



- Board of Directors
Engineering and Operations Committee

5/13/2014 Board Meeting

8-4

Subject

Appropriate \$9.4 million; and authorize: (1) \$6,583,000 agreement with Advanced Electronics, Inc. for the Emergency Radio Communications System; and (2) increase of \$300,000 to agreement with Hatfield & Dawson Consulting Engineers, LLC (Approp. 15376)

Executive Summary

This action authorizes design, procurement, and deployment of a new Emergency Radio Communications System which will cover Metropolitan's entire service area. The planned system includes handheld, vehicle-mounted, and base-station radios utilizing modern, centrally managed digital technology, networked across Metropolitan's existing communication infrastructure. The system is critical to providing emergency and day-to-day communications, workplace safety, and site security throughout the conveyance and distribution system.

This action authorizes an agreement to furnish equipment, conduct pilot tests, and deploy the new radio system. This action also authorizes an amendment to an existing agreement for Owner's engineering services to provide independent technical support to Metropolitan.

Timing and Urgency

Metropolitan staff rely on handheld, vehicle-mounted, and fixed-station radios for both emergency response and day-to-day operational communications. The existing radio configuration uses a combination of three different localized systems which were deployed over a period of three decades. The current systems are not integrated and are unable to communicate across Metropolitan's entire service area. The systems lack reliability, capacity, and coverage to meet disaster recovery needs, and are difficult to use. During recent disaster recovery exercises, the radio systems could not provide an effective means of communication. This project will replace the existing three systems with a single system of sufficient capacity, usability, and coverage to communicate across Metropolitan's entire service area.

This project has been reviewed with Metropolitan's Capital Investment Plan (CIP) prioritization criteria, and is categorized as an Infrastructure Upgrade project. Funds for this action are available within Metropolitan's capital expenditure plan for fiscal year 2013/14.

Details

Metropolitan relies on radio communication by a variety of staff to perform core business functions. Radio users include patrollers, maintenance staff, operators, construction and shutdown staff, aircraft pilots, and others. In the event of a regional disaster, where conventional communications may fail, the radio system would be used by emergency response personnel, patrollers, remote operators, Incident Command Centers, the Emergency Operations Center, and the Operations Control Center. Communication between Metropolitan and its member agencies is also essential during emergencies, and is presently accomplished via the Member Agency Response System (MARS) base-station radios.

Metropolitan currently uses three different radio systems: (1) a Very-High Frequency (VHF) system used by most patrollers across the distribution system; (2) an Ultra-High Frequency (UHF) system used for vehicles,

Colorado River Aqueduct (CRA) staff, and for some local facilities; and (3) a low-band VHF system for the MARS radios. These three systems were initiated as small local systems and have grown independently for over 30 years.

The three existing systems cover limited and independent areas, and as a result are unable to communicate together. Moreover, these systems have limited radio traffic capacity, which impacts the messaging capability during urgent situations, where dozens of independent conversations may be required. The current radio systems rely primarily on older analog technology, which suffers from diminished voice quality over long distances in comparison with newer digital technology. In addition, the radios are difficult to use, requiring dialing and tower codes to be mutually known in order for remote parties to talk, or while traveling over any moderate distance. The combination of these shortcomings creates critical challenges to system-wide communications, especially during emergencies. These shortcomings also reduce the utility of the radio systems for daily operations, which further degrades staff's familiarity with the system during an emergency.

In July 2006, Metropolitan's Board authorized initial investigations into radio system requirements and potential solutions. This effort concluded that a single digital "trunked" (networked) UHF radio system would be the optimal solution to meet Metropolitan's day-to-day and emergency communications needs. In July 2009, the Board authorized conceptual design of a new digital comprehensive communications system. In October 2010, the Board authorized procurement of a key regional frequency needed to support a single radio system.

The recommended system will meet three target requirements: coverage, capacity, and usability, as follows:

- End-to-end coverage of Metropolitan's service area will be provided via networking of a common digital technology system and by use of recently acquired clear channel frequencies. A clear channel is a license privilege reserved for single agency use within a specified geographic region.
- Communication capacity will be increased through use of networking and improved frequency management, much like a computer router allows multiple users to share the same network.
- Usability will be improved with features such as underground (e.g., plant tunnel and gallery) communications, cell phone-like roaming, and automatic security features.

The planned system will be internet protocol (IP) based and the software will be controlled from a central location, simplifying management. The system will also include emergency backup capability and will improve the reliability of member agency communications through the MARS system.

The conceptual design has now been completed, and necessary local frequencies have been obtained and licensed through the Federal Communications Commission (FCC). Per FCC licensing and use regulations, Metropolitan must utilize these frequencies prior to the application period end date of December 2015, or risk losing them back to the public domain where they may be acquired by other parties.

During the conceptual design process, a third-party Value Engineering review was performed on the planned system, and its recommendations were incorporated into the conceptual design. This review confirmed that the estimated cost and scope for the Emergency Radio Communications System are appropriate when balancing Metropolitan's needs with the heavily crowded radio spectrum in Southern California. Further, the review confirmed that this type of radio system technology is consistent with those used by other regional utilities and agencies.

A partial test of the radio system's proposed technology has recently been successfully completed through an equipment upgrade of the MARS system. A Request for Proposals (RFP) for procurement, pilot testing, and deployment was issued, and responses have been received and reviewed. Staff recommends moving forward at this time to complete the Emergency Radio Communications System.

Emergency Radio Communications System – Design, Procurement, and Deployment (\$9,400,000)

The planned system will include: 19 integrated high-elevation (wide area) repeater stations located at various mountaintop locations; 12 low-elevation (local area) radio stations located at key facilities such as treatment plants and the Headquarters Building at Union Station; approximately 400 handheld radios; approximately 400 vehicle-mounted radios; 26 updated base-stations for the MARS system; a trunked network management

system; and needed support equipment such as power supplies, cabling, software, and antennas. End-to-end communication networking will be provided over Metropolitan's existing backbone microwave and fiber optic telecommunications system.

The activities authorized by this action include equipment procurement, pilot testing, and deployment of the new radio communications system. The pilot test will be conducted to validate the design and functionality of the system prior to procurement and deployment of the balance of the equipment. This work will primarily be performed by Advanced Electronics, Inc., as discussed below. This action also authorizes final design of a future installation/construction contract; overall program management and technical oversight; installation and testing of the pilot system; and final system testing and start-up. These activities will be performed by Metropolitan staff. Owner's engineering services are recommended to be provided by Hatfield & Dawson Consulting Engineers, LLC (H&D Consulting), as discussed below. H&D Consulting's services will include specialized technical review, radio system consulting, and assistance with testing and start-up.

Installation of specific components of the full-scale communication system will be accomplished via a future construction contract. This contract will be competitively bid and staff will return to the Board in early 2015 with a recommendation for award. The anticipated amount of the future installation/construction contract is estimated to range from \$1.1 million to \$1.4 million.

This action appropriates \$9.4 million, and authorizes design, procurement, and deployment of a new Emergency Radio Communications System. These funds and scope are intended to be inclusive of all work required to complete the radio system, except for the future installation/construction contract. The total amount expended to date on the Emergency Radio Communications System, including frequency acquisition, is approximately \$2 million. The total estimated cost to complete this project, including the amount authorized to date, current funds requested, and future installation/construction work, is \$14 million.

The funds requested in this action include \$6,583,000 for the agreement with Advanced Electronics, Inc.; \$214,000 for installation/construction activities by Metropolitan forces for the pilot system; \$300,000 for Owner's engineering services by H&D Consulting; \$291,000 for final design by Metropolitan staff of the future installation/construction contract; \$66,000 for technical review of submittals from Advanced Electronics, Inc.; \$42,000 for radio frequency survey assistance; \$355,000 for project management, controls, and bidding of the installation contract; \$267,000 for system start-up and integration with Metropolitan's communications infrastructure; \$65,000 for factory acceptance testing; and \$1,217,000 for remaining budget.

Advanced Electronics, Inc. – Agreement for Procurement and Deployment

In November 2013, a competitive solicitation (RFP No. 1046) was issued to obtain radio system procurement, pilot testing, and deployment services. Four responses were received on December 16, 2013. Staff recommends that Advanced Electronics, Inc. provide these services. Advanced Electronics has extensive experience in radio system design and implementation, and has installed systems of similar technology at Edwards Air Force Base, NBC-Universal Studios, and multiple police departments.

This action authorizes an agreement with Advanced Electronics, Inc., in an amount not to exceed \$6,583,000, to perform procurement, pilot design and testing, installation oversight, and deployment of a new Emergency Radio Communications System. For this agreement, Metropolitan established a Small Business Enterprise (SBE) participation level of 20 percent of the agreement amount. Advanced Electronics is both a Small and Regional Business, and thus achieves 100 percent participation.

Hatfield & Dawson Consulting Engineers, LLC – Amendment to Agreement to Provide Owner's Engineering Services

Owner's engineering services and technical assistance are recommended to be provided by H&D Consulting. H&D Consulting was initially selected through a competitive process via RFP No. 925 to perform technical investigations, provide frequency acquisition support, and develop the conceptual design for the planned radio system. The agreement with H&D Consulting was awarded under the General Manager's contracting authority per Metropolitan's Administrative Code. This agreement currently has a maximum payable amount of \$150,000 per year, and will expire on June 30, 2014.

The planned scope of Owner's engineering services includes: technical review of design documents, specialized radio communications consultation, and assistance with testing and start-up. The estimated cost for these services is \$300,000.

This action authorizes an increase of \$300,000 to the existing agreement with H&D Consulting, for a new not-to-exceed total of \$550,000, to provide Owner's engineering services. The term of this agreement will be extended by two years to provide this support. Given the firm's direct experience on this project, staff believes it is in Metropolitan's interest for H&D Consulting to provide independent third-party technical support. H&D Consulting is a registered SBE firm, and thus achieves 100 percent SBE participation for this work.

Summary

This action appropriates \$9.4 million; authorizes design, procurement, and deployment of a new Emergency Radio Communications System; authorizes a \$6,583,000 agreement with Advanced Electronics, Inc.; and authorizes an increase of \$300,000 to an existing agreement with H&D Consulting.

This project has been evaluated and recommended by Metropolitan's CIP Evaluation Team, and funds are available within the fiscal year 2013/14 capital expenditure plan. See [Attachment 1](#) for the Financial Statement.

This project is included within capital Appropriation No. 15376, the Information Technology System – Infrastructure appropriation, which was initiated in fiscal year 2001/02. With the present action, the total funding for Appropriation No. 15376 will increase from \$36,401,000 to \$45,801,000.

Project Milestone

February 2015 – Completion of design and pilot testing of the Emergency Radio Communications System

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

California Environmental Quality Act (CEQA)

CEQA determination for Option #1:

The proposed action is categorically exempt under the provisions of CEQA and the State CEQA Guidelines. The proposed action involves the funding, design, and minor alterations, reconstruction or replacement of existing public facilities along with the construction of minor appurtenant structures with negligible or no expansion of use and no possibility of significantly impacting the physical environment. Accordingly, the proposed action qualifies under Class 1, Class 2, and Class 3 Categorical Exemptions (Sections 15301, 15302, and 15303 of the State CEQA Guidelines).

The CEQA determination is: Determine that pursuant to CEQA, the proposed action qualifies under three Categorical Exemptions (Class 1, Section 15301; Class 2, Section 15302; and Class 3, Section 15303 of the State CEQA Guidelines).

CEQA determination for Option #2:

None required

Board Options

Option #1

Adopt the CEQA determination that the proposed action is categorically exempt, and

- a. Appropriate \$9.4 million;
- b. Authorize \$6,583,000 agreement with Advanced Electronics, Inc., for the Emergency Radio Communications System; and
- c. Authorize increase of \$300,000 to the existing agreement with Hatfield & Dawson Consulting Engineers, LLC, for a new not-to-exceed total of \$550,000.

Fiscal Impact: \$9.4 million of capital funds under Approp. 15376

Business Analysis: This option would provide a radio communications system with sufficient coverage, capacity, and usability for daily operations and emergency response needs.

Option #2

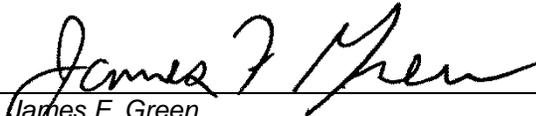
Do not proceed with the Emergency Radio Communications System.

Fiscal Impact: None

Business Analysis: This option would forgo an opportunity to improve operational and emergency communication capabilities. In addition, under FCC rules, Metropolitan may lose the use of multiple licensed frequencies due to lack of utilization.

Staff Recommendation

Option #1



 James F. Green 4/24/2014
 Group Manager, Water System Operations Date



 Jeffrey Nightlinger 4/30/2014
 General Manager Date

Attachment 1 – Financial Statement

Financial Statement for Information Technology System – Infrastructure Appropriation

A breakdown of Board Action No. 16 for Appropriation No. 15376 to provide a Metropolitan-wide Emergency Radio Communications System¹ is as follows:

	Previous Total Appropriated Amount (Feb. 2013)	Current Board Action No. 16 (May 2014)	New Total Appropriated Amount
Labor	\$ 16,644,562 ^{2,3}	\$ -	\$ 16,644,562
Studies & Investigations	97,500	-	97,500
Final Design and Specifications	87,600	291,000	378,600
Owner Costs (Technical review, program mgt., frequency surveys, bidding, start-up)	147,900	730,000	877,900
Submittals Review & Record Drawings	19,000	-	19,000
Construction Insp. & Support	95,000	-	95,000
Metropolitan Force Construction (Pilot system)	153,000	214,000	367,000
Materials & Supplies	11,414,989	-	11,414,989
Incidental Expenses	169,493	65,000	234,493
Professional/Technical Services	5,537,608	-	5,537,608
H&D Consulting Engineers, LLC	250,000 ³	300,000	550,000
Equipment Use	43,231	-	43,231
Contracts	759,558	-	759,558
Advanced Electronics, Inc.	-	6,583,000	6,583,000
Remaining Budget	981,559 ²	1,217,000	\$ 2,198,559
Total	\$ 36,401,000	\$ 9,400,000	\$ 45,801,000

Funding Request

Appropriation Name:	Information Technology System - Infrastructure		
Source of Funds:	Revenue Bonds, Replacement and Refurbishment or General Funds		
Appropriation No.:	15376	Board Action No.:	16
Requested Amount:	\$ 9,400,000	Budget Page No.:	308
Total Appropriated Amount:	\$ 45,801,000	Total Appropriation Estimate:	\$48,408,000

¹ The total amount expended to date on the Emergency Radio Communications System is approximately \$2 million. The total estimated cost to complete the project, including the amount authorized to date, current funds requested, and future construction/installation costs, is \$14 million.

² Includes the reallocation of \$7,939 to Remaining Budget from completion of the Enterprise Geographic Information System project.

³ Funds for H&D Consulting were transferred from the labor budget.