

**OPERATIONS COMMITTEE**  
**JUNE 21, 2007**

**SUBJECT:           ADVANCED TRANSPORTATION MANAGEMENT SYSTEM (ATMS)  
                          UPGRADE**

**ACTION:            ESTABLISH LIFE-OF-PROJECT BUDGET**

**RECOMMENDATION**

Establish a life-of-project (LOP) budget for the Advanced Transportation Management System (ATMS) Upgrade CP# 202232 in the amount of \$12,107,000 and include the project in the FY08 capital program budget.

**BACKGROUND**

The ATMS system is the core operational system used to manage Metro's 2500+ bus vehicle fleet. The ATMS system provides voice/data radio dispatching capabilities as well as automatic passenger counting (APC), automated vehicle annunciation (AVA), video surveillance, real-time automated vehicle location (AVL) information and daily operator schedules. The ATMS system development began in 2001 and was operational across the fleet in 2004. The original \$100M+ capital expenditure provided the basis for many of Metro's newer operational initiatives and provides the means to monitor and enhance Metro's on-going operational performance objectives.

**RATIONALE**

In January 2005, the Board adopted the FY06 Financial Standards, which require that all capital projects with expenditures greater than \$5 million be approved by the Board separate from Metro's annual budget approval process.

As with all critical operational systems of the size and nature of ATMS, there is a need to provide on-going operational support and maintenance of the system. As the agency continues to rely on the data, and as the need for accessibility and availability of information derived from the ATMS system increases, there is a need to expand the ATMS system capabilities to meet the coming operational challenges as well as take advantage of improvements in the technology and transit industry.

The proposed ATMS Upgrade project establishes the funding needed to provide incremental system improvements in a variety of operational areas in order to take advantage of new

technology applications, hardware and software development, and normal life-cycle system improvements. A description of the proposed project enhancements is summarized in Attachment B.

### **FINANCIAL IMPACT**

Funding for CP 202232 will be included in the FY08 proposed budget. This capital project was approved by the Capital Executive Investment Committee and is proposed to be funded in the FY08 capital program with TDA Article 4 depending on cash availability. A detailed financial plan is included in Attachment A.

Since this is a multi-year project, the Project Manager and Chief Operations Officer is responsible for budgeting costs in future years consistent with the board-adopted total life-of-project budget.

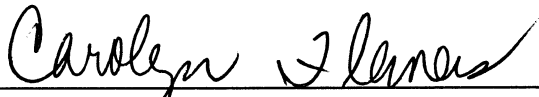
### **ALTERNATIVES CONSIDERED**

An alternative is to not proceed with this proposal. This is not recommended, as it will result in increased operational expenses to support daily revenue service requirements as the ATMS system struggles to meet the performance needs of on-going operational development (Rapid Bus Expansion, Metro Connections, Bus Signal Priority, Next-Bus arrival information, etc.) that are being developed throughout the agency. Similarly, a delay in approving the life-of-project budget will increase present value costs incrementally at a later date.

### **ATTACHMENTS**

- A. Capital Project Funding & Expenditure Plan
- B. Project Description Summary

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**ATTACHMENT A**  
**ADVANCED TRANSPORTATION MANAGEMENT SYSTEM UPGRADE – CP 202232**

**CAPITAL PROJECT FUNDING & EXPENDITURE PLAN**

	<b>FY08</b>	<b>FY09</b>	<b>FY10</b>	<b>TOTAL</b>	<b>% of Total</b>
<b>Use of Funds</b>					
a. OrbCAD Software Enhancements	\$100,000	\$200,000		\$300,000	2.5 %
b. BOC Workstation Upgrade	\$50,000	\$200,000		\$250,000	2.0 %
c. Portable Radios	\$330,000			\$330,000	2.7 %
d. Disaster Recovery Voice System	\$200,000	\$1,400,000	\$1,000,000	\$2,600,000	21.5 %
e. Windows XP Upgrade		\$200,000	\$100,000	\$300,000	2.5 %
f. LAN Upgrade			\$400,000	\$400,000	3.3 %
g. RF Channel Integration		\$1,400,000	\$450,000	\$1,850,000	15.3 %
h. ATMS Mobile Units			300,000	\$300,000	2.5 %
i. Division Fallback Communication		\$98,000		\$98,000	0.8 %
j. RF Monitoring Bench	\$86,000			\$86,000	0.7 %
k. Site and Tower Replacement			\$375,000	\$375,000	3.1 %
l. Engineering Services	\$75,000	\$75,000	\$75,000	\$225,000	1.9 %
m. Wireless Access Point Upgrade	\$400,000	\$2,000,000		\$2,400,000	19.8 %
Labor	\$515,278	\$530,736	\$546,659	\$1,592,673	13.2 %
Contingency		\$500,000	\$500,327	\$1,000,327	8.2 %
<b>Total Project Cost</b>	<b>\$1,756,278</b>	<b>\$6,603,736</b>	<b>\$3,746,986</b>	<b>\$12,107,000</b>	<b>100.0 %</b>
<b>Sources of Funds:</b>					
TDA Article 4	\$1,756,278			\$1,756,278	14.5 %
Future Year Bus Capital Funds		\$6,603,736	\$3,746,986	\$10,350,722	85.5 %
<b>Total Project Funding</b>	<b>\$1,756,278</b>	<b>\$6,603,736</b>	<b>\$3,746,986</b>	<b>\$12,107,000</b>	<b>100.0 %</b>

**ATTACHMENT B**  
**ADVANCED TRANSPORTATION MANAGEMENT SYSTEM UPGRADE – CP 202232**

**PROJECT DESCRIPTION SUMMARY**

- a. **OrbCAD Software Enhancements** – These enhancements would improve on-time performance statistics (i.e. pink letter tool) by providing the ability to account for daily unscheduled changes; implement AVA volume control by providing the ability to set interior speaker volume to adjust for changing environments; allow the ability to make AVA changes to categories (i.e. major stops only) and provide the ability to make incidental software updates as required.
- b. **Bus Operations Control (BOC) Workstation Upgrade** - The fifty dispatching workstations need to be upgraded in order to improve performance and allow the ability for fleet monitoring by Sectors, Divisions or fleet wide. The update is consistent with the normal life-cycle update for hardware that is used 24/7 by BOC controllers and would ensure operation is not affected by maintenance concerns that normally increase over time. The ATMS consoles were purchased in 2002 and designed specifically for dispatching and the availability of like-part replacements are no longer available.
- c. **ATMS Portable Radios** - Additional ATMS portable 900 MHz radios are needed so that the bus fleet can operate as intended instead of operating make-shift mobile units and cell phones to meet operational service needs. The need to deploy portable radios in non-equipped bus fleet as well as maintain a small percentage of spares for quick replacement is a safety, security, and operational concern. Newer radios are needed to partly replace salvaged units as well as expand the availability of communications equipment to vehicles that need them. These portable radios are also used in the field to support special events and emergencies.
- d. **ATMS Disaster Recovery System** – An ATMS Disaster Recovery Plan was mandated by a Metro audit and established the options available for ATMS recovery if a disaster were to occur. The least cost, highest operational return option provides for a redundant voice-only system to be installed on an ATMS radio frequency site that would provide 80% coverage for use in the event of a major disaster. Funds would also be used to implement other incidental recommendations for software redundancy, BOC shutdown switches and water seepage prevention for the BOC.
- e. **Windows XP Upgrade** - The OrbCAD upgrade from Windows 2000 to XP replaces hardware and software that has reached its useful life and which is no longer supported by commercial software manufacturers. There is a need to stay current with Microsoft supportability to allow other software upgrades that are available by Orbital for the ATMS system, but which cannot be implemented as they are not backward compatible. The XP platform is stable and robust and would improve system performance. Waiting for the new Microsoft Vista software to mature will likely take years to meet all system security and industry accepted development objectives with unknown benefits over the known XP upgrade.

- f. **ATMS LAN Upgrade** - The Local Area Network (LAN) upgrade would improve the bandwidth capacity for the ATMS network from a copper-type throughput (1 GB) to a fiber-type throughput (100 GB). This project affects network efficiency and will help towards improving overall system performance and decreasing Bus Operations Control response times to calls. This upgrade also helps data to be efficiently and effectively moved (interfaced) from the ATMS system to other systems for data analysis by groups such as the System Performance Analysis, RIITS/511, M3, etc. With the increasing need of various users (Divisions, Sectors, VOs, Customer Service, M3, UFS, etc.) to access ATMS, there is a need to upgrade the network to meet the growing need for system access.
- g. **RF Channel Integration** – This line item provides for the integration of 2-900 MHz and 2-508 MHz channels into Metro's RF network. Metro currently owns these valuable assets, but since the frequencies have not been integrated into the ATMS voice and data system, the benefits have not been fully realized. The risk in not implementing this project is that Metro could be cited by the Federal Communications Commission for not effectively operating the frequencies and potentially be at risk of losing the frequencies, thereby limiting any additional future fleet expansion capabilities. Additional data channels would allow the 5 minute poll rate to be reduced for bus signal priority and other high poll rate applications.
- h. **ATMS Mobile Units** - The ATMS mobile units will soon reach their life cycle term and like-replacements are no longer available. These mobile units would upgrade the current MW800 units and provide continued field support for field-to-BOC and field-to-ATMS communication to ensure accurate and timely information is maintained. The ATMS mobile units are primarily used for field supervision purposes.
- i. **Division Fallback Communications** - This radio communication equipment provides a method for divisions to communicate with the BOC in the event that all telephone and data lines were somehow disrupted, cut, or disconnected at either end. The portable nature of this equipment enables communications with BOC should emergency relocation become necessary. Under power outage circumstances, cellular communications would not be available due to system overloading, loss of cell sites, or both. Carrier provided T-1 communications lines are susceptible to drop outs and would likely be intermittent, or completely out of service.
- j. **RF Monitoring Bench** - This equipment provides the ability to monitor and pro-actively troubleshoot ATMS radio communications hardware scattered among various bus locations, and remote antenna sites throughout Los Angeles County. This equipment would also help to identify radio signals from neighboring cities, agencies, and broadcast stations, that may be interfering with the ATMS radio network. The radio test bench reduces ATMS downtime and improves the turnaround repair time by being able to remotely identify developing problems in early stages, so that equipment and manpower can be effectively applied and dispatched to make field adjustments or repairs.

- k. **Site Shelter and Tower Replacement** – This line item provides for the replacement of a communications equipment shelter and tower at the Verdugo Peak antenna site. After 25 years of service, the Metro owned communications equipment shelter at Verdugo Peak is in a state of advanced decay. At the same time, the agency has outgrown this facility making it more cost effective to remove and replace the equipment shelter with a more modern unit. In addition, the antenna tower at the Verdugo Peak antenna site is overloaded and can no longer serve the increasing radio/microwave infrastructure requirements of Metro.
  
- l. **Engineering Services** - This line item provides engineering assistance in the areas of scope of work preparation, equipment specification, requirements, audits, engineering analysis, acceptance testing, documentation, and contract close out activities. These engineering services are also required to provide specialized services in specific technical areas that are not readily available within Metro.
  
- m. **Wireless Access Point Upgrade** - The current Wireless Access Network (WAN) at each division is relatively slow. This technology was the best at the time, but current technology provides up/download speed improvements by more than 10 times. The WAN is used to download AVA voice images and APC data, and upload daily schedule data so that the fleet has timely and accurate information every day. The semiannual shakeup download process could be reduced from 2 weeks to 1 day if the WAN were upgraded. M3, Transit-SAFE and ATMS could all share in these improvements and similarly help make those systems be more efficient.

