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MWD

METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

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EXECUTIVE SECRETARY

March 14, 1996

To: Board of Directors (Engineering and Operations Committee — Information)
(Finance & Insurance Committee — Information)
(Information Systems Ad Hoc Committee—Information)

From: General Manager
Submitted by: Lambertus Becker
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Subject: Assessment of Savings and Benefits Achieved since the Phase One Oracle and PeopleSoft Implementation

RECOMMENDATION(S)

For information only

EXECUTIVE SUMMARY

On November 9, 1993, your Board authorized an increase in Capital Appropriation 634 to commence Phase One of the Information Systems Strategic Plan to implement 19 key business applications. Between April and October of 1995, a major portion of these applications were implemented and a number of related projects were completed. In order to quickly determine the return on investment provided by these activities, a benefits assessment focusing on the newly implemented Oracle and PeopleSoft systems was conducted. This Board Letter documents the value and benefits obtained in the first seven months after implementation.

This benefits assessment is the first in a series of assessments that will be conducted and reported periodically to your board. The report contains both benefits and impacts assessed through a direct observation of system functioning and interviews with Metropolitan personnel familiar with the new systems.

The following projects were evaluated:

- I. A new client-server infrastructure was implemented. (Phase One)
- II. Several old computer applications were replaced by new ones: (Phase One)
 - A. Materials Management (Purchasing, Inventory Control and Accounts Payable)*
 - B. Financials (General Ledger, Accounts Receivable, Revenue Accounting, Fixed Assets)*
 - C. HR/Payroll (Human Resources Management and Payroll) *
- III. A new chart of accounts was implemented. (Phase One)

* These applications were adapted from packaged software developed by Oracle Corporation and PeopleSoft. The old applications had been custom-built by Metropolitan programmers or were not automated.

IV. The Materials Management process was reengineered, resulting in a decentralization of warehouse and data-entry responsibilities and replacement of some inventory items with just-in-time vendor contracts. (non-Phase One)

V. A physical inventory of fixed assets was conducted. (non-Phase One)

The applications identified above constitute only a portion of the Phase One systems to be implemented over the course of three years.

The original Phase One board letter dated September 17, 1993 identified tangible and intangible benefits over a period of ten years expressed in labor full-time equivalent (FTE) reductions and material cost savings. Although most organizations implementing new systems do not typically begin to realize benefits for one or two years after the systems have been implemented, this benefits assessment revealed that Metropolitan is well on its way to meeting the goals projected in the Phase One board letter dated September 17, 1993.

Impacts of the new systems were assessed through (a) direct observation of system functioning, and (b) interviews with Metropolitan personnel familiar with the new systems. Since all processes were not measured or baselined prior to beginning the Phase One program, the benefits and savings attained were calculated based on estimated productivity gains and measurable cost reductions. In those areas in which implementation has occurred, the targeted savings have been achieved or exceeded.

Cost Savings

Cost savings resulting from Phase One and related changes are estimated at \$1,483,000 (net of additional costs for support and maintenance and software license fees). The following table (Table 1) summarizes the cost savings achieved as of November 1995.

<u>Summary of Cost-Savings</u>	Attained by Nov. 95	(\$000 Saved Annually)
<u>MATERIALS MANAGEMENT (Purchasing, Inventory, Payables)</u>		
Employee time spent in materials management activities.....	\$	1,278
Use of vendor payment terms and discounts.....		108
Handling cost savings on reduced inventory levels.....		300
<u>PAYROLL</u>		
Employee time spent in payroll and compensation/benefit administrative activities.....		355
<u>GENERAL ACCOUNTING</u>		
Employee time spent in accounting and reporting activities.....		213
<u>INFORMATION SYSTEM INFRASTRUCTURE</u>		
Employee time spent in support and maintenance.....		(142)
Cost of fees and outside services for support and maintenance.....		(204)
Software license fees.....		(425)
Total	\$	1,483

Table 1. Summary of Cost Savings (Business Benefits)

Concurrent with the implementation of the new systems, 167 people elected early retirement; and currently Metropolitan has a total of approximately 200 vacant positions. Although not all of the vacancies are associated with administrative functions, the new Phase One

systems combined with the reengineering efforts have allowed us to continue to provide the same level of service as before.

Operational Improvements

- **Timeliness of information.** Users can access up-to-the-minute information regarding costs, requisition status, fixed asset locations, etc. In addition, period closes are now completed in 7 to 10 working days (versus 20 working days prior to April 1995). Before the new systems were implemented, cost-to-budget reports contained six-week-old data and fixed asset registers were updated only once a month. Up-to-date information provides an environment where much more control can be gained over business processes and remedial action can occur sooner.
- **Wide access to information.** Information now resides in a single, integrated database that can be accessed by trained users throughout the organization. Divisions can share data and analysis tools, so that a common institutional intelligence can be fostered and redundant data entry is eliminated.
- **Accuracy of data.** Part of the Phase One effort included a clean-up of data. Although all of the clean-up effort is not yet completed, many inaccuracies in vendor files, employee databases and fixed asset registers have already been corrected.
- **Converting raw data into focused information.** The new Phase One environment includes new tools for application development and data analysis. The new system is much more flexible in its ability to focus information on the emerging needs of managers and key decision makers. For example, a new cost-to-budget reporting tool provides automatic links between PC spreadsheets and the Oracle database. Spreadsheet data is up-to-date and cost report formats can be controlled by the user.
- **Accountability.** Transactions are controlled through system-enforced rules for account coding, invoice matching, etc. This enables the decentralization of data entry, so that key information is captured closer to the point where the transaction originates (i.e., where equipment, materials and services are actually received and used). Employees now have accountability for transactions related to their portion of the business.
- **Future cost savings.** Vendors are continually updating their products and releasing new versions that provide greater efficiency and enhanced value. Upgrading to the new software and hardware releases will become part of the normal business practice at Metropolitan. Along with the upgrades, Metropolitan staff is proactively reviewing their business processes to identify opportunities for improvement and realize productivity gains.

More explanations of benefits are given in the Detailed Report section of this letter.

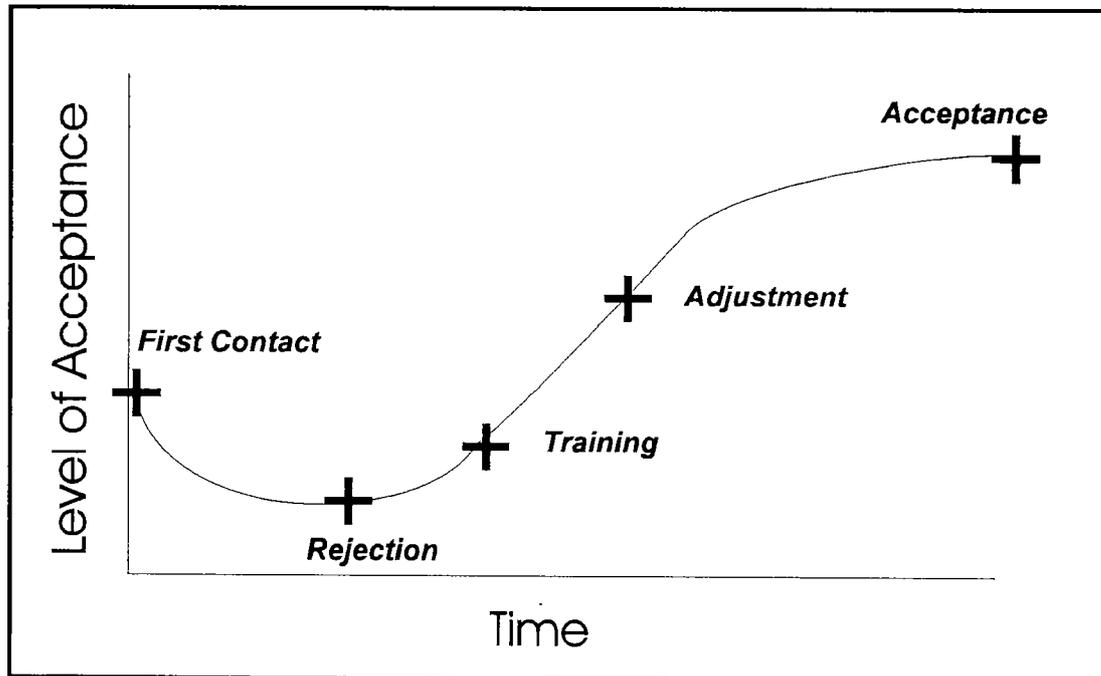
Overall Challenges

As with any major change, the implementation of the new system initially presented a challenge for users. The users now conduct their business using a new set of tools and following a different set of procedures. Initially, users found the new level of transaction control unfamiliar. However, with additional on-the-job training, documentation, improved telephone support and their own practice, the users' confidence has continued to grow and their comfort level has

increased. Most users can now readily perform their functions and continue to make daily productivity gains in their business.

The following diagram (Diagram 1) shows the stages of transition through change, compared to the Metropolitan's Phase One stages of change.

A Period of Adjustment



MWD's Phase One Stages

- Step 1. First Contact
- Step 2. Rejection
- Step 3. Training (to overcome resistance and assist in adjustment)
- Step 4. Adjustment Period
- Step 5. Acceptance of the new system(s) and new business processes

Classic Stages of "Transition Through Change"

- Stage 1. Denial ("It won't really happen")
- Stage 2. Resistance ("It's too hard")
- Stage 3. Exploration ("Maybe I'll learn about it")
- Stage 4. Commitment ("Gosh, this is great!")
- Stage 5. The "new" becomes the "standard"

Source: *Managing Organizational Change*, Cynthia Scott, Ph.D., Dennis Jaffe, Ph.D., Crisp Publications, Inc. Menlo Park, CA 1989

Diagram 1. Period of Adjustment

DETAILED REPORT

Metropolitan began the process of updating and enhancing its information systems environment through the implementation of new software and hardware under the Phase One project of the Information Systems Strategic Plan (Phase One). The goal of the initial implementation of Phase One was to replace the core business applications at Metropolitan utilizing a new technical environment. This consisted of implementing:

- Oracle Financials, including the General Ledger, Accounts Receivable, Revenue Accounting and Fixed Assets modules
- Oracle Materials Management, including the Purchasing, Inventory Control and Accounts Payable modules
- PeopleSoft Human Resource Management and Payroll modules
- Pyramid hardware utilizing the Oracle database.

The initial Phase One system implementation occurred over a two year period (November 1993 through November 1995). Through November 1995, approximately \$17.7 million of the original \$23 million appropriation had been spent. Costs identified include all activities necessary to fully install and implement the hardware and software selected to meet the requirements of core business applications. In addition, our current projections indicate that the Phase One Program will complete all of the implementation projects under the overall appropriation amount.

While the intent was for the fully implemented systems to yield total benefits over ten years of about \$54 million as identified in the original letter to your Board in September 1993, the intangible benefit of serving as a catalyst for widespread organizational change was expected and has proven to be extensive. In the areas where we have implemented, we have actually achieved or exceeded that targeted savings. (As of the date of this assessment, the Health, Safety and Environmental systems, Benefits Administration, Advanced H/R functionality and Electronic Time-keeping are still in the process of being implemented).

Described below are the key changes and benefits by application area affected during the Phase One project.

Materials Management - Description of What Has Changed

- **New Oracle application software.** Prior to Phase One, Metropolitan procurement and accounts payable processes were conducted using a custom-built on-line application on the IBM mainframe. In April 1995 Metropolitan implemented the Oracle Purchasing, Payables, and Inventory software to replace the old system. Over 500 users were given training in the new system, although only half of them have become frequent users.
- **Electronic rather than paper-based work flow.** Prior to Phase One, requisitions were entered and electronically approved and sent to buyers for creation of purchase orders. Purchase orders were printed and distributed as paper documents to various parties. Information about items received from vendors was entered on paper receivers. Purchase orders, receivers, and vendor invoices were manually matched in Accounts Payable, where account code distributions were entered. Payment checks were then electronically processed, however, cash fund balancing was a manual process. Inventory was controlled using a

separate mainframe application. The new software provides electronic interfaces to replace paper-handling under the old process, such as between inventory control and purchasing.

- **Clean-up of vendor file.** Vendor lists and open transaction data were converted from the old files into the new database. Clean-up of redundant data is continuing.
- **Decentralization of stores.** The materials-management business process was reengineered, which resulted in each site having its own responsibility for local inventory management in place of the previous central stores approach.
- **Reduction of stores items.** Very low-value items were eliminated from inventory as part of the business-process reengineering. In addition, Metropolitan placed a greater reliance on just-in-time vendor delivery arrangements for many supplies.
- **Just-in-time purchasing.** Prior to Phase One, only two just-in-time arrangements were in effect — for office supplies and computer software. Currently, seventeen just-in-time contracts are in place; eight more are scheduled for implementation during 1996.
- **Decrease in requisitions and increase in blanket-order releases.** The new emphasis on just-in-time arrangements resulted in a decrease in requisitions, replaced by an increase in releases against blanket purchase orders.

Materials Management - Key Benefits

- Total staff reductions from the implementation of the materials management software — 18:
 - Purchasing staff has been reduced by two full-time equivalents.
 - Central Stores personnel has been reduced by fifteen full-time equivalents (excluding two truck drivers and a storekeeper transferred to Operations), with no increase in other warehouses.
 - Accounts Payable staff has been reduced by six full-time equivalents.
 - Requisitioner clerical staff have more responsibilities in the new system and an additional five full-time equivalents are spread across various jobs.
- The net current reduction of eighteen full-time equivalents is a savings of \$1,278,000 per year.
- Cash management has been improved by scheduling delayed payment without delaying invoice processing. This represents increased investment earnings of \$36,000 per year since the District can keep funds invested longer because bills are paid when they are due and not sooner.
- Automatic calculation of vendor discounts has resulted in savings of approximately \$72,000 per year. Up to \$132,000 per year in benefits is possible from vendor discounts.
- Stores operating stock inventory has been gradually reduced by \$1.5 million during the 1993 through 1995 time frame, partially in anticipation of the Phase One systems. From this, annual savings for handling costs are estimated at \$300,000.

Fixed Assets Management - Description of What Has Changed

- **New Oracle application software (with additional enhancements).** Prior to Phase One, assets were tracked using a custom-built application on the IBM mainframe. Each asset was

manually entered into that system from accounts payable paper invoices. In April 1995, Metropolitan implemented the Oracle Assets software package. New assets are added through an electronic interface with accounts payable data. Retirements are entered into the new system and automatically create journal entries into the general ledger. Asset transfers are entered on-line by each asset custodian, with the new custodian entering a confirmation of the transfer.

- **Continuous rather than monthly update of asset owners and locations.** Prior to Phase One, monthly asset lists were printed from the computer system and distributed to managers for update of asset transfers and retirements. It was generally conceded that Metropolitan assets were not well-controlled under that process. There was significant lag time between actual inventory changes and the information contained in the old system. The new control process includes plans for random verifications of fixed assets.
- **New physical inventory.** The new fixed asset database was developed from a conversion of the old asset data combined with a physical inventory of operating equipment and fixed assets taken in December 1994. Metropolitan has recorded over 17,000 assets in the new database.

Fixed Assets Management - Key Benefits

- The new software calculates asset accounting entries automatically, eliminating the need for most manual entries for asset retirement and depreciation.
- Individuals and asset custodians now have direct access to the fixed asset system, and are able to view assets assigned to them, transfer assets and accept transfers on-line.
- There is much more control over fixed assets due to clear management visibility as to the status of each asset or groups of assets by type, location, etc. Because of the on-line updates, information is current throughout the year.
- On-line tracking and reports regarding emergency equipment provides better preparedness for emergency response. The asset database is updated on-line to reflect the current location of emergency equipment.

Payroll - Description of What Has Changed

- **New PeopleSoft application software (with additional enhancements).** Prior to Phase One, Metropolitan payroll was conducted using custom-built applications on the IBM mainframe. The old system was inflexible and required significant manual work. For example, the old system was limited in its ability to process changes in the District's labor contracts or changes to benefit programs. As of September 1995, PeopleSoft Payroll replaced the old payroll system.

Payroll - Key Benefits

- The Human Resources Division staff has decreased by four full-time equivalents (three in the Compensation and Benefits area and one in the HR Systems area) for a savings of \$284,000 per year. In addition, the Payroll section has reduced their staff by one person.
- Payroll can now be generated in 4 days, rather than 5 days under the old system.

- Prior to Phase One, two separate processes were used to enter new-hire information into the human resources and payroll data files. Now this has been consolidated into one process, resulting in a speedier and more reliable hiring process. This is especially important for last-minute acceptances of employment offers, changes in start date, etc.

General Accounting - Description of What Has Changed

- **New Oracle application software (with additional customization).** Prior to Phase One, Metropolitan accounting was conducted using custom-built applications fragmented between the IBM mainframe and various PC's. The system was inflexible and required significant manual work involving cut-and-paste activities. As of April 1995, Oracle Government Financials replaced the old accounting system.
- **New Chart of Accounts.** A new chart of accounts was implemented, which tracks costs in much more detail.
- **Data Entered At Source.** Account distribution codes are entered at requisition time rather than at invoice payment. Responsibility for entering account distribution data has been moved closer to the point where expenditures are initiated.

General Accounting - Key Benefits

- The general and cost accounting staff has decreased by three full-time equivalents for a savings of \$213,000 per year.
- Reducing manual steps for cost transactions, the general and cost accounting process has been significantly streamlined, despite the increased amount of information being processed in the new chart of accounts. With periodic upgrades to the Oracle applications, continual refinements in the underlying accounting process and further skill improvement among Finance personnel, it is estimated that the Finance Division general/cost accounting function may eventually be handled with three less full-time equivalents than with the old system.
- Redundant data on PC-based "shadow systems" are no longer necessary because current accounting data is widely accessible through on-line query functions and faster budget-to-cost reporting. The time savings on the part of budget analysts and others in various divisions has not yet been quantified.
- Prior to Phase One, accounting codes were entered during invoice processing rather than by requisitioners. Previously, many adjustments were necessary in closing each period. Now, accounting codes are entered by the requisitioning division, with on-line validation. The system prevents inappropriate code combinations from being entered. Accounting periods can now be closed in seven to eight working days.
- The Finance Division has changed the way costs are budgeted at Metropolitan. The new method of budgeting incorporates the new Chart of Accounts segments; these new segments (Activity and Location) add value to the quality and type of management information tracked. These segments add more useful information to the traditional Fund / Appropriation / Organization / Account expense distributions.
- Business unit managers now get more timely feedback on spending versus budget. Electronic spreadsheets have been implemented; these new reports summarize all journal entries to each

manager's business unit as of "yesterday," and can be "drilled down" to show the transaction detail included in the summary data.

- All divisions now track financial transactions according to a common framework (i.e., the new chart of accounts), indicating the location, activity, project, appropriation and organization associated with each transaction. This information was not comprehensively captured in the old system. Accounting data can now be summarized in a more meaningful way on a Metropolitan-wide basis.
- Common spreadsheet tools are now used to select accounting data needed, analyze it, present summary information in any format required and drill down to detailed transactions on demand. Prior to Phase One, a programmer was needed to meet each new requirement for customized information. As more applications reside on the Pyramid hardware, more information will be accessible to people who need it.

Information System Infrastructure - Description of What Has Changed

- **New UNIX computers (to eventually replace the IBM mainframe).** Prior to Phase One, Metropolitan's core business systems resided on an IBM mainframe computer running VSAM and ADABAS database management systems. As part of the Phase One program, Metropolitan installed a set of Pyramid UNIX computers to operate as application servers in a client-server environment. Metropolitan now supports both the IBM and Pyramid environments. This is a temporary arrangement until all applications can be migrated from the IBM mainframe (by the end of calendar year 1997). The applications still residing on the IBM mainframe, include: electronic time-keeping (ETS), project management (PMIS), and E-mail (PROFS).
- **New Oracle database management system.** Oracle database management software was installed on the Pyramid servers.
- **Extension of Banyan network.** Prior to Phase One, Metropolitan had a Banyan network connecting to most — but not all — key sites. As part of Phase One, Metropolitan installed PC/TCP software to link workstations with application servers through the Banyan network.
- **New tools for application developers and end-users.** Oracle Designer/2000 and Developer/2000 CASE tools are available for use in developing new applications that will reside in the new Oracle database.

Information System Infrastructure - Key Benefits

- New releases of the Oracle application software will provide additional functionality and ensure conformance with new regulations and industry standards as they become effective.
- The Oracle CASE (Computer-Assisted Systems Engineering) tools enable developers to rapidly design new applications that can be easily integrated into the rest of the Oracle database. These tools are being used by the Engineering Division to develop a replacement for the PMIS (Project Management Information System) now on the IBM mainframe.
- End-user tools are significantly better in the new client-server environment. The information in the Oracle database is easily accessible through data maps and templates developed by the Phase One Program Office. Using Microsoft Excel, analysts are building spreadsheets that automatically retrieve Oracle data.

- All of the Oracle application software is more reliable and more easily maintained than the old custom-built programs, resulting in decreased risk that software problems would disrupt Metropolitan's ability to procure outside goods and services and control payments.

Future Outlook

Metropolitan will continue to fine-tune business policies, roles and procedures to take full advantage of the new products. These refinements will result in additional benefits. Some of the specific opportunities are:

- improving the invoice processing as employees become more proficient in using the system;
- shortening the processing of approved requisitions;
- re-engineering the business processes related to approvals of out-of-budget requisitions, power-of-attorney assignments, releases against blanket orders from bids, creation of blanket orders, releases against blanket orders, handling of vendor trade-ins or take-backs and revising in-process requisitions;
- continually updating the fixed asset records to bring the database into alignment with the actual inventory; and
- implementing Electronic Data Interchange (EDI) which is fast becoming an industry standard among vendors as a way to transmit orders and invoices electronically between Metropolitan and vendor computers. Metropolitan is now well-positioned to take advantage of this technology.

The benefits achieved by the new systems far out-weigh the challenges we have encountered in undertaking such a major project. Implementation of the new version of Oracle software, the continual enhancement of the current business practices and the increasing skill level of Metropolitan staff will work together to provide even further cost savings in the future.