CITY OF PITTSBURGH

Office of Management & Budget

on behalf of the

Department of Innovation & Performance

Request for Information

for

Smart Streetlights

RFI No. 2017-0001

Release Date: March 2, 2017

Submittal Deadline: April 10, 2017
no later than 4:00pm EST

1 Request

March 2, 2017

To All Prospective Respondents:

The City of Pittsburgh Office of Management and Budget on behalf of the Department of Innovation & Performance invites you to submit information on Smart Streetlights, a potential project to deploy Smart City technologies during the upgrade of our streetlights.

Any questions in regard to this RFI should be submitted in writing **no later than** EOB March 16 and directed to:

Thoryn Simpson
Senior Procurement Analyst
Office of Management and Budget
City-County Building, Room 502
Pittsburgh, PA 15219
Email: thoryn.simpson@pittsburghpa.gov

All responses will be due by **April 10** as previously noted on the cover page of this RFI.

Sincerely,

Jennifer L. Olzinger
Assistant Director/Procurement Manager
Office of Management and Budget

2 Introduction

The City of Pittsburgh has become a symbol of 21st century economic and civic transformation. Central to this success, as to many in our history, has been a mix of vision and practicality. Under the leadership of Mayor Bill Peduto, we have pursued opportunities that offer both immediate, real-world improvement to our citizens' quality of life, and that serve to join global civic innovation movements. As trends in energy savings and Smart City technologies converge, an exciting such opportunity presents itself today.

Pittsburgh has approximately 40,000 City-owned and operated streetlights, the vast majority of which are traditional high-pressure sodium HID luminaires controlled by simple photocell units. This infrastructure has unnecessarily high energy and maintenance costs. The City is therefore developing a plan to replace the bulk of this system with remotely managed LED luminaires, resulting in potential energy savings of 60-80%. These savings will finance the conversion program through an Energy Savings Performance Contract. The City piloted this approach in 2012, upgrading 4,500 luminaires through a State-funded energy savings program.

In addition to energy and maintenance cost savings, the City recognizes that updated streetlights can offer a ready-made physical and communications platform for the sensors, controls, and backhaul that power a Smart City. But the City of Pittsburgh seeks a broad vision of the Smart City, one grounded in the practical opportunities that exist to address real challenges.

A Smart Pittsburgh will leverage new technologies to provide a more equitable level of service for all city residents across our 90 neighborhoods. A Smart Pittsburgh will empower citizens, through their government and perhaps even more directly, to perfect how their city is illuminated. The quality of the light in our streets at night can affect our moods, our sleep patterns, the safety of our roads and more. Streetlights affect public safety, the enjoyment of public spaces, and the beauty of our streets. A Smart Pittsburgh will envision how we address these issues in concert with the connectivity, efficiency and urban informatics opportunities the Smart City presents.

To that end, the City issues this Request for Information (RFI) to entities for-profit and nonprofit that are interested in forming partnerships with the City to develop, operate, and/or fund next-generation Smart City projects while providing a more efficient and equitable lighting system.

As a hockey town, Pittsburgh seeks partnerships that will help us "skate to where the puck is going" on Smart City technologies, making wise investments that balance short-term applications with the long-term stewardship of our public resources.

3 Guidelines

Financing

The City has identified many financially sustainable models that will further these goals while leveraging existing assets and established funding mechanisms, with the goal of maximizing integration and reducing the duplication of effort. The City seeks responses from potential partners who wish to participate in our Smart City deployment through funding proposals, technical solutions, or both.

The City will consider the full range technical and funding models; responses should present innovative, equitable structures for sharing operational responsibility and technological or financial risk between potential partners and the City. The primary source identified for funding will be the aforementioned energy savings agreement based on replacing approximately 35,000 conventional HID luminaires with more efficient centrally-managed LED luminaires. Supplemental or future funding may also come from the following:

- Synergies with the DOT Advanced Transportation and Congestion Management Technologies Deployment (ATCMTD) grant, awarded to the City in 2016
- Agreements around network or other capacity built into the new streetlight deployment, for use in expanding partner infrastructure, such as femtocells
- Partnerships that sustainably distribute maintenance and other costs between the City and vendors of the deployed technology
- Future commitments of City Capital Budget resources

Objectives

The Applications section of this RFI articulates four areas with particular potential to serve our citizens. These have been selected based on considerable research into successful deployments in other cities. However, the City is open to creative solutions that go beyond current initiatives, and in ideas that look to the future of Smart City applications.

Given the wide array of potential devices and applications, and the rapid pace of technological change, we seek to deploy an open, extensible platform that can be built upon as new opportunities--financial, technological and policy--present themselves. Ideally, we will form relationships that allow us to add new partners and technologies as time goes on. No one truly

knows how technology will develop, so we seek to "future proof" our solutions by embracing that fluidity.

The City of Pittsburgh staff and leadership are excited to bring to bear the benefits of Smart Cities technologies, as part of an overall effort to grow a more efficient, responsive, and equitable community. We therefore subscribe to a "co-creation" approach, whereby we as a public entity can work collaboratively with private sector partners to engineer the future. The City also encourages respondents to work together if such a collaborative approach will best meet the City's goals.

The City may issue a more detailed Request for Proposal (RFP) relating to this project, but may choose another direction that is deemed in the City's best interest. Responding to this RFI is not a guarantee of a contract award or any further engagement. Further, there is no guarantee an RFP will be developed as a result of this RFI. The City reserves the right to withdraw the RFI or any subsequent RFP, or decline to award a contract.

Assets

In the development of solutions to serve the City of Pittsburgh, we'd like to share some basic data about the City's assets. More specific information will be provided later in the process as necessary.

- Streetlights (May 2016)
  - There are 39,799 in total, mostly HID HPS, with 4,500 already replaced in a pilot with Cree LED luminaries, and another 500-1000 of varying types.
  - Most of the HPS lamps are at 70, 100, and 150 watt, with some at 250 and 400.
  - 93% of the total are "cobra heads;" 7% are a mix of decorative "pendant teardrops" and "acorns." Only the cobra heads are targeted for replacement at this time.
  - Poles are a mix of utility-owned wood and city-owned metal, inconsistently spaced from 80 to 150 feet apart.
  - Mast extension arms are typically 4- to 8-foot and mounted at 25 feet high for cobra heads, 25-30 for pendant teardrop, and 10-18 for acorns.
  - City code requires from 1.7 FC (commercial) to 0.3 FC (residential) illuminance with 3:1 uniformity on Major streets, 4:1 on Collector and 6:1 on Local; efficacy must be 80 lumens/W, CCT 3000-5000 Kelvin and CRI 60 or higher.
- Intersections
  - See List
- Potential "Smart Spines"
  - Existing Smart Spine Network

  - Smart Spine 1: Bigelow Boulevard
  - Smart Spine 2: Second Avenue and Irvine Street
  - Smart Spine 3: Fifth Avenue and Forbes Avenue
  - Smart Spine 4: Centre Avenue
  - Smart Spine 5: Saw Mill Run Boulevard/Route 51
- City Property/Assets
  - City Facilities open data: https://data.wprdc.org/dataset/pittsburgh-city-facilities1

Applications

As described in the introduction, the City is open to a variety of public policy and amenity applications for Smart City technologies. The City encourages respondents to include examples of any applications they envision, along with how they could interact with a streetlight deployment. Though the City is not committing to the installation of any of these applications on the streetlight network, we seek to understand the direction that applications are moving, and how our new streetlight network could be leveraged, now or later, for these opportunities.

All of these applications, and others that may be developed in the future, should clearly identify their quantifiable benefit to the needs of residents, business owners, and visitors to the City. As examples, issues that such applications could address include, but are not limited to:

- A shift toward multimodal transportation options
- Safer and more efficient transportation journeys
- Improved delivery of core city services
- Market-based revenue opportunities
- Improved equity in access to City resources

Below are four examples of priority Smart City applications for the City of Pittsburgh.

<u>Traffic Management</u>

Core to any initiative would be the deployment of transportation control systems such as real time adaptive traffic signals, pedestrian detection, and vehicle-to-infrastructure technology. This will set the stage for the level of connectivity and automation necessary to improve mobility and enhance safety for users of all modes in our rights of way.

A number of emerging sensor and signaling technologies (and economies around those technologies) could address these issues by extending and enhancing our existing traffic infrastructure. For instance, mid-block sensors installed on streetlights and integrated with

traffic signals at nearby intersections could allow for traffic control patterns and timing that is more responsive to real traffic conditions.

An essential component on which the City seeks detailed information is the traffic control software platforms and algorithms themselves. Furthermore, the process of iteratively improving those algorithms in a co-creative effort between City and State officials and partners should be described.

The City has already deployed a pilot of the locally-developed adaptive digital traffic control system Surtrac, and may choose to expand this deployment under the ATCMTD grant mentioned above. Solutions that target the problem domain of Surtrac and similar systems are especially sought.

Many other solutions to traffic control may apply as well, subject to legislative or regulatory processes, such as cameras or other imaging devices that support the enforcement of the City's traffic laws. The City seeks creative, forward-thinking, practicable ideas on how these sorts of traffic control solutions can be deployed as part of the planned upgrades to our streetlights.

Public Safety

The City has already deployed the ShotSpotter gunshot detection system in limited locations, demonstrating the viability of the solution for our public safety services. Given the confidence in its outcomes, this kind of technology deployment is very likely to expand in the near future regardless of its inclusion in the upgrade process for streetlights and attendant Smart City projects.

The streetlight upgrade project clearly presents an opportunity to expand the reach of this system through shared resources for its installation, backhaul, and perhaps actual device purchase. Such solutions need not (and where possible arguably should not) be standalone.

Therefore the City welcomes ideas that include gunshot detection devices in their installation plan, or even make multiple use of single devices or device packages to support gunshot detection.

Connected streetlights also present opportunities for direct control in the event of emergencies, illuminating the site of an accident, even designing targeted or city-wide warning systems. The real-world implications of such a system, including necessary regulation and/or protocol, should be considered.

Air Quality

Pittsburgh's air quality long ago recovered from the impact of a century of heavy industry, but air quality issues persist in the region. The opportunity to deploy large numbers of sensors throughout the city during the streetlight upgrade process could be particularly impactful on this issue.

The City seeks ideas on how to cost-effectively collect air quality data that is more granular and in real time, allowing for more material interventions and a better comprehension in our communities of the current state of our air quality. Responses should consider how to apply such data, as well as how to collect it.

Ultimately the goal should be to create a positive feedback loop of data and interventions that can make Pittsburgh a model for improvement in this crucial public health area.

The City is looking for creative solutions that make the most of our resources, which are significant but constrained relative to the scope of the data collection need. For instance, research has shown that PM10 air quality readings can be generated from image analysis of even low-quality video.

Could such data, gathered from camera deployments proposed under other sections of this RFI, augment less granular but more precise air quality data from a smaller number of strategically-placed specialized sensors? Would this create sufficient benefit to justify the relatively lower cost?

Ideas that stand on the shoulders of recent science and technical research, and ask these sorts of practical questions in order to drive maximum leverage for this, or other, applications are especially valuable.

Shared Capacity

As in any City government, costs relative to the scale of solutions required is a serious constraint. This makes revenue-generating opportunities crucial. Just as devices for measuring traffic and air quality data can be more economically deployed during the course of the planned streetlight upgrades, devices with applications supporting local utilities, telecoms, or other partners could be as well.

Femtocells are a prime example. As mobile data usage increases in the city, cellular network infrastructure will need to expand. This presents a potential point of collaboration between the City and cellular operators in the region, providing critical infrastructure for cellular companies and needed revenue for the City.

The City is open to proposals from utilities, telecoms or other partners with distributed infrastructure in the region. Proposals should draw on assessments of the scale of investment savings possible. Specific revenue guarantees are not expected, but estimates as to the kinds of revenue possible, based on real data, would provide the basis for further discussion.

4 Responses

Your response to this RFI should be no longer than 10 pages. A response may include, but is not limited to, the following items listed below:

Project Overview
Describe the solution you are proposing and its objectives. Provide designs that help us understand how it would work with the existing streetlight poles and other infrastructure on our streets. Detail the scale, scope and stage of your idea. Has it been deployed elsewhere? If so include detailed materials describing that deployment. If not, provide as much technical details as you can. If the idea is in beta or more nascent, please indicate this; ideas at all stages are of interest to the City.

Deployment Plan
Please let us know how specifically this project will deploy across Pittsburgh's infrastructure. Would you recommend a pilot deployment before undertaking the full project? If so, describe the scale of the pilot and parts of the city you feel would make the best testbed for your idea, and why.

Technical Specifications
Provide as much technical detail for the project as you can, including its power, sensor and communications technologies. Any solution will be selected based on a technical evaluation of not just its Smart City aspects but also its traditional technical aspects, such as the color temperature, photometrics and other details of the LED luminaires. (Note that should we proceed through an RFP process, all devices will be tested in the real world.) Describe your plans for data ownership, transmission, security, and privacy. Open standards and industry best-practices will be applied in considering ideas.

Operational Considerations
Provide detailed information about the useful life of the component technologies included in your proposed project, along with specific information about how and where any of its technologies have been field tested. The City will need to fully understand the additional investment required to maintain technology over the life of the project, as well as the proposed maintenance model. Will the City or partner vendors maintain components in the field? What failure rate would be expected and what costs incurred by the City for replacement components?

Business Model

Describe any business model or revenue sharing you imagine supporting your idea. None is required, outside of a basic discussion of the feasibility of your idea based the revenue streams identified above, but the City is interested in hearing any such ideas.

Evaluation

Please evaluate of your idea's strengths and weaknesses, with hard data if available. Describe how you would analyze, and recommend we analyze, any data produced by your idea in order to gauge the effectiveness and civic value of the project.

Format

The response should be bound or contained in a loose leaf binder. Document pages shall be 8-1/2 inches by 11 inches in size or folded to such a size.

A cover letter should be submitted with the following information:

- Title of this RFI
- Name and Mailing Address of Firm (including physical location if mailing address is a PO Box)
- Contact Person, Telephone Number, Fax Number, and Email Address
- Acknowledgement that all responses may be considered public information in accordance with the Commonwealth of Pennsylvania Right to Know Laws as described in Section 5 of this document.
- If you, as an individual, or if any principal or employee of your firm, has a relationship or knowledge of, or contact with any official or employee of the City; that relationship, knowledge, or contact should be stated and described.

Submittal Requirements

A. Your submittal package, to be returned by the date and time outlined in Section 1 of this document, shall include the following:
  - One (1) original and five (5) printed copies of your response; and
  - One (1) electronic copy of your response in either MS Word or PDF format to be delivered via email.

B. Submittals shall be sent by U.S. Mail, commercial delivery service or Hand Delivery. Submissions may not be sent by fax.

C. Responses should be delivered ONLY to the OMB RFI Coordinator:

Thoryn Simpson
Senior Procurement Analyst
Office of Management and Budget
City-County Building, Room 502
Pittsburgh, PA 15219
thoryn.simpson@pittsburghpa.gov

D. The City of Pittsburgh shall not be responsible for responses delivered to a person or location other than that specified herein.

E. All submittals shall become the property of the City of Pittsburgh and will not be returned.

F. All costs associated with response preparation shall be borne by the Respondent.

5 General Terms & Conditions

5.1 Public Record

Respondent, by submittal of a proposal, acknowledges that all proposals may be considered public information in accordance with the Commonwealth of Pennsylvania Right to Know laws. Subject to submission of this RFI, all or part of any submittal may be released to any person or firm who may request it. Therefore, proposers shall specify in their Cover Letter if any portion of their submittal should be treated as proprietary and not releasable as public information. Proposers should be aware that all such requests may be subject to legal review and challenge.

Any information considered proprietary should be indicated as such or not included in the response.