City of Long Beach
Working Together to Serve

Memorandum

Date: November 26, 2018

To: Patrick H. West, City Manager

From: Lea D. Eriksen, Director of Technology and Innovation Department

For: Mayor and Members of the City Council

Subject: **City Technology Cloud Update**

At its June 19, 2018 meeting, the City Council requested the Technology and Innovation Department (TID) to develop plans to leverage the "cloud" for the City's data and systems and report back on the progress in 120 days. TID believes that cloud services can complement, extend, and enhance the City's portfolio of technology services, resulting in better technology services, faster time to market, and cost efficiencies that directly benefit the City's residents, businesses, and visitors. This memorandum outlines the City's existing use of the cloud, plans to utilize the cloud for upcoming projects and systems, and the approach and considerations for leveraging the cloud in the long term.

Existing Use of the Cloud

In 2014, TID implemented Office 365 for electronic communications. With approximately 5,000 users, this cloud-based software, as a service (SaaS) application, is the City's largest cloud service supporting electronic communications across all City departments, and between the City and its residents, businesses, visitors, and external partners. Office 365 is a mission-critical application that supports the City's day-to-day operations and delivers continuous availability, automatic feature updates, and routine maintenance.

Other examples of cloud applications and services leveraged by the City include BizPort, Go Long Beach, PulsePoint Respond, Medic Clipboard Electronic Patient Care Reporting, Axon Evidence Management, and Kubra credit/debit card and electronic check processing (see attachment for more details). Many City departments and services leverage both cloud and on-premise services, and new cloud services are routinely evaluated as opportunities arise.

Upcoming Projects and Systems

TID is currently implementing several cloud systems, including a new Marina management system, new disaster recovery services for the LB COAST and Mainframe financial and human resources systems, a new Automated License Plate Reader (ALPR) system, and a new Identity and Access Management (IAM) system.

In addition, through the Critical Technology Infrastructure Needs Program, TID is currently updating foundational elements of the City's technology architecture enhancing the City's technology platforms, and enabling the City to integrate cloud services in a standard, secure, and scalable manner (see attachment for more details).

Upcoming projects that may leverage the cloud include a new Customer Relationship Management (CRM) system, a new Cyber Security management system, website hosting services, workforce scheduling system, customer information systems (CIS), and geographic information systems (GIS) and permitting systems upgrades.

Approach and Considerations

Because the applications in the City's technology portfolio have complex interdependencies, unique regulatory and privacy requirements, and unique support expectations and risk profiles, and, because the City's applications continue to evolve, TID's recommended approach to enable and leverage the cloud involves defining and establishing:

- Cloud computing architecture, standards, and roadmaps that guide cloud adoption
- Cloud enabling platforms that integrate, manage, or secure cloud systems
- Cloud training programs for staff to understand and integrate cloud computing
- Cloud compatible job classifications to support new technology standards
- Portfolio management focus to improve technology alignment and execution

These approaches will help ensure the City's cloud initiatives are continually aligned with citywide standards, that transition to the cloud services are seamless, and that performance, security and costs of moving to the cloud are managed over the long-term.

In FY 19, TID will focus on completing the in-progress and Critical Technology Infrastructure Needs Programs already underway and will work on defining additional projects and proposals to establish the City's cloud capabilities.

Should you have any questions, please call Cason Lee, Deputy Director of Technology and Innovation Department, at (562) 570-5553.

ATTACHMENT

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Technology Portfolio

The Technology and Innovation Department (TID) manages over 600 Unix/Windows servers and an enterprise mainframe server. These servers run approximately 300 business applications including financial management, budget preparation, human resources, payroll, geographic information systems (GIS), customer information systems (CIS), customer care and billing (CCB), Police, Fire, and land management systems. In addition, TID manages citywide technology infrastructure including: radio and microwave systems that support public safety and automated meter communications, voice and data networks that connect over 3,000 personal computers in over 150 City facilities, and Internet and security systems that enable the City to access the Internet and protect the data and systems used to deliver City services. Cloud services used by the City include:

- Office 365
- Go Long Beach
- Evidence Management
- Planetbids Procurement Solutions
- Emergency Notification and Mobilization System
- NeoGov Insight Applicant Tracking
- Flight Information Display Systems
- Arcadis Orion Program Management
- Parking Enforcement Citations
- ServiceNow ITSM SaaS for IT service and workflow management
- BizPort
- PulsePoint Respond
- Electronic Patient Care Reporting
- Disaster Preparedness Crisis Hub
- Kubra credit/debit card and electronic check processing
- Irregular Workforce Management
- Media Resources message board
- BlueBeam Revu design planning
- Quickbase web applications
- IBM MaaS360 Mobile Data Management

<u>Cloud Perspective</u>

Gartner, Inc., a global research and advisory firm, defines cloud as "a style of computing in which scalable and elastic IT-enabled capabilities are delivered as a service," and states that cloud "has disrupted existing IT markets, IT job skills mix and IT decision making... it continues to disrupt markets by itself and increasingly, as a necessary enabler for future disruptions."

Uptime Institute, a global research and advisory firm, estimated that in 2017, 65 percent of enterprise workloads ran in data centers owned or operated by those enterprises, and 22 percent of enterprise workloads ran in colocated or multi-tenant data centers. Only 13 percent of enterprise workloads were in the cloud.

e.Republic, the nation's only media and research company focused on state and local government and education, stated that "cloud, like any other technology, is meant to be used where it counts... seeing beyond the hype is essential to successfully moving valuable data and applications to the cloud. Failing to plan and develop a thorough strategy can lead to more problems without any of the perceived benefits."

TID believes that cloud services can complement, extend, and enhance the City's portfolio of technology services resulting in better technology services, faster time to market, and improved cost efficiencies that directly benefit the City's residents, businesses and visitors. In addition, cloud services can help prepare the City to leverage future disruptive services like Artificial Intelligence, Natural Language Processing, Internet of Things, Big Data and blockchains that may have a significant role in next-generation City services and transformation.

Critical Technology Infrastructure Needs Program

In 2017, TID engaged with multiple City departments and an extensive team of construction, engineering, design and technology consultants to assess the technology infrastructure and future needs of the City. With simultaneous and time-sensitive objectives of modernizing the City's outdated technology infrastructure, building a new Civic Center, downsizing and transitioning the City's primary data center, migrating staff and services to the new Civic Center, implementing technology systems like Enterprise Document Management System (EDMS), Customer Relationship Management (CRM), Cyber Security management systems, and LB Coast, TID developed the Critical Technology Infrastructure Needs Program.

In December 2017, TID presented to City Council the Critical Technology Infrastructure Needs Program to address foundational infrastructure that is at its end-of-life and incapable of supporting the new Civic Center and the business needs. Currently, the program is in process of building the foundation for the new data center, citywide network communications, audio video and security systems, and public safety communication systems. Through this program, the new architecture is designed to improve technology efficiency, effectiveness, performance, reliability, scalability, security, and flexibility while also providing better services to staff, residents, and businesses. The new architecture is designed with features that align with the "cloud computing" strategy and overall technology trends and evolution.

Some highlights of how this program enables cloud computing is outlined in the table below.

Technology Projects	Cloud Enabling Benefit
Application Assessment and Planning	Inventories and evaluates the City's legacy applications, focusing on identifying system interdependencies, foundational platforms, operational impacts, and supporting organizations and processes. The results of the analysis enable continued improvements to TID's support processes, development of data center migration plans, and assessment of cloud opportunities.
Data Center	Delivers a downsized and modern data center with a modernized compute (servers), storage and network architecture that supports private and hybrid cloud integration and supports legacy on-premise applications, e.g. building management systems, radio dispatch systems, security systems, voice and call center systems, traffic management systems, technology management systems, audio-video systems, and other systems that have specific performance, regulatory, security, and privacy needs.
Fiber and Network Communications Upgrades	Enhances bandwidth and access paths for applications between City facilities and assets, to/from the Data Centers, and to/from to the Internet. A fiber network will enable applications, devices and users to reach the Internet with better speed, reliability, security and cost, while modern networking equipment supports newer standards in software-defined networking, data tunneling and segmentation which are foundational for Cloud integration.

Technology Projects	Cloud Enabling Benefit
Access Control and Identity Access Management	Modernizes the City's access control system (ACS) and identity management system (IAM) that provide employee and visitor access to City buildings and network and application resources. The upgrade and integration of the City's physical and logical access control systems will help improve processing of new and terminated City personnel, standardize access security tools, streamline access level change processes, and enable cloud application security integration.
Cyber Security	Establishes a cyber security framework and toolset to protect City data and systems against operational failures and loss. As the City leverages cloud computing, the end-to-end architecture, technology and accountabilities become distributed, complicating data integration, security, privacy, resiliency, and compliance with Health Insurance Portability and Accountability Act (HIPAA), Payment Card Industry Data Security Standard (PCI-DSS), and Criminal Justice Information Services (CJIS). Cyber Security will define a framework and toolset for cloud computing data and systems protection.

Cloud Architecture, Standards and Roadmaps

Cloud architectures, standards and roadmaps guide cloud adoption by establishing directional plans that align the City's needs with the diverse cloud service options available, including:

- Infrastructure as a Service (IaaS) delivers compute (servers), storage and networking, such as Amazon Web Services (AWS), Microsoft Azure, Google Compute Edge
- Platform as a Service (PaaS) delivers software application components, such as AWS Lambda, Microsoft Azure Web Apps, Dell Boomi, Azure SQL Database
- Software as a Service (SaaS) delivers complete applications, e.g., Salesforce, Office 365, Workday, Google Apps, WebEx

Each cloud service architecture has vastly different functional objectives, characteristics, and costs, including differences in interoperability, security, and licensing.