City of Miami Beach Smart City Street Lighting Initiative (RFQ# 2017-119-KB)

Executive Summary

Phase 1A Design - Benefits, Highlights, & Adoption of Recommendations

In Partnership with Johnson Controls, Inc.

Project Background

The City of Miami Beach selected Johnson Controls as the highest ranked, and most qualified contractor, to partner on the City's exciting Smart City Street Lighting Initiative (RFQ# 2017-119-KB). The Initiative is to be delivered in 3 stages:

Stage 1 - Phase 1A Design
Stage 2 - Phase 1B Design
Stage 3 – Turnkey Construction, Project Management, and Delivery of all equipment and services designed in Phase 1A and Phase 1B.

The purpose of this Executive Summary is to highlight the Phase 1A Design process, partnership with the City and public stakeholders, and recommended benefits for the City Commission to adopt at its May 2020 Board meeting.

Johnson Controls, Inc. (JCI) Partnership

Johnson Controls is a national and state accredited leader in Smart Street Lighting Technologies & Systems, Building Solutions, and Energy Savings Performance Contracting. JCI, along with our team of expert sub-consultant professionals, has worked closely with the City of Miami Beach throughout this Phase 1A Design Program to identify beneficial recommendations for the City to adopt.

As a Fortune 200 Global Leader, JCI has successfully delivered similar projects for public sector agencies across the U.S. over the past 30 years – over 3,000 projects - with over 615 active projects resulting in $6.5 Billion in guaranteed cost savings to our clients.

Smart City Street Lighting Initiative

Phase 1A Design Highlights

- Detailed Survey, Inventory, Review, and Analysis of ~9,000 City-Owned Street Lights
- Series of Public Community Outreach and Engagement Meetings
- Series of City Staff Stakeholder Engagement Meetings & Workshops
- Urban Lighting Analysis Development for Public Safety, Environmental, and unique neighborhood/zone aesthetics
- City-Wide Lighting Standards Development & Recommendations
- Preliminary Smart City Services, Data Strategy, and Public Benefit Use Case Analysis

Next Steps for City Commission Action

1. City Commission Adoption of the Smart City Street Lighting Initiative: **Phase 1A** Design Deliverables & Recommendations at the May 13th, 2020 Commission meeting

2. Now that the Phase 1A Design Program is completed, the City needs to proceed with the Phase 1B Design Program (The Phase 1B Design Contract and Funding were already previously approved by the City Commission)

   Phase 1B Design Program to include:
   - Computerized Maintenance Management System Design
   - Installation of Street Lighting Fixture Mock-Ups in Agreed Upon City Areas
   - Construction Plans for Architectural and Street Lighting Design Upgrades
   - Data Strategy Plan and Community Feedback – **NO** unauthorized Data Collection
   - Smart City Services with City & Public Input to Prepare for Future Technology Advances
   - Fiber Optic Network Design, Permit Plan, and Interconnection Points Plan
   - Final Revenue Generation Models & Financial Analysis with Options

3. Upon completion of the Phase 1B Design Program, Johnson Controls and the City Staff Leadership will present the Smart City Street Lighting Implementation Contract – complete with all design considerations from Phase 1A and Phase 1B, technology vetting and selections, full scope of work, financial and funding analysis, savings and return on investment analysis, revenue generation analysis, construction drawings, and construction implementation schedule.

Our team at Johnson Controls appreciates our continued partnership and collaboration with the City of Miami Beach. We look forward to the adoption of the Phase 1A Design Deliverables and Recommendations and proceeding to the Phase 1B Design Program.

Regards,

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A. Public Outreach and Community Engagement Meetings

From the very beginning of the Smart City Street Lighting Initiative, it was clear that community outreach and engagement would be critical to the overall success of the program. Gaining the valuable input of both the public and the City staff stakeholders has been a tremendous asset to the Johnson Controls design team.

As a sub-consultant to Johnson Controls, the public outreach team led by Infinite Source Communications Group, conducted extensive coordination with the City of Miami Beach staff, key stakeholders and the general public. The purpose of the outreach was to educate the community of the benefits in establishing citywide lighting standards and discuss priorities based on the needs of the community. The team divided the community geographically, targeting stakeholders in the North, Middle and South Beach areas. The various meetings served as a platform for the team to engage the community and gather valuable feedback on their lighting priorities, which in turn aided in the development of the standards.
Outreach efforts were conducted both online and offline through a series of stakeholder meetings, public meetings, and an online survey. The team also partnered with the Communications Office and Miami Beach Police to disseminate project information to the masses through Citywide email communication, social media platforms, event calendars and the City Clerk's office resources. Below is a description of initiatives.

Technical Review Sessions

After completing the citywide street lighting audit, the team met with internal city staff to present their findings and discussed the potential recommendations prior to going to the general public on the following dates:

May 16, 2019
August 29, 2019

After the community outreach was completed, the team gathered their findings and presented their recommendations to the city staff and worked together to fulfill their requests. In recent meetings, the environmental department was pleased that their feedback was taken into consideration and reflected on the standards. Law enforcement provided positive feedback and requested a seasonable adjustment to the Turtle lights. The team explained that currently FWC does not accept this; however, they will continue to investigate the adoption of seasonal control. Presentations occurred on the following dates:

January 6, 2020
January 16, 2020
January 16 & 17; February 11 & 25, 2020 – City Staff Stakeholder Workshop Sessions for Levatas' Public Benefit Use Case Analysis and Data Strategy

Stakeholder Briefings

The team conducted one-on-one briefings with key stakeholder groups throughout the city, with FDOT and Miami-Dade County. The key stakeholders selected served to represent the community in the North, Middle and South Beach areas. Within the stakeholder list were homeowner association presidents and members of various groups such as the:

- Sea Turtle Protectors Group
- Crime Watch groups
- Miami Design Preservation League
- Miami Beach Visitor and Convention Authority

- Business Alliance
- Historic Preservation Board
- The Greater Miami and Beaches Hotel Association

These interactive briefings educated the participants about the different aspects of lighting and encouraged group discussions. As part of these meetings, the team asked each participant to fill out a matrix defining the level of priority for each of the lighting aspects. Invitations were sent via email; calendar invites and follow up calls were conducted to ensure attendance. The participants received a follow up email after the briefing thanking them for attending and asked to share the online version of the lighting priority matrix with their respective groups. Meetings were conducted on the following dates:

- FDOT & Miami-Dade County - July 10, 2019
- Mid Beach - July 11, 2019
- South Beach - July 24, 2019
- North Beach - July 30, 2019

Public Meetings

Two meetings were held for the general public. The outreach team sent invitations via email blast using the Miami Beach Communications Department and Constant Contact, conducted door-to-doors, social media postings and outreach phone calls. Meetings were conducted on the following dates:

- North Beach - September 12, 2019
- Mid & South Beach - September 18, 2019

Online Survey

In an effort to engage the public virtually, the team programmed the priority matrix online via Zoho Survey. The intent of the survey was to provide the public with the opportunity to define levels of priorities for each lighting aspect as was presented in the stakeholder and public meetings.

Overall, the public outreach and community engagement meetings were successful in aiding the Johnson Controls team with valuable feedback for the Phase 1A Design Program.

B. Citywide Lighting Standards

As a sub-consultant to Johnson Controls, global engineering & lighting experts, Jacobs and HLB led the task of the development of the Miami Beach Citywide Lighting Standards for the Phase 1A Design Program. These standards are intended to be used as the basis of design for all city owned lighting. The standard covers lighting fixture specifications, lighting controls, lighting levels, and calculation criteria. The standards were based on input from the residents and stakeholders within Miami Beach. Multiple meetings and online surveys were setup to establish the concerns and priorities of stakeholders, as well as balance the lighting requirements of public safety and environmental, particularly on the coast where lighting affects sea turtle habitations. Keeping the concerns of the all the invested interests in mind the standards were established based on Illuminating Engineering Society's RP-8-18, "Recommended Practice for Design and Maintenance of Roadway and Parking Facility Lighting", and industry expertise to provide standards that unified the concerns of the stakeholders while balancing the environmental lighting requirements and meeting the Florida Fish and Wildlife Conservation Commission requirements.

Full details of the Citywide Lighting Standards have been vetted with the City Staff Stakeholders. The full set of Standards are submitted and attached as part of the Phase 1A Design Deliverables for adoption by the City Commission.

C. Urban Lighting Design Report

The Urban Lighting Design Report was led by Jacobs to establish the lighting criteria for the Phase 1A Design Program. The purpose of the document was to establish the lighting design criteria beyond those covered in the Citywide Lighting Standards and address concerns about existing lighting levels. The report established the lighting design zones to aid in the identification of different lighting areas and schemes. The zones were established based on meetings with the City during the technical review sessions.

The established zones in the report are:

- Corridors
- Hospital District
- Mixed-Use Entertainment District
- Town Center Area District
- Open Space and Parks
- Convention Center District
- Parking Facilities
- City Hall / City Services
- Lincoln Road Pedestrian Mall
- Oceanfront Environmental

Each zone requires a different lighting approach based on usage and the needs of the area. In addition, the report evaluated the existing lighting levels in the area based on a survey conducted by Citelum in 2017 and provided recommendations for improvement.

Full details of the Urban Lighting Design Report have been vetted with the City Staff Stakeholders. The full report has been submitted and attached as part of the Phase 1A Design Deliverables for adoption by the City Commission.

D. The Virginia Tech Transportation Institute (VTTI)

As a sub-consultant to Johnson Controls, The Virginia Tech Transportation Institute (VTTI) provided expertise and public outreach for the Phase 1A Design Program. Various city meetings and public outreach meetings were attended in person or via teleconference. VTTI reviewed and suggested improvements to the design standards, particularly the lighting levels for road user safety and turtle friendly lighting standards. The research behind the lighting standards was validated with stakeholders in internal meetings as needed to help stakeholders understand changes that may have been needed in lighting levels. VTTI also assisted in communicating the safety benefits of smart solid-state lighting to the public in the outreach meetings and assisted in gathering public opinions.

Methods and Results

After the initial kickoff meeting, VTTI provided presented at the smart city ideation meeting in March 2019 with city stakeholders, JCI and the rest of the design team. The concepts of smart lighting and adaptive lighting were discussed with regards to using only the lighting needed to provide maximum safety benefits to the users of the roadway. Also discussed was the ubiquity of the roadway lighting system. The roadway lighting power network and control networks were presented as the ideal starting point for collecting data for smart city services.

After the citywide lighting audit was completed, the team JCI met with internal city staff to present their findings and discussed the potential recommendations prior to going to the general public. VTTI attended these meetings again for technical expertise regarding the lighting levels in the standards as well as in assisting in describing the findings from the audit. VTTI also attended a coordination meeting between the Lighting team and the City Tree Master Plan development group. During this meeting various lighting and tree interference challenges were discussed and a plan was developed to limit pole heights in certain areas to keep the lighting under the planned foliage canopy.

VTTI attended the public stakeholder outreach meetings. VTTI helped explain the reasoning for various lighting technology choices and enumerated ways that smart lighting could be used to address some of the concerns voiced by the public. Additionally, VTTI helped in allaying concerns of impacts to the environment, flora, fauna, and human health.

Two meetings were held for the general public. VTTI attended these two meetings as the team's representatives for road-user safety and for minimizing the use of light.
The 70% and 100% design review meetings were also attended by VTTI. During these meetings, the lighting design standard was presented at each level of completion. Feedback was garnered from the city stakeholders at each meeting. VTTI assisted the team in editing the lighting standard during each phase. Additionally, the VTTI team assisted in gathering data relating to the Florida Fish and Wildlife Conservation Commission (FFWCC) lighting requirements. VTTI surveyed the lighting already certified for use in "Beach Construction" as well as the general recommendations and the physical location of the coastal construction line through the City of Miami Beach boundaries (see Coastal Construction Control Line Program). Modifications and suggestions were presented in additional meetings.

VTTI played a crucial role in development and communicating the proposed Phase 1A Design Program. VTTI helped clarify the lighting design standard choices, from the relationship of the lighting design standards to roadway safety to the standards relationship to existing wildlife regulations and best practices. Various city

meetings and public outreach meetings were attended and VTTI reviewed and suggested improvements to the design standards, particularly the lighting levels for road user safety and turtle friendly lighting standard. VTTI helped the stakeholders and the public understand the benefits that will come from new roadway lighting installed in conformance with the Phase 1A Design Program.

E. Preliminary Smart City Services, Data Strategy, and Public Benefit Use Case Analysis

As a sub-consultant to Johnson Controls, our partner, Levatas, focused their research on data captured as a commodity, deriving both value from insights as well as syndication of the data. With a strong focus on creating value using data, this strategy uses descriptive statistics to better understand activity, machine learning models to create probability-based future outcomes, and prescriptive analytics to provide guidance for decisions to be made. This data-centric approach also leads to the creation of a set of data offerings and a strategy around how to syndicate such products. This Phase 1A iteration of a Preliminary Order of Magnitude Public Impact Use Case Analysis and Data Strategy is designed to explore the opportunities that data as a service can provide to the City of Miami Beach in the area of increased service levels based on city-provided services from smart lighting initiatives. The assumptions included in this report reflect the following activities in Phase 1A by the Smart Lighting city stakeholders, Johnson Controls and additional partners included in the discovery and exploration, as well as significant research in other smart-city implementations around the globe. Please note that the team values the importance of data privacy concerns and will continue to educate the City of Miami Beach and the public on data privacy trends, legislation, and best practices in the Phase 1B Design Program.

Discovery and Research Activities in the Phase 1A Design included:

- Smart city and smart lighting research, including previous city implementations
- Explore potential data consumers and level of interest
- Use Case Analysis and Technical Workshops with representatives from Environment and Sustainability, Information Technology, Parking, Police, Public Works, and Transportation
- Additional feedback sessions with all city department representatives to validate high-level assumptions and estimates

Prioritized Beneficial Public Impact Use Cases

1) Parking Detection

   Computer vision and visual analytics to detect empty and filled parking locations

2) Traffic Flow

   Computer vision and visual analytics to determine congested traffic patterns and light traffic patterns

3) Severe Weather / Flood Detection

   Computer vision, audio detection, visual analytics and machine learning to identify areas of flooding and areas prone to flooding

4) Wi-Fi Access

   Wi-Fi, Bluetooth and GPS technology on poles to provide residents access to free/discount Wi-Fi access and opportunities for digital advertising

5) Crowd Detection

   Computer vision and visual analytics to identify areas of crowd congestion and crowd disbursements

6) Camera Based Monitoring

   Collection of recorded video camera footage based on multiple smart pole positions as a data service

Full details of the Preliminary Smart City Services, Data Strategy, and Public Benefit Use Case Analysis have been vetted with the City Staff Stakeholders. The full report has been submitted and attached as part of the Phase 1A Design Deliverables for adoption by the City Commission.

F. Phase 1A Design Program Conclusion

The Phase 1A Design Program for the City of Miami Beach Smart City Street Lighting Initiative is now complete. The next step in the overall initiative is to move forward to the Phase 1B Design Program. Upon completion of the Phase 1B Design Program, Johnson Controls will return to the City Commission to present the fully developed Smart City Street Lighting contract for approval to commence implementation.

Our team at Johnson Controls appreciates our continued partnership and collaboration with the City of Miami Beach. We look forward to the adoption of the Phase 1A Design Deliverables and Recommendations and proceeding to the Phase 1B Design Program.

Any questions regarding this Executive Summary or the attached full set of Phase 1A Design Program Deliverables may be directed to Jon Ridley, Senior Account Executive, Johnson Controls.

Regards,

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