
Project Change Order Review

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Project Change Order Review

1. Introduction

In its 2005 Annual Work Plan, the Office of the City Auditor (OCA) scheduled a review of project change orders for construction projects. Previous change order reviews focused on changes to contracts, this review was extended to include all aspects of changes to projects from conceptualization through to project closure.

2. Background

The project management process in the City is guided by Administrative Directive A1424A, Project Management for Projects. Under this directive General Managers are responsible for developing a project management framework and procedures to set out basic expectations/standards. Project managers are responsible for developing project management manuals in concert with project plans. Each project manager is also fully responsible and accountable for assigned projects.

Project change orders are a product of the project management process and are either a result of planned and managed changes in project scope or a response to changes over which there is little or no control.

The project management process is impacted or impacts services delivered by the Finance Branch, Corporate Services Department. These include:

- The capital budget process which is managed by the Financial Planning and Budget section;
- The procurement process which is guided by Administrative Directive A1439, Purchasing Goods, Service and Construction and managed by Materials Management;
- The financial results reporting process which is managed by Corporate Accounting and Reporting; and
- General accounting services, which are managed by Finance Business Partners.

Through the City Administration Bylaw 12005, City Council delegated authority to the City Manager to monitor and control expenditures and enter into agreements and contracts on behalf of the City within specified limits. Authority has been further delegated within the limits specified for the City Manager to General Managers, Branch Managers and other employees through the Delegation of Authority Process.

Generally, the project management process is applied to all capital projects. The projects approved in the 2006-2010 Capital Priorities Plan and Budget have a total

value of \$3.1 billion with approximately \$600 million approved for expenditure in 2006. Based on historical information it is estimated that more than half of the budget is spent on contracts.

3. Objectives

The objectives for this review were to identify the underlying reasons for the changes to contracts issued for capital construction projects, verify compliance with delegated authority and other relevant governance documents, and determine where opportunities for improvement to the City's processes exist.

Three key risks associated with project change orders that were considered during this review are:

1. Escalating costs – Costs may exceed the original approved budget to a degree where, had the total cost been known prior to approval; the project may not have been undertaken.
2. Reputation – Public interest in projects increases when costs exceed the original budget. This can negatively impact the reputation of the City.
3. Unauthorized Change Orders – Use of an inappropriate purchasing/payment process may result in expenditures that exceed authorized contract amounts.

4. Scope and Methodology

The scope of the review included capital construction projects that were completed in 2003 and 2004. Projects were selected from budget files maintained by the Financial Planning and Budget section, Corporate Services.

For 2003, 127 projects with a total budget of \$183 million were classified as complete and for 2004, 130 projects with total budget of \$297 million were classified as complete. Based on the project descriptions, 151 of these completed projects were classified as construction projects. Twenty-one of these construction projects were selected on a judgemental basis for review. In addition, the OCA selected four construction projects currently in progress to obtain preliminary information on current processes. The selected sample covered projects managed by:

- The Land & Buildings, Drainage Services, Waste Management, and Parkland Services Branches in Asset Management & Public Works; and
- Roadways and Edmonton Transit in Transportation.

The first step of the review focused on the extent of change to the original approved budget and assessed the reason for the change(s) to the budget. The budget for the selected sample was traced from its original approval through to its removal from the budget upon completion. For the four ongoing projects the budget was traced to the 2005 approved budget. Staff members in the branches were interviewed to discuss the nature of the projects and any issues encountered during construction. This step also

included a review of actual expenditures for the 21 completed projects to determine the extent of variances between the budget and actual expenditures and the reason provided for any significant variances.

The next step was to conduct a more in-depth review of the project change management practices, and assess the reasons for changes to contracts, as well as compliance with delegation of authority levels. A sub-sample of 7 projects was selected from the original sample following an assessment of the information gathered in the first step. The sample selected covered each of the branches listed above and included single, composite, and partnership projects. This step included the review of project files maintained in the branches, discussions with project managers and directors, and the review of purchase order/contract files maintained by Materials Management. This sample was selected on a judgemental basis from a listing obtained from SAP and included 14 straight purchase orders, 18 contracts, 20 open orders, and 20 low value purchase orders.

At the same time the OCA was completing the review of Project Change Orders, the administration was completing its current state assessment of the Capital Budget Process. As there were a number of common elements assessed, the OCA also reviewed the results of the Capital Budget Process and compared our observations against the weaknesses identified by City Council and Management. This allowed the OCA to identify common concerns and avoid duplicating recommendations for process improvements.

5. Observations and Analysis

Generally, project change orders are well managed at the project level. While there were specific instances where there appeared to be opportunities for improvement, project managers were able to provide reasonable explanations for employing different practices. Therefore, the OCA re-evaluated the focus of our review and adjusted our work to determine whether, at the corporate level, the administration could demonstrate that existing project change management processes adequately protect the City's interests.

By comparing the differing practices observed and reviewing corporate processes and documentation, the OCA was able to identify opportunities for improvement to four processes: Capital Budget, Project Change Management, Monitoring and Reporting, and Governance and Accountability.

5.1. Capital Budget

The objective in this category was to determine whether capital budget requests were presented in a consistent manner that would facilitate informed decision making and whether all expenditures were authorized by City Council.

Observations were assessed against criteria requiring projects to be supported by sufficient detail to increase the probability that optimal solutions will be implemented at the right time and right cost; requiring all expenditures to be authorized by City Council; and allowing the City Manager to authorize transfers up to \$1,000,000 from one budgeted program to another.

5.1.1. Budget Amounts

Generally, project profiles for the selected sample reflected the total estimated cost for a project. However, inconsistencies that impact budget approval include project estimates being presented in phases; project estimates reflecting only the City's portion of a partnership project; costs being capitalized that may be operational in nature; and different philosophies being used to develop composite project estimates. These inconsistencies occur as a result of different interpretation of guidelines and can result in decisions being made based on incomplete/partial information with funding not being allocated in a manner that optimizes spending at the corporate level. Further, approved budgets may be based on unachievable goals/targets resulting in large year-end variances that negatively impact the public's perception of the City's finances.

The City's annual reports for 2003 and 2004 show that, at a corporate level, the expenditures from the Capital Fund are significantly lower than the budget. Generally, the variances were due to delays in implementation of approved capital projects resulting from negotiation, tendering, resource availability, and coordination issues. (Table 1)

Table 1 – Capital Fund Expenditures (millions)

<u>Year</u>	<u>Budget</u>	<u>Actual</u>	<u>Variance</u>
2003	\$455	\$325	28.5%
2004	\$521	\$385	26.1%

Changes proposed in the Capital Budget Process review should address these observations.

5.1.2. Budget Authorization

While researching budget adjustments for the 21 projects reviewed, the OCA noted that transfers between programs and most expenditure increases were appropriately authorized for the years under review. However, a few expenditure increases that were funded by additional grants or third party financing were not authorized by City Council. A review of the budget adjustment guidelines showed that they provide insufficient guidance on approval requirements. At the time of this review the Financial Planning

and Budget office had engaged the Law Branch to provide advice on delegation of authority and budget adjustment approval issues. The flow chart used to provide guidance on the processing of budget adjustments has been enhanced clarifying authorization requirements. These guidelines will need to be reviewed when proposed changes to the Capital Budget Process are implemented to ensure authorization levels are consistent with current delegated authority.

5.1.3. Recommendations

The OCA Recommends	Management Response and Action Plan
<p>1. That the Financial Planning and Budget section ensure that guidelines for the proposed Capital Budget process clearly identify corporate requirements for both budget approval and budget adjustments.</p>	<p>Accepted Comments: Financial Planning and Budgets commenced the process of clarifying requirements in 2005. More detailed requirements will be identified in the 2007 Budget Instructions and considered as part of the Capital Process Review.</p> <p>Planned Implementation: June 2006 for Budget instruction; Capital Process Review implementation beginning in March 2006 and extending to December 2007. Responsible Party: Director, Financial Planning and Budgets</p>
<p>2. That the Financial Planning and Budget section develop communication and monitoring strategies that will increase the likelihood of consistent understanding and application of the capital budget instructions and budget adjustment guidelines.</p>	<p>Accepted Comments: Financial Planning and Budgets will commence implementation of communication and monitoring strategies through the 2007 Budget Instructions. Additional strategies may result from the Capital Process Review. Successful implementation will require the support of Finance staff in line departments and project managers.</p> <p>Planned Implementation: June 2006 for Budget instructions; Capital Process Review implementation beginning in March 2006 and extending to December 2007. Responsible Party: Director, Financial Planning and Budgets in conjunction with Finance Branch.</p>

5.2. Project Change Management

The objective in this category was to determine whether accurate and complete information was available for contract changes and whether corporate interests were protected.

Criteria used to assess project change management included project managers being responsible for directing, monitoring and controlling projects and a Law Branch recommendation that changes to existing contracts should be supported by a written agreement to protect the City's and contractor's interests.

5.2.1. Supporting Information

Generally accepted practices in the cost engineering profession state that during the construction phase of a project, actual costs should be within $\pm 10\%$ of the bid/tender estimate.

The OCA analyzed thirty-two contracts/purchase orders; there were no change orders processed for eighteen of these contracts. For the remaining fourteen, the values for two contracts were reduced, changes to two contracts were within the 10% guideline and the increases for remaining ten exceeded the guideline. The most significant increases were associated with lower value contracts. The ranges for changes to the fourteen contracts based on contract value are:

- Three contracts with original values less than \$50,000 ranged from 22.7% below to 126.6% above the original value;
- Four contracts with original values between \$50,000 and \$100,000 ranged from 26.7% below to 133.3% above the original value;
- Four contracts with original values between \$100,000 and \$250,000 ranged from 7.4% to 78.7% above the original value;
- Two contracts with original values between \$250,000 and \$500,000 ranged from 29.7% to 38.3% above the original value; and
- One contract with an original value greater than \$1 million increased by 15.7%.

As a rule, the changes were supported by documents outlining the specific reason for change, however, instances were found where minimal support existed or general statements were used to support the change. Changes to contracts were normally due to:

- Changes in scope during construction (e.g., an additional feature or change in plans);
- Inaccurate or incomplete information during the tender phase (e.g., specification for existing assets were wrong); or
- Unknown/unexpected conditions detected during construction (e.g., unstable ground condition).

5.2.2. Change Order Process

While most change orders were authorized prior to work taking place, instances were noted where formal purchase change orders were not issued until after work was complete. The OCA also observed instances where the change order requests were not authorized until after the contractor submitted an invoice for completed work. Further, in a few instances alternate purchasing methods were used instead of change orders. Reasons given for these observations included 1) lack of role clarity resulting in poor communications and 2) immediate action being required to minimize adverse impact on the overall project. Work being completed before documents are authorized may also be a reflection that corporate procedures are not fully aligned with operational requirements and the current construction environment.

5.2.3. Amending Agreements

The OCA’s final observation related to project change management is that practices for documenting changes to contracts are not consistent. Practices range from requiring contractors to acknowledge changes in writing prior to work commencing to having no requirements for acknowledgement of changes by contractors. The inconsistency is a result of insufficient guidance and support being provided to project managers and priority being given to meeting operational requirements. This variation in practices may limit the City’s recourse in the event of poor vendor performance.

5.2.4. Recommendations

The OCA Recommends	Management Response and Action Plan
<p>3. That SMT incorporate cost estimating guidelines in Administrative Directive A1424A, Project Management for Projects and implement a process to monitor performance against the guidelines.</p>	<p>Accepted Comments: Asset Management/Transportation, with input from Materials Management, will provide an amendment to Administrative Directive A1424A which will incorporate cost estimating guidelines and processes to monitor performance.</p> <p>Planned Implementation: June 2006 Responsible Party: Asset Management/Transportation</p>

The OCA Recommends	Management Response and Action Plan
<p>4. That the Finance Branch in conjunction with the Law Branch and departments review change order procedures to determine whether greater efficiency can be achieved to better meet the needs of operational areas while ensuring the City’s interests are protected.</p>	<p>Accepted Comments: Implementation plan to be developed in conjunction with Standards Document Committee (representatives from Law, Asset Management & Public Works, and Transportation Departments).</p> <p>Planned Implementation: Implementation plan developed by December 2006, Implementation in first Quarter, 2007. Responsible Party: Director, Materials Management</p>

5.3. Monitoring and Reporting

The objective in this category was to determine whether existing project monitoring and reporting practices effectively meet the needs of the corporation and promote improving corporate performance.

Criteria used to assess the projects included the use of performance reporting tools to manage resources and control activities for individual projects effectively and efficiently, monitor financial performance at the corporate level, and evaluate projects upon completion in order to identify areas for improvement and learn from past experiences.

5.3.1. Project Management Tools

Operational areas developed their own processes to support their project management needs because corporate systems did not have the functionality to adequately support project managers. Project management processes ranged from the use of hand written control sheets to a variety of Excel spreadsheets. This inconsistency may result in project managers using incomplete or inaccurate financial information for project tracking. A corporate Project and Contract Management initiative has recently been introduced that may bring some consistency into the project performance monitoring process.

5.3.2. Corporate Reporting

For the period reviewed, Corporate Accounting & Reporting was provided project information in various formats and levels of detail since corporate requirements had not been clearly defined. Inconsistent data makes it difficult to complete a corporate analysis and increases the risk of error. Corporate templates have since been developed and are currently in use. The Finance Branch will need to monitor the data they receive to ensure the templates are achieving the desired results.

5.3.3. Project Learning

Post project evaluations and consultant/vendor performance evaluations are not being completed consistently following project completions. When completed, evaluations are not being shared with other project managers outside the operational area. Corporate guidelines provide little guidance on when evaluations are to be completed, leaving this to the discretion of operational areas. A review of project manuals shows that some departments have developed criteria identifying the circumstances under which evaluations are required while others have not. Without a consistent approach and sharing of experiences, limited corporate learning and improvement can take place.

5.3.4. Recommendations

The OCA Recommends	Management Response and Action Plan
<p>5. That the Finance Branch develop communication and monitoring strategies that will increase the likelihood of consistent understanding and application of corporate financial monitoring and reporting requirements.</p>	<p>Accepted Comments: Corporate capital financial monitoring and reporting requirements will form part of the financial performance reporting process review being initiated in 2006. Although some enhancements may be made more quickly, the overall review is expected to be completed with implementation of recommendations in 2007. As well, the monitoring and reporting requirements will also be addressed within the parameters of both the capital process review which is underway and the future project management system module implementation.</p> <p>Planned Implementation: December 2007 Responsible Party: Director, Corporate Accounting and Reporting</p>
<p>6. That SMT ensure corporate criteria are established to assist project managers in determining when post project and vendor performance evaluations need to be completed and that an effective mechanism for sharing experiences is in place.</p>	<p>Accepted Comments: Asset Management/Transportation will ensure the development of criteria to determine when post project/vendor evaluation must be undertaken.</p> <p>Planned Implementation: September 2006 Responsible Party: Asset Management/Transportation</p>

5.4. Governance and Accountability

The objective in this category was to determine whether projects are managed in an effective and efficient manner and in accordance with corporate policies and procedures.

Projects were assessed against criteria that require the governance structure to provide assurance that corporate interests and assets are protected. They also include existence of clear lines of accountability and responsibility to optimize decision making and minimize misunderstandings, and standardized education and training programs to develop staff.

5.4.1. Governance Framework

The corporate Project Management guidelines delegate responsibility for the development of project manuals to project managers. The manuals are to follow a framework established by their department. As a result, operational areas are employing various processes to manage project activities. Further, corporate project management guidelines, capital budget instructions and purchasing directives do not identify monitoring responsibilities and processes to ensure consistency or compliance with corporate requirements. As a result, corporate monitoring is either not in place or is ineffective.

In addition, it was noted that the level of support provided by the Finance Branch to project managers varied from one department to another, with most support being provided in a reactive rather than proactive mode. This observation is consistent with the delivery of shared services prior to 2005 when the priority was on delivering services required by operational areas. In January 2005 SMT approved a revised shared services model that promotes balancing corporate and operational requirements in the delivery of service. An accountability framework for shared services has been established and implementation efforts are currently underway.

5.4.2. Project Management Training

In November 2001 a corporate project management training program was initiated to provide standardized training to staff with project management responsibilities. This program was last offered in October 2002. Although some departmental training has taken place or is being planned, a corporate program is not currently being offered.

Without effective corporate oversight and standardized training there is limited assurance that corporate interests and assets are being protected consistently.

5.4.3. Recommendations

The OCA Recommends	Management Response and Action Plan
<p>7. That SMT reassess the structure and establish a process for monitoring compliance with corporate guidelines for project management, capital budget and purchasing to ensure effective governance and accountability for projects.</p>	<p>Accepted Comments: The Project and Contract Management Initiative (reference 5.3.1) that has recently been introduced would bring some consistency into the project performance monitoring process when completed. A monitoring role and responsibilities will be identified during the process development.</p> <p>Planned Implementation: Currently discussing approach and implementation timetable. Responsible Party: Asset Management/Transportation</p>
<p>8. That SMT review existing training programs and determine how best to achieve the objectives of a corporate project management program.</p>	<p>Accepted Comments: Transportation currently has a pilot Project Management Refresher program being implemented. Once the pilot is complete, findings will be shared with SMT. Corporate Services will implement the program, modifying elements to suit Corporate/Department needs.</p> <p>Planned Implementation: Transportation - June 2006. Corporate Services thereafter. Responsible Party: Transportation/Corporate Services</p>

5.5. Capital Budget Process Review

As a final step, the OCA compared the results of this review with the results of the Capital Budget Process review conducted by the administration.

The overall goal of the Capital Budget Process review was to streamline and enhance the current capital process to make it more transparent and clearly understood by all participants. A number of the activities considered in the review were also considered in the OCA’s review. These included development of guidelines/instructions, project development, project management and financial reporting.

The Capital Budget Process review adopted a high level, top down approach with input provided by members of City Council, Senior Management Team, and other City Staff

involved in the capital budget process. The OCA Project Change Order review used a detailed, bottom up approach which included the review of specific project files.

Based on our review the OCA is of the opinion that results of the Capital Budget Process review are aligned with the observations and recommendations contained in this report.

6. Conclusions

While the City has procedures and training available to mitigate risks associated with project change management, project management practices within individual branches are inconsistent. This is due in part to the lack of clear corporate guidelines and the absence of a strong corporate monitoring and oversight role. As a result, the City has limited its ability to demonstrate that its processes consistently protect corporate interests.

The recommendations contained in this report and the “key tasks” identified in the Capital Budget Process Review Future State Implementation Plan complement each other. In the opinion of the OCA, implementing the recommendations in this report in concert with the changes to the Capital Budget Process will:

- Increase the likelihood of effective governance,
- Increase the capture of consistent information,
- Lead to a better balance of achieving corporate and operational requirements, and
- Realize the benefits associated with the standardization of processes.

The OCA thanks all City staff who participated in this review for their support, cooperation and feedback.