

APPENDIX 1

A Mid-Term Review of the Union Station Revitalization: Managing Risks in a Highly Complex Multi-Year, Multi-Stage, Multi-Million Dollar Project

August 15, 2012



Auditor General's Office

Jeffrey Griffiths, C.A., C.F.E.
Auditor General
City of Toronto

TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
BACKGROUND	5
AUDIT OBJECTIVES, SCOPE AND METHODOLOGY	7
AUDIT RESULTS	9
A. ENHANCE OVERSIGHT AND REPORTING TO PROMOTE ACCOUNTABILITY AND TRANSPARENCY	9
A.1. Establish Additional Reporting Requirements to Enhance Accountability and Oversight for Large Scale Capital Projects	9
A.2. Revise the Capital Plan Milestones Based on Updated Forecasts of the Cost of Construction	10
A.3. Improve Monitoring of Adherence to the Construction Schedule	13
B. IMPROVE CONTROL FRAMEWORK TO MANAGE RISKS ON LARGE AND COMPLEX PROJECTS	16
B.1. Develop Comprehensive Risk Management Procedures for the Overall Project.....	16
B.2. Late Selection Impacts the Effectiveness of the GC/CM’s Role in Managing Risks.....	18
B.3. Process for Selecting the Head Lessee.....	20
B.4. Maintain Adequate Documentation and Records for All Contracts	21
C. CONTINUE STRENGTHENING CHANGE MANAGEMENT CONTROLS	22
C.1. Accurately and Completely Define the Scope of Trade Contracts Prior to Tenders	23
D. CONTINUE STRENGTHENING CONSTRUCTION MANAGEMENT AND CONTRACT ADMINISTRATION CONTROLS	24
CONCLUSION	27
Glossary.....	28
Exhibit 1	30
Exhibit 2	31

EXECUTIVE SUMMARY

Why we did this review

The Auditor General’s 2012 Audit Work Plan included a review of the adequacy of controls over the management of the Union Station Revitalization.

The objective of this review was to assess the adequacy of controls implemented by management with respect to the Union Station Revitalization to ensure:

- Project achieves value for money
- Sound stewardship of project funds is demonstrated
- Accountability for project outcomes is transparent
- Outcomes are achieved within time and cost constraints

Unlike previous construction audits conducted by the Auditor General’s Office which occur closer to completion of construction, this is a mid-project review of the Union Station Revitalization.

Objective of the Union Station Revitalization

As noted on the City’s website, the objectives of the Revitalization project are:

“to improve the quality and capacity of pedestrian movement in and around the station; to restore heritage elements; and to transform Union Station into a major destination for shopping, dining and visiting”.

Construction related activities for the Revitalization began in December 2009 and continue to progress towards a targeted completion at the end of 2016. The project has an approved budget of \$665 million with total expenditures to March 31, 2012 of \$172 million.

Stage one of the project, which is currently underway, is primarily related to the initial excavation activities. This stage also carries the highest level of risk due to the number of unknowns.

Project challenges

The Union Station Revitalization project presents a number of unique challenges:

- The need to coordinate with other large concurrent construction projects within and in the vicinity of Union Station
- Maintaining passenger flow and safety of the public and workers
- Operations must be maintained while the construction is undertaken
- Difficult site logistics
- Heritage considerations
- Multi-year, multi-phase schedule

Our review was conducted during the initial stages of the project. As a result, a number of the issues we have identified would have likely been addressed in the later stages of the project. Nevertheless, this review has identified certain issues which require more timely attention.

Reporting to Council

Although as with all capital projects, there have been regular reports to City Council, the current reporting standards do not provide detail on progress in meeting planned timelines and costs.

Internal reporting on spending and schedule to Deputy City Manager and Chief Financial Officer

Staff provide periodic reports directly to the Deputy City Manager and Chief Financial Officer. In their March 31, 2012 report staff advised that “*construction contingency allocations have been drawn down considerably...however, with the substantial amount of untendered and uncommitted work remaining, managing the construction cost to meet the funding allocation remains an achievable objective.*”

On a project this size Council should be kept up to date on its status in sufficient detail to allow for direction for remedial action if and when required.

In the same report staff advised that “*Opportunities for minor scope reductions/deferrals and value engineering are currently being identified for possible implementation.*”

Although it is normal to expect some changes to initial plans on a project of this nature, any major excluded or deferred work that will require additional funding in the future should also be reported to Council.

Project Stage 1 reported as being behind but this is due to advancing work from later project stages

In March 2012, the General Contractor/Construction Manager, (GC/CM) reported to management that “*The project has currently completed month 28, as of the end of March 2012, and is assessed as 24 weeks behind schedule when measured against the baseline schedule.*”

Staff report that advancing work from later stages will keep project on schedule

Baseline project stages have been updated due to the complexity of the project. Stage 1 scope increased by advancing work from later project phases. This will decrease the time required for later stages of the project.

Staff report that, when these changes are factored in, the project is within the overall schedule.

Need to improve analysis and recording of risks and planned responses

With competing priorities and a limited number of City project management resources dedicated to this project, best practices for project risk management should be implemented. Some of these practices have not been fully executed such as:

- Completion and maintenance of an overall project risk analysis
- Ensuring GC/CM's risk register is updated on a regular basis

Prime Consultant and GC/CM engaged to manage day to day activities

Due to limited City resources, the City engaged and relies on a Prime Consultant and GC/CM for much of the day to day monitoring and management of the project.

Delay in engaging GC/CM reduced potential benefits

In late 2007, City Council approved the Revitalization recommended approach. The project designs commenced following that approval. However, the selection of the GC/CM could not commence until Council approved the implementation plan for the Revitalization in August 2009.

A construction manager is most effective in contributing to cost and schedule savings if allowed early involvement in design review, value engineering, and risk analysis prior to design completion.

City should retain its own records

The Prime Consultant and GC/CM are primarily responsible for processing much of the project documentation with City staff approval. Therefore they have been relied upon to retain relevant records on behalf of the City. However, divisional staff should centrally maintain sufficient project records in order to ensure City possession of adequate project documentation.

Increase in number of change orders as sub trades engaged prior to completion of design and due to unpredictable site conditions

In order to expedite the initial work, contracts were scoped and awarded to sub trades prior to full completion of the design. As a result, several change orders were required to adjust the scope of work. Staff advise that the number of change orders were high in the first stage due to the large quantity of unknowns. Staff anticipate a reduction in change orders in the project's subsequent stages.

Additional administrative controls needed

In addition, we identified a number of administrative areas where additional controls or greater adherence to existing policies and procedures would increase the likelihood of meeting project goals and targets:

- Prime Consultant fees to be aligned to project progress
- Random verification of labour costs
- Increased monitoring of Reimbursable General Accounts
- Enhanced design review and approval procedures
- Improved monitoring of pricing for extra work
- Compliance with change order policies and procedures
- Tracking and documenting quality control test results and follow up.

Conclusion

The report contains 20 recommendations. Implementing the recommendations will improve monitoring and oversight of the Union Station Revitalization project.

BACKGROUND

Union Station is Canada's busiest passenger transportation hub, handling as many as 65 million passengers annually. It is also a designated National Historic Site.

Revitalization objectives

The revitalization objectives for the station include an expanded GO Transit concourse, an increase in the number of exits and entrances, alleviated commuter congestion, and restoration and preservation of the station's heritage elements.

New lower retail level

The revitalization will also create a new lower level below the Station to increase capacity for retail services. The City, through a competitive process, entered into a head lease with a third party, Redcliff (Union Station) Inc. who will be responsible for all individual retail leases.

An overview of the five stages of the project is attached as Exhibit 1 to this report.

Other projects within the Union Station precinct

There are several other significant projects being undertaken in and around Union Station which are not included in the City's revitalization project. This includes the construction of the TTC's Union Station Subway Second Platform and Metrolinx's Union Station Train Shed Roof Revitalization.

Financial highlights

The \$665 million revitalization is funded by \$164 million from the Government of Canada and \$197 million from the Government of Ontario. The City of Toronto is contributing the remaining \$304 million. The retail revenue stream from the head lease for Union Station is expected to begin in 2016 and will be directed toward offsetting the City's debt costs.

Key project costs

A breakdown of the major cost areas and related expenditures to March 31, 2012 is summarized in Table 1.

Table 1 – Summary of Project Costs and Total Expenditure to March 31, 2012

Key Project Costs	Total Budget <i>(in \$000s)</i>	Total Expenditures <i>(in \$000s)</i>
Professional Services	65,765	45,888
Construction Contracts	499,735	114,181
Third Party Construction	25,000	-
North West PATH	65,000	4,850
Fees / Permits	7,200	7,065
Internal Charges	2,500	588
Total	\$ 665,200	\$172,572

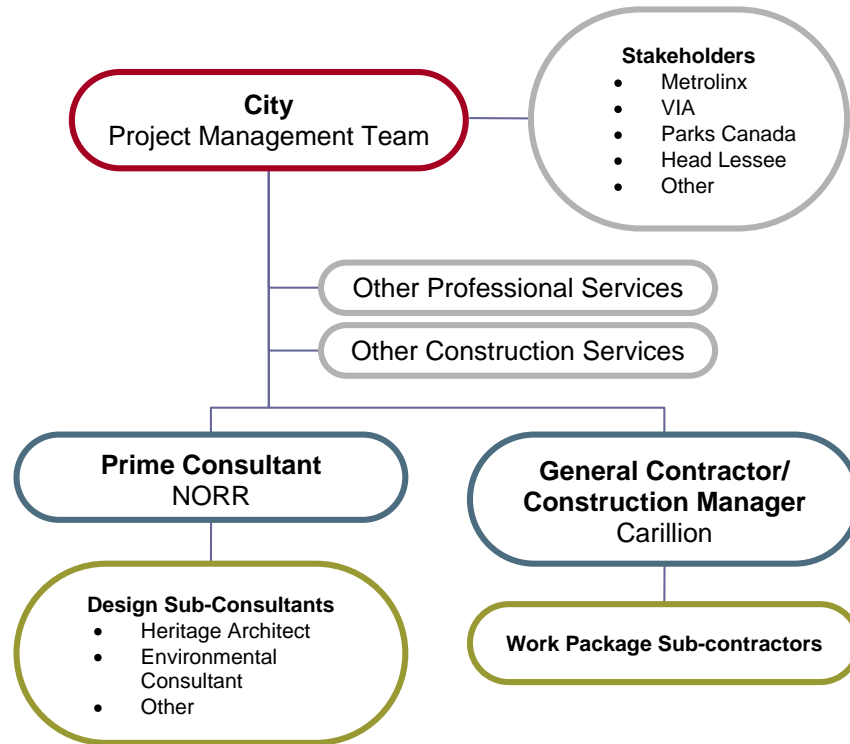
Construction management method of project delivery

In November 2009, City Council authorized, pursuant to a competitive procurement call, the award of a contract for \$450 million to Carillion Construction Inc., as the GC/CM for the Union Station Revitalization. As the GC/CM, Carillion is to provide construction leadership, contract management, direction, supervision, coordination and control of the construction work. Carillion is responsible for all sub-contracts.

Prime Consultant oversees design team

At the same November 2009 meeting, City Council authorized the continuation of an existing contract with NORR Limited Architects & Engineers, as the Prime Consultant. NORR is to provide design services, contract documentation, bidding and negotiation support, and construction administration services, including remaining heritage approvals at a cost not to exceed \$35.4 million. NORR engages other sub-consultants as needed.

Organizational Structure



This report addresses some complex contractual issues and in some cases it was most efficient to use terminology common to construction contracts. To assist in understanding these terms we have included a glossary of the more technical of these terms. The glossary may be found on page 28.

AUDIT OBJECTIVES, SCOPE AND METHODOLOGY

2012 Audit Work Plan

The Auditor General’s 2012 Audit Work Plan included a review of the adequacy of controls over the management of the Union Station Revitalization.

Objective of this review

The objective of this review was to assess the adequacy of controls implemented by management with respect to the Union Station Revitalization to ensure:

- Project achieves value for money
- Sound stewardship of project funds is demonstrated
- Accountability for project outcomes is transparent
- Outcomes are achieved within time and cost constraints

This review included an assessment of:

- Organizational structure and overall project governance
- Contract administration and project management practices implemented to control project scope, cost, and schedule
- Openness, fairness, and transparency of procurement processes.

This is a mid-project review of the Union Station Revitalization. The audit focused on the period from the start of construction in late 2009 until March 31, 2012 as well as certain pre-construction activities including procurement. This audit included a review of contracts awarded to the Prime Consultant, the GC/CM and the Head Lessee. The North West PATH was not included within the scope of this audit.

Limitations of a mid-project review

Construction related to the Union Station Revitalization continues towards a targeted completion at the end of 2016. A limitation of the mid-project review is that management controls designed to address certain areas of risk will not yet have been implemented or observable. For example, construction has not progressed to the point where an assessment of controls can be made over the resolution of claims and disputes, substantial completion, and final payment. Additionally, certain master agreement clauses will not yet have come into effect.

Audit Methodology

Our audit methodology included the following:

- Review of key agreements with funding partners
- Review of the process and records retained with respect to the selection of the Head Lessee.
- Interviews with staff
- Site tour of the project
- Review of proposal submissions, contractual agreements, and other operating procedures agreed upon between the City, the GC/CM, and the Prime Consultant
- Examination of documents and records
- Review of audit reports previously issued by the Auditor General regarding construction contract and contract management as well as related audit reports of other municipalities
- Other procedures deemed appropriate

Compliance with generally accepted government auditing standards

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

AUDIT RESULTS

A. ENHANCE OVERSIGHT AND REPORTING TO PROMOTE ACCOUNTABILITY AND TRANSPARENCY

The large and complex nature of the Union Station Revitalization necessitates effective monitoring and governance procedures to manage risks and promote accountability and transparency at all stages of the project.

Oversight of accurate and timely information is essential for holding management accountable for adhering to planned budgets and schedules, and achieving project outcomes in order to ensure the prudent use of funding and resources.

A.1. Establish Additional Reporting Requirements to Enhance Accountability and Oversight for Large Scale Capital Projects

Same reporting requirements for Union Station Revitalization as for much smaller projects

The Union Station Revitalization Project is a unique, stand alone capital project. However, similar to any other capital project, the annual capital budget and quarterly capital variance reports are the primary channels for providing status updates to City Council.

Spending against the capital budget is reported on an overall basis

Spending against the capital budget is reported on an overall basis with little detail, especially for a \$665 million multi-year, multi-stage project with significant contracts.

Since the \$173 million expenditures to date is within the \$665 million spending authority for the project, staff are not required under the Financial Control By-law to provide City Council with any further detail. The total expenditures by sub-project is reported on a quarterly basis to the Deputy City Manager and Chief Financial Officer.

Variance reports do not provide information on life-to-date expenditures or percentage complete

The annual capital budget and quarterly capital variance reports for the Revitalization do not include any life-to-date information and do not review project status in terms of percentage complete. Life to date information pertaining to capital projects is readily available in SAP reports.

For a project of this magnitude, additional reporting would improve the information provided to Council allowing for more proactive oversight of the project. Otherwise, within the current reporting mechanisms, a clear picture of the potential for delays and over-expenditures will not be evident until much later on in the project's life.

Recommendation:

- 1. City Council request the Deputy City Manager and Chief Financial Officer to implement additional status reporting for large capital projects, including the Union Station Revitalization including:**
 - a. Additional detail in capital budget and capital variance reports; and**
 - b. Separate status reporting to City Council for large capital projects. Thresholds on milestone slippage and cost escalation should be developed to determine the frequency and extent of such reporting.**

A.2. Revise the Capital Plan Milestones Based on Updated Forecasts of the Cost of Construction

\$450 million contract includes GC/CM's fee and construction costs

The \$450 million contract with the GC/CM comprises nearly 70 per cent of the overall capital plan for Union Station. This contract amount is to allow for the estimated construction cost, inclusive of all subcontracts to be procured, and an estimated 12 per cent provision for the GC/CM's fixed fees, and fixed and cost reimbursable general accounts.

Construction budget is based on cost estimates by a third-party cost consultant

The \$450 million budget is based on cost estimates by a third-party cost consultant prepared prior to the start of construction in December 2009. The GC/CM reviewed the estimates in March 2010, generally found them to be reasonable, and concluded that the overall budget was +/- three per cent on the high side. Since that time, the original cost estimates have not been revisited to confirm their accuracy.

Cost of Stage 1 Construction Forecasted to Exceed Baseline Stage 1 Budget

Stage 1 forecasted final cost exceeds GC/CM budget but project forecasted to remain within overall budget.

The GC/CM's forecasted final cost of the first stage of construction is expected to exceed the original construction budget by \$16 million. This is primarily due to costs associated with site unknowns in the early excavation stage of the project. However, the overall project is forecasted to be completed within the City approved capital budget for stages 1-5. Table 2 summarizes the status of the construction budget and the GC/CM's forecast of final cost as at March, 31, 2012.

Table 2 – GC/CM Construction Budget and Forecast of Final Cost, March 31, 2012

Construction Stage	Budget (in \$000s)	Forecast (in \$000s)
Fees and General Accounts	65,840	70,221
Stage 1 Work Packages <i>(excluding third-party funded work)</i>	265,233	281,003
Stages 2 to 5 Work Packages	102,210	102,210
Contingencies and Escalation	16,717	
Total Contract Budget	\$ 450,000	\$ 453,434
Total Council Approved Construction Budget	\$462,484	

Staff indicate that sufficient project scope remains to allow for remedial action to complete the project on budget

Changes to the mechanical and electrical work is one of the main reasons for the significantly increased costs. These costs have been covered by the project's contingencies. Although costs are currently forecasted to exceed budget for Stage 1, staff have advised the Deputy City Manager and Chief Financial Officer that “*construction contingency allocations have been drawn down considerably ...however, with the substantial amount of untendered and uncommitted work remaining, managing the construction cost to meet the funding allocation remains an achievable objective.*”

Given the scope of the project and the significant draw down in construction contingencies, it is important for senior management and Council to be kept up to date on its status in sufficient detail to allow for direction for remedial action if and when required.

Recommendation:

- 2. City Council request the Deputy City Manager and Chief Financial Officer to report periodically to City Council to provide:**
 - a. An update on the forecasted final cost to complete each stage of construction; and**
 - b. Explanations for significant variances from the original phase construction budgets and any remedial action planned or necessary.**

All Planned Work May Not Be Completed Within Existing Construction Budget

It is possible that some elements of work included in the original design for the Revitalization may not be constructed within the budgetary ceiling. In their March 31, 2012 report to the Deputy City Manager and Chief Financial Officer staff advised that “*Opportunities for minor scope reductions/deferrals and value engineering are currently being identified for possible implementation.*”

Estimated cost of excluded works not yet known

Staff have advised that after the detailed budget estimates for Stages 2 and 3 construction are complete, the City will be better equipped to identify the elements in the design that may not be constructed and the estimated cost to construct these works.

Although it is normal to expect some changes to initial plans on a project of this nature, care should be taken to identify and report on any major excluded or deferred work that will require additional funding in the future.

Recommendation:

- 3. City Council request the Deputy City Manager and Chief Financial Officer to report back to City Council in supplementary status reports, the nature of any work that will be omitted from the Union Station Revitalization and the related impact on the timing and cost of future state of good repair and service improvement projects within the overall Capital Plan for Union Station.**

A.3. Improve Monitoring of Adherence to the Construction Schedule

Staff indicate project is on time with the overall schedule

Construction commenced at the end of December 2009 with project completion expected in 2016. The completion date is within the bounds established in the funding partner agreements and head lease agreement. Staff report that the Revitalization is on time with the overall schedule.

The GC/CM's proposal committed that their staff would take complete ownership of the project schedule. Consequently, City staff rely on the GC/CM to maintain and report on accurate updates to the schedule.

The GC/CM's master schedule was accepted by the City on June 1, 2011, almost 18 months after the award of the construction contract. This schedule forms the baseline for monitoring the status of Stage 1 of the project.

Increasing Schedule Slippages Reported By the GC/CM

Master schedule considered unreliable by GC/CM

The GC/CM reports the “*current baseline schedule is proving to be less and less of a reliable metric for measuring progress as time passes*”. Increasing schedule slippages have also been reported by the GC/CM in their monthly progress reports

Stage 1 schedule slippage is due to advancing work from later stages

In the monthly progress report for March 2012, the GC/CM states “*The project has currently completed month 28, as of the end of March 2012, and is assessed as 24 weeks behind schedule when measured against the baseline schedule.*” A summary of the variances for construction milestones in Stage 1 can be found in Exhibit 2 to this Report. The Stage 1 slippage resulted from significantly adding work from later Stages into construction Stage 1 and dealing with unforeseen site conditions. Advancing this later Stage work, although extending Stage 1, will shorten subsequent Stages allowing the project to meet its overall schedule.

Staff report the project is on time within overall schedule

Staff report that, when these timing changes are considered, the project is on time within the overall schedule.

Plan changes being implemented to stay on time and on budget

The GC/CM has identified that plans are needed to correct delays in the progress of the work. It is anticipated that any “Corrective Plans” the GC/CM submits will include charges for additional costs to implement the plans. For example, in June 2011, staff approved a \$671,400 change order for additional materials and a schedule recovery plan to amend the methodology for replacement of supporting columns. The new plan enabled an increase in the number of columns being worked on at any one time.

Staff advise that this is the kind of management decision that will be made as the project progresses to allow them to keep the project on schedule and, since the amount required is available from contingencies, on budget.

The GC/CM’s working schedule does indicate that all stages of construction will be completed by the end of 2016. Staff have advised that a review of the sequencing of construction activities on the overall project is currently underway to ensure the time lost in Stage 1 is recouped.

Recommendation:

- 4. City Council request the Executive Director, Facilities Management to report to City Council annually on the actual progress of the Union Station Revitalization project against the baseline schedule for each stage of construction. Such reports to include:
 - a. Explanations for significant delays;**
 - b. Plans to make up for schedule delays; and**
 - c. Identification of any significant costs resulting from the implementation of schedule recovery plans.****

Monitoring of Schedule Lacks Adequate Focus on Critical Path

Increase focus on monitoring progress against the critical path

The City should re-evaluate its approach to ensuring the GC/CM adheres to the schedule. Focus should be placed on detailed monitoring of the progress of specific activities on the critical path as this is the primary indicator of whether the overall completion time is achievable.

Results of analysis of GC/CM's assertions of delays should be formally documented

The GC/CM has documented and communicated schedule changes and delays on a repeated basis in their monthly progress reports and in work package meeting minutes. The City has not clearly and formally documented their assessment of the changes and delays. The City and its Prime Consultant should clearly document and communicate any observations with respect to the accuracy of delays reported for work on the critical path.

Recommendation:

5. **City Council request the Executive Director, Facilities Management to obtain and monitor adherence to the General Contractor/Construction Manager’s critical path schedule. Monitoring activities should include:**
 - a. **Identification, analysis and resolution of any deficiencies or impracticalities in the critical path schedule;**
 - b. **Written communication of any disagreement with delays reported and changes made to the critical path schedule; and**
 - c. **Tracking of the causes of delays.**

B. IMPROVE CONTROL FRAMEWORK TO MANAGE RISKS ON LARGE AND COMPLEX PROJECTS

The complex nature of the Union Station Revitalization, with its significant contracts and multiple stakeholders and accountabilities makes a coordinated risk management plan integral to the successful completion of the project.

With competing priorities and a limited number of City project management resources dedicated to this project, best practices for project risk management have not been implemented. Under these circumstances, the City instead places a heavy reliance on the activities of the Prime Consultant and GC/CM to manage its risks.

B.1. Develop Comprehensive Risk Management Procedures for the Overall Project

Comprehensive risk assessment not completed at outset of project

In August 2009, when City Council authorized the undertaking of the revitalization of Union Station, staff communicated a very simple risk analysis and associated risk mitigation measures. This risk analysis was not comprehensive and focused on financial risk only.

No focus was placed on the uncertainty associated with project implementation and specific project conditions. Additional areas of focus for the risk analysis could have included:

- Adequacy of project staffing in terms of number and qualifications
- Reliability of cost and schedule estimates
- Accuracy and stability of the project scope
- Impact of stakeholder relationships
- Environmental and safety issues

Risk register is a work in progress

The City's project management team began to develop a risk register in November 2011. This risk register is a work in progress. While a number of risks have been identified, responses and action plans to address risks have not been documented.

Typically, a comprehensive risk assessment should be prepared at the outset of the project and appropriate responses to manage or mitigate these risks should be documented. Relating the risk assessment process directly to the development of specific line item construction contingencies may improve the quality of construction estimates, project budget, and schedule.

Regular review of the overall project risk assessment and the identification and addition of relevant risks throughout the duration of the project can help to ensure the project is completed as efficiently and effectively as possible.

GC/CM has not implemented their proposed risk management process in practice

In addition, the GC/CM's proposal stated that "*With input from client's consulting team, we will identify the major risks on the project and agree methods of managing those risks ... Each risk will be assigned a champion who will be responsible to implement the agreed mitigation strategy. The risks will be managed using a 'risk register', which will be discussed at the regular bi-weekly consulting team meetings and updated frequently. This represents a highly pro-active and comprehensive approach to manage risk, starting at an early stage in the project.*" The GC/CM has not fully implemented this risk management process.

While construction issues are documented in meeting minutes and in the GC/CM's Monthly Progress Reports, in accordance with best practice and the proposal submission, a risk or issues register should be prepared and updated throughout the construction period to track issues and status of action plans.

Recommendations:

- 6. City Council request the City Manager to ensure that the responsible City division develop and implement, for all significant and complex capital projects, an enhanced process for assessing and managing project risks. The risk assessment should be comprehensive prior to the start of the project and be continuously reviewed and updated.**
- 7. City Council request the Executive Director, Facilities Management to ensure the General Contractor/ Construction Manager implement their proposed risk management process within the agreed lump sum amount for Fixed General Accounts and Fee Price.**

B.2. Late Selection Impacts the Effectiveness of the GC/CM's Role in Managing Risks

Factors contributing to project complexity

The Union Station Revitalization project is challenging because of the following factors:

- Coordination with other large concurrent construction projects within the Union Station precinct
- Reconstructing the Station while it continues to be operational (passenger flow, building systems, existing tenants)
- Difficult site logistics including lack of a large marshalling area and access to the site during rush hour
- Heritage approval requirements from Parks Canada
- Multi-year, multi-phase schedule
- Complex subcontractor coordination

Construction management approach selected to address project complexity

Given this complexity, staff recommended a Construction Management firm be hired to manage the construction process rather than use a stipulated price (lump sum) contract for the project. Under such an approach, typically the construction manager is hired during the design phase.

The GC/CM is expected to provide value engineering services throughout each phase of construction. This involves investigating and offering methods to reduce the overall construction cost, through such means as providing constructability input into the design, and through more efficient tender packaging, scheduling, staging, and claims management.

GC/CM selected after design was complete

The GC/CM for the Union Station Revitalization was selected after design development was complete and construction documents for Stage 1 construction were already significantly underway.

The development of the designs for Union Station commenced in late 2007 following City Council approval of the recommended approach for the Revitalization. However, the process to select the GC/CM could not commence until Council approved the implementation plan for the Revitalization in August 2009.

At the time the implementation plan was presented in 2009, staff advised City Council that the design development documents needed to be completed to facilitate the commencement of the first phase of construction. Furthermore, preparation of the contract documents for Stage 1 had to commence in July 2009 to meet early tender package dates for construction. To keep the project moving, all of this happened before the GC/CM was engaged.

Value and savings come from early involvement in review of designs and contract documents

A construction manager's effectiveness in contributing to cost and schedule savings is typically linked to early involvement with design review, value engineering, and risk analysis prior to design completion. While continuous value engineering efforts are expected in all phases of construction, the principal goal is to do this when it will do the most good; the initial stages of planning and design, prior to tendering.

Staff advised that the benefits from leveraging the GC/CM for constructability and value engineering reviews of the design and contract documents should be better realized for subsequent stages of construction.

Recommendation:

- 8. City Council request the Deputy City Manager responsible for the oversight of significant and complex capital projects where the Construction Manager model is being used, to ensure that the Construction Manager is engaged in sufficient time to allow for an effective review of design and contract documents.**

B.3. Process for Selecting the Head Lessee

Significant retail space is being created

The focus of our review of the Union Station Revitalization was on the construction portion of the project. However, given the significance of the future potential revenues from renting out the new retail space, we did review the process used to select a head lessee.

Renting retail space of the magnitude that will be created in Union Station Revitalization is beyond the scope of experience for City staff. As a result, significant outside advice and experience was contracted to ensure the City obtained the best possible outcome. Steps taken by staff included:

Staff engaged extensive external resources to assist in achieving value from the new retail space

- Engaging a consultant as a strategic advisor on retail real estate
- Contracting a separate consultant to perform a retail feasibility study
- Engaging a Process Monitor who reported favourably on the process used
- Hiring external specialized Legal resources
- Requesting non binding letters of Intent from a variety of potential interested parties
- Using the external legal resource to ensure submissions complied with requirements
- Provided proponents opportunity to request clarification
- Requested formal offers from prospective Lessees
- Direct negotiations with final proponent to obtain mutually agreeable lease

While we did not review all steps in the process in any level of detail, the extent of the advice and controls put in place to select the Head Lessee provide some assurance that the final contract represents good value for the City.

B.4. Maintain Adequate Documentation and Records for All Contracts

Divisional staff should be maintaining contract records in sufficient detail to allow anyone reviewing such documentation to understand how the contracts were procured, awarded, conducted and administered.

Limited Retention of Construction Documentation

Inadequate record keeping for progress billings, change orders, and quality records

A protocol does not exist to formally retain adequate records related to contract administration and construction management for the Union Station Revitalization. Among other things, the documents and records retained on hand by the City for progress billings, change orders, and quality control is lacking.

Staff rely on access to GC/CM's and Prime Consultant's records

City staff rely on their ability to access records maintained by the GC/CM and Prime Consultant. There is a large volume of documentation that the GC/CM and Prime Consultant retain. The City needs to determine the extent of these records that need to be turned over to the City, when such records should be obtained, and in what format these records should be retained.

Retention of Documentation Supporting the Selection of the Head Lessee

We experienced significant delays in obtaining documents related to the selection of the head lessee for the redeveloped Union Station.

Delays in receiving information related to head lease

From February 2012 through May 2012, the Auditor General's Office, on numerous occasions, requested access to reports and records related to the head lease. In particular, staff were requested to provide:

- Reports by Deloitte & Touche LLP, the consultant engaged to provide financial/real estate advice and undertake negotiations leading to the selection of a head lessee and a long term lease agreement.
- Documents and records relating to the process for selecting the head lessee.

Important documentation on head lease was not readily available

The requested documents were finally received in June 2012. Staff advised that the delays were a result of:

- retirement of key staff
- termination of contract with Deloitte & Touche LLP
- documentation not retained in central location

The head lease agreement represents the largest commercial revenue transaction the City has negotiated. The process and results should have been completely and efficiently documented for easy retrieval and review.

Recommendation:

- 9. City Council request the Executive Director, Facilities Management, in consultation with the City Solicitor, to ensure adherence to procedures for the retention of critical and other relevant records related to the head lease, design, construction, and contract administration of the Union Station Revitalization.**

C. CONTINUE STRENGTHENING CHANGE MANAGEMENT CONTROLS

City Council approval will only be sought when cumulative changes exceed \$90 million

In a staff report presented to City Council in November 2009, staff stated that Council approval of change orders would be required when they cumulatively exceeded the overall contract price (\$450 million) by more than 20 per cent (\$90 million). At the end of March 31, 2012, the GC/CM tendered trade contracts total approximately \$181 million and authorized changes to the trade contracts total \$16 million.

C.1. Accurately and Completely Define the Scope of Trade Contracts Prior to Tenders

Trade contracts did not include all work required

It is apparent that the tenders for trade contracts for Stage 1 construction did not include all work required for the construction stage.

Changes ranged up to 450% of the original contract value

In a sample of 10 trade contract awards reviewed, changes to the original contract value ranged from zero per cent on a \$300,000 contract to 450 per cent on a \$90,000 contract.

Change orders issued because designs were not yet complete at time of tender

Change orders were issued to trade contractors outside of the competitive tendering process because at the time the trade contracts were tendered, the work had not yet been designed. For example, a \$570,000 change order was issued for soil and rock face shoring work that should have been tendered with the Shoring Systems work package. However, according to the GC/CM, at the time the work package was tendered this work was not yet designed. This change order represents a 26 per cent increase to the original tendered contract value.

Staff indicated that the Stage 1 trade contract tenders did not always include the full scope of work required because there was a rush to begin some preparatory work such as demolition and abatement. Also there were unknowns due to complexity of the project that needed to be managed real time.

Process improvements are planned

Staff expect a reduction in the number of changes for future stages of construction because the contract documents prepared by the Prime Consultant will be 100 per cent complete. Consequently, the GC/CM will have sufficient time to conduct a thorough constructability review and identify gaps and coordination issues in specifications and drawings that can be corrected prior to tendering the trade contracts.

Recommendation:

- 10. City Council request the Executive Director, Facilities Management, to implement procedures to ensure trade contracts are accurately and completely scoped prior to issuing competitive tenders.**

D. CONTINUE STRENGTHENING CONSTRUCTION MANAGEMENT AND CONTRACT ADMINISTRATION CONTROLS

The terms and conditions of the contractual agreements as well as the agreed upon operating procedures between the City, the Prime Consultant, and the GC/CM, are generally designed to provide adequate internal control over construction management and contract administration.

We noted certain areas where controls could be strengthened. It is certainly possible, that, had we performed our review towards the end of the project, these issues would have been addressed through normal project procedures. Regardless, we include these issues here in summary form with related recommendations. Like all our recommendations, these will be included in our follow up process to provide assurance that the underlying issues are resolved.

Prime Consultant Progress Payments

Recommendation:

- 11. City Council request the Executive Director, Facilities Management, review fees paid to the Prime Consultant and ensure that fees payable for contract administration align with actual progress of each Stage of construction.**

Verify Pass Through Labour Costs To Source Documents

Recommendation:

- 12. City Council request the Executive Director, Facilities Management to ensure controls are implemented to verify, on a periodic random test basis, labour costs against source documents such as time sheets or services records.**

Strengthen Oversight Over Reimbursable General Accounts

Recommendation:

- 13. City Council request the Executive Director, Facilities Management to ensure controls are implemented to monitor the Reimbursable General Accounts. Controls should include:**
 - a. Authorization of work plans for significant components in accordance with the Phase 2 Agreement including monthly forecast to completion; and**
 - b. Timely comparison of the total amounts billed by component to budgets in the Phase 2 Agreement and investigation of any significant variances.**

Taking Steps to Reduce Design Errors or Omissions

Recommendation:

- 14. City Council request the Executive Director, Facilities Management to implement procedures to reduce design errors and omissions. Such procedures to include:**
 - a. Ensuring that design work is properly reviewed and authorized;**
 - b. Ensuring the Prime Consultant and General Contractor/Construction Manager carry out surveys of the site;**
 - c. Ensuring the General Contractor/Construction Manager performs a review to confirm the “constructability” of the design; and**
 - d. Evaluating the performance of the Prime Consultant at frequent intervals.**

Improve Enforcement of GC/CM's Responsibilities to Review Costing of Change Orders

Recommendations:

- 15. City Council request the Executive Director, Facilities Management to establish a process to ensure the cost of extra work is determined in accordance with the terms of the Master Agreement. Criteria should be established as guidance for when independent cost estimates or reviews are required for the pricing of change orders.**
- 16. City Council request the Executive Director, Facilities Management to ensure previously approved change orders are reviewed to ensure compliance with the terms of the Master Agreement and, where applicable, change orders are revised and credits owing to the City for pricing errors are obtained.**

Ensure Timely Recovery of Costs Related to Changes Initiated By Third Parties

Recommendation:

- 17. City Council request that the Executive Director Facilities Management expedite the identification of and billing for additional work undertaken and paid for by the City for third parties.**

Other Improvements to the Administration of Change Orders

Recommendation:

- 18. City Council request the Executive Director, Facilities Management to ensure adherence to operating procedures for change orders and change directives. Adherence should be evidenced in the official records retained in the City's possession.**

Enforce the GC/CM's Compliance With Proposed Project Quality Management Plan

Recommendation:

- 19. City Council request the Executive Director, Facilities Management to enforce the General Contractor/ Construction Manager's adherence to key controls in their "Project Quality Management Plan" within the agreed lump sum amount for Fixed General Accounts and Fee Price.**

Clearly Document the Resolution of Potential Problems Identified Through Inspections and Testing

Recommendation:

- 20. City Council request the Executive Director, Facilities Management to establish a process to track and follow up on issues, deficiencies, and non-conformance identified through site reviews, inspections, and testing.**

CONCLUSION

This report presents the results of our review of the Union Station Revitalization project. We conducted this review mid way through a multiple year project in order to identify any control weaknesses early enough to allow management to make the necessary adjustments reducing long term risks.

Addressing the recommendations in this report will enhance the quality of reporting as well as strengthening controls, improve accountability and enhance the overall effectiveness of contract management.

GLOSSARY

<i>Agreements</i>	<i>Master Agreement</i> (also referred to as the “Master Contract”): The contract documents which govern the general relationship between the City and the GC/CM. <i>Phase Agreement:</i> The agreement between the City and the GC/CM for the construction of a Phase of the Project.
<i>Baseline</i> (<i>budget / schedule</i>)	A formally approved version of the project schedule and/or budget that is used as the benchmark for comparing future progress as the project is completed. A baseline cannot be changed without going through a change approval process.
<i>Constructability</i>	A project management technique to review construction processes from start to finish during pre-construction phase. It is to identify obstacles before a project is actually built to reduce or prevent errors, delays, and cost overruns.
<i>Critical Path</i>	A series of interdependent activities that are critical to the completion of the project, which are used to determine the shortest total duration of the project. The critical path may change from time to time as activities are completed ahead of or behind schedule.
<i>Early Works</i>	Include demolition, abatement and other preparatory work which were included in work packages that were initiated prior to the execution of the Master Agreement and Phase Agreements.
<i>Fee Price</i>	Is (also referred to as the “Contractor’s Fee”) included in the Fixed General Accounts and Fee Price. The Fee Price compensates the GC/CM for all off-site services of district and head office officers and employees, providing reasonable assistance to the project as well as for all of the profit for services provided.

Fixed General Accounts

The “Fixed General Accounts” together with the “Fee Price” is the agreed lump sum amount payable to the GC/CM. Fixed General Accounts includes mobilization and demobilization, core construction staff cost, core construction staff travel (parking and mileage), temporary office furniture and equipment, telephone and fax (including cell phones), site communications, insurance, sanitation and temporary washroom, and project photos.

Reimbursable General Accounts

“Reimbursable General Accounts” work is broken down in the Phase 2 Agreement into a number of different components including permits, bonds, protection of existing facilities, safety equipment, signage, cleanup, winter conditions, temporary enclosures, partitions, barricades, hoarding, water supply, fire protection, surveying, quality control inspection and testing, printing, trash disposal, courier.

Phase

Refers to scopes of work as described in a given Phase Agreement. A Phase may include one or more work packages.

Stage

Describes the grouping together of construction work generally in the order of when the work will be completed within the construction period. A Stage may include one or more phases.

Value Engineering

A process of examining construction processes to determine if equivalent quality can be achieved through less expensive practices or products.

Work Package

Describes deliverables. A work package may be divided into activities performed by multiple trade contractors.

CONSTRUCTION STAGING

Union Station's revitalization is a five-year project. Substantial project completion is expected in 2015, with final completion in 2016.

Stage one

- Completion of early works (demolition, abatement and other preparatory work)
- Start of excavation (“dig down”) under the York concourse, VIA concourse and part of the Bay concourse
- Start of upgrades to mechanical and electrical systems
- Start of restoration work on the exterior façade
- Completion of loading dock
- Completion of the Bay and York teamways (covered walkways) within the viaduct structure
- Completion of West Wing
- Completion of VIA Panorama Lounge
- Completion of two new bike stations
- Completion of York concourse
- Completion of lower retail level on west side
- Completion of first part of North/West PATH across Front St.

Stage two

- Continue with dig down under the Bay concourse
- Continue with construction of the new Bay concourse
- Construction of a retail level below the Bay concourse (part of the future Bay promenade)
- Restoration of VIA concourse
- Continuation of the restoration/repair of the exterior facade and initiate work within the Great Hall
- Restoration of Front St. West moat and York St. moat and installation of moat covers

Stages three through five

- Renovation of the first floor of the East Wing
- Multi-phased dig down below the East Wing for the completion of the Bay promenade retail level
- Completion of the repair/restoration of the Great Hall
- Complete the repair/restoration of the exterior facade
- Reconstruction of the Front St. East moat and installation of a moat cover including removal of the steps down to the TTC
- Restoration of Bay St. moat and installation of a moat cover
- Completion of the NW Path to Wellington St.

Source: Union Station Revitalization website

(http://www.toronto.ca/union_station/construction_staging.htm)

EXHIBIT 2**CONSTRUCTION MILESTONES FOR STAGE 1****Summary**

Activity	Scheduled Start	Scheduled Completion	Actual Start	Actual / Planned Completion
Panorama Lounge	18-Oct-10	6-Oct-11	18-Oct-10	26-Jan-12
Bay Construction Zone	23-Aug-10	26-Jul-12	23-Aug-10	27-Mar-13
York Construction Zone (South and Centre)	23-Aug-10	12-Dec-12	23-Aug-10	29-May-13
(North and North East)	5-Dec-11	12-Jun-13	18-May-12	21-Jan-14
(Vertical Transportation) Via Construction Zone	3-Nov-11	21-May-13	21-Aug-12	6-Jan-14
(South)	23-Aug-10	17-Sep-12	23-Aug-10	20-Mar-13
(North)	20-Jun-12	10-May-13	5-Feb-13	19-Dec-13
West Wing	10-Jan-11	28-Jun-12	10-Jan-11	26-Feb-13
Head House & Concourse	16-May-11	8-Apr-13	14-Mar-11	19-Nov-13
Remaining Works	12-Jun-13	24-May-16	21-Jan-14	23-Dec-16