – Housing

- 1.2.68 The housing will be designed to ensure maximum heat dissipation and prevent the accumulation of water, ice, dirt, and debris.
- 1.2.69 The housing will have a passive cooling method with no moving or rotating parts used for heat management.
- 1.2.70 The projected area of the luminaire will not exceed 1.4 square feet.
- 1.2.71 The total weight of the luminaire(s) and accessories will not exceed 75 pounds.

- 1.2.72 The wiring within the electrical enclosure should be rated at 600 V, 221 degrees Fahrenheit (105 Celsius) or higher.

Luminaire - Finish

- 1.2.73 The luminaire finish or painted surfaces exposed to the environment should exceed a rating of six according to ASTM D1654 after 1,000 hours of ASTM B117 testing.
- 1.2.74 The luminaire coating will exhibit no greater than 30% reduction of gloss according to ASTM D523 after 500 hours of ASTM G154 Cycle 6 QUV accelerated weathering testing.

Luminaire – Attachment

- 1.2.75 For cobra head and shoe box housing styles, the attachment will have a slip-fit on a mounting arm with a 2-inch (5 cm) diameter tenon or other as specifically needed by municipality in accordance with this RFP. The outer diameter will be 2.375 inches (6cm) and have a barrier to limit the amount of insertion.
- 1.2.76 The luminaire will be provided with a leveling surface and be capable of being tilted +/-5 degrees from the axis of attachment in no more than 2.5 degree increments and rotated to any degree with respect to the supporting arm.

Luminaire – Receptacle

- 1.2.77 The luminaire will include a fully prewired, 7-pin twist lock ANSI C136.41 compliant receptacle and a shorting cap.
- 1.2.78 Any unused pins will be connected as directed by the manufacturer and approved by the municipality.

Luminaire – Vibration

- 1.2.79 The luminaire will meet the ANSI C136.31 specifications for vibration.
- 1.2.80 Luminaires mounted on a bridge and high mast luminaires should be rated for 3G peak acceleration.
- 1.2.81 Vibration testing should be run using the same luminaire in all three axes.

Luminaire – Decals and Labels

- 1.2.82 All luminaires will have external labels in compliance with the latest version of ANSI C136.15 and internal labels in compliance with the latest version of ANSI C136.22.

Luminaire – Wet Locations

- 1.2.83 Luminaires will be listed for wet locations by a Nationally Recognized Testing Laboratory (NRTL) as defined by the Occupational Safety and Health Administration (OSHA) and be in compliance with Underwriters Laboratories (UL) 8750 and UL 1598. It should be identified as such by the holographic UL tag/sticker on the inside of the luminaire.

Luminaire – Hardware

1.2.84 External fasteners on the luminaires will be stainless steel and have a corrosion resistance.

Luminaire – Optical Assembly

1.2.85 The luminaire optical assembly will have a minimum Ingress Protection (IP) rating of IP66 according to ANSI C136.25.

1.2.86 The assembly circuiting should be designed to minimize the impact of individual LED failures on the operation of the other LEDs.

1.2.87 The optical assembly will utilize high brightness, long life, minimum 70 color rendering index (CRI) of 2,700 to 4,000 K color temperature (+/-300K) LED binned according to ANSI C78.377.

1.2.88 Cobra style luminaires, shoe box style luminaires and decorative style luminaires will have color temperatures of at least 2,700 K, 3,000 K, 3,500 K, and 4,000 K.

1.2.89 Lenses will be UV-stabilized acrylic or glass or as otherwise approved by the municipality in accordance with this RFP. Provision for house-side shielding should be provided when required by the municipality.

1.2.90 Lumen depreciation at 50,000 hours of operation shall not exceed 15% of initial lumen output at the specified LED drive current and ambient temperature of 77 degrees Fahrenheit (25 degrees Celsius).

1.2.91 The optical assembly shall have individual serial numbers or other means for manufacturer tracking.

Luminaire – Photometric performance

1.2.92 The classification of LED luminaires shall be as follows:

- Very Low (VLW) – Wattages < 100, minimum delivered lumens 5,000
- Low (LW) – Wattages 101-200, minimum delivered lumens 10,000
- Medium (MW) – Wattages 201 – 300, minimum delivered lumens 20,000
- High (HW) – Wattages 301 – 400, minimum delivered lumens 30,000
- Very High (VHW) – Wattages > 401, minimum delivered lumens 40,000

Luminaire – Driver Specifications

1.2.93 The driver will be integral to the unit.

1.2.94 The driver will be mounted on the rear of the luminaire on the inside of a removable door or on a removable mounting pad or as otherwise approved by the municipality in accordance with this RFP. The removable door or pad should be secure when fastened in place and all individual components should be secured upon the removable elements. Each component should be readily removable from the removable door or pad for replacement.

1.2.95 The driver should tolerate indefinitely open and short circuit output conditions without damage.

- 1.2.96 The driver shall have Ingress Protection with a minimum IP66 rating.
- 1.2.97 The driver will be suitable for operation over a range of 120 to 277 volts or 347 to 480 volts as required by the system operating voltage.
- 1.2.99 The driver will have an operating ambient temperature range of -40 to 104 degrees Fahrenheit (-40 to 40 degrees Celsius).
- 1.2.99 The driver will have an operating lifetime expectancy of 100,000 hours at 77 degrees Fahrenheit (25 degrees Celsius) ambient.
- 1.2.100 The driver will be listed under UL 1310 or UL 1012.
- 1.2.101 The driver will maintain a power factor of 0.9 or higher and total harmonic distortion of less than 20% at 50% load across the full supply voltage range.
- 1.2.102 The driver will have a minimum efficiency of 90% at maximum load and a minimum efficiency of 85% for the driver operating at 50% power with driver efficiency defined as output power divided by input power.
- 1.2.103 The driver will meet the Electromagnetic Compatibility (EMC) specifications for class A digital devices included in the FCC Rules and Regulations, Title 47, Part 15 (47 CFR 15).
- 1.2.104 The driver will reduce the current to the LED module if the driver is overheating due to abnormal conditions.
- 1.2.105 The driver will support the Digital Addressable Lighting Interface (DALI) dimming capability. Vendor can provide drivers that are 0-10 Volt Dimmable, if needed.
- 1.2.106 The driver will comply with leakage safety standards according to International Electrotechnical Commission (IEC) 61347-1 and UL 1012.

Luminaire – Surge Protection

- 1.2.107 The surge protection device will be labeled as Type 4 in accordance to UL 1449 and be an integral part of the luminaire. It will provide a minimum system protection level of 10kV, 10 kA. To protect for a 10 kV, 10 Ka surge the required clamping voltage of the external Metal Oxide Varistor (MOV) or other SPD shall be lower than 1 kV AT 8 Ka $\{(10 \text{ kV}-2 \text{ kA})/1 \text{ ohm}=8 \text{ kA}\}$.
- 1.2.108 The surge protector device will comply with the following standards:
- Institute of Electrical and Electronics Engineers (IEEE) C62.41.1, IEEE Guide on the Surge Environment in Low Voltage (1000 V and Less) AC Power Circuits
 - IEEE C62.41.2, IEEE Recommended Practice on Characterization of Surges in Low Voltage (1000 V and Less) AC Power Circuits
 - IEEE C62.45, IEEE Recommended Practice on Surge Testing for Equipment Connected to Low Voltage (1000 V and Less) AC Power Circuits
 - ANSI C136.2, American National Standard for Roadway and Area Lighting Equipment – Luminaire Voltage Classification

1.2.109 The surge protection device and performance parameters will be posted at [www. UL.com](http://www.UL.com) under Category Code VZCA2.

Luminaire – Testing Specifications

1.2.110 Test Procedure provided in “Luminaire Test Procedure Attachment A” if desired by municipality.

1.2.111 Luminaires will be tested according to IES LM-79. The laboratory performing this test should hold accreditation from the NVLAP under the National Institute of Standards and Technology (NIST). Submitted reports to the municipality should have a backlight, upright, and glare (BUG) rating according to IESNA TM-15 including a luminaire classification system graph with both the recorded lumen value and percent lumens by zone. The municipality may require test results.

1.2.112 Lumen maintenance will be measured for the LEDs according to IES LM-84. The LM-84 report should be based on a minimum of 6,000 hours, yet 10,000-hour reports should be provided for luminaires where those tests have been completed. If required, test results should be provided to the municipality.

1.2.113 Thermal testing will be provided according to UL 1598. The luminaire should start and operate in the ambient temperature range specified. The maximum rated case temperature of the driver, LEDs, and other internal components should not be exceeded when the luminaire is operated in the ambient temperature range specified.

1.2.114 The mechanical design of protruding external surfaces such as heat sink fins should facilitate hose-down cleaning and discourage debris accumulation. Testing should show the maximum rated case temperature of the driver, LEDs, and other internal components are not exceeded when the luminaire is operated with the heat sink filled with debris. If required, test results should be provided to the municipality.

1.2.115 Complete point-by-point luminance and veiling luminance calculations as well as listings of all indicated averages and ratios as applicable should be provided according to IES RP-8 recommendations. Lighting calculations should be performed using AGI32 software with calculations performed to two decimal places (i.e. x.xx cd/m²). If required, results should be provided to the municipality.

1.2.116 The LEDs should have long term lumen maintenance documented according to Illuminating Engineering Society of North America (IES) Technical Memorandum-28 (TM-28). The submitted calculations should incorporate an in-situ temperature measurement test (ISTMT) and IES LM-84 data with IES TM-28 inputs and reports according to the TM-28 calculator. Ambient temperature shall be 77 °F (25 °C). If required test results should be provided to the municipality.

Luminaire – Warranty

1.2.117 The entire luminaire and all of its component parts shall be covered by a 10-year warranty. The warranty period should begin on the date of final acceptance of the lighting work by the municipality.

1.2.118 Failure is when one or more of the following occur:

- Negligible light output from more than 10% of the LED packages
- Condensed moisture inside the optical assembly
- Driver that continues to operate at a reduced output below 15% of the rated nominal output

1.2.119 Vendor warrants that these products are free from defects in materials or workmanship.

Luminaire - Documentation

1.2.120 The Vendor will submit an electronic version of all associated luminaire IES files, AGI32 files and the IES TM-21 calculator spreadsheet with input and reports associated with the project luminaires, as requested.

1.2.121 The Vendor will provide an electronic version of the following manufacturer's product data for each type of luminaire:

- Descriptive literature and catalogue cuts for luminaire, LED package, driver and surge protection device
- LED drive current, total luminaire input wattage and total luminaire current at the system operating voltage or voltage range and ambient temperature of 77 degrees Fahrenheit (25 degrees Celsius)
- Luminaire efficiency expressed in lumens per watt (lm/W) per luminaire
- Initial delivered lumens at the specified color temperature, drive current and ambient temperature
- Computer photometric calculation reports
- IES TM-15 BUG rating report
- Manufacturer's experience
- Documentation of compliance with ANSI standards as well as listing requirements
- Documentation of laboratory accreditations and certifications for specified testing
- Thermal testing documents
- IES LM-79, LM-80 (or LM-84) and TM-21 (or TM-28) reports
- Salt spray (fog) test reports and certification
- Vibration characteristics test reports and certification
- Ingress Protection (IP) test reports
- Manufacturer written warranty
- Luminaire installation, maintenance and washing instructions

Adaptive Controls – Security

1.2.122 The Vendor will ensure that the Control Manufacturer (CM) will provide all relevant security data in support of each project.

- 1.2.123 Vendor will ensure that CM's security certification is an independent third-party audit Statement on Standards for Attestation Engagements (SSAE-16) SOC 1 Type 2, SOC 2 Type 2 or equivalent.
- 1.2.124 Vendor will ensure that CM's software does not have a specified procedure for purging all municipal data at the conclusion of the contract between the Vendor and municipality, but would follow industry standards in the event of such an occurrence.
- 1.2.125 Vendor's CMS is hosted on Amazon Web Services (AWS) -or other municipality approved-servers, a hosting platform or installed onsite within the municipality's infrastructure.
- AWS Application Programming Interface (API) endpoints are hosted on large, Internet-scale, world-class infrastructure that benefits from the same engineering expertise that has built Amazon into the world's largest online retailer. Proprietary DDoS mitigation techniques are used. Additionally, AWS's networks are multi-homed across a number of providers to achieve Internet access diversity. UrlScan is used to filter potential malicious requests from being processed by IIS.
- 1.2.126 Data is segregated by user accounts and organizations, with each user associated within an organization and all data is tagged by organization. The product, if hosted in the cloud, will be hosted on multiple dedicated servers and is geographically diverse.
- 1.2.127 The CMS will provide a monthly security status report that include security posture of the system, effectiveness of the controls deployed, ongoing monitoring activities and remediation efforts to address known vulnerabilities.

Adaptive Controls – Central Management System

The Central Management System is a computer environment that functions as the core of a Networked Outdoor Lighting Control System by providing all shared System services, and consolidating and storing (or managing the storage of) all System data. A System typically uses only one Central Management System, although several software applications may be used to manage System operation.

1.2.128 The following features are supported via a Graphical User Interface (GUI):

- Map data
- Satellite image data
- Control point location
- Control point equipment type (i.e. luminaire types, sensor type)
- Luminaire status (on, off)
- Luminaire dimmed state
- System power quality requirements (current, peak in last prescribed time period e.g. peak in last 24 hours)
- System energy consumption (daily over last prescribed time period e.g. daily for last 7 days)

1.2.129 The CMS provides report availability for Energy Consumption, Energy Savings, Day Burners, Burn Hours, Lighting Faults, Lighting Exceptions, Lighting Configurations, Alarms, Alarm Configuration, Alarm Status, Maintenance and Asset Management. Ad hoc reports are also available for reports

"on the fly" and can be filtered by Power or Status parameters. All report data is available for export to Excel or .csv files.

Dashboards are also available for Energy Consumptions, Energy Savings, SLC Status, Alarm Status, Maintenance Status, Trends and Custom Trend Dashboards. A Dashboard "writer" is included for users who want to configure the look and feel of their own dashboards.

1.2.130 All parameters in the system can be reported based on user requirements and customized for report content, report frequency and report summary features. Report data can be exported to other systems via a rich APL.

Adaptive Controls – Central Management System – User Access

1.2.131 Access to the CMS is via User Name and Password via management by the System Administrator.

The CMS has extensive User and Group management features that allow System Administrator-level users to manage access to each functional area within the CMS. The Administrator can set up different user groups with varying levels of access.

1.2.132 In the CMS the data is segregated by user accounts and organizations, with each user associated with an organization and all data tagged by that organization. User login via OAuth and HTTPS using usernames and passwords. Users are created by a customer administrator. Passwords are stored server side using one-way encryption.

1.2.133 Both systems are mobile responsive via a web browser that renders content in a format designed to accommodate the size and user interface of the mobile device.

The CMS supports Internet Explorer (8.0/9.0/10.9/11.0), Safari 5.17 or higher, Firefox 17 or higher and Chrome 23 or higher.

Adaptive Controls – Central Management System - Data

1.2.134 All asset data will be stored on the CMS.

1.2.135 Users will configure all attributes for each asset to capture data and report. At minimum, this will include:

- Pole number
- Pole type
- Pole GPS location
- Pole grouping
- Luminaire make, model and firmware version, if applicable
- Luminaire nominal input voltage
- Luminaire power requirement (wattage)
- Luminaire installation date
- Utility billing account number

1.2.136 The CMS system will be capable of retrieving and storing all remote monitoring data.

1.2.137 The CMS system will allow for ad-hoc custom reporting, given the power and status parameters.

Data collected from field devices may include but are not limited to: controller status, luminaire status, GPS location, temperature, data logging, photocell threshold synchronization, motion detector interface, voltage, current, kilowatt, cumulative kilowatts, burn hours, dimming percentage, power factor, lamp steady current, mode, temperature, lamp status, photocell status, voltage over/under, energy consumption, LED driver status, lamp, photocell oscillation, photocell feedback, lamp cycling, communication, ballast, abnormal lamp condition, rtc status, event overflow, em fault, relay weld, dimming short, day burning, pole fault, photocell fault, controller fault and tilt fault.

Adaptive Controls – Central Management System – Interaction with Field Devices

1.2.138 Vendor will not allow adware or any other marketing or promotional software to be pushed to any field device.

1.2.139 Vendor will ensure secure communication between the CMS and all field devices by enabling security features inherent to the underlying communications protocols.

1.2.140 Vendor will ensure that the CMS is capable of detecting communication failures between the field devices and the CMS such as noting on Google maps interface, Status screens and alerts via email or text message.

1.2.141 The CMS will be capable of delivering field device firmware upgrades over the backhaul communication network.

1.2.142 The CMS will be able to remotely monitor field device performance and be able to report any exception to normal field device operation.

Adaptive Controls – Central Management System – Functional Features

1.2.143 The CMS will be capable of storing and retrieving the following Control Point parameters:

- Controller status (online, offline, warning, errors)
- Luminaire status (on, off, dimmed state, warnings, errors)
- Average input voltage in on state
- Average input current in on state
- Average input power factor in on state
- Cumulative on state time
- Cumulative energy consumption
- LED driver status (warning or error codes)
- Ambient light level via integral sensor
- GPS location via integral sensor
- Temperature via integral sensor

1.2.144 The CMS will allow for programming the reporting frequency of online Control Point parameters for all Control Points. It should allow for user definable from 1 hour to 24 hours in one-hour increments. Alerts from Controllers do not wait for a polling interval, but are passed immediately to the CMS.

1.2.145 Luminaire groups can be fully defined based on user requirements.

1.2.146 The CMS will be capable of Manual Control, whereby the on/off and dimmed state of a single or group of luminaires can be modified in response to commands from the CMS.

1.2.147 The CMS will be capable of Schedule Control, whereby the Controllers modify the luminaire operations based on specific scheduled times or events with a minimum of four times/events per day.

For example, the CMS will fully support Scheduled Control for up to eight times/events per day using Manual, Scheduled, Astronomical Clock, Photocell or Mixed Mode scheduling. (Mixed Mode uses a combination of time and events to define up to eight time "slices" of schedule each day). Every luminaire can have its own (and different) schedule for every day of the week. Special Day schedules (festivals, 4th of July, etc.) can be created to override the existing schedule for that day. Users can create and save schedules for use across the system. Users can also direct these schedules to be pushed to groups of lights or all lights. All schedules are stored in each controller so as long as there is power to the pole, the light will operate on its proscribed schedule for that day. A Real Time Clock keeps track of time in the event of power outages to the pole.

1.2.148 The CMS will be capable of creating programs for:

- Dynamic Control, based on inputs from sensors or commands
- Prioritized Control, based on modifications or overrides from sensor or command input
- True Input Power Control, based on desired percent relative watts; may include ensuring that a maximum is never exceeded
- Light Output Control, based on desired percent relative lumens
- Luminaire dimmed state, based on achieving a constant light output over time by compensating for lumen depreciation (may require external light sensor)

1.2.149 Remote monitoring reports

- Optional pre-defined maximum and minimum threshold parameters
- Error messages in real time for conditions that violate pre-defined thresholds
- Based on generation of an error message
- Based on a schedule
- Pre-defined such as instances of communication loss between field devices and the CMS, Control Points with error conditions, sorted by error type and/or electrical service point location, energy consumption data for luminaires
- Can be generated to assigned users/user groups via text message and/or email
- Can detect and report wire theft through an algorithm that identifies a user defined number of Controllers report a loss of electrical service, the loss of electrical service occurs within a user-defined time window or the Controllers are physically located consecutively along a roadway

Adaptive Controls – Central Management System – Interchangeability

1.2.150 The CMS may conform to TALQ specifications.

1.2.151 The Vendor will work with each municipality to determine TALQ testing conformance parameters.

Adaptive Controls – Central Management System – Interoperability

1.2.152 The CMS may be interoperable with LonMark certified field devices

1.2.153 The Vendor will work with each municipality to determine the conformance needs of LonMark standards.

Adaptive Controls – Backhaul Communication Network (BCN) – Features

1.2.154 The BCN components will be capable of normal operation over an ambient temperature range of -40 degrees C to 70 degrees C.

1.2.155 The BCN components installed external or remote to luminaires will be rated at least IP66.

1.2.156 The BCN will use an open, standard-based physical layer for communication such as IEEE 802.15.4g for wireless mesh networks or Global System for Mobile communications (GSM) standards for cellular networks.

1.2.157 The BCN will be capable of connecting to the CMS using open, standard-based networking technologies such as HTTP, SMTP, SNMP, COAP, TCP, UDP or FTP.

1.2.158 The data communications over the BCN will be secured using a standard-based security protocol (e.g. TLS, DTLS, IPsec).

1.2.159 The BCN will be capable of communicating using Internet Protocol version 6 (IPv6). Every device must be addressable via an assigned IPv6 address.

1.2.160 The BCN will only allow authenticated and authorized access to network services by the CMS or Field Device (or Field Device gateway).

1.2.161 The BCN and any connected device will be capable of authenticating and authorizing each other by a standard-based mechanism such as X.509 certificates or pre-shared keys.

1.2.162 The data exchange between the BCN and any connected device or system maintain confidentiality and be checked for integrity using a standard-based algorithm.

1.2.163 The BCN will maintain time on its own or by synchronizing with a remote service.

1.2.164 The BCN provides viewing of network and topology, including all connected field devices, links and ports.

1.2.165 The BCN will provide views of network performance, including available bandwidth, field device, reachability, round trip times, path costs and packet delivery success/failure.

1.2.166 The BCN will provide configuration management tool with the ability to view and ability to apply changes, updates and patches to operating systems and applications on any single or group of network components.

- 1.2.167 The BCN will time stamp all events.
- 1.2.168 The BCN will provide basic firewall capabilities including filtering by port, protocol, source IP address and destination IP address.
- 1.2.169 The BCN will be capable of two-way communication.
- 1.2.170 The BCN will provide support failover to alternate routes.
- 1.2.171 The BCN will conduct automatic retries during message/packet delivery attempts.
- 1.2.172 The BCN will generate asynchronous alerts and routing both its own alerts and other devices' alerts to the CMS.
- 1.2.173 The BCN will be able to prioritize the delivery of specified traffic types (e.g. high priority) over others (low priority).
- 1.2.174 The BCN will be capable of addressing groups of field devices for bulk messages including remote firmware upgrades and configuration changes.
- 1.2.175 The BCN will be capable of maintaining network availability of 99.99%.
- 1.2.176 The BCN will maintain round trip message time of less than 60ms.
- 1.2.177 The BCN will maintain latency for individual on-demand message of average size of less than 20ms.
- 1.2.178 The BCN will perform bulk firmware upgrades of 95% in 24 hours and 100% in 4 days. Vendor quantifies that this will vary based on network configuration and sizing.
- 1.2.179 The BCN will be fully interoperable with the CMS, Field Devices and Luminaires.

Adaptive Controls – Field Devices

Field Devices are networked Components (hardware and embedded software, consisting of Controllers and possibly Gateways) installed in the field that, following purchase, installation, start-up and commissioning, function together to adaptively control and remotely monitor Luminaires

- 1.2.180 The Field Devices will be capable of normal operation over an ambient temperature range of -40C to +70C.
- 1.2.181 The Field Devices installed external or remote to luminaires shall be housed in enclosures rated at least IP65.
- 1.2.182 The Controllers must be integrated (mechanically and electrically connected) at Control Points via the NEMA standard 7 pin receptacle. For decorative Luminaires, the controller may be integrated internally.
- 1.2.183 The Controllers will be capable of actuating the luminaire statuses:

- On/Off state
- Dimmed state by creating a control signal that complies with DALI standard
- Changes occur instantaneously

1.2.184 The Controllers will be capable of measuring and monitoring over time the following power quality parameters: RMS input voltage, RMS input current, Apparent power, True input power and Power factor.

1.2.185 The Controllers are capable of measuring power quality parameters at each Control Point for the luminaire and the controller with the luminaire.

1.2.186 The Controllers are capable of measuring energy consumption and energy consumption accuracy for all luminaires proposed by the Vendor.

1.2.187 The Controllers are capable of integrally sensing and monitoring over time the environmental parameters of expected sunrise and sunset times, ambient light levels, GPS location, and temperature.

1.2.188 Field Devices are capable of logging:

- Cumulative hours in the luminaire on state for each Control Point
- Cumulative energy consumption of each Control Point
- Cumulative energy consumption according to IEC 61968-9

Offline Operation

1.2.189 Field Devices are capable of storing the following offline time-stamped Control Point parameters: Controller status, luminaire status, cumulative on state time and cumulative energy consumption.

1.2.190 Field Devices are capable of storing measurements of all offline parameters at a storing frequency of no less than once very second and for a storing period of greater than one day.

1.2.191 Field Devices are capable of communicating the loss of electrical service and any stored data automatically to the CMS in the event of an unscheduled or otherwise unforeseen event.

1.2.192 Field Devices support operating system updates and patches to ensure future security vulnerability can be resolved.

Online Operation

1.2.193 Field Devices are capable of reporting the following online Control Point parameters:

- Controller status
- Luminaire status
- Average RMS input voltage in the on state
- Average RMS input current in the on state
- Average true input power in the on state
- Average input power factor in the on state
- Cumulative on state time

- Cumulative energy consumption
- LED driver status
- Ambient light level (via integral sensor)
- GPS location (via integral sensor)
- Temperature (via integral sensor)

- 1.2.194 Field Devices are capable of reporting all online Control Point parameters for all Control Points at a maximum reporting frequency of once every 60 minutes.
- 1.2.195 Field Devices are capable of reporting all Control Point parameters for a single Control Point at a maximum reporting frequency of once every 15 seconds, whether automatic or manual.
- 1.2.196 Field Devices will execute any single command received from the BCN in less than 5 seconds.
- 1.2.197 Field Devices will automatically report all data stored during offline operation once online operation is restored.
- 1.2.198 Field Devices will utilize a secure boot-up scheme to verify the integrity of firmware images that are to be executed, thereby preventing unauthorized or maliciously modified software from running on the device.

Adaptive Controls – Field Devices – Functional Features

- 1.2.199 Field Devices will be capable of controlling a single luminaire or groups of luminaires.
- 1.2.200 Changes in the on/off or dimmed states to groups of luminaires will be staggered to limit the inrush current through other electrical components on the luminaire group electrical circuit.
- 1.2.201 Field Devices are capable of the following luminaire controls, both singularly and in groups:
- Manual control, whereby the on/off and dimmed state is modified in response to commands from the CMS
 - Scheduled control, whereby the on/off and dimmed state is modified according to a pre-defined schedule that is time-based (up to eight times per day) or event based (daily, weekly, weekend, special)
 - Scheduled Control that is defined according to inputs from integral sensors or the CMS
 - Adaptive Control, whereby the on/off and dimmed state is modified in response to dynamic inputs from integral sensors or the CMS
 - Prioritized Control, whereby the on/off and dimmed state is modified in response to dynamic inputs from integral sensors or the CMS
 - Prioritized Control, whereby the Scheduled Control is modified or overridden according to input from integral sensors or the CMS.
- 1.2.202 During offline operation, Field Devices are capable of maintaining Luminaire control by continuing to operate according to the most recently programmed Scheduled Control or a default Scheduled Control if one has not yet been programmed; or continuing to operate according to the most recently programmed Adaptive Control or a default Adaptive Control if one has not yet been programmed, using Input from an integral sensor.
- 1.2.203 Field Devices are capable of the following luminaire control:

- Dimmed state is actuated to achieve a desired true input power (percent relative watts)
- Dimmed state is actuated to achieve a desired light output (percent relative lumens), which may require an external light sensor
- By automatically maintaining constant light output over time by compensating for lumen depreciation ensuring that a maximum true input power is never exceeded

Adaptive Controls – Field Devices – Interoperability

1.2.204 Field Devices may conform to TALQ specifications. Vendor will work with each municipality to define requirements for conformance standards.

1.2.205 Field Devices may conform to LonMark standards. Vendor will work with each municipality to determine parameters for LonMark standards.

1.3 FINANCING

1.3.1 The Vendor will allow the municipality to:

1.3.1.1 Pay for the upgrade via upfront capital (or municipal sourced financing);

1.3.1.2 Enter into an energy performance contract with guaranteed energy savings thus requiring no upfront capital by the municipality; or

1.3.1.3 Benefit from additional Vendor provided finance mechanisms.

1.3.2 Energy Performance Implementation

The Vendor will implement LED street light conversions through an Energy Performance Contract if this is the desired approach by the municipality.

1.3.2.1 There will be no initial capital costs to the municipality for the street light upgrade.

1.3.2.2 An annual energy savings guarantee that is equal to or greater than the total annual project costs.

1.3.2.3 Monthly payment plan option.

1.3.3 Vendor will utilize each individual Illinois municipality's current inventory audit spreadsheet (if available) in determining the project size, with the assumption that there is a certain level of accuracy. The final project size will be represented in the form of a request for proposals for financing that indicates the final amount may likely vary as the project costs are refined and completed.

1.3.4 Vendor uses a fully cost disclosed "add"/ "deduct" approach to ensure and inform each Illinois municipality of any discrepancies experienced in the audit as the installation of the project is completed. This (i) reduces the redundant cost of providing a second audit if an existing audit is complete; ii) shortens the delivery time of the project and allows Vendor to begin installing the project on the individual Illinois municipality's timeline and when weather conditions are more favorable to more efficient installation; and iii) protects the municipality from incurring unnecessary costs knowing "upfront" what the costs are for any changes encountered during construction.

1.3.5 Vendor does not have any monetary interest in financing the project, nor will Vendor receive any commissions related to a financed project should the Vendor introduce each municipality to an eventual funding source.

1.3.6 Vendor provides the following examples of financing:

Tax-Exempt Lease Purchase Option

A third-party funded, tax-exempt lease is a common method of funding LED street lighting conversion projects. The tax-exempt lease structure generally offers the advantage of quick availability of funding, low issuance costs and flexible payment terms that can match up to the savings cash flow, thereby always assuring the municipality borrowing the funds is cash flow positive, or at the very least, neutral.

Shared Savings"/ "Sale Leaseback" and Power Purchase Agreement (PPA) Options

A municipality enters a system acquisition agreement whereby an independent third party (not the municipality) purchases the street lighting system from the municipality or on behalf of the municipality then leases the system back to the municipality. This "Shared Savings" funding model, in most cases, is unnecessarily costly and is generally reserved for non-government organizations that do not have access to extremely low-cost, tax-exempt funding sources.

1.3.7 The Vendor will process and receive all available rebates and incentives from the Illinois Energy Now Program and all other available State and Federal programs.

1.3.8 Vendor will establish and maintain necessary records for any products eligible for rebates and incentives, and will submit rebate applications per the program's instructions (as completed or at the end of construction) to the state and/or local utility. Upon receipt from the municipality, Vendor will submit all necessary documentation required by the rebate and/or incentive provider to maximize available rebates and incentives.

1.4 MILESTONES AND DELIVERABLES:

1.4.1 Vendor will conduct a kickoff meeting with the interested municipality to establish scope of work.

1.4.2. Vendor will conduct an inventory audit (if an existing audit is not sufficient), as requested by the municipality that includes the following information for each fixture, stored in the inventory audit results data and in a geographic information system (GIS) utilizing an Environmental Systems Research Institute Shapefile (ESRI SHP), standard GIS format and in Excel format:

- Geographic location
- Road width and classifications as local, collector, arterial or other
- Pedestrian activity level (high, med, low)
- Sidewalk width and location
- Pole height and arm length
- Pole spacing (average and max)
- Luminaire style as cobra head, floodlight, shoebox, decorative, or other
- Luminaire wattage
- Ownership: municipality or utility
- Illuminance, luminance and uniformity

- Infrastructure stabilization recommended, including upgrade or replacement of the street light pole and/or cabling

1.4.3 Vendor will provide a Project Plan that will include, but not be limited to:

- Timeline
- Project Team, including subcontractors
- Schedules of project team
- Necessary road closures
- Hazardous material removal
- Installation costs
- Maintenance costs
- Recommended equipment (luminaires, style, etc.) and product procurement costs
- Warranty coverage
- Best practices
- Rebates and incentives available from all State and Federal agencies and local utilities

1.4.4 The agreed upon specifications in the project plan will become part of the resulting contract with the municipality.

1.4.5 Vendor will provide training for luminaire replacement/maintenance or provide a service contract on behalf of the municipality.

1.4.6 Vendor will provide software that is included as part of the ten-year agreement.

1.4.7 Vendor will provide software updates and releases included as part of the ten-year agreement.

1.4.8 Vendor will supply operation manuals and training for commissioning and maintaining the systems.

1.4.9 Vendor will process and receive all available rebates from the Illinois Energy Now program as well as all other available State and Federal programs.

1.4.10 Following project completion, the Vendor must provide final project reporting documentation to the municipal Project Manager. Vendor will work in conjunction with each municipality's project manager and other personnel to make sure all systems, fixtures and equipment are performing as designed. Any deficiencies will be identified via a punch list of items and will be used to track and correct the deficiencies.

1.4.11 The Vendor will provide for all warranties in written and electronic format.

1.4.12 The State has the ability to update the material specifications and provide the Vendor the opportunity to submit new materials that either replace or are in addition to the Vendor's originally proposed materials.

1.4.13 The State makes no commitment to the Vendor regarding the quantity of equipment or services purchased by Illinois municipalities.

1.5 VENDOR / STAFF SPECIFICATIONS:

1.5.1 Vendor will comply with IES RP-8-14 Roadway Lighting.

1.5.2 Vendor may be a National Association of Energy Services Companies (NAESCO) Accredited Energy Service Provider (ESP).

1.5.3 Vendor will provide a copy of its security certifications and maintain those certification(s), including but not limited to:

- Independent third-party audit Statement on Standards for Attestation Engagements (SSAE-16)
- SOC 1 Type 2, SOC 2 Type 2 or equivalent certifications

1.6 TRANSPORTATION AND DELIVERY:

1.6.1 The Vendor will provide the following materials and services to Illinois municipalities throughout the full geographical parameters of the State:

- Inventory audit services
- Photometric design services
- Energy savings analysis
- LED luminaire procurement or manufacture, installation and commissioning services
- Adaptive controls

1.6.2 Terms should be established in each contract between the Vendor and each municipality.

1.7 SUBCONTRACTING

Subcontractors are allowed.

For purposes of this section, subcontractors are those specifically hired to perform all or part of the work covered by the contract. If subcontractors will be utilized, Vendor must identify below the names and addresses of all subcontractors it will be entering into a contractual agreement that has an annual value of \$50,000 or more in the performance of this Contract, together with a description of the work to be performed by the subcontractor and the anticipated amount of money to the extent the information is known that each subcontractor is expected to receive pursuant to the Contract. Attach additional sheets as necessary.

1.7.1 Will subcontractors be utilized? Yes No

- Subcontractor Name: WESCO Distribution

Amount to be paid: TBD

Address: 630-862-8860 abilhymer@wesco.com

Description of work: distribution services

- Subcontractor Name: Cisco Systems, Inc.

Amount to be paid: TBD

Address: 7364 Bahr Road, Sherman, IL 62684 217-303-6782
btobias@cisco.com

Description of work: IT and networking services

- Subcontractor Name: Presidio Networked Solutions Group

Amount to be paid: TBD

Address: 401 SW Water St, Suite 601, Peoria, IL 61602 309-306-7831
drisk@presidio.com

Description of work: IT, networking, digital infrastructure services

- Subcontractor Name: CIMCON Lighting

Amount to be paid: TBD

Address: 740-502-9476
martin.woolard@CIMCONlighting.com

Description of work: lighting products and services

- Subcontractor Name: Echelon Corporation

Amount to be paid: TBD

Address: Easton, PA 484-542-3998
kchinchar@echelon.com

Description of work: lighting products and services

- Subcontractor Name: John Burns Construction Co

Amount to be paid: TBD

Address: 17601 Southwest Highway, Orland Park, IL 60467
708-670-1796

Description of work: electrical contracting services

- Subcontractor Name: Ficek Electric & Communication Systems Inc. (BEP certified)

Amount to be paid: 20%

If additional space is necessary to provide subcontractor information, please attach an additional page

- 1.7.2** All contracts with the subcontractors identified above must include the Standard Certifications completed and signed by the subcontractor.
- 1.7.3** If the annual value of any the subcontracts is more than \$50,000, then the Vendor must provide to the State the Financial Disclosures and Conflicts of Interest for that subcontractor.
- 1.7.4** If the subcontractor is registered in the Illinois Procurement Gateway (IPG) and the Vendor is using the subcontractor's Standard Certifications or Financial Disclosures and Conflicts of Interest from the IPG, then the Vendor must also provide to the State a completed Forms B for the subcontractor.
- 1.7.5** If at any time during the term of the Contract, Vendor adds or changes any subcontractors, Vendor will be required to promptly notify, in writing, the State Purchasing Officer or the Chief Procurement Officer of the names and addresses and the expected amount of money that each new or replaced subcontractor will receive pursuant to this Contract. Any subcontracts entered into prior to award of the Contract are done at the sole risk of the Vendor and subcontractor(s).

1.8 SUCCESSOR VENDOR

- Yes No This contract is for services subject to 30 ILCS 500/25-80. Heating and air conditioning service contracts, plumbing service contracts, and electrical service contracts are not subject to this requirement. Non-service contracts, construction contracts, qualification based selection contracts, and professional and artistic services contracts are not subject to this requirement.

If yes is checked, then the Vendor certifies:

- (i) that it shall offer to assume the collective bargaining obligations of the prior employer, including any existing collective bargaining agreement with the bargaining representative of any existing collective bargaining unit or units performing substantially similar work to the services covered by the contract subject to its bid or offer; and
- (ii) that it shall offer employment to all employees currently employed in any existing bargaining unit who perform substantially similar work to the work that will be performed pursuant to this contract.

This certification supersedes a response to certification 4, Form F, of the Illinois Procurement Gateway (IPG).

1.9 WHERE SERVICES ARE TO BE PERFORMED: Unless otherwise disclosed in this section all services shall be performed in the United States. If the Vendor performs the services purchased hereunder in another country in violation of this provision, such action may be deemed by the State as a breach of the contract by Vendor.

Vendor shall disclose the locations where the services required shall be performed and the known or anticipated value of the services to be performed at each location. If the Vendor received additional

consideration in the evaluation based on work being performed in the United States, it shall be a breach of contract if the Vendor shifts any such work outside the United States.

- Location where services will be performed: State of Illinois /Commonwealth of Pennsylvania

Value of services performed at this location: 90%/10%

2 PRICING

2.1 TYPE OF PRICING: The Illinois Office of the Comptroller requires the State to indicate whether the contract value is firm or estimated at the time it is submitted for obligation. The total value of this contract is estimated.

2.2 EXPENSES ALLOWED: Expenses are not allowed.

2.3 DISCOUNT: N/A

2.4 VENDOR’S PRICING:

2.4.1. Time & Materials Hourly Rates

TURNKEY SERVICES Hourly Rates	Monday-Friday 8am - 5pm	Monday-Friday 5pm-8pm	Saturdays/ Sundays	Holidays
Inventory Audit Services	\$ 110.00	\$ 170.00	\$170.00	\$220.00
Infrastructure Stabilization Services	\$1012.50	\$1255.50	\$1572.75	\$1809.00
Photometric Design	\$135.00	\$135.00	\$135.00	\$135.00
Energy Savings Analysis	\$150.00	\$150.00	\$150.00	\$150.00
Installation for Luminaires	\$654.75	\$823.50	\$1026.00	\$1181.25
Installation for Adaptive Controls	\$654.75	\$823.50	\$1026.00	\$1181.25
Acceptance Services	\$75.00	\$103.00	\$103.00	\$150.00
Operations & Maintenance Services	\$654.75	\$823.50	\$1026.00	\$1181.25
Test Services	\$654.75	\$823.50	\$1026.00	\$1181.25

2.4.2 Luminaires

The percentage discount off MSRP will be used for luminaire models (e.g. shoebox, acorn, decorative, etc.) and all future models. The municipality will be eligible to order luminaires from the Vendor that at a minimum meet the mandatory requirements in this contract. The percentage discount off MSRP shall be given to all luminaires ordered for Smart Street Lighting upgrades.

MSRP also refers to the list price, catalog price or commercially available price for the products offered by the Vendor. The MSRP (or list price, catalog price or commercially available price) shall be publicly available, via website, or other means, on contract execution.

The Vendor provided 50 percent discount off MSRP (or list price, catalog price, commercially available price) is the contractual price.

During the contract term and subsequent renewals, the price to the municipality may be lower than the contractual price, but can never be higher than the contractual price.

2.4.3 Adaptive Controls

The percentage discounts off MSRP for the Central Management System, Field Devices and Backhaul Communication Network will be used for all models of Central Management System, Field Devices and Backhaul Communication Network respectively. The municipality will be eligible to order all adaptive controls that, at a minimum, meet the mandatory requirements in this contract. The percentage discount off MSRP shall be given to all adaptive controls ordered for Smart Street Lighting upgrades.

MSRP also refers to the list price, catalog price or commercially available price for the products offered by the Vendor. The MSRP (or list price, catalog price or commercially available price) shall be publicly available, via website or other means, on contract execution.

The Vendor provided percentage discounts off MSRP (or list price, catalog price, or commercially available price) are the contractual prices.

Central Management System 20%
Field Devices 50%
Backhaul Communication Network 10%

During the contract term and subsequent renewals, the price for adaptive controls to the municipality may be lower than the contractual price, but can never be higher than the contractual price.

2.4.4 Value Add Service and Application Pricing

The percentage discount off MSRP will be used for all models. The municipality will be eligible to order all Value Add Services and Applications that, at a minimum, meet the mandatory requirements in this contract. The percentage discount off MSRP shall be given to all Value Add Services and Applications ordered for Smart Street Lighting upgrades.

MSRP also refers to the list price, catalog price or commercially available price for the products offered by the Vendor. The MSRP (or list price, catalog price or commercially available price) shall be publicly available, via website or other means, on contract execution.

The Vendor provided percentage discounts off MSRP (or list price, catalog price, commercially available price) are the contractual prices.

Fuse Holder and Fuse 50%
2' to 4' Mast Arm 50%
LED Long Life Photo Cell 50%
Surge Protection 50%

2.4.5 Vendor will process all available rebates from the Illinois Energy Now Program and all other available State and Federal programs.

2.5 RENEWAL COMPENSATION: If the contract is renewed, the price shall be at the same rate as for the initial term.

2.6 MAXIMUM AMOUNT: n/a as this is a master contract, available to all Illinois agencies, local units of government and municipalities.

3 TERM AND TERMINATION

3.1 TERM OF THIS CONTRACT: This master contract has an initial term of five years beginning upon the last dated signature of the Parties.

3.1.1 In no event will the total term of this master contract, including the initial term, any renewal terms and any extensions, exceed 10 years.

3.1.2 Vendor shall not commence billable work in furtherance of the contract prior to final execution of the contract except when permitted pursuant to 30 ILCS 500/20-80.

3.2 RENEWAL:

3.2.1. Any renewal is subject to the same terms and conditions as the original contract unless otherwise provided in the pricing section. The State may renew this contract for any or all of the option periods specified, may exercise any of the renewal options early, and may exercise more than one option at a time based on continuing need and favorable market conditions, when in the best interest of the State. The contract may neither renew automatically nor renew solely at the Vendor's option.

3.2.2. Pricing for the renewal term(s), or the formula for determining price, is shown in the pricing section of this contract.

3.2.3. The State reserves the right to renew for a total of up to five years in any one of the following manners:

3.2.3.1 One renewal covering the entire renewal allowance;

3.2.3.2 Individual one-year renewals up to and including the entire renewal allowance; or

3.2.3.3 Any combination of full or partial year renewals up to and including the entire renewal allowance.

3.3 TERMINATION FOR CAUSE: The State may terminate this contract, in whole or in part, immediately upon notice to the Vendor if: (a) the State determines that the actions or inactions of the Vendor, its agents, employees or subcontractors have caused, or reasonably could cause, jeopardy to health, safety, or property, or (b) the Vendor has notified the State that it is unable or unwilling to perform the contract.

If Vendor fails to perform to the State's satisfaction any material requirement of this contract, is in violation of a material provision of this contract, or the State determines that the Vendor lacks the financial resources to perform the contract, the State shall provide written notice to the Vendor to cure the problem identified within the period of time specified in the State's written notice. If not cured by that date the State may either: (a) immediately terminate the contract without additional written notice or (b) enforce the terms and conditions of the contract.

For termination due to any of the causes contained in this Section, the State retains its rights to seek any available legal or equitable remedies and damages.

3.4 TERMINATION FOR CONVENIENCE: The State may, for its convenience and with thirty (30) days prior written notice to Vendor, terminate this contract in whole or in part and without payment of any penalty or incurring any further obligation to the Vendor.

3.4.1. Upon submission of invoices and proof of claim, the Vendor shall be entitled to compensation for supplies and services provided in compliance with this contract up to and including the date of termination.

3.5 AVAILABILITY OF APPROPRIATION: This contract is contingent upon and subject to the availability of funds. The State, at its sole option, may terminate or suspend this contract, in whole or in part, without penalty or further payment being required, if (1) the Illinois General Assembly or the federal funding source fails to make an appropriation sufficient to pay such obligation, or if funds needed are insufficient for any reason (30 ILCS 500/20-60), (2) the Governor decreases the Department's funding by reserving some or all of the Department's appropriation(s) pursuant to power delegated to the Governor by the Illinois General Assembly, or (3) the Department determines, in its sole discretion or as directed by the Office of the Governor, that a reduction is necessary or advisable based upon actual or projected budgetary considerations. Contractor will be notified in writing of the failure of appropriation or of a reduction or decrease.

4 STANDARD BUSINESS TERMS AND CONDITIONS

4.1 PAYMENT TERMS AND CONDITIONS:

- 4.1.1 Late Payment: Payments, including late payment charges, will be paid in accordance with the State Prompt Payment Act and rules when applicable. 30 ILCS 540; 74 Ill. Adm. Code 900. This shall be Vendor's sole remedy for late payments by the State. Payment terms contained on Vendor's invoices shall have no force and effect.
- 4.1.2 Minority Contractor Initiative: Any Vendor awarded a contract under Section 20-10, 20-15, 20-25 or 20-30 of the Illinois Procurement Code (30 ILCS 500) of \$1,000 or more is required to pay a fee of \$15. The Comptroller shall deduct the fee from the first check issued to the Vendor under the contract and deposit the fee in the Comptroller's Administrative Fund. 15 ILCS 405/23.9.
- 4.1.3 Expenses: The State will not pay for supplies provided or services rendered, including related expenses, incurred prior to the execution of this contract by the Parties even if the effective date of the contract is prior to execution.
- 4.1.4 Prevailing Wage: As a condition of receiving payment Vendor must (i) be in compliance with the contract, (ii) pay its employees prevailing wages when required by law, (iii) pay its suppliers and subcontractors according to the terms of their respective contracts, and (iv) provide lien waivers to the State upon request. Examples of prevailing wage categories include public works, printing, janitorial, window washing, building and grounds services, site technician services, natural resource services, security guard and food services. The prevailing wages are revised by the Illinois Department of Labor (DOL) and are available on DOL's official website, which shall be deemed proper notification of any rate changes under this subsection. Vendor is responsible for contacting DOL at 217-782-6206 or (<http://www.state.il.us/agency/idol/index.htm>) to ensure understanding of prevailing wage requirements.
- 4.1.5 Federal Funding: This contract may be partially or totally funded with Federal funds. If Federal funds are expected to be used, then the percentage of the good/service paid using Federal funds and the total Federal funds expected to be used will be provided to the awarded Vendor in the notice of intent to award.
- 4.1.6 Invoicing: By submitting an invoice, Vendor certifies that the supplies or services provided meet all requirements of the contract, and the amount billed and expenses incurred are as allowed in the contract. Invoices for supplies purchased, services performed and expenses incurred through June 30 of any year must be submitted to the State no later than July 31 of that year; otherwise Vendor may have to seek payment through the Illinois Court of Claims. 30 ILCS 105/25. All invoices are subject to statutory offset. 30 ILCS 210.
- 4.1.6.1 Vendor shall not bill for any taxes unless accompanied by proof that the State is subject to the tax. If necessary, Vendor may request the applicable Agency's state tax exemption number and federal tax exemption information.
- 4.1.6.2 Vendor shall invoice at the completion of this contract unless invoicing is tied in this contract to milestones, deliverables, or other invoicing requirements agreed to in the contract.

Send electronic invoices to:

Agency:	User Agency/Unit of Government/Municipality
Attn:	User Agency/Unit of Government/Municipality
Email:	User Agency/Unit of Government/Municipality
Address:	User Agency/Unit of Government/Municipality
City, State Zip	User Agency/Unit of Government/Municipality

4.2 ASSIGNMENT: This contract may not be assigned, transferred in whole or in part by Vendor without the prior written consent of the State.

4.3 SUBCONTRACTING: For purposes of this section, subcontractors are those specifically hired to perform all or part of the work covered by the contract. Vendor must receive prior written approval before use of any subcontractors in the performance of this contract. Vendor shall describe, in an attachment if not already provided, the names and addresses of all authorized subcontractors to be utilized by Vendor in the performance of this contract, together with a description of the work to be performed by the subcontractor and the anticipated amount of money that each subcontractor is expected to receive pursuant to this contract. If required, Vendor shall provide a copy of any subcontracts within fifteen (15) days after execution of this contract. All subcontracts must include the same certifications that Vendor must make as a condition of this contract. Vendor shall include in each subcontract the subcontractor certifications as shown on the Standard Certification form available from the State. If at any time during the term of the Contract, Vendor adds or changes any subcontractors, then Vendor must promptly notify, by written amendment to the Contract, the State Purchasing Officer or the Chief Procurement Officer of the names and addresses and the expected amount of money that each new or replaced subcontractor will receive pursuant to the Contract. 30 ILCS 500/20-120.

4.4 AUDIT/RETENTION OF RECORDS: Vendor and its subcontractors shall maintain books and records relating to the performance of the contract or subcontract and necessary to support amounts charged to the State pursuant the contract or subcontract. Books and records, including information stored in databases or other computer systems, shall be maintained by the Vendor for a period of three (3) years from the later of the date of final payment under the contract or completion of the contract, and by the subcontractor for a period of three (3) years from the later of final payment under the term or completion of the subcontract. If Federal funds are used to pay contract costs, the Vendor and its subcontractors must retain their respective records for five (5) years. Books and records required to be maintained under this section shall be available for review or audit by representatives of: the procuring Agency, the Auditor General, the Executive Inspector General, the Chief Procurement Officer, State of Illinois internal auditors or other governmental entities with monitoring authority, upon reasonable notice and during normal

business hours. Vendor and its subcontractors shall cooperate fully with any such audit and with any investigation conducted by any of these entities. Failure to maintain books and records required by this section shall establish a presumption in favor of the State for the recovery of any funds paid by the State under this contract or any subcontract for which adequate books and records are not available to support the purported disbursement. The Vendor or subcontractors shall not impose a charge for audit or examination of the Vendor's or subcontractor's books and records. 30 ILCS 500/20-65.

- 4.5 TIME IS OF THE ESSENCE:** Time is of the essence with respect to Vendor's performance of this contract. Vendor shall continue to perform its obligations while any dispute concerning the contract is being resolved unless otherwise directed by the State.
- 4.6 NO WAIVER OF RIGHTS:** Except as specifically waived in writing, failure by a Party to exercise or enforce a right does not waive that Party's right to exercise or enforce that or other rights in the future.
- 4.7 FORCE MAJEURE:** Failure by either Party to perform its duties and obligations will be excused by unforeseeable circumstances beyond its reasonable control and not due to its negligence, including acts of nature, acts of terrorism, riots, labor disputes, fire, flood, explosion, and governmental prohibition. The non-declaring Party may cancel the contract without penalty if performance does not resume within thirty (30) days of the declaration.
- 4.8 CONFIDENTIAL INFORMATION:** Each Party to this contract, including its agents and subcontractors, may have or gain access to confidential data or information owned or maintained by the other Party in the course of carrying out its responsibilities under this contract. Vendor shall presume all information received from the State or to which it gains access pursuant to this contract is confidential. Vendor information, unless clearly marked as confidential and exempt from disclosure under the Illinois Freedom of Information Act, shall be considered public. No confidential data collected, maintained, or used in the course of performance of the contract shall be disseminated except as authorized by law and with the written consent of the disclosing Party, either during the period of the contract or thereafter. The receiving Party must return any and all data collected, maintained, created or used in the course of the performance of the contract, in whatever form it is maintained, promptly at the end of the contract, or earlier at the request of the disclosing Party, or notify the disclosing Party in writing of its destruction. The foregoing obligations shall not apply to confidential data or information lawfully in the receiving Party's possession prior to its acquisition from the disclosing Party; received in good faith from a third Party not subject to any confidentiality obligation to the disclosing Party; now is or later becomes publicly known through no breach of confidentiality obligation by the receiving Party; or is independently developed by the receiving Party without the use or benefit of the disclosing Party's confidential information.
- 4.9 USE AND OWNERSHIP:** All work performed or supplies created by Vendor under this contract, whether written documents or data, goods or deliverables of any kind, shall be deemed work for hire under copyright law and all intellectual property and other laws, and the State of Illinois is granted sole and exclusive ownership to all such work, unless otherwise agreed in writing. Vendor hereby assigns to the State all right, title, and interest in and to such work including any related intellectual property rights, and/or waives any and all claims that Vendor may have to such work including any so-called "moral rights"

in connection with the work. Vendor acknowledges the State may use the work product for any purpose. Confidential data or information contained in such work shall be subject to confidentiality provisions of this contract.

- 4.10 INDEMNIFICATION AND LIABILITY:** The Vendor shall indemnify and hold harmless the State of Illinois, its agencies, officers, employees, agents and volunteers from any and all costs, demands, expenses, losses, claims, damages, liabilities, settlements and judgments, including in-house and contracted attorneys' fees and expenses, arising out of: (a) any breach or violation by Vendor of any of its certifications, representations, warranties, covenants or agreements; (b) any actual or alleged death or injury to any person, damage to any real or personal property, or any other damage or loss claimed to result in whole or in part from Vendor's negligent performance; (c) any act, activity or omission of Vendor or any of its employees, representatives, subcontractors or agents; or (d) any actual or alleged claim that the services or goods provided under this contract infringe, misappropriate, or otherwise violate any intellectual property (patent, copyright, trade secret, or trademark) rights of a third party. In accordance with Article VIII, Section 1(a),(b) of the Constitution of the State of Illinois and 1973 Illinois Attorney General Opinion 78, the State may not indemnify private parties absent express statutory authority permitting the indemnification. Neither Party shall be liable for incidental, special, consequential, or punitive damages.
- 4.11 INSURANCE:** Vendor shall, at all times during the term of this contract and any renewals or extensions, maintain and provide a Certificate of Insurance naming the State as an additionally insured for all required bonds and insurance. Certificates may not be modified or canceled until at least thirty (30) days' notice has been provided to the State. Vendor shall provide: (a) General Commercial Liability insurance in the amount of \$1,000,000 per occurrence (Combined Single Limit Bodily Injury and Property Damage) and \$2,000,000 Annual Aggregate; (b) Auto Liability, including Hired Auto and Non-Owned Auto (Combined Single Limit Bodily Injury and Property Damage), in amount of \$1,000,000 per occurrence; and (c) Worker's Compensation Insurance in the amount required by law. Insurance shall not limit Vendor's obligation to indemnify, defend, or settle any claims.
- 4.12 INDEPENDENT CONTRACTOR:** Vendor shall act as an independent contractor and not an agent or employee of, or joint venture with the State. All payments by the State shall be made on that basis.
- 4.13 SOLICITATION AND EMPLOYMENT:** Vendor shall not employ any person employed by the State during the term of this contract to perform any work under this contract. Vendor shall give notice immediately to the Agency's director if Vendor solicits or intends to solicit State employees to perform any work under this contract.
- 4.14 COMPLIANCE WITH THE LAW:** The Vendor, its employees, agents, and subcontractors shall comply with all applicable federal, state, and local laws, rules, ordinances, regulations, orders, federal circulars and all license and permit requirements in the performance of this contract. Vendor shall be in compliance with applicable tax requirements and shall be current in payment of such taxes. Vendor shall obtain at its own expense, all licenses and permissions necessary for the performance of this contract.
- 4.15 BACKGROUND CHECK:** Whenever the State deems it reasonably necessary for security reasons, the State may conduct, at its expense, criminal and driver history background checks of Vendor's and

subcontractors' officers, employees or agents. Vendor or subcontractor shall immediately reassign any individual who, in the opinion of the State, does not pass the background check.

4.16 APPLICABLE LAW:

4.16.1 PREVAILING LAW: This contract shall be construed in accordance with and is subject to the laws and rules of the State of Illinois.

4.16.2 EQUAL OPPORTUNITY: The Department of Human Rights' Equal Opportunity requirements are incorporated by reference. 44 ILL. ADM. CODE 750.

4.16.3 COURT OF CLAIMS; ARBITRATION; SOVEREIGN IMMUNITY: Any claim against the State arising out of this contract must be filed exclusively with the Illinois Court of Claims. 705 ILCS 505/1. The State shall not enter into binding arbitration to resolve any dispute arising out of this contract. The State of Illinois does not waive sovereign immunity by entering into this contract.

4.16.4 OFFICIAL TEXT: The official text of the statutes cited herein is incorporated by reference. An unofficial version can be viewed at (www.ilga.gov/legislation/ilcs/ilcs.asp).

4.17 ANTI-TRUST ASSIGNMENT: If Vendor does not pursue any claim or cause of action it has arising under Federal or State antitrust laws relating to the subject matter of this contract, then upon request of the Illinois Attorney General, Vendor shall assign to the State all of Vendor's rights, title and interest in and to the claim or cause of action.

4.18 CONTRACTUAL AUTHORITY: The Agency that signs this contract on behalf of the State of Illinois shall be the only State entity responsible for performance and payment under this contract. When the Chief Procurement Officer or authorized designee or State Purchasing Officer signs in addition to an Agency, he/she does so as approving officer and shall have no liability to Vendor. When the Chief Procurement Officer or authorized designee or State Purchasing Officer signs a master contract on behalf of State agencies, only the Agency that places an order or orders with the Vendor shall have any liability to the Vendor for that order or orders.

4.19 NOTICES: Notices and other communications provided for herein shall be given in writing via electronic mail whenever possible. If transmission via electronic mail is not possible, then notices and other communications shall be given in writing via registered or certified mail with return receipt requested, via receipted hand delivery, via courier (UPS, Federal Express or other similar and reliable carrier), or via facsimile showing the date and time of successful receipt. Notices shall be sent to the individuals who signed this contract using the contact information following the signatures. Each such notice shall be deemed to have been provided at the time it is actually received. By giving notice, either Party may change its contact information.

4.20 MODIFICATIONS AND SURVIVAL: Amendments, modifications and waivers must be in writing and signed by authorized representatives of the Parties. Any provision of this contract officially declared void, unenforceable, or against public policy, shall be ignored and the remaining provisions shall be interpreted, as far as possible, to give effect to the Parties' intent. All provisions that by their nature would be expected

to survive, shall survive termination. In the event of a conflict between the State's and the Vendor's terms, conditions and attachments, the State's terms, conditions and attachments shall prevail.

4.21 PERFORMANCE RECORD / SUSPENSION: Upon request of the State, Vendor shall meet to discuss performance or provide contract performance updates to help ensure proper performance of the contract. The State may consider Vendor's performance under this contract and compliance with law and rule to determine whether to continue the contract, suspend Vendor from doing future business with the State for a specified period of time, or whether Vendor can be considered responsible on specific future contract opportunities.

4.22 FREEDOM OF INFORMATION ACT: This contract and all related public records maintained by, provided to or required to be provided to the State are subject to the Illinois Freedom of Information Act (FOIA) (50 ILCS 140) notwithstanding any provision to the contrary that may be found in this contract.

4.23 SCHEDULE OF WORK: Any work performed on State premises shall be done during the hours designated by the State and performed in a manner that does not interfere with the State and its personnel.

4.24 WARRANTIES FOR SUPPLIES AND SERVICES:

4.24.1. Vendor warrants that the supplies furnished under this contract will: (a) conform to the standards, specifications, drawing, samples or descriptions furnished by the State or furnished by the Vendor and agreed to by the State, including but not limited to all specifications attached as exhibits hereto; (b) be merchantable, of good quality and workmanship, and free from defects for a period of twelve months or longer if so specified in writing, and fit and sufficient for the intended use; (c) comply with all federal and state laws, regulations and ordinances pertaining to the manufacturing, packing, labeling, sale and delivery of the supplies; (d) be of good title and be free and clear of all liens and encumbrances and; (e) not infringe any patent, copyright or other intellectual property rights of any third party. Vendor agrees to reimburse the State for any losses, costs, damages or expenses, including without limitations, reasonable attorney's fees and expenses, arising from failure of the supplies to meet such warranties.

4.24.2. Vendor shall ensure that all manufacturers' warranties are transferred to the State and shall provide to the State copies of such warranties. These warranties shall be in addition to all other warranties, express, implied or statutory, and shall survive the State's payment, acceptance, inspection or failure to inspect the supplies.

4.24.3. Vendor warrants that all services will be performed to meet the requirements of this contract in an efficient and effective manner by trained and competent personnel. Vendor shall monitor performances of each individual and shall immediately reassign any individual who does not perform in accordance with this contract, who is disruptive or not respectful of others in the workplace, or who in any way violates the contract or State policies.

4.25 REPORTING, STATUS AND MONITORING SPECIFICATIONS: Vendor shall immediately notify the State of any event that may have a material impact on Vendor's ability to perform this contract.

4.26 EMPLOYMENT TAX CREDIT: Vendors who hire qualified veterans and certain ex-offenders may be eligible for tax credits. 35 ILCS 5/216, 5/217. Please contact the Illinois Department of Revenue (telephone #: 217-524-4772) for information about tax credits.

5. SUPPLEMENTAL PROVISIONS

5.1. STATE SUPPLEMENTAL PROVISIONS

Agency Definitions

“Chief Procurement Officer” means the chief procurement officer appointed pursuant to 30 ILCS 500/10-20(a)(4).

“Governmental unit” means State of Illinois, any State agency as defined in Section 1/15.100 of the Illinois Procurement Code, officers of the State of Illinois, any public authority which has the power to tax or any other public entity created by statute.

Required Federal Clauses, Certifications and Assurances

Public Works Requirements (construction and maintenance of a public work) 820 ILCS 130/4.

Prevailing Wage (janitorial cleaning, window cleaning, building and grounds, site technician, natural resources, food services, and security services, if valued at more than \$200 per month or \$2,000 per year or printing) 30 ILCS 500/25-60.

Agency Specific Terms and Conditions

The chief Procurement Officer for General Services makes this contract available to all governmental units.

Vendor agrees to extend all terms and conditions, specifications, and pricing or discounts specified in this contract for the items in this contract to all governmental units.

The supplies or services subject to this Contract shall be distributed or rendered directly to each governmental unit.

Vendor shall bill each governmental unit separately for its actual share of the costs of the supplies or services purchased.

The credit or liability of each governmental unit shall remain separate and distinct.

Disputes between vendors and governmental units shall be resolved between the affected parties.

All terms and conditions in this Contract apply with full force and effect to all purchase orders.

Other (describe)

Luminaire Test Procedure – Attachment 1

If required by a municipality, the following test procedure should be executed.

When a contract has 30 or more luminaires of the same type, wattage and distribution, that luminaire shall be tested. The quantity of luminaires requiring testing shall be one luminaire for the first 30 plus one additional luminaire for each additional 50 luminaires of that type, wattage, and distribution. Testing is not required for temporary lighting luminaires. The Vendor shall coordinate the luminaire testing, propose a properly accredited laboratory and an independent witness, submit their qualifications for municipal approval prior to any testing, and pay all associated costs including travel expenses for the independent witness. Delays caused by the luminaire testing process shall not be grounds for additional compensation or extension of time.

The independent witness shall be present when tests are performed by the luminaire manufacturer. A laboratory independent of the luminaire manufacturer, distributor, and Vendor may self-certify the test results, in which case the independent witness need not be present during the testing.

After all qualifications have been approved, the independent witness shall select from the project luminaires at the manufacturer's facility the luminaires for testing. In all cases, the selection of luminaires shall be a random selection from the entire completed lot of luminaires required for the contract. Selections from partial lots will not be allowed. The independent witness shall mark each sample luminaire's shipping carton with the municipal contract number and a unique sample identifier.

At the time of random selection, the independent witness shall inspect the luminaire(s) for compliance with all physical, mechanical, and labeling requirements for luminaires according to Vendor – CMS contract. If deficiencies are found during the physical inspection, the Vendor shall have all luminaires of that type, wattage, and distribution inspected for the identified deficiencies and shall correct the problem(s) where found. Random luminaire selection and physical inspection must then be repeated. When the physical inspection is successfully completed, the independent witness shall mark the project number and sample identifier on the interior housing and ballast of the luminaires and have them shipped to the laboratory.

The testing performed by the laboratory shall include photometric, colorimetric, and electrical testing. Colorimetric values shall be determined from total spectral radiant flux measurements using a spectroradiometer. Photometric testing shall be according to IES recommendations (as stated in specifications D-62 to D-67) and as a minimum, shall yield an isofootcandle chart, with max candela point and half candela trace indicated, an isocandela diagram, maximum plane and maximum cone plots of candela, a candlepower table (house and street side), a coefficient of utilization chart, a luminous flux distribution table, BUG rating report, and complete calculations based on specified requirements and test results. All testing shall cover the full spherical light output at a maximum of 5-degree intervals on both the vertical planes and the cones. Tests that "mirror" results from one hemisphere or quadrant to another are not acceptable.

The results for each photometric and colorimetric test performed shall be presented in a standard LM-79 report that includes the outputs listed above. The calculated results for each sample luminaire shall meet or exceed the contract specified levels in the luminaire performance table(s). The laboratory shall mark its test identification number on the interior of each sample luminaire.

Electrical testing shall be in accordance with LM-79.

The summary test report shall consist of a narrative documenting the test process, highlight any deficiencies and corrective actions, and clearly state which luminaires have met or exceeded all test requirements and may be

released for delivery to the jobsite. Photographs shall also be used as applicable to document luminaire deficiencies and shall be included in the test report. The summary test report shall include the Luminaire Physical Inspection Checklist (see table at end of this section), photometric and electrical test reports, and point-by-point photometric calculations performed in AGi32 sorted by luminaire type, wattage, and distribution. All test reports shall be certified by the independent test laboratory's authorized representative or the independent witness, as applicable, by a dated signature on the first page of each report. The summary test reports shall be delivered to the municipality as an electronic submittal. Hard copy reports shall be delivered to the municipality for record retention.

Should any of the tested luminaires fail to satisfy the specifications and perform according to approved submittal information, all luminaires of that type, wattage, and distribution shall be deemed unacceptable and shall be replaced by alternate equipment meeting the specifications. The submittal and testing process shall then be repeated in its entirety. The Vendor may request in writing that unacceptable luminaires be corrected in lieu of replacement. The request shall identify the corrections to be made and upon approval of the request, the Vendor shall apply the corrections to the entire lot of unacceptable luminaires. Once the corrections are completed, the testing process shall be repeated, including selection of a new set of sample luminaires. The number of luminaires to be tested shall be the same quantity as originally tested.

The process of retesting corrected or replacement luminaires shall be repeated until luminaires for each type, wattage, and distribution are approved for the project. Corrections and re-testing shall not be grounds for additional compensation or extension of time. No luminaires shall be shipped from the manufacturer to the jobsite until all luminaire testing is completed and approved in writing.

Submittal information shall include a statement of intent to provide the testing as well as a request for approval of the chosen independent witness laboratory. All summary test reports, written reports, and the qualifications of the independent witness and laboratory shall be submitted for approval to the municipality.

Luminaire Physical Inspection Checklist

Municipality Contract No: _____ Date: _____ Inspector: _____

Luminaire Type: _____ Wattage: _____ Distribution: _____

Packaging:

Inspection Item	Sample:	Sample:	Sample:	Sample:
Shipping carton properly labeled				
Packaging adequately secures and protects luminaire				

Luminaire Housing

Inspection Item	Sample:	Sample:	Sample:	Sample:
Paint and coatings even and reasonably unblemished				
Correct 7-pin receptacle in place and adequately sealed				
No dents, cracks, or other malformations present				
Correct seal of the housing and individual LEDs				
Internal and external labels correct				
Pole or bracket mounting hardware correct				

Light Source Compartment

Inspection Item	Sample:	Sample:	Sample:	Sample:
Lens properly secured to each LED or door or housing				
Lenses not cracked or scratched				
Correct number of LEDs and LED array assemblies				
LEDs correctly installed and oriented				
All fasteners are stainless steel				
Surfaces are smooth to prevent dirt accumulation				

Electrical Compartment

Inspection Item	Sample:	Sample:	Sample:	Sample:
Driver(s) is held securely in place				
Wiring is undamaged, protected from sharp edges, and neatly routed				
Terminations for incoming power wiring are clearly marked and correct for 10 AWG cables				
Driver has quick-disconnect plugs for power and lamp connections which cannot be mis-connected				
Photocell socket is securely mounted				
Photocell receptacle operates correctly				
All fasteners are stainless steel and captive				
Electrical components securely mounted on removable tray with quick-disconnect plugs for ease of maintenance				

Describe any deficiencies found:



CHIEF PROCUREMENT OFFICE
Ellen H. Daley, General Services

Authorization for Joint Purchasing

Smart Street Lighting

CMS802850C

Pursuant to 30 ILCS 525/2(a-5), 30 ILCS 525/3, and 30 ILCS 525/4.2, I hereby authorize the attached Joint Purchase between the Central Management Services and governmental units in Illinois. A copy of this authorization shall be kept in each individual State agency's procurement file as authorization of the Joint Purchase.

The agencies and/or governmental units subject to this Joint Purchase have agreed each agency or governmental unit shall pay the cost of obtaining the services and/or supplies under the contract with TEN Connected Solutions, Inc. at the rate specified in the contract. Pursuant to 30 ILCS 525/3, the credit or liability of each agency or governmental unit shall remain separate and distinct, and disputes between TEN Connected Solutions, Inc. and any of the agencies or governmental units subject to this Joint Purchase shall be resolved between the immediate parties.

Authorized this 11th day of June, 2018



Ellen H. Daley
Chief Procurement Officer – General Services