

- **Board of Directors**
Engineering and Operations Committee

November 14, 2006 Board Meeting

8-1

Subject

Appropriate \$3.95 million to enhance the reliability of Metropolitan's Wide Area Network for facility communications as a part of the IT Network Upgrade initiative (Approp. 15376)

Description

Metropolitan has undertaken a phased initiative to increase the reliability and capacity of Metropolitan's networks as part of its IT infrastructure program within the IT Strategic Plan. Phase One of the network upgrade, which was approved by the Board in February 2006, has the objective to increase the capacity of Metropolitan's Local Area Network (LAN) and to replace end-of-service-life network equipment at the field facilities and Los Angeles Headquarters at Union Station. LANs provide high-speed transport of data within a building or a facility. Installation of Phase One end-of-service-life network equipment is nearing completion.

This board letter requests authorization to proceed with the second and final phase of the IT Network Upgrade initiative. The primary objective of Phase Two is to upgrade Metropolitan's Wide Area Network (WAN) by improving its reliability and increasing communication capacity between facilities.

The WAN interconnects all Metropolitan facilities and transports voice, data and video traffic between the different sites. It was installed nine years ago. The phone system and water operation-related systems such as SCADA, maintenance management (Maximo), water billing (WINS) and the security cameras all rely on the WAN. The WAN also connects users in field locations to business systems located at Union Station. Examples of these business systems include: email, Computer Aided Design, Geographical Information System, Oracle financials, timekeeping and PeopleSoft human resources/payroll. As critical operations-related and business functions increase their reliance on Metropolitan's networks, the requirement for a high level of network dependability becomes more acute. In addition, traffic on the WAN has increased 175-fold over the last five years. The increase is due to a number of factors including: installation of a new video surveillance system, the addition of new software applications such as the Enterprise Geographic Information System, and increases in the transmission of data to Metropolitan's alternate data center to achieve greater reliability and more timely recovery of systems in the event of a disaster. For example, as part of the project to strengthen Metropolitan's security, 250 new surveillance cameras were installed at 62 different Metropolitan sites. Video transmission inherently consumes considerably more capacity (bandwidth) than data transmission does. All of the video feeds from the surveillance cameras are transmitted over the WAN to the Operations Control Center where they are viewed and monitored by security staff.

In a planned response to this reliance and growth in usage, staff conducted a competitive process to select a consultant to perform a telecommunications assessment study. MTM Technologies, Inc. was selected and completed the study in December 2005. The study highlighted several important upgrades to raise the levels of network reliability and capacity necessary to meet Metropolitan's current and anticipated future requirements.

The assessment study's recommendations form the basis of Phase Two of the IT Network Upgrade effort. MTM recommended that the overall network configuration be upgraded to eliminate potential single points of failure, where a malfunction of a single component in the network could cause multiple sites to lose communication. For example, should certain desert microwave towers be damaged in an earthquake, data communication to the desert facilities could be interrupted. To mitigate this risk, staff has taken interim measures to address high priority areas in advance of the Phase Two upgrade. The balance of the potential single points of failure will be addressed under the Phase Two project by adding four new microwave links, upgrading two microwave towers and adding

leased lines. These enhancements will improve dependability by adding alternate routes to each site in the event that primary network paths are out of service.

The MTM study also recommended replacing battery backup components and upgrading electrical grounding systems at key communication sites throughout the system. These upgrades will ensure that the WAN continues to function in the event of power loss and protect the systems from lightning damage and other power disruptions.

The initiative also includes replacement of several WAN components in the desert that are approaching the end of their useful life. WAN monitoring and management equipment will also be deployed that will significantly improve the ability of Metropolitan network management staff to monitor the status of WAN components and links throughout the system from Union Station, and to remotely make modifications to the network to respond to problems anywhere in the system. This capability will enable increased levels of network reliability and minimize staff travel time to remote hilltop and desert locations where these devices are located. Overall, the single points of failure remediation, battery and electrical grounding upgrades, WAN component replacement, and WAN monitoring and management equipment deployment activities are estimated to be a two-year effort, with the most critical sites being addressed first.

This action appropriates \$3.95 million in budgeted funds and authorizes Phase Two of the IT Network Upgrade project in order to upgrade hardware and software, and to procure specialty consulting services to ensure reliability of Metropolitan's IT network. Consulting firms will be selected through a competitive process to perform discrete elements of work, as the various components require different skill sets. Staff anticipates that consulting agreements will be awarded by the General Manager under his Administrative Code authority.

This project has been evaluated and recommended by Metropolitan's Capital Investment Plan Evaluation Team and funds have been included within the FY 2006/07 capital budget. Staff anticipates returning to the Board in June 2007 for authorization to enter into competitively bid contracts for the purchase of materials for this project.

See [Attachment 1](#) for the Financial Statement.

Policy

Metropolitan Water District Administrative Code Section 5108: Appropriations

California Environmental Quality Act (CEQA)

CEQA determination for Options #1 and #2:

The proposed action is categorically exempt under the provisions of CEQA and the State CEQA Guidelines. The proposed action includes the rehabilitation and replacement of existing equipment where older components are replaced by new components with the same purpose. Accordingly, the proposed action qualifies under a Class 2 Categorical Exemption (Section 15302 of the State CEQA Guidelines).

The CEQA determination is: Determine that pursuant to CEQA, the proposed action qualifies under a Categorical Exemption (Class 2, Section 15302 of the State CEQA Guidelines).

CEQA determination for Option #3:

None required

Board Options

Option #1

Adopt the CEQA determination and

- a. Appropriate \$3.95 million in budgeted funds; and
- b. Authorize Phase Two of the IT Network Upgrade initiative.

Fiscal Impact: \$3.95 million of budgeted funds under Approp. 15376 and up to \$400,000 in annual O&M costs for additional leased lines to improve WAN reliability

Business Analysis: This option will address network issues/recommendations identified by a network consultant's assessment study and will improve the reliability and capacity of Metropolitan's communications networks.

Option #2

Adopt the CEQA determination and

- a. Appropriate \$2.6 million in budgeted funds; and
- b. Authorize selected upgrades to enhance the Metropolitan network with additional links to eliminate single points of failure in the network. Other tasks such as the battery and electrical grounding upgrades, WAN component replacement, and WAN monitoring and management equipment deployment will be deferred.

Fiscal Impact: \$2.6 million of budgeted funds under Approp. 15376 and up to \$400,000 in annual O&M costs for additional leased lines to improve WAN reliability

Business Analysis: This partial implementation of the assessment study findings will increase risk to Metropolitan’s network infrastructure because end-of-life equipment are more prone to failures resulting in potential extended service disruptions.

Option #3

Do not perform work as described and do not replace Metropolitan’s network equipment.

Fiscal Impact: No additional expenditure of budgeted capital funds

Business Analysis: Deferral of this project will continue to expose the WAN to single points of failure and potential extended service disruptions.

Staff Recommendation

Option #1



Roy L. Wolfe
Manager, Corporate Resources

10/30/2006

Date



Jeffrey Kightlinger
General Manager

10/30/2006

Date

Attachment 1 – Financial Statement

BLA #4497