

5

WATER AND WASTEWATER OPTIMIZE WORKS PROGRAM CONTRACT AWARD FOR COMPUTERIZED WORK MANAGEMENT SYSTEM (CWMS)

The Transportation and Works Committee recommends the adoption of the recommendation contained in the following report, April 26, 2004, from the Commissioner of Transportation and Works:

1. RECOMMENDATION

It is recommended that:

1. Regional Council authorize the contract award for the provision of a computerized work management system for the Water and Wastewater Branch and associated services to MRO Software Inc. with an upset limit of \$788,000 (excluding GST).

2. PURPOSE

This report provides Transportation and Works Committee and Regional Council with the details of the process followed to select the work management software package for the Water and Wastewater Branch. A work management system allows municipal staff to efficiently manage all work activities associated with the operations and maintenance of its assets and infrastructure. This report recommends the award of the contract to provide the software and implementation and training services to MRO Software Inc.

3. BACKGROUND

Driven by challenges facing the Water and Wastewater Branch – increased regulatory environment, hiring and retaining staff, growth pressure, improved asset management, and performance measures – staff embarked on an assessment of the overall branch effectiveness and efficiency. The Operations and Maintenance Service Assessment (OMSA) carried out in 2002 concluded that significant gains could be made in three strategic areas: Technology, Program Driven Work, and Asset Management.

The OMSA results guided the Water and Wastewater Branch to conduct a review of all branch business units. In the fall of 2002, the Region issued an RFP for planning and implementation services for the Best Practices redesign (OPTimize Works Phase 1).

The project consisted of the following elements:

- Project Management and Integration.
- Work Process Redesign.
- Development of an Information Systems Master Plan (ISMP).

- Selection and Implementation of a Computerized Work Management System (CWMS).
- Implementation Plan for Phase 2.

The OMSA project identified the CWMS as a vital element in implementing work process improvements. As a result, this technology solution was included in the OPTimize Works Phase 1 project requirements. Council authorized the OPTimize Works Phase 1 project through the adoption of Clause No. 5 of Report No. 1 of the Transportation and Works Committee on January 23, 2003.

The subject of this report is the selection and award of a Computerized Work Management System (CWMS). The conclusions and recommendations from OPTimize Works Phase 1 are presented in a separate Transportation and Works Committee Report prepared for the May 5, 2004 agenda (*Water and Wastewater OPTimize Works Program Phase 1 Update and Final Report*).

3.1 Computerized Work Management System

A CWMS typically represents the central point of contact for operational and maintenance activities. CWMS's are used widely in both public and private sector organizations. They are a powerful tool used to improve operational efficiency, streamline workflow and communication, enhance work scheduling, manage assets, and build an historical basis for asset and infrastructure costs.

The primary benefits of implementing the CWMS are:

- Effective data management through a central data warehouse.
- Effective work flow management through central planning.
- Effective data analysis and reporting for improved decision making.
- Budgeting and forecasting functionality based on roll up of discrete assets.
- Performance management and measurement reporting.

A CWMS allows organizations to manage activities from the initial work request, through assignment of personnel and materials, through confirmation of task completion, to close-out of the work order. CWMS's also provide the opportunity for collecting data for future decision making on the asset base of the organization.

Once a user has initiated a work request through the CWMS, it is routed to the planner or scheduler (typically a supervisor). The scheduler can then determine whether the work request is valid and proceed to plan the activities associated with completing the work or the work request can be declined with appropriate reasoning provided. Valid work requests will be assigned the appropriate personnel, equipment, materials, and parts to complete the work activities. If materials need to be ordered, the work order will be deferred until all necessary resources are available. Work orders can be routed to ensure the required financial and management authorizations are obtained prior to issuing to staff. During the planning stage, the scheduler can consolidate the work request with other work requests for the same facility or the new work could be added to a work order

already in progress. Additional information on CWMS features are outlined in the following sections.

3.1.1 Asset and Resource Management

Computerized work management systems can be used to manage physical assets (buildings, facilities, piping, equipment, vehicles, etc.), labour resources (employees, suppliers, contractors, etc.) and documentation (specifications, drawings, procedures, MSDS sheets, etc). The CWMS allows the user to search for data on the asset such as reliability history, age of equipment, or to track employee qualifications and training hours among other features.

3.1.2 Work and Maintenance Management

The CWMS focuses on planned maintenance activities to reduce reactive and corrective maintenance practices. Automation using work management modules allows the user to plan and schedule work and resources, and closeout the task upon completion. Safety, compliance, employee timekeeping and project tracking are also managed in the 'Work' and 'Maintenance' modules of most CWMS's.

3.1.3 Inventory Control and Materials Management

CWMS's allow workers to ensure essential materials are available when the job needs to be done. They include the ability to see the disposition of parts or materials (i.e. whether the part is already reserved by another worker, the location of where the part is stored) and automatic reordering of parts. These features reduce delays and equipment or facility downtime.

3.1.4 Analysis and Reporting

A CWMS simplifies the use of data and the method for reporting data throughout the branch. Users are able to view data and reports either online, in real-time, or as exported documents to standard business tools (spreadsheets, word processing, Hyper Text Markup Language (HTML) products, etc). Data can be filtered to allow the user to drill down to the information needed for a specific task with minimal effort by the user. Information can be made available to staff at all levels on a "dashboard" – to give a summary of trends and key performance indicators that the user wishes to monitor.

3.1.5 Other Features

CWMS's also include interfaces with financial systems including purchasing/procurement and accounting functions. Additionally, a CWMS can have interfaces with Geographical Information Systems (GIS), mobile computing devices (laptops, handheld personal data assistants (PDAs), barcode systems, etc.), and graphical viewers.

4. ANALYSIS AND OPTIONS

The CWMS procurement process followed the requirements of the Region's Purchasing By-law. Supplies and Services Branch staff was helpful in guiding the OPTimize Works project team throughout this complex procurement process. The CWMS selection team determined it was appropriate to pre-qualify vendors for this project. A Request for Qualifications (RFQ) was issued in May 2003. The notice was advertised in *the Globe and Mail*, on bid navigator through the Electronic Tender Network, and distributed to known vendors of CWMS software products.

The RFQ closed on May 23, 2003 and nine responses were received. Submissions were received from the following vendors:

- ESRI Canada Limited.
- Hansen Information Technologies.
- Harfan Technologies/Dillon Consulting Limited.
- IFS Industrial & Financial Systems Canada Inc.
- Indus International Inc.
- Ivara Corporation.
- MRO Software, Inc.
- Synergen, Inc.
- WorkTech Incorporated.

Vendors were required to respond to a table of requirements categorized as mandatory or discretionary requirements. Two submissions were eliminated from further consideration due to non-compliance with the mandatory requirements. The remaining submissions were evaluated and scored based on their responses to the requested requirements. The CWMS selection team carried the three top-scoring vendors to the Request for Proposal (RFP) stage. On July 2, 2003, the Region issued the RFP to the following vendors:

- Hansen Information Technologies.
- MRO Software, Inc.
- Synergen, Inc.

The Region received proposals from all three short-listed vendors on the proposal closing date. The RFP followed the typical two-envelope format with the technical proposals being evaluated out of 80 points and the financial proposals accounting for the remaining 20 points. The RFP required the vendors to respond to a comprehensive set of functional requirements in a series of tables, conduct product demonstrations, and provide locations for possible site visits to facilities that use the vendors' products.

Technical scoring included: Submission and Qualifications (25), and project Deliverables (55). Submission and qualifications points were given for the vendors' qualifications, experience (both of the firm and the individual resources proposed to complete the assignment), list of references (15), project understanding and approach (5),

and proposed schedule (5). For the deliverables section, points were given for the responses to the functional requirements outlined in the RFP submission tables 1 to 10 (20), technical and integration requirements described in the RFP submission tables 11 and 12 (20), implementation services (7.5), and training services (7.5 points).

Table 1
Evaluation Summary

Criteria (Weighting)	MRO Software, Inc.	Synergen, Inc.	Hansen Information Technologies
Submission and Qualifications (25)	20.3	20.2	19.0
Deliverables (55) ¹	45.6	40.3	32.5
Total (80)	65.9	60.5	51.5

1. Deliverables include the functional and technical requirements in addition to the proposed implementation and training services.

The CWMS technical evaluation, product demonstrations, and subsequent site visits resulted in the highest score being for the MAXIMO product provided by MRO Software Inc.

The financial proposals were opened and yielded the following prices:

- MRO Software Inc. - \$1.146M
- Synergen, Inc. - \$1.461M
- Hansen Information Technologies - \$2.049M

The preliminary review of the financial proposals identified potential irregularities in each of the three fee proposals due to qualifying statements. A staff Bid Review Committee (BRC) including representatives from the Supplies and Services Branch, the Corporate and Legal Services Department, and members of the OPTimize Works project team concluded that all three proposals contained pricing irregularities and were declared non-compliant.

On the basis of three non-compliant submissions, the RFP process was terminated. Section 6 of the Purchasing By-law was invoked to proceed with negotiations which in part states:

“6.1 (c) Where all bids received fail to meet the specifications and / or tender terms and conditions and it is impractical to recall tenders or quotations due to time or other restrictions”

Using the highest overall technical score, the CWMS selection team decided to start negotiations with MRO Software, Inc.

4.1 Negotiation Process

The negotiation process was completed as a continuation of the selection process in accordance with the Purchasing By-law. Staff from Supplies and Services and the Legal Department assisted Water and Wastewater Branch staff in proceeding through vendor negotiations and were representatives of the negotiation team. The Negotiation Team met to confirm the scope of services that were to be included in the negotiations with MRO. The Region issued a letter to MRO requesting licensing and services clarifications and a confirmation on their proposed pricing. Following receipt of MRO's response on January 30, 2004, the Region invited MRO representatives to a negotiation session on February 10th and 11th, 2004.

The negotiation session outcomes included a defined list of services to be provided by MRO, a clear understanding of the license types available in the MAXIMO product, and a starting point for discussing the payment terms and other conditions in the contracts.

To assist the Region with the software negotiations, the Region engaged a legal consultant familiar with software contracts. The external legal consultant was hired to review the background material on the file (RFP, vendor proposal, correspondence between the parties, draft licence and services agreements), attend meetings, draft and finalize the appropriate license, services and ongoing support and maintenance agreements related to the procurement of the software.

4.2 Technical Strengths of MAXIMO

The strengths of the MAXIMO product in the following areas were factors in the selection:

- Ease of use (user friendliness).
- Conformance with functional requirements.
- Workflow.
- System Administration.
- Integration.

The primary users of the CWMS will be the field maintenance staff. Therefore, the selected product needed to meet the functional requirements and also provide an intuitive interface for the end users. MAXIMO presents a simplified home page with logical groupings for the key modules (i.e. Work Requests, Work Orders, Purchase Requisitions, Resources Planning, etc.). Staff can easily navigate through the product to complete work management and maintenance tasks.

A key feature of the MAXIMO product is Workflow. This feature allows system administrators to easily and quickly amend definitions, business processes, and authorization paths. Additionally, Workflow enables routing information to the appropriate people at the appropriate time. Staff involved in the software configuration and set up will gain knowledge of Workflow functionality. Ultimately, this means that the Region will be able to make changes in the work processes as they evolve over time without securing additional consulting or professional technology services.

System administration in MAXIMO is managed using the control centre module. This module allows the system administrator to configure access permissions, write scripts, create templates, and access the Workflow feature.

4.3 Licensing Options

MRO Software Inc. offers access to the MAXIMO product through three types of registered users: primary users, secondary users, and work requestors. Each type of registered user is licensed for a defined set of access and capabilities that allows interaction with the various modules of MAXIMO. Based on the Water and Wastewater Branch needs, it is proposed that the Region purchase primary and secondary mobile user licenses.

4.3.1 Primary Users

A primary user is a registered user with full access to all MAXIMO modules: work orders, preventative maintenance, inventory, equipment, purchasing, plans, resources, and reports. A primary user can create, edit, and view records in all MAXIMO applications and have full access to all MAXIMO reporting capabilities. Full access to the MAXIMO product is required for approximately half of the proposed user community.

4.3.2 Secondary Users

A secondary user is an infrequent registered user where MAXIMO is not instrumental to the user's job function. Access to MAXIMO can be either directly through the MAXIMO applications and/or database, or supported indirectly through other licensed applications, portals, or mobile devices.

Secondary users are restricted to specific modules of the base MAXIMO product. The modules available to secondary users include: work orders, equipment, and reports. Secondary users are able to run existing reports and queries but cannot create new ones.

Mobile users are secondary users with access to the same modules (work orders, equipment, and reports) in addition to the mobile suite of applications. Mobile users access MAXIMO using mobile devices only (i.e. laptops, PDA's, tablets). In keeping with the overall direction of the branch to move towards a self-sustaining, flexible work environment, leverage the mobile technology available today, and promote information and technology usage throughout the branch, the mobile user classification is an ideal option. The branch has negotiated to purchase mobile licenses for approximately half of the user community.

Work requestors are a subcategory of secondary users and do not fulfill the needs of the branch at this time. Therefore, work requestor licenses are not being purchased.

4.4 Proposed Implementation Services

The CWMS assignment includes both the acquisition of the licensed software and the provision of select services to be carried out by MRO. These services are:

- Familiarization Workshop.
- Project Management and Administration.
- Product Training.
- Fit/Gap Workshop.
- Establish the Prototype Build and Test Environment.
- Prototype System Development and Testing.
- Production System Implementation and Start-up.
- Post “Go-Live” Support.

The work to be covered by these services is described briefly in the following sections.

4.4.1 Familiarization Workshop

The familiarization workshop is intended to orient the MRO team on the outcomes of the larger best practices initiative underway (OPTimize Works). The workshop will enable the teams to confirm the project scope, responsibilities, and schedule and to ensure the functional IT system requirements are in place to accommodate the software implementation. MRO provide an overview of how the CWMS will be configured to meet the Water and Wastewater Branch business requirements. This will be the opportunity for gaining a shared understanding of the business process documentation methodology.

4.4.2 Project Management and Administration

The majority of the project management and administration activities will be managed by the Region. The services in this statement of work (SOW) include developing and documenting the detailed project plan, reviewing and agreeing on standard operating procedures, tools and templates to be used for documentation and record keeping on the project, and assistance with installing the immersion training software at the Region’s project room.

4.4.3 Product Training

Prior to configuring the software to the Region’s business needs, the Region’s implementation team requires training on the software. The implementation team includes the Water and Wastewater Branch project lead and systems administrator, a corporate IT staff member to assist with database, network and hardware issues, and subject matter experts from the Water and Wastewater Branch as needed to cover operations, maintenance, and business practice issues. Immersion training – providing a complete overview of the modules available in the MAXIMO product – is required for the extended implementation team. Control Centre and Actuate Report Writer training is required for the implementation team members that will be responsible for system administration, programming and report creation in the future.

4.4.4 Fit/Gap Workshop

The documented work flow from the OPTimize Works Phase 1 project will be the basis for demonstrating the functionality of the 'out-of-the-box' MAXIMO product. MRO will conduct the demonstration and document any needs for tailoring the product during configuration. The outcomes of this workshop will be the functional specification document outlining all modules of MAXIMO slated for implementation in addition to the functional specification for any report modifications and additions.

4.4.5 Establish the Prototype Build and Test Environment

Activities in this statement of work include working with Regional staff to ensure the project room is adequately set up for the software configuration and subsequent conference room pilot. Regional and MRO staff will resolve questions and clarifications around the system environment, validate the infrastructure, install the licensed software, and complete the acceptance testing and sign-off.

4.4.6 Prototype System Development and Testing

This statement of work involves the greatest effort by both MRO and Regional resources for the implementation. Activities will include: data migration and related scripts, data entry, modifications to standard reports, creation of new reports, work flow set up, finalizing business processes and key performance indicator documentation, conducting a 'proof of concept' for the Mobile Auditor feature, exploratory session on GIS integration, First and Second Level Prototype testing, and preparing the MAXIMO system configuration document.

4.4.7 Production System Implementation and Start-up

The conference room pilot will be an opportunity to test the configuration of the MAXIMO product in a simulated Water and Wastewater Branch scenario. This will be based on one of the operations areas and the maintenance work practices. Activities in this statement of work will include training Regional staff to deliver user training, finalizing all documentation, preparation of post "Go-Live" support plans, setting up security profiles, and acceptance testing and sign-off.

4.4.8 Post "Go-Live" and Roll out Support

Following the conference room pilot, MAXIMO will be rolled out sequentially to the remaining Water and Wastewater Branch operations areas. MRO will provide support to the Region as the CWMS is introduced to the operations areas. For the first area, support will be available by MRO to assist with modification or expansions to the tailoring and configuration of the software, provide additional training, create additional reports, and develop the roll-out plan and schedule. The intention of having active Regional participation in the software configuration and conference room pilot is to transfer knowledge of MAXIMO from MRO to Regional staff. Therefore, on subsequent roll-outs to the remaining operational areas, support will be largely provided by the Regional team with a reducing level of effort expected from MRO.

4.4.9 Services Provided by EMA Canada, Inc.

EMA Canada, Inc. continues with services under the OPTimize Works Phase 1 contract for the implementation of the CWMS. EMA's roles and responsibilities include:

- Support the Region during the CWMS implementation activities and on CWMS related decisions.
- Provide OPTimize Redesign and water and wastewater utility best practices input into implementation.
- Integrate and coordinate with other concurrent OPTimize Works project activities.
- Ensure that appropriate external team resources are identified to participate appropriately in system implementation.

4.5 Other Regional Impacts

The success of implementing the CWMS relies on dedicating key staff to this project on a full time basis. Conclusions of the OPTimize Works Phase 1 program include the addition of a technology asset team as part of the implementation (refer to the Transportation and Works Committee Report prepared for the May 5, 2004 agenda entitled *Water and Wastewater OPTimize Works Program Phase 1 Update and Final Report* for additional details on the program conclusions). Temporary full time resources have been allocated to the project for the CWMS implementation. Upon approval to implement the conclusions of OPTimize Works Phase 1 including the proposed organizational changes, the technology asset team positions could be filled on a permanent basis.

The core implementation team will include the CWMS Team Leader, the CWMS system administrator, and a temporary full time resource from Corporate IT. The Corporate IT resource will assist with database, network and hardware issues. Subject matter experts will be brought in to configure certain modules. These experts will form part of the extended implementation team and will be called upon as needed. Project scheduling is paramount in ensuring staff and consultant time is used most effectively to achieve the project goals.

Implementation activities for the initial software roll-out are expected to take approximately a year and half to complete. The software configuration and conference room pilot will occur during the first seven or eight months. Given the anticipated duration of the project, the need for an ongoing user training facility, and the future integration needs for the CWMS, the team identified the need for a project room early in the life of this project. A project room was created and it will become a corporate asset at the end of the CWMS project.

5. FINANCIAL IMPLICATIONS

Several pricing options were presented to the Region during the negotiations sessions. Staff looked at alternatives that included different pricing options and payment terms and whether or not to include the MAXIMO Mobile licenses. Pricing was also based on the breakdown of licenses needed during the configuration and conference room pilot (field trial) versus the remaining licenses for roll-out. For the pricing options and payment terms, the negotiation team reviewed:

- Regular pricing that allows the Region to purchase the licenses as they are needed with a price quote confirmed for 120 days.
- Discounted pricing based on a commitment to purchase the total number of licenses with payment terms of 30 days and 120 days for the field trial and roll-out licenses, respectively.

The original payment terms were based on the “date of shipment” which was unacceptable to the Region. The parties have subsequently agreed on payment terms based on the date of installation of the ‘out-of-the-box’ MAXIMO product subject to acceptance testing and sign-off.

The options included the purchase of MAXIMO Mobile secondary licenses or regular MAXIMO secondary licenses. Secondary licenses are independent – that is, if regular secondary licenses are purchased initially, they are not upgradeable to the Mobile licenses in the future. Separate Mobile licenses would need to be purchased under that circumstance. Given the overall direction of the branch towards technology-oriented work practices, staff opted to purchase the Mobile secondary licenses now.

The team recommended pursuing the discounted pricing option and committing to the purchase of the full number of licenses at the outset. This will result in a savings on the license fees of approximately \$54,000 and a savings on the associated support and maintenance costs of \$10,700 annually. The total savings of \$107, 500 over five years represents a 17% reduction over the regular pricing option.

5.1 Five Year Project Costs

Costs for implementing the CWMS include: the licensed software, annual software support and maintenance, vendor services, and other project related costs. Project related costs include other licences needed to use MAXIMO (Oracle), the project room, and additional staffing costs.

Table 2
Five Year Project Costs (\$1,000)

Item	Year 1	Year 2	Year 3	Year 4	Year 5	Total by Item
CWMS Project Costs						
Licensed Software ¹	266	0	0	0	0	266
Implementation Services						
Stage 1 – Requirements Definition & Implementation Preparation ²	152	0	0	0	0	152
Stage 2 – Prototype System Development & Testing	238	0	0	0	0	238
Stage 3 Production System Implementation & Start-up	85	0	0	0	0	85
Post ‘Go-Live’ Support	47	0	0	0	0	47
Total CWMS Project Costs	788	0	0	0	0	788
Annual Operational Costs						
Annual Software Support	54	54	54	54	54	270
Project Room ³	8	8	8	0	0	24
Servers ⁴	35	35	35	35	35	175
Other Software Needed ⁵	43	7	7	7	7	71
Staffing ⁶	68	0	0	0	0	68
Total Operational Costs	208	104	104	96	96	608

1. Assumes 35 Primary User licenses, 39 Mobile Secondary User licenses, 2 Mobile Auditor licenses, 5 MAXIMO Project Manager licenses, and 74 Dynamic Value List licenses.
2. Activities under this line item are described in Sections 4.4.1 to 4.4.5 inclusive.
3. Project Room costs include 7 laptop computers and 3 IP phones over the three-year project implementation.
4. Five-year lease costs for 4 multi-purpose servers at \$8,860.66 annual cost per server.
5. Oracle licensing (one-time capital cost) and annual support costs as outlined by Corporate IT.
6. Temporary full-time IT resource funded by Water and Wastewater Branch – included in 2004 Budget.

Funding for the OPTimize Works program is included in the Transportation and Works Budget and Business Plan. The overall OPTimize Works program includes the activities related to implementation (work practices, organizational changes, and supporting technology solutions) together with the CWMS purchase and implementation. Sufficient funding is available in the 2004 Budget for the acquisition of the CWMS software and implementation services as illustrated in Table 3. The services required to implement the OPTimize Works program are outlined in a separate Transportation and Works Committee Report prepared for the May 5, 2004 agenda (*Water and Wastewater OPTimize Works Program Phase 1 Update and Final Report*).

6. LOCAL MUNICIPAL IMPACT

The introduction of a CWMS will improve the Water and Wastewater Branch's ability to manage its assets and collect historical information on the overall performance of the system. This project is one component of an overall efficiency improvement program aimed at York's water and wastewater services and products. The nine local municipalities that are the direct users of the services and products provided by the Water and Wastewater Branch will similarly benefit, resulting in increased value for customers.

7. CONCLUSION

The Water and Wastewater Branch is in the midst of a Best Practices Program (referred to as OPTimize Works). A critical element of the implementation process for this program is the procurement and implementation of a Computerized Work Management System. Staff has followed the Region's procurement process to select a CWMS. Staff recommends that the contract for licensed software and associated implementation services be awarded to MRO Inc. for the upset limit of \$788,000 excluding GST.

Sufficient funding is available in the current budget.

The Senior Management Group has reviewed this report.