



● **Board of Directors**
Organization, Personnel and Technology Committee

8/21/2018 Board Meeting

7-3

Subject

Adopt CEQA determination and appropriate \$680,000; and authorize \$385,500 agreement with Esri for the purchase and implementation of an infrastructure upgrade for Metropolitan's Geographic Information System (GIS) software and hardware environment (Appropriation No. 15501)

Executive Summary

This action authorizes the upgrade of the Enterprise GIS (EGIS) infrastructure, including server software and hardware, to accommodate increasing demand for big data services. Big data services include the real-time display of time-series data (e.g., from the SCADA system), three-dimensional "point cloud" data, and self-service online map-making that includes large amounts of Metropolitan data. The improved infrastructure will also allow data-intensive GIS applications to run seamlessly on mobile devices. This action also authorizes a \$385,500 agreement with Environmental Systems Research Institute (Esri) for this project.

Timing and Urgency

Metropolitan's current EGIS infrastructure is over a decade old and was implemented in an era when current data needs were not yet envisioned. This project will enable Metropolitan to take full advantage of three-dimensional point cloud data and vastly improve the ability to display time-series data from the SCADA system. The three-dimensional point cloud data is relatively new and increasing rapidly in demand. This project will make these big data sources available to a wider audience. Implementing these improvements now maximizes the value of investments in data generation devices, such as unmanned aerial vehicles (UAV) and remote sensing equipment.

Details

Background

Metropolitan implemented its current EGIS infrastructure in 2007, in response to development of the EGIS Strategic Plan in 2003. The goal of that project was to build the EGIS infrastructure, including server hardware, data, and applications, and provide web-based access to that data. At the time, data included in EGIS generally consisted of simple elements, such as lines, points, or polygons with attached tabular data. Metropolitan staff routinely use the data developed as a part of that project on a day-to-day basis, and the EGIS infrastructure has served Metropolitan staff well over the last decade.

Big data is a term which refers to a recent and pending dramatic increase in the size and complexity of data sets, such as three-dimensional scans of buildings. Use of big data services has increased in the last few years and is anticipated to increase significantly more in the future. Big data will be used for analyses across Metropolitan. These analyses will assist in efforts supporting and studying ways to increase operational flexibility and maintain infrastructure reliability, as well as potentially assisting in regulatory compliance.

Real-time data refers to live data values occurring in the physical world. For example, the flow entering the Santa Monica Feeder could be shown in real time. Real-time data from the SCADA system is an area of growth that this project will enable. The WSO Water Quality Section uses the current EGIS infrastructure to view real-time data on maps. WSO can view real-time flow data from the Automatic Meter Reading system, real-time water

quality readings, and settling basin information on GIS mapping applications. This capability was developed by the Information Technology Groups GIS and CAD Team over the last few years. However, it has been found during these development efforts that implementing these features using the current infrastructure reduces the performance of the EGIS system. The upgrade of EGIS infrastructure will solve the reliability problem and vastly increase the potential throughput to accommodate more map base time-series data displays.

Point cloud is a term which refers to three-dimensional scans of physical items, such as buildings, structures, or field equipment. Point cloud data is another area of rapid growth for Metropolitan. New technologies such as laser scanners and UAV drive this increase in data. Potential future uses for this data include maintenance management, asset management, and building information systems. The ArcGIS Datastore and Geoanalytics Server are new technologies to be implemented under this project to address these challenges. Currently, a powerful desktop computer is required to work with point cloud data. This project will shift the computational work to servers instead of the desktop computer, thus allowing the manipulation and viewing of point cloud data from any computer, even mobile devices. This technology will open the potential of three-dimensional data to more applications and more users, allowing more utilization of data Metropolitan already captures and maintains.

This project will also enable on-site hosted web-based mapping. This project will enable self-service map-making for Metropolitan employees. Currently, the amount of data that a user can incorporate in an online map is limited. This project will allow full access to all Metropolitan EGIS data, better performance, and improved self-service map-authoring tools increasing utilization of the data Metropolitan maintains.

Enterprise GIS Infrastructure Upgrade (\$680,000)

The planned work includes the purchase, installation, and configuration of the following components:

- a big data storage solution
- an on-site hosted GIS portal for improved performance
- a data storage and display component which optimizes time-series specific data
- a software component which works with the big data storage solution to optimize data analysis
- Servers (4) – includes operating system, database licensing, and storage

This action appropriates \$515,930 for the purchase of the listed components, \$48,243 for internal labor, \$54,000 for professional/technical services, with \$61,827 remaining for remaining budget.

This action also authorizes a \$385,500 sole-source agreement with Esri for the purchase and implementation of an infrastructure upgrade. Esri is a major provider of GIS-related software and has provided the software components of the majority of Metropolitan's GIS infrastructure since the EGIS was established in September 2003. The Metropolitan Administrative Code Section 8140(1)(d) provides that competitive procurement is not required if it could not produce an advantage. Metropolitan would not realize an advantage by obtaining the required software through a new competitive procurement because the existing EGIS infrastructure was built using Esri software and this project would expand the existing EGIS infrastructure by increasing licensing for existing software and adding licenses for new Esri applications that are components of our existing EGIS infrastructure.

Other procurement contracts to implement this project will be made under the General Manager's Administrative Code authority to award contracts of \$250,000 or less.

Summary

This action appropriates \$680,000 for the upgrade of the EGIS infrastructure to accommodate increasing demand for big data services. Big data services include the real-time display of time-series data (e.g., from the SCADA system), three-dimensional "point cloud" data, and self-service online map-making that include large amounts of Metropolitan data. This project is included within capital Appropriation No. 15501, Infrastructure Reliability Information System, which was initiated in fiscal year 2016/17. With this action, the total funding for Appropriation No. 15501 will increase from \$1,290,000 to \$1,970,000.

This project has been evaluated and recommended by Metropolitan’s Capital Investment Plan Evaluation Team, and funds are available within the fiscal year 2018/19 capital expenditure plan. See **Attachment 1** for the financial statement.

Project Milestones

October 2018 - Complete purchase of hardware and software

January 2019 - Set up hardware and database infrastructure

March 2019 - Install and configure software

Policy

Metropolitan Water District Administrative Code Section 5108: Appropriations

Metropolitan Water District Administrative Code Section 8121: General Authority of the General Manager to Enter Contracts

Metropolitan Water District Administrative Code Section 8140: Competitive Procurement

California Environmental Quality Act (CEQA)

CEQA determination for Option #1:

The proposed action is not defined as a project under CEQA (Public Resources Code Section 21065, State CEQA Guidelines Section 15378) because the proposed action will not cause either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment and involves continuing administrative activities, such as general policy and procedure making (Section 15378(b)(2) of the State CEQA Guidelines). In addition, where it can be seen with certainty that there is no possibility that the proposed action in question may have a significant effect on the environment, the proposed action is not subject to CEQA (Section 15061(b)(3) of the State CEQA Guidelines).

The CEQA determination is: Determine that the proposed action is not defined as a project under Public Resources Code Section 21065 and Section 15378(b)(2) of the State CEQA Guidelines and is not subject to CEQA pursuant to Section 15061(b)(3) of the State CEQA Guidelines.

Option #2

None required

Board Options

Option #1

Adopt the CEQA determination that the proposed action is not defined as a project and is not subject to CEQA, and

- a. Appropriate \$680,000;
- b. Authorize the purchase and implementation of an infrastructure upgrade for Metropolitan’s Geographic Information System (GIS) software and hardware environment; and
- c. Authorize a \$385,500 agreement with Esri for the purchase and implementation of an infrastructure upgrade for Metropolitan’s GIS software and hardware environment.

Fiscal Impact: \$680,000 of capital funds under Appropriation 15501

Business Analysis: This project will accommodate increasing demand for big data services, including real-time display of time-series data (e.g., from the SCADA system), three-dimensional “point cloud” data, and more.

Option #2

Do not proceed with this project at this time

Fiscal Impact: Unknown

Business Analysis: Leave the system as it is and forgo the opportunities offered by better storage and analysis of big data sources.

Staff Recommendation

Option #1



Charles Eckstrom 7/31/2018
Group Manager, Information Technology Date



Jeffrey Kightlinger 8/6/2018
General Manager Date

Attachment 1 – Financial Statement

Ref# IT12658517

Financial Statement for the Infrastructure Reliability Information System Appropriation

A breakdown of Board Action No. 3 for Appropriation No. 15501 for the purchase and implementation of an infrastructure upgrade for Metropolitan’s Geographic Information System (GIS) software and hardware environment is as follows:

	Previous Total Appropriated Amount (Jun. 2018)	Current Board Action No. 3 (Aug. 2018)	New Total Appropriated Amount
Labor	\$ -	\$ -	\$ -
Owner Costs	328,000	48,243	376,243
Construction Inspection & Support	-	-	-
Installation, configuration & integration	376,000	-	376,000
Materials & Supplies	77,000	515,930	592,930
Incidental Expenses	126,000	-	126,000
Professional/Technical Services	230,000	54,000	284,000
Equipment Use	-	-	-
Contracts	-	-	-
Remaining Budget	153,000	61,827	214,827
Total	\$ 1,290,000	\$ 680,000	\$ 1,970,000

Funding Request

Appropriation Name:	Infrastructure Reliability Information System Appropriation		
Source of Funds:	Revenue Bonds, Replacement and Refurbishment or General Funds		
Appropriation No.:	15501	Board Action No.:	3
Requested Amount:	\$ 680,000	Budget Page No.:	111
Total Appropriated Amount:	\$ 1,970,000	Total Appropriation Estimate:	\$ 7,400,000