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DATE: October 10, 2017

SUBJECT:

PRESENTATION ON INTELLIGENT LIGHTING PROSPECTS AT THE SAN DIEGO UNIFIED PORT DISTRICT

EXECUTIVE SUMMARY:

Since 2014, the San Diego Unified Port District (District), has been investigating smart technologies, or technologies that have the capability to be informed in real time by large volumes of data to increase the accuracy of their output. For example, in 2014, the District convened a pilot project with private industry to measure energy usage in the heating, ventilation and air conditioning system in the District's administration building resulting in operational adjustments that saved the District $5,000 annually from just one piece of equipment. The measuring, monitoring, and remote adjustment capability associated with smart technology enables professionals to visualize intricate operations in real time using computer-based dashboards, and to adjust machinery from a remote location over an internet connection, increasing efficiencies and providing valuable data and insights to inform District policies.

Aside from the work occurring at the District, there has been much collaboration within the San Diego region on implementing smart technologies. A large portion of this effort has taken place in collaboration with Cleantech San Diego, a member based trade organization promoting cleantech priorities and investment. One of Cleantech San Diego's initiatives is Smart City San Diego, a broad public-private collaborative, which has served as a catalyst for the City of San Diego's Intelligent Lighting program, outlined as follows.

In January 2017, the City of San Diego authorized a purchase and service agreement with Current, Powered by GE (a GE subsidiary including AT&T) and a $30,273,755 tax-exempt equipment lease through GE Government Finance. The repayment term is 13 years on a fixed interest basis with principal and interest payments to be paid on a semi-annual basis. This project will retrofit approximately 14,000 City of San Diego owned outdoor lighting fixtures to intelligent adaptive control light emitting diode (LED) systems. In addition, the City will be adding 3,200 sensors with cameras attached to streetlight poles.

Benefits of this technology include better lighting control options, extended lifespan of lamps and equipment due to improved dimming capabilities, improved light and visual qualities, as well as a potential for improved remote asset management related to maintenance activities. The lighting retrofits will bring an estimated $2.4 million in annual savings to the City of San Diego associated with an estimated 11,600 megawatt hours (MWH) in annual energy savings. These lighting retrofits directly support the implementation of the City of San Diego's Climate Action Plan (CAP) by

introducing more efficient lighting technologies, that use less energy, thus reducing demand on the grid and increasing accuracy in mobility management with cameras and mobile applications. City officials will gain a real time sense of vehicle throughput in areas where the technology is in place, which will allow them to analyze and make adjustments more rapidly to alleviate congestion. Ultimately, the reduction in energy use and increase in mobility efficiency will save the use of fossil fuels and reduce greenhouse gas emissions.

Since May 2017, District staff has been evaluating the feasibility of implementing a similar project on Port tidelands, and they will provide an update to the Board on those efforts, including a first-of-its-kind collaboration with the City of San Diego to undergo a pilot project on District tidelands to test the use Current Powered by GE's CityIQ equipment.

RECOMMENDATION:

Receive presentation and update regarding Intelligent Lighting prospects at the San Diego Unified Port District, in cooperation with the City of San Diego.

FISCAL IMPACT:

This is an informational presentation, and has no fiscal impact. Project funds are budgeted within the Advertising Demand Metric Collection System line item of the District's Fiscal Year 2018 Technology Management Program.

COMPASS STRATEGIC GOALS:

This agenda item supports the following Strategic Goal(s).

- A Port that the public understands and trusts.
- A thriving and modern maritime seaport.
- A vibrant waterfront destination where residents and visitors converge.
- A Port with a healthy and sustainable bay and its environment.
- A Port with a comprehensive vision for Port land and water uses integrated to regional plans.
- A Port that is a safe place to visit, work and play.
- A Port with an innovative and motivated workforce.
- A financially sustainable Port that drives job creation and regional economic vitality.

DISCUSSION:

On May 16, 2017, District and City of San Diego staff provided an informational presentation to the Board on Smart Cities and the prospects for Intelligent Lighting at the District. Smart Cities is the concept of data driven systems management within municipalities, and Intelligent Lighting is the concept of co-locating sensors and an internet connection with lighting assets in order to gain the ability to collect data, monitor and control energy usage remotely. During the presentation, District staff highlighted a commitment to return to the Board with a business case for an Intelligent Lighting project similar to the one underway at the City of San Diego. Since May 2017, District staff has been in contact with the City of San Diego, learning from City staff's efforts at implementing Intelligent Lighting, and analyzing potential applications on tidelands. Staff members from both agencies have

been able to share information and contacts in order to create a network that is truly collaborative.

To gain the best perspective to inform the business case the District will enter into a three month Digital Infrastructure Introductory Program to demonstrate Current Powered by GE's CityIQ sensor node technology. The pilot project will run for three months, from October through December 2017. The proposal for the pilot project is included in Attachment A. The purpose is to create a network of sensors that will provide real time data, which can be visualized and assessed by District staff. At the end of the project, an assessment will be made, and recommendations provided for bringing a larger project to scale. A full-scale project will include LED fixtures with dimming and remote monitoring capability (LightGrid technology), and CityIQ sensors for mobility management. For the pilot, the District will purchase 23 CityIQ sensor nodes from Current Powered by GE, and Southern Contracting will install the sensor nodes along Harbor Drive between G Street and Laurel Street along the Central Embarcadero as highlighted in Attachment B. Each node will be equipped with a camera and two microphones, as well as sensors for environmental inputs such as temperature, pressure and vibration as shown in Attachment C.

Data collected through the CityIQ sensor nodes will be transferred via cellular service and viewed through a cloud-based software program called Predix. Over the course of the pilot project, District staff will have access to three Reference Applications, CitySight, TrafficPulse, and ParkingView, which will show basic data informing public safety and situational awareness, traffic, and parking. For example, staff will be able to gain real time traffic counts along Harbor Drive that could inform future mobility studies. The amount and types of applications can grow over time to fit the needs of District staff as the Intelligent Lighting program becomes more sophisticated. This pilot project will not involve the retrofit of streetlight fixtures for dimming capability at this time, that portion of the project is still being researched. Retrofits of the streetlight fixtures would involve adding an ANSI 7-pin socket to the top of each light fixture so that the LightGrid sensor nodes could be added, and the addition of an internet gateway at a master light pole to communicate information to the cloud. The District's existing light fixtures are still being assessed to determine the benefit and cost of retrofitting them.

The District has been conducting exterior lighting retrofits and converting streetlight fixtures to LED since 2014. Currently, 327 of the District's 442 streetlight fixtures have been replaced with LED, to conserve energy and reduce greenhouse gas emissions. The lighting retrofits have been phased over several years, and there are still opportunities to introduce future lighting retrofit phases. However, for the District to complete a similar project to the City of San Diego's Intelligent Lighting Project, all of the existing streetlight fixtures (LED and non-LED) require retrofitting to incorporate dimming and energy monitoring capability, and CityIQ sensors would need to be added as well. Retrofitting the District's existing streetlight fixtures with GE's LightGrid energy monitoring technology, facilitates remote monitoring of energy via AT&T's cellular network as well as the ability to dim the lights to specified limits. CityIQ sensors would be incorporated into the network to provide information on mobility as well. Upon completion, District staff would be able to monitor both mobility and energy usage from its streetlight locations, allowing real time and reliable analysis of conditions that will inform a number of operations, and increase staff's ability to interact with the public.

The total cost of the pilot project is approximately $90,000, and data transfer services are hosted by AT&T for three months. The information gained from this project will be used to better understand the viability for use of the CityIQ technology within the District tidelands and build a business case to expand the efforts to a full-scale Intelligent Lighting program. If a larger project does not move forward, the District can continue gain insight from this initial three month pilot, and can continue to

leverage the data for a fee of approximately $23,000 annually, for data services, at the pilot's conclusion. The sensors may be removed, if necessary, without significant impact to the streetlights. In addition, District staff has met several times with the City of San Diego's staff to discuss the potential for data sharing and the creation of a seamless network between the District and the City.

Throughout the project, great attention will be paid to privacy and security. The initial pilot will produce counts of people and traffic that move through the network area. No personal information will be retained, and images from the cameras will remain stored for a period of seven days within the node and the photos will then be subsequently overwritten. Data transfer will be conducted over an encrypted network, following lawful polices for record retention. The data will be managed by AT&T and GE, and all data will be monitored for any security threats.

Upon completion of the project at the end of December 2017, an evaluation will be conducted to ascertain opportunities to expand the network of CityIQ sensors, and include LightGrid Sensor Technology within the streetlight fixtures so that the District can realize greater energy savings teamed with the ability to better manage mobility. At that time, costs and return on investment will be determined to substantiate a larger investment.

General Counsel's Comments:

The Office of the General Counsel reviewed this agenda for form and legality.

Environmental Review: (9-21-17 Language Added from LH)

This item would provide a presentation on intelligent lighting prospects on District tidelands. This presentation to the Board does not constitute an "approval" or a "project" under the definitions set forth in California Environmental Quality Act (CEQA) Guidelines Sections 15352 and 15378 because no direct or indirect changes to the physical environment would occur. CEQA requires that the District adequately assess the environmental impacts of its projects. Further, while the Board may request certain project components be included or alternatives studied, such direction to staff will not bind the District to a definite course of action prior to CEQA review. Full CEQA analysis will be completed prior to the approval of any entitlements, concept approval, or agreements necessary for the project. Moreover, the Board reserves its discretion to adopt any and all feasible mitigation measures, alternatives to the project, including a no project alternative, a statement of overriding consideration, if applicable, and approve or disapprove the project and any permits or entitlements necessary for the same. Those decisions may be exercised in the sole and absolute discretion of the Board. Based on the totality of the circumstances and the entire record, the Board's direction does not commit the District to a definite course of action prior to CEQA review being conducted. Therefore, no further CEQA review is required.

In addition, this presentation allows for the District to implement its obligations under the Port Act and/or other laws. The Port Act was enacted by the California Legislature and is consistent with the Public Trust Doctrine. Consequently, this presentation is consistent with the Public Trust Doctrine.

Finally, this presentation does not allow for "development," as defined in Section 30106 of the California Coastal Act, or "new development," pursuant to Section 1.a. of the District's Coastal Development Permit (CDP) Regulations because it will not result in, without limitation, a physical change, change in use or increase the intensity of uses. Therefore, issuance of a Coastal

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Development Permit or exclusion is not required. However, the District's projects require processing under the District's CDP Regulations. If a project is formulated as a result of the work plan, the Board will consider approval of the project and any improvements associated after the appropriate documentation under District's CDP Regulations has been completed and authorized by the Board, if necessary. The Board's direction in no way limits the exercise of the District's discretion under the District's CDP Regulations.

Equal Opportunity Program:

Not applicable.

PREPARED BY:

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Attachment(s):
Attachment A: Digital Infrastructure Introductory Program Proposal (submitted to the District on August 1, 2017)
Attachment B: Lighting Location Maps
Attachment C: CityIQ Sensor Node Description

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