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**DEPARTMENT OF
PUBLIC WORKS**

**BUREAU OF
STREET LIGHTING**
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October 14, 2020

Honorable Members of the City Council
c/o Office of the City Clerk
Roo 395, City Hall
Los Angeles, CA 90012

**SUBJECT: AUTHORIZE NASA GRANT ACCEPTANCE AND EXECUTION OF NECESSARY
AGREEMENTS AND APPROPRIATION OF FUNDS**

Dear Councilmembers:

The Bureau of Street Lighting (BSL) requests approval to accept grant funding in an amount not to exceed \$2,500,000 from the National Aeronautics and Space Administration (NASA). BSL is also requesting to execute two agreements with Open AQ and the California State University Los Angeles (CSULA) and appropriate funds to BSL's contractual services account upon availability of funds.

The City submitted a competitive proposal to NASA's Advanced Information Systems Technology call for proposals and was selected. The project, Predicting What We Breathe, funds air quality research and system development using machine learning and predictive data analytics using satellite and ground data. This will provide the City of Los Angeles with information about the effectiveness of our interventions (from tree planting to policy changes) on air quality in specific L.A. neighborhoods, and provide a platform for sharing data and successful city solutions with other global cities. In addition, the project will study the effect of decreased traffic during the COVID-19 safer at home time.

About L.A.'s Air Quality Data

The City of Los Angeles is in a unique situation to be an urban proving ground to look at how to better understand, predict, and mitigate the issues of air pollution for 4 million citizens. The proposed system (Predicting What We Breathe) looks at the time-series measurements of aerosol and ozone data and public and private ground data sensors and applies machine learning to uncover patterns that may not be discernible to human analysts. By enhancing human understanding and prediction of air quality, local governments and others can help mitigate the effects of air pollution through interventions that have measured results.

Data will be brought together from multiple sources, many of which (but not all) are running through the Open AQ platform and are being used or provided by Federal, State, City, or other



organizations, and this allows for easier data federation and layering. Most of the data used is expected to be geospatial data as the assessments and sensors are all tied to a specific location. Partners on this project include the South Coast Air Quality Management District (AQMD) and the County of Los Angeles, and private organizations like Anthem Blue Cross, and community groups like the Southern California Asthma Association.

Ambient air quality data (PM2.5, PM10, O3, and NO2 from ground monitoring sources in other global cities will be accessed via the OpenAQ Platform (openaq.org), which is an open-source platform (github.com/openaq) that makes available historical air quality data from government and research sources, and has aggregated 405,485,362 air quality measurements from 10,386 locations in 70 countries. Data are aggregated from 117 government level and research-grade sources. The disparate data sources are made available through one harmonized data format, making the dataset well-suited to analyzing and comparing cities' ambient air quality. We will be using the data standards and toolkit within OpenAQ for data aggregation and normalization.

Complementing the COVID data analysis, the Green New Deal, a Resilient L.A., and the Sustainability pLAn

The project supports both the City's Green New Deal Sustainability pLAn and the Resilient Los Angeles Plan as they relate to air quality efforts. Within the Green New Deal, this project supports achieving the targets for clean, healthy air through identifying ways to reduce air pollution (Chapter 8, Industrial Emissions and Air Quality Monitoring). In the Resilient Los Angeles plan, Goals 12 and 15 with corresponding actions 74, 75, and 95 will be addressed by the NASA project:

- Goal 12: Use climate science to develop adaptation strategies consistent with the Paris Climate Agreement
 - Action 74: Transition to zero-emissions technology at the Port of LA to reduce emissions, improve air quality and build disaster resilience
 - Action 75: Transition to fossil-fuel free streets to fight air pollution and help tackle the global threat of climate change
- Goal 15: Grow public, private and philanthropic partnerships that will increase resources dedicated to building resilience
 - Action 95: Collaborate with cities to build resilience around the globe

The Air Quality Lead in the Office of Sustainability and the Chief Resilience Officer are part of the Project's Leadership team.

The Chief Data Officer is also serving as the Principal Investigator and was the submitter of the proposal. She has 30 years of experience at NASA in the field of satellite data and extensive experience in data architectures, machine learning, and smart cities.

Project Goals and Expected Outcomes

Year One: The team will identify the datasets, and develop a framework to collect and analyze data, look at historical trends and events, select a data architecture and models, initialize the computational space and migrate data to it, create a first set of machine learning algorithms to understand data trends, run the algorithm against the training data, and validate the initial set of algorithms. Community meetings at conferences and in Los Angeles, online forums, and a social media campaign will help to ensure community usage and participation early on. A workshop in L.A. will occur virtually or in person as possible.

Year Two Focus: The team will refresh the data identification to include possible additional

datasets, validate the models based on emergent research, run the algorithms against control data, and update/retrain algorithms and run against additional control data. As this work is completing and preparing for initial open source publication, the team will hold an international workshop to socialize the models, promote the open source, and gather requirements. Sister cities will be identified and recruited.

Throughout the task, there are administrative activities as well to ensure that the project meets the goals and remains on time and on budget. These include:

- Weekly virtual team meetings and monthly virtual team deep dive sessions
- Quarterly technical reports (7) and quarterly budget meetings
- Mid-year interim reports (2) and annual reports (2)
- Annual ESTO meeting attendance

Specific goals of this project are to:

1. Create a sustainable city and community
2. Continue leadership on climate action
3. Innovate approaches to clean water and sanitation

BSL will oversee \$822,271 for project management and conduct data collection, integration, and analysis work to be conducted at the City, while \$433,593 will be contracted to California State University, Los Angeles (a member of the City's Data Science Federation) to apply machine learning to these big data sets and develop algorithms that provide predictive analytics and historical assessment of past interventions. \$74,000 will be used by OpenAQ to support access to high-quality air quality data and to conduct open workshops to make this more useful for Angelenos and community groups, and also for other megacities in the world. This work will be coordinated with the Chief Data Officer who is the designated NASA Principal Investigator for the project.

RECOMMENDATIONS

- 1) Authorize the BSL GM or designee to accept this NASA Grant and execute any necessary agreements, in an amount not to exceed \$2,500,000 from NASA, for a 2.5-year period effective October 20, 2020 through May 15, 2023;
- 2) Authorize the Bureau of Street Lighting to accept the NASA grant, approve the designation of the Bureau of Street Lighting as the administrative and fiscal agent for the NASA Grant to facilitate receipt and disbursement of grant funds, track and report matching funds, as well as reimburse the City for any grant-related expenditures;
- 3) Approve the program grant agreement the Bureau of Street Lighting to assist the City in the NASA Grant implementation in accordance with the terms and conditions set forth in the grant agreement;
- 4) Authorize the Controller to Transfer and deposit \$822,271 to BSL Fund 347 Dept 50 Account TBD;
- 5) Approve the program grant agreement between BSL and Open AQ in the amount of \$74,000 to conduct two workshops and assist the City in the NASA Grant implementation in accordance with the terms and conditions set forth in the grant agreement;

- 6) Approve the program grant agreement between BSL and the California State University Los Angeles (CSULA) in the amount of \$433,593 to conduct data analysis and assist the City in the NASA Grant implementation in accordance with the terms and conditions set forth in the grant agreement.

FISCAL IMPACT STATEMENT

There is no additional impact to the General Fund in the current year with the approval of the above recommendation. The recommendation in this report is consistent with the City's Financial Policies.

If you have any questions, please don't hesitate to call me at 213 847-2090.

Sincerely,

A handwritten signature in black ink, appearing to read "Miguel Sangalang". The signature is fluid and cursive, with a horizontal line extending from the end.

Miguel Sangalang, Interim Director
Bureau of Street Lighting

Attachments (3):
NASA Grant Award Letter
OpenAQ MOU Agreement
CSULA MOU Agreement

H:\EXE\FEX\MH\Mayor\Crsp\ NASAGrant
cc: Barbara Romero, Deputy Mayor