



Metrolinx

**GO rail corridor construction projects audit
report**

December 2013



**Building a better
working world**

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1. Executive Summary

Background and objectives

With the Big Move (the Regional Transportation Plan), construction projects contribute significantly to the activity at GO. For many years, GO Transit ran relatively small construction projects in the rail corridors. To this effect, direct day-to-day involvement by senior management and leadership enabled hands-on control around the prevention, detection and correction of concerns.

However, the nature of the operations support is changing with an increasing number of rail corridors now being owned by GO Transit. Indeed, GO Transit now owns almost 70% of the rails across which it travels; all of which are in shared rail corridors. As a result, GO has a significant number of construction projects, a range of contractual relationships and a growth of internal resources which it is required to manage. GO Transit is now at a stage where it needs to upgrade its policies and procedures. These policies and procedures need to include strong definitions of roles and responsibilities (for increased consistency, efficiency and risk management) and stronger controls.

Recognizing this, Metrolinx's Internal Audit department engaged Ernst & Young ("EY") to assess the controls in place for the following aspects of GO's project management:

1. Scope development
2. Their review of quotes and estimates and the creation of formal agreements
3. Scope and quality management of the project during construction

In addition to documenting the controls, EY selected 5 sample projects (based on project status, project cost and anticipated scope/cost growth) on one key supplier (chosen by Metrolinx) to test the compliance with those controls and to identify key areas for improvements in the controls environment.

We have been informed that the audit plan will include future priority areas (based on the project lifecycle) and projects, not addressed as part of this audit.

Summary of Observations

In response to the rapid increase in capital project spend, GO is endeavoring to improve its existing project management framework. Furthermore, our interviews with applicable GO Rail Corridor Infrastructure resources and data reviews confirmed that a range of preventative and detective controls are currently being executed to manage risk in each of the three areas addressed by the review. Key existing controls at GO identified during the course of this review include:

- ▶ Creation of Project Charters by the Project Delivery Team ("PDT") to define the scope, cost and schedule.
- ▶ Requirement for review and approval of the Project Charters by GO Management teams and sign-off by relevant stakeholders
- ▶ Definition of project scope and design for execution
- ▶ Use of benchmarks in estimating
- ▶ Review of supplier estimates by the PDT prior to a Purchase Order ("PO") being issued
- ▶ Use of periodic field inspections and bi-weekly progress meetings with the Supplier and Construction teams to monitor project progress and quality issues

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These and other controls are discussed in more detail in section 3 of this report.

The increase in scale, volume and complexity of projects managed by GO has significantly increased the need for expanded project management controls. Specifically, the organization would benefit from the following additional actions:

- ▶ Assessment of the Program Management Handbook (“PM Handbook”) in comparison to industry leading standards with remediation of any identified gaps
- ▶ Development of Project Management Plans (“PMP”) for each project based on the PM Handbook. These would categorize each project based on scale, complexity and risk and then define how each specific project would be planned, executed, controlled and monitored
- ▶ Clarification of roles, responsibilities and accountabilities
- ▶ Establishment of structured periodic project and portfolio level reporting to the original baseline. This should include upgrade of associated processes and systems, including mandating the contractor reporting requirements
- ▶ Stronger document management and control, the use of formal Organizational Change management techniques for their deployment and an assurance program to help ensure consistency

These and other opportunities for improvement are detailed in section 4 of this report. Management noted that they recognize the importance of maturing the project management framework and are investing in further development of project controls.

This report has been drafted solely for the use of Metrolinx management and the Board of Directors and is not to be used for any other purpose.

The logo for Ernst & Young LLP, featuring the company name in a stylized, handwritten-style script.

2. Scope and approach

To understand the current project management practices and document the associated controls, EY interviewed GO Rail Corridor Infrastructure personnel. We also reviewed controls documentation (PM Handbook) and evaluated project documentation (Project Charters, project estimates, purchase orders, change orders, meeting minutes and project statuses) for the five selected projects listed in table 1 below.

Table 1 - List of projects reviewed for controls compliance

PM Team	Project Reference	Status	% Complete	Approval for Capital Expenditure (AFCE) Amount	Contract Type
Civil	119710 - Grade Separation-King Road	Construction	95%	\$17,000,000	Cost-plus
Civil	119714 - KW1 EXP - Georgetown to Silver junction	Design/Study	15%	\$18,000,000	Fixed price
Civil	106713 - TWAD P1-Bay ST N. Bridge EXP-Niagara	Construction	65%	\$3,000,000	Fixed price
Track & Signals	119715 - TWAD P1-Hamilton Rail Service EXP	Design/Study	52%	\$87,900,000	Fixed price
Track & Signals	89793 - Track & Signal Extension-Richmond Hill	Design & Construction	70%	\$60,900,000	Fixed price

Source: Project Financial Summary and 5 Year Capital Plan information for T&S and CI provided by Project Management team

The observations and opportunities for improvement were presented to the GO Rail Corridor Management team and the Project Management and Program Systems (“PMPS”) team for their concurrence.

The scope of work reflected the following:

- a) This review is limited to those areas within the defined scope and approach. EY’s review did not cover the entire project lifecycle; the project focused on (i) Scope development; (ii) Review of quotes and estimates and the creation of formal

- agreements; and (iii) Scope and quality management of the project during construction.
- b) EY selected a sample of 5 projects for testing the controls in place, and the selection was limited to one supplier and may not be representative of other suppliers.
- c) This review did not assess the broader performance of controls across the complete project lifecycle.

In addition, this review was conducted during October and November 2013. As such, it represents the situation at this point in time and does not include assessment of any improvement initiatives that Metrolinx is currently undertaking.

3. Existing Controls

Capital Infrastructure projects in the rail corridors are managed by the Track & Signals (“T&S”) and Civil Infrastructure (“CI”) teams whose projects differ widely both in terms of scope and contractual structure. The following table (Table 2) forecasts the volume of activity for the Track & Signals and Civil Infrastructure teams in FY2013/14.

Table 2 – Forecasted volume of projects for FY2013/14

Group	Number of Active Projects	Capital Spend Forecast (2013/14)	Estimated total project costs
Track & Signals	24	\$32,600,000	\$543,500,000
Civil Infrastructure	13	\$85,000,000	\$868,900,000

Source: Project Financial Summary and 5 Year Capital Plan information for T&S and CI provided by Managers

To assist in the standardization of its project management practices, GO has developed a PM Handbook for construction projects. The purpose of this handbook is to provide project management guidance to the Project Delivery Team (“PDT”) spanning the lifecycle of their projects.

The PM Handbook was developed by the PMPS group in conjunction with GO’s Project Delivery Teams across the different Business Units and was rolled out to the organization.

We also noted that both GO PDT from Track & Signals and Civil Infrastructure consist of Managers and Project Managers with experience in the rail industry. Key specific controls identified through our interviews, high-level review of the PM Handbook, testing, and walk-throughs of documentation on select projects are listed below.

- A. Scope development:** Controls identified in this section cover scope development and refinement from project inception through completion of the detailed design. These controls include scope identification via Project Identification Forms, Environmental Assessments (EA) or other initiating documents; development of a high level scope in the Project Charter; and further development/refinement of the detailed scope and design for construction.
 - i. The project is identified and the scope is circulated to management using the Project Identification Form (“PIF”). A PIF is not required for projects initiated via other methods (e.g., EAs, government ruling, etc.)
 - ii. The PDT is engaged to further define the scope, cost and schedule in a Project Charter.

- iii. The Project Charter (“PC”) is approved at the appropriate levels per the PC template. These approvals include GO Executive Management (“GEM”) approvals and relevant stakeholder sign-offs.
- iv. The detailed scope, design and specifications are then developed with the design engineer.
- v. The accuracy and completeness of the design and specifications are reviewed and approved by the Project Manager and their supervisors prior to either being sourced as a public tender or sourced through the supplier.

B. Review of quotes and estimates and creation of formal agreements: Controls identified in this section cover creation and refinement of the project estimate starting from the project planning phase and ending prior to commencement of the construction phase. These controls include creation and review on internal estimates (if applicable); evaluation of the Suppliers (or their Design Engineer’s) estimate; and agreement of a final project estimate prior to commencement of construction.

- i. In some cases, an internal estimate is created by the Project Manager and is reviewed by the Manager. This internal estimate is included in the Project Charter.
- ii. The accuracy and completeness of the suppliers estimates are tested through benchmarking exercises and other internal/external reviews.
- iii. Benchmarking includes comparison of hours and costs with historical projects and the past experience of the technical team. Moreover, depending on the complexity of the project, the estimates are sent to the PMPS group for further internal/external reviews.
- iv. Prior to committing the funds, the PO is signed off by the technical project team and appropriate levels as per financial authority.

C. Scope and quality management of construction work: Controls identified in this section cover the management of scope and quality during execution of the construction phase. These controls include management of the scope and all associated changes; providing assurance on the quality of the deliverables; and the associated project progress and quality assurance reporting.

- i. The scope and quality is managed by the GO project management team through field inspections and bi-weekly progress meetings. These meetings are documented and actions are tracked.
- ii. Changes to the project baseline (scope, cost and schedule) are controlled through a change management process and PC updates. All change order requests with the necessary justification are provided to the GO Project Management team for review and approval (via financial authority).
- iii. Once the Change Order Request has been approved the Change Order is formalized and an approved change order is issued to the Supplier.

4. Opportunities for Improvement

Project management practices at GO have been evolving to address the growth of capital project activities. During the course of discussions with GO Rail Corridor Infrastructure Management, management noted that several improvement initiatives are under way.

Our review of existing controls and their effectiveness has identified certain opportunities for improvements which will further develop the standards of project management at GO. Overall, the organization would benefit from the following additional actions:

- ▶ Assessment of the PM Handbook in comparison to industry leading standards with remediation of any identified gaps
- ▶ Development of a PMP for each project based on the PM Handbook. These would categorize each project based on scale, complexity and risk and then define how each specific project would be planned, executed, controlled and monitored
- ▶ Clarification of roles, responsibilities and accountabilities
- ▶ Establishment of structured periodic project and portfolio level reporting to the original baseline. This should include upgrade of associated processes and systems, including mandating the contractor reporting requirements
- ▶ Stronger document management and control, the use of formal organizational change management techniques for their deployment and an assurance program to help ensure consistency

These were recurrent themes during our review. The detailed potential improvements are described in Sections 4.1, 4.2 and 4.3 organized in line with our review work scope.

4.1 Scope development

Given the diverse nature of projects in the Track & Signals and Civil Infrastructure teams, the initial scope of the project can originate from a number of different sources within and outside of GO. GO could benefit by considering the following improvements in scope development:

- a. Ensuring alignment of scope definition requirements in the project charter with the phase, size and complexity of the project
- b. Ensuring that the impact of the project scope on other functions, projects and/or systems is captured in the Project Charter including any scope exclusions
- c. Implementing mandatory use of the PMP (tailored for the project) and capturing the baseline. For each project, this should include definition of the specifics tailoring and use of the following management processes:

- ▶ Scope and change management
 - ▶ Cost management
 - ▶ Schedule management
 - ▶ Procurement management
 - ▶ Quality management
 - ▶ Risk management
 - ▶ Document management
 - ▶ Communication management
- d. Identifying risks in sufficient detail enabling alignment of the scope definition by the risk factors in the internal and external environment
 - e. Clarifying responsibilities and accountabilities for accuracy and completeness in scope development
 - f. Evaluating the strength and effectiveness of scope development controls through appropriate, periodic assurance activities

4.2 Review of estimates

The role of GO's project management team in review of estimates varies according to the phase and contractual structure of the project. In some projects, an external cost estimator is engaged to develop an independent estimate. Typically cost estimate reviews occur at estimation of design fee, estimation of construction cost during design, and construction bid reviews. GO could benefit by considering the following improvements in review of estimates:

- a. Developing and implementing documented procedures for review and approval of estimates including related document management
- b. Updating the PM Handbook to:
 - ▶ Provide guidance around determining the accuracy and completeness of estimates at each phase of the project along with clearly established responsibilities and accountabilities.
 - ▶ Define tolerance ranges for the estimates at each phase
 - ▶ Contain guidance on creation of pre-design estimates to ensure a controlled scope and to account for costs related to permitting, internal resource requirements, engagement of additional consultants, etc.
- c. Establishing service level agreements between the Business Units and the project controls team (within the PMPS group) in order to engage them in the development and review of estimates as appropriate (including external third party reviews)

- d. Developing and implementing documented procedures for calculating the owner's contingency commensurate with the project's risk profile
- e. Ensuring estimate reviews include the review of owner's contingency reserves. Additionally, the contingency reserves should also be tied to the allocation of contingency for risk mitigation
- f. Improving benchmark data in the centralized cost database and augmenting its use to develop and review estimates
- g. Clarifying roles, responsibilities and accountabilities for evaluating the accuracy and completeness of estimates
- h. Evaluating the strength and effectiveness of estimate review controls through appropriate, periodic assurance activities

4.3 Scope and quality management

The role of GO's project management team in managing scope and quality varies according to the phase and contractual/funding structure of the project. Often a third party construction administrator is engaged to monitor, control and report on construction activities. GO could benefit by considering the following improvements in scope and quality management:

- a. Implementing mandatory use of the PMP and documenting the scope, change and quality management approach for each project
- b. Ensuring that the PMP captures the original baseline and tracks scope changes without resetting the baseline
- c. Documenting and classifying change orders in GO's cost tracking and reporting system. Classification of change orders will enable GO to analyze change orders and evaluate the root causes thereof
- d. Enforcing that change order request requirements (documented in the PM Handbook) are complied with
- e. Ensuring that project reporting requirements are established in the contracts and, at a minimum, include reporting on risks and other concerns on scope and quality
- f. Clarifying roles, responsibilities and accountabilities for scope and quality management
- g. Evaluating the strength and effectiveness of scope development controls through appropriate, periodic assurance activities
- h. Ensuring that project management reporting covers end-to-end performance reporting against the baseline, and leveraging the following logs/reports will improve the monitoring and controlling of project scope performance and management of risks:
 - ▶ Issues log
 - ▶ Non-conformance log
 - ▶ Change order log
 - ▶ Back charge log
 - ▶ Risk register
 - ▶ Project performance reports