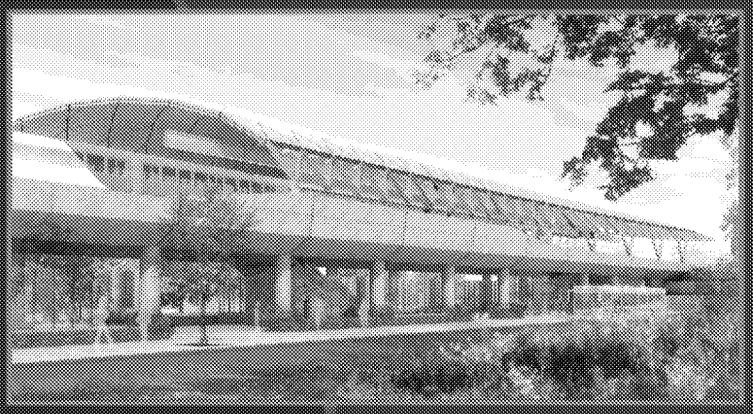
Ottawa



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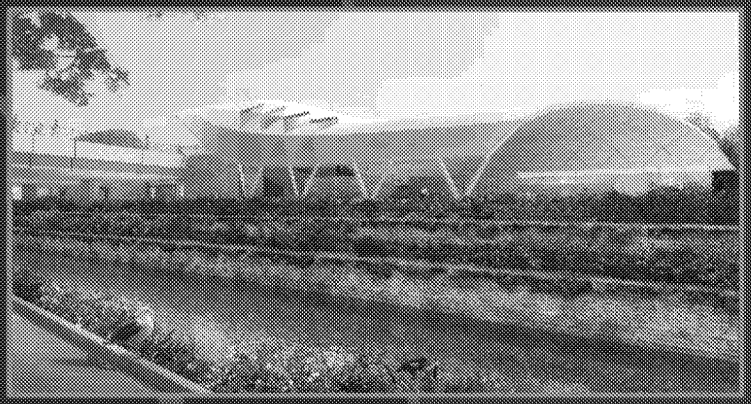

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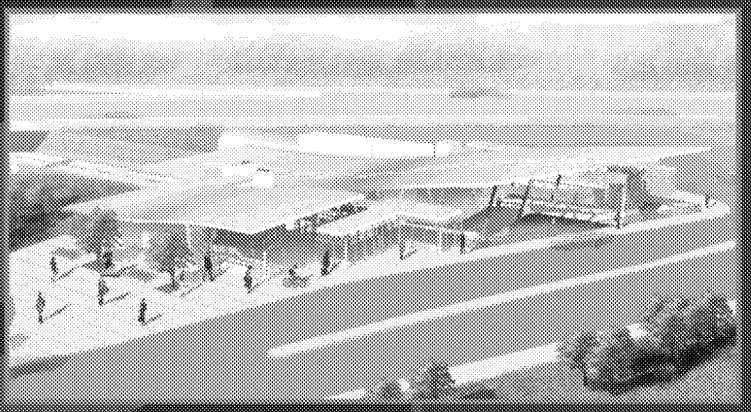

AFFORDABLE

Project Management Plan

30 March 2012

Ottawa Light Rail Transit Project

Phase 1, Increment 1 | Tunney's Pasture to Blair Station

www.ottawalightrail.ca

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Table of Contents

[TOC \o "1-2" \h \z \u]
List of Tables:

[TOC \h \z \c "Table"]
List of Figures:

[TOC \h \z \c "Figure"]

1. INTRODUCTION

Purpose

The purpose of this Project Management Plan (PMP) is to establish a high level framework of management and governance between the Rail Implementation Office (RIO), the Deputy City Manager, the City Manager and City Council for the planning and implementation of the Ottawa Light Rail Transit (OLRT) project. This PMP will also provide the framework for the development of a detailed and ongoing plan for the management and implementation of the project by the RIO as assisted by Infrastructure Ontario and Lands Corporation (IO).

This document provides a description of the project objectives and benefits, project scope and deliverables, project governance and detailed management plans needed for the effective delivery and management of this project, including the expenditure of public funds and schedule.

City of Ottawa Term of Council Priorities

In 2011, Ottawa City Council approved a new Corporate Planning Framework that describes the Term of Council strategic priorities, strategic objectives and strategic initiatives to be achieved in the 2011 – 2014 timeframe. The City of Ottawa Strategy Map included below provides an overview of the strategic priorities. The development of a Light Rail Transit system is an integral component of the Transportation and Mobility Strategic Priority.

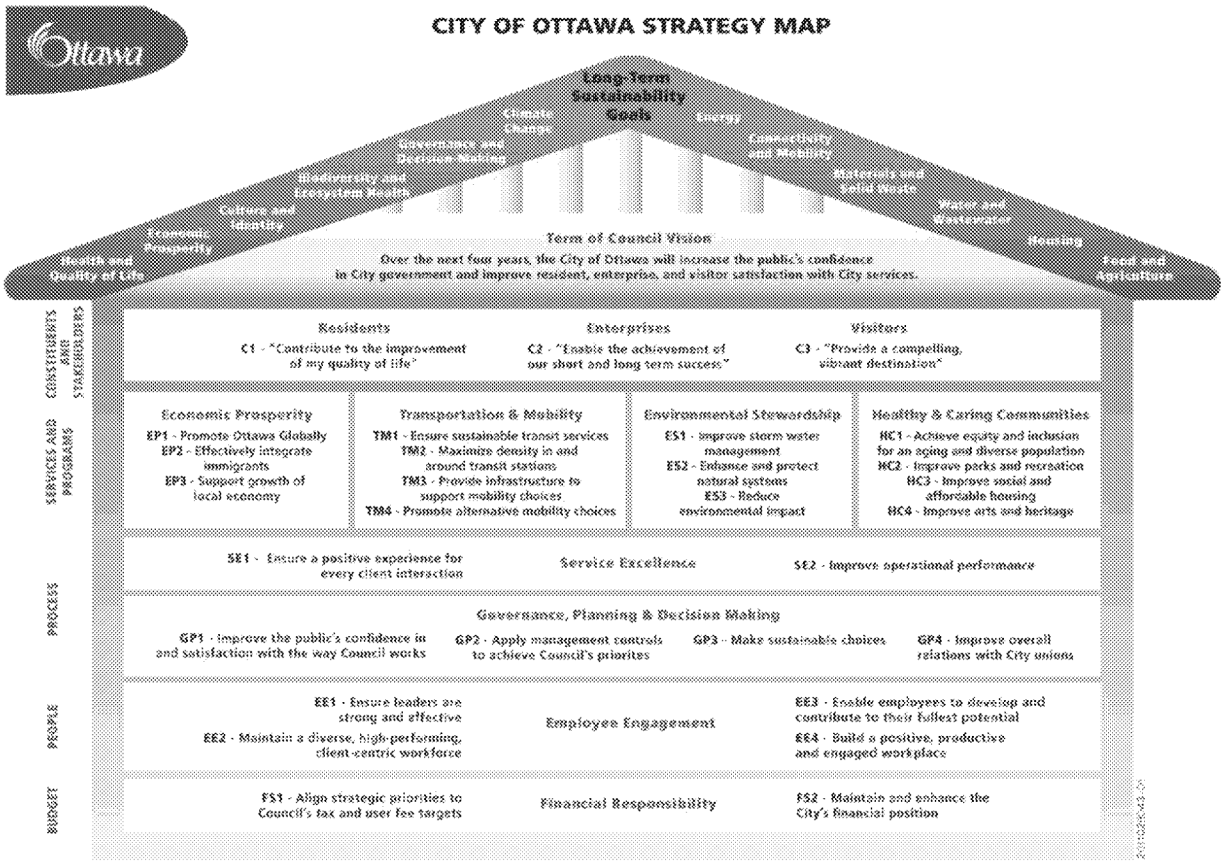

Figure [SEQ Figure * ARABIC] - City of Ottawa Strategy Map

Background

The Downtown Ottawa Transit Tunnel (DOTT) Planning and Environmental Assessment Study developed a plan for a new electrified grade-separated rapid Light Rail Transit (LRT) system. It follows Council's November 2008 decision to move forward with Phase 1, Increment 1, of the Transportation Master Plan (TMP). In May 2009 City Council approved the preferred corridor alignment and station locations. The preferred alignment was based on an evaluation using a set of criteria developed for a grade-separated LRT system and forms an important part of the planning phase of the study.

Council adopted a series of recommendations in January 2010 that led to the approval of the Recommended Plan for the project and the start of the formal Environmental Assessment (EA) under the Province's new expedited transit EA process.

The project schedule was advanced by a full year when Council approved the schedule acceleration and procurement option recommendations included in the May 2011 Report to Council. Substantial completion will occur in 2018 instead of 2019.

On July 14, 2011 Ottawa City Council approved the implementation of the Ottawa Light Rail Transit Project report. The report included approval of the following key recommendations related to the implementation of the project:

- A revised Queen Street tunnel alignment
- Selection of the public-private Design-Build-Finance-Maintain (DBFM) procurement model
- Selection of the Request for Qualifications (RFQ) / Request for Proposals (RFP) process
- Engagement of Infrastructure Ontario (IO) as the Commercial Procurement Lead for the ORLT procurement process, and
- Approval of the Business Case update for the OLRT project.

The light rail transit project encompasses 12.5 kilometres of new electrified light rail transit, between the Tunney's Pasture and Blair transit stations, primarily on the existing Transitway corridor. Thirteen LRT stations have been identified along this route, which includes three underground stations serving downtown in a 2.4 km long twin tunnel system. The project also includes the design and construction of a maintenance and storage facility to support LRT operations, which will be located on Belfast Road.

Project Vision

To leverage the power of transportation and community to create a modern, integrated capital city that is environmentally, socially, economically and culturally sustainable and a desirable place for living, working and visiting.

Light rail will shape how we grow our City.

The City of Ottawa's Light Rail Transit system will be in line with the city's sustainability goals, efficient, and universally accessible while also providing residents and visitors with a convenient link to a variety of communities and specific destinations. The LRT will present a safe, comfortable, pleasant and above all efficient means of transportation for all transit riders. The system will be attractive, with every station respecting and capitalizing on its context, incorporating public art and showcasing the City's local, national or international significance – both historical and contemporary.

Project Focus

The City of Ottawa's LRT Project will strive to deliver upon the following three focus areas:

1) The implementation of a functional project that is capable of addressing Ottawa's projected transit ridership rates. The OLRT Project will also provide the design flexibility needed to increase the system's capacity in response to future fluctuations in transit usage.
2) Minimizing the impact of construction on the quality and efficiency of the transportation options available to residents. While also, re-orienting Ottawa's transit system in order to provide residents with the most effective transportation system following completion of the LRT system.

3) The OLRT Project will support Transit-Oriented Development Strategies through the intensification and re-orientation of development around all thirteen OLRT stations. The project will also contribute to the creation of liveable downtown core by establishing rapid transit connections with mixed-use urban areas that are easily manageable for pedestrians and other forms of sustainable transportation.

Document Organization

The Project Management Plan informs the process, from preliminary engineering to implementation and handover of the LRT project. It sets out and confirms certain existing guidelines, policies and regulations and establishes new guidelines that will affect the Project implementation. The intended audience for this document is the City of Ottawa Senior Management, RIO managers and select Project stakeholders.

Document Change Control

The Project Management Plan will be amended in accordance with City of Ottawa policies whenever changes to the project scope, schedule, and funding move the Project outside of the original intent of the plan or when there is a significant change in any of the management plans associated with the overall plan.

If a significant change occurs to the Project Management Plan that affects the governance of how the Project will be managed, how change control will be handled or how documents will be approved then the Project Management Plan should be sent to be re-endorsed/ re-signed with the modifications. The Project Management Plan should also be re-endorsed/ re-signed if there is a new Project Director or Manager of Project Controls.

The following format will be used to control the development and amendment to the Project Management Plan. It will be used together with the change management process. Changes to the Project Management Plan will be documented by replacing the original sections in the overall plan but noting the change via the version # in the footer of the section number.

The Project Management Plan will be stored on the Business Information Management System (BIMS), the City's official records management system, as a transient record. The plan will be stored as a transient record instead of an Official Business Record (OBR) to enable changes to be made to the document. At the completion of the project the Project Management Plan will become an OBR.

Revision Number	Date of Issue	Author(s)	Brief Description of Change
-	30 March 2012	John Beard	Initial release for approval

2. ENDORSEMENT AND SIGNOFF

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3. SCOPE OF WORK

Project Description

The overall scope of the Ottawa Light Rail Transit Project involves the delivery of 12.5 km of new electric light rail transit (LRT) running from Tunney's Pasture to Blair via a downtown transit tunnel. Included in the scope are thirteen stations, three of which are underground in the 2.5 km tunnel, while the remainder are situated along the above grade corridor. The new LRT generally follows the alignment of the existing Transitway. In addition, a Maintenance and Storage Facility will be provided to house and maintain the light rail vehicles (LRVs) running on the line and on future extensions to the City's LRT network and provide maintenance, signalling, communication and control facilities required for the entire planned LRT network. The Project also includes the purchase of 65+ LRV and the purchase of all necessary land currently not owned by the city of Ottawa.

In order to deliver this scope, the Ottawa Light Rail Transit Project is comprised of multiple related projects, initiated throughout the Project's life cycle and managed in a coordinated fashion. The City of Ottawa's Rail Implementation Office (RIO) oversees and provides guidance to the projects, and integrates monitors and controls the interdependencies among the projects. The RIO will ensure that project management methodologies evolve to remain current, as design evolves and more implementation detail becomes available over the life cycle of the project.

The RIO mitigates the risk activities that span the projects and manages the contingencies accordingly and tailors the project management processes and interfaces across the project to align with individual project methodologies. For example, a complex and crucial component of overall project success was the City's evaluation of the various procurement and project delivery models for the coordination of the interface between projects. Prior to the engagement of IO, several different procurement vehicles (e.g. Public Private Partnership (P3), Alternative Finance & Procurement (AFP) as well as traditional Design-Bid-Build (DBB)) were assessed.

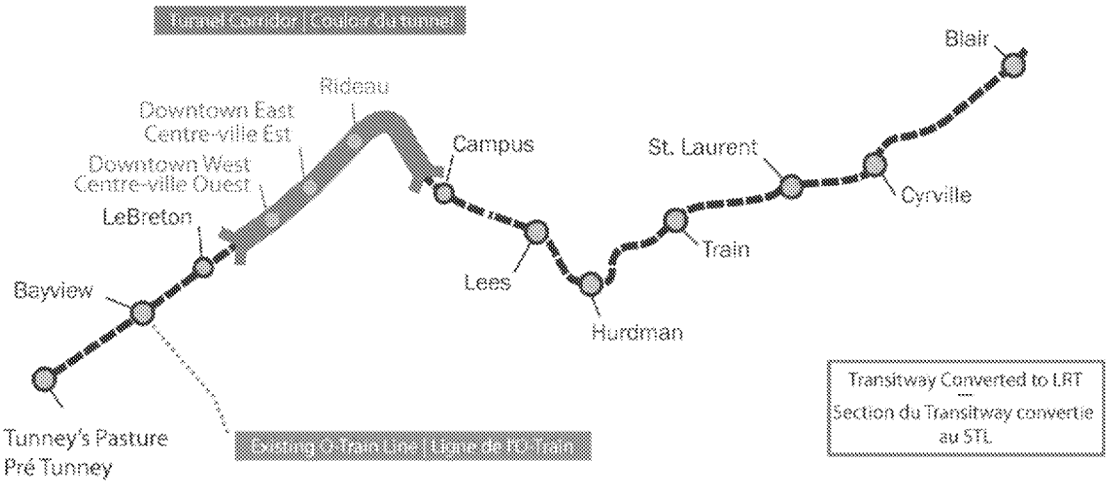

Figure [SEQ Figure * ARABIC] - Overview of the Approved Light Rail Transit Corridor

Projects within the Project

The individual projects that comprise the OLRT Project have been identified based on expected timing of delivery and continuity of deliverable scope, and include:

- Transportation Demand Management (TDM)
- Transit Oriented Development (TOD) and Urban Renewal
- Preliminary Engineering
- Property Procurement
- Construction
- Mobility and Detour Planning
- Vehicle Purchase

The following diagram depicts the inter–relationship between these projects and priorities contained within the OLRT Project:

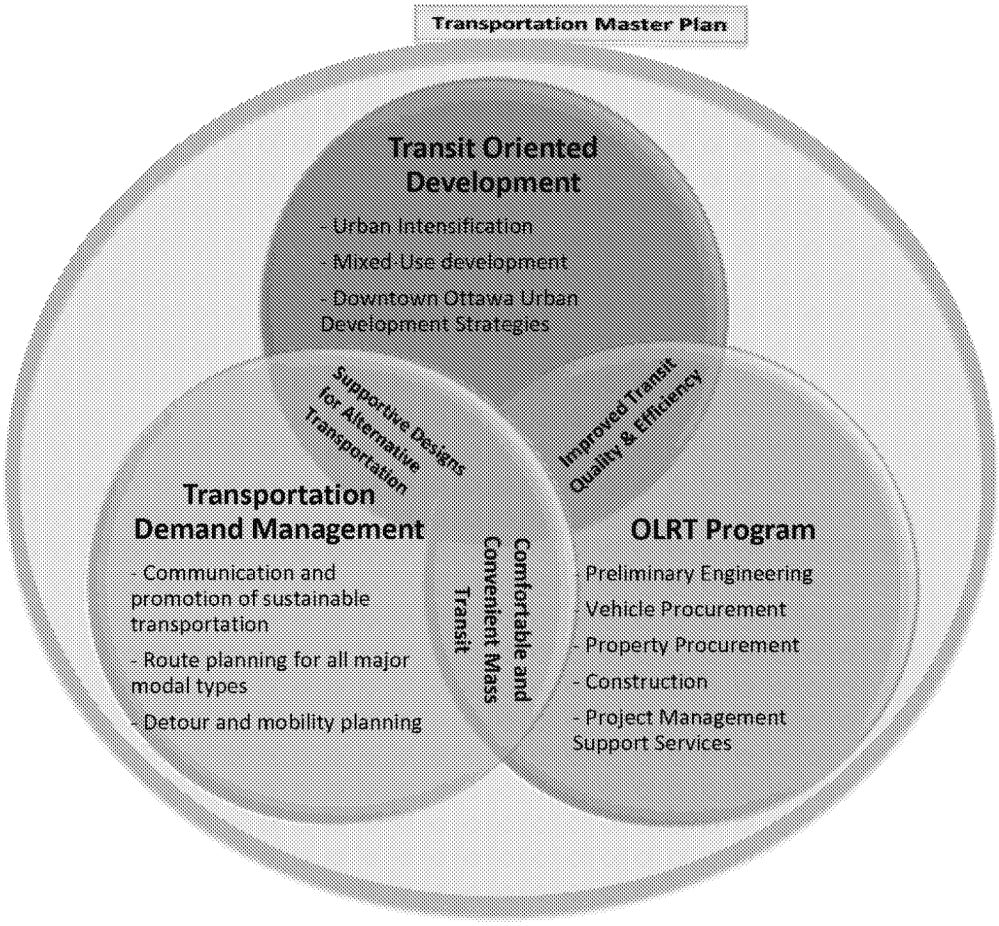

Figure [SEQ Figure * ARABIC] - Inter-relationships between the projects and priorities contained within the OLRT Project

The Scope of Work for each of these projects has been detailed below:

Transportation Demand Management (TDM)

TDM seeks to reduce traffic congestion and improve transportation by encouraging residents to limit the number and length of their trips, travel by alternative methods of transportation, and to travel outside of peak periods. The OLRT project will contribute to the objectives of Ottawa's Transportation Master Plan

by developing a TDM Strategy (TDMS). The objective of the
TDMS is to identify key measures that can: reduce single-occupancy vehicle travel; increase transit ridership; encourage other sustainable modes of transport and advocate flexible work arrangements. The TDMS will also develop a strategy for communication and outreach of key transportation issues in order to educate residents of the available options and to promote the transition toward greater use of public transit and eventually the OLRT system.
The TDMS will facilitate the use of sustainable transportation for the duration of construction, while also contributing to the achievement of the City of Ottawa's the long term public transit modal split by 2031. The TDMS will place a high priority on promoting the use of pedestrian and cycling networks throughout the City as a means of transforming Ottawa into a more sustainable urban area. Coordination with the Traffic Management Plan and the Transit Detour Plan will also be critical in order to maintain the efficiency of all the City's transportation networks throughout the project.

Transit Oriented Development (TOD) and Urban Intensification
The OLRT project will encourage and actively integrate high level TOD strategies into the communities surrounding all thirteen OLRT stations. The TOD activities will focus on promoting efficient and effective land use and layout of all of the new developments. This will contribute to the intensification of residential developments and the re-urbanization of Ottawa's core. OLRT Project's land use strategies will also improve the efficiency of the transit system by fostering growth of mixed-use centres enabling transit riders to accomplish more tasks at a single location. Mixed-use centres will also contribute to economic rejuvenation and community re-development in line with the City of Ottawa's TOD Guidelines.

The TOD strategies will strive to make walking, cycling, and public transit the easiest forms of transportation within all of the new development areas. These activities will mainly focus on the creation of supportive streetscapes and intensified pedestrian friendly commercial developments. The OLRT Project will also design and orientate all stations and the surrounding environment to support transit usage, in combination with pedestrian or bicycle travel.

Finally, the OLRT Project will seek to improve the ridership experience and the community usage of transit stations by incorporating public art and other cultural elements. The City of Ottawa is also placing a high priority on making the stations destinations in themselves that support the activities of the surrounding community in accordance with the City's TOD Guidelines.

Preliminary Engineering
The initial phase of the OLRT Project is the work required to advance the level of design outlined in the DOTT Planning and Environmental Study – Recommended Plan that was approved by City Council on 13 January 2010. The recommendation and commitments identified in the Environmental Assessment will be taken into account and the completed design must comply with both Federal and Provincial regulations.

The Preliminary Engineering (PE) phase scope includes all professional design, engineering administration and Project Management Services required to further develop the design to a level suitable for procurement, including:

- Station elements
- Runningway elements
- Special track work
- Light Rail Vehicles
- LRT maintenance & storage facility
- Traction Power and Distribution
- Life safety features

Station Elements
Final design of the thirteen OLRT station elements, including three located underground in the downtown transit tunnel, will be developed in accordance with the draft Design Guidelines for Light Rail Stations and the Ottawa Green Building Policy (OGBP). The design of Tunney's Pasture, Campus, Lees, St. Laurent and Cyrville stations will reflect a straightforward conversion from existing Bus Rapid Transit (BRT) platforms, while other stations will require more complex reconstruction in order to:

- Accommodate connections to future LRT lines
- Integrate into NCC development lands
- Accommodate major bus-rail passenger transfers
- Provide an improved alignment for rail operations

OLRT stations will be incorporated into existing structures and integrated with mixed-use areas in order to promote economic development and sustainable communities. The convenience afforded by mass transit such as LRT provides direct economic benefits due to the improved accessibility of the businesses and communities surrounding the transit stations.

All of the thirteen OLRT stations will incorporate local art and other cultural elements into the station design. The public investment in art is part of the City's wider strategy aimed at improving the ridership experience, decreasing vandalism, and supporting local innovation and creativity.

Runningway Elements
The runningway preliminary engineering design work addresses the conversion of the existing BRT, as well as new at-grade, elevated and underground LRT segments.

Special Track Work
The preliminary engineering scope includes the design of special track work at key locations along the LRT alignment to support operational requirements such as temporary train storage, train turn back, switching, and full operating speed at the West and East ends of the DOTT alignment.

Light Rail Vehicles (LRV)
The preliminary design effort included development of a LRV concept report which engaged the LRV industry through workshops. It also leads efforts in the production of project specific output specifications for the LRV to support the OLRT project in the procurement process and contract administration.

LRT Maintenance and Storage Facility
During the preliminary engineering phase, the design of the maintenance & storage facility on Belfast Road will be developed in accordance with the Design Guidelines for Light Rail Stations. As required by the Ottawa Green Building Policy (OGBP), stations will be designed and delivered in accordance with the 'Certified' performance level of the Leadership in Energy and Environmental Design – Canada (LEED™ - Canada) Building Rating System.

Traction Power and Distribution
The scope of the Preliminary Engineering phase included load flow studies to determine the number and location of Traction Power Substations across the alignment to feed direct current power to the Light Rail Vehicle via an overhead catenary system.

Life Safety
The preliminary engineering project scope involves the design of life safety features and systems in accordance with National Fire Protection Association standards, especially NFPA 130: Standard for Fixed Guideway Transit and Passenger Rail Systems – 2007. Life safety features include fire detection and voice alarm systems, smoke control and ventilation systems, communications systems, firefighting equipment and fire fighters facilities, emergency lighting, and construction materials.

Property Procurement
Property Acquisition is required for temporary and permanent project needs:

- Station and support facilities
- Runningway
- Maintenance and Storage Facility
- Below-grade easements for tunnel
- Station integration with adjacent properties
- Ancillary Requirements (staging, power, construction and material storage)

The project includes the identification of the land requirements as part of the Preliminary Engineering Project and the development of a strategy for the procurement of such land. This task will be undertaken by the RIO team and will be done through a number of means that will be further articulated in the Procurement Plan section of this document.

Construction

Construction of the project will include the following major tasks:

- Conversion of existing Transitway segments and stations
- Collaboration with MTO regarding the widening of Highway 417
- Construction of new at-grade OLRT segments and stations
- Construction of new underground OLRT segments and stations
- Construction of a new Maintenance and Storage Facility
- Specifying and procuring the required vehicles
- Testing and commissioning of the new OLRT system

The conversion of the existing Transitway will be undertaken in phases in order to limit the impact on Ottawa's current public transit system. Construction elements without any impact on transit service, such as the DOTT, will take place first as an additional means of condensing the transitional period between the existing BRT and the future LRT system. The actual conversion itself will take place in a logical manner with constant consideration for residents relying on public transportation.

Mobility and Detour Planning

The construction phases of the OLRT project will have a direct impact on the operations of Ottawa's public transit system. In response, the OLRT project will mitigate disruptions to overall transportation system by developing a Transit Detour Plan. The central aim of this plan will be maintaining the capacity of the bus system after the Transitway closes for conversion. The project team has identified logical detour routes for the buses that will enable continued service to the existing demand patterns. The efficiency of the Transitway detour routes will be actively supported and improved through the introduction of advanced bus signals, designated transit lanes for BRT along major arteries, and finally through the modification of existing intersections.

The mobility planning component of the project will also re-orient Ottawa's transportation system shortly before the completion of the OLRT system. The transit network will be re-configured in order to truncate at the OLRT and improve the efficiency of the system in general. However, the detailed plan will not be finalized until construction approaches completion due to possible changes to the alignment and/or station elements.

Vehicle Purchase

The project anticipates that approximately 65 to 80 vehicles will need to be purchased to support the project. It currently has been assumed that the vehicle purchase will be integrated with the procurement process for the Design-Build portion of the project. Further review of the contracting and procurement process may lead to the vehicle purchase being segregated from the construction and purchased in a separate arrangement. This will be determined during the development of the procurement plan and the completion of the preliminary engineering.

Project Deliverables

- Property agreements and purchase of required rights to property
- 12.5 km of track
- 2.5 km of tunnel
- 10 above ground, 3 underground LRT stations
- Vehicle purchase
- Art and cultural integration
- Maintenance and Storage facility
- Maintenance spares

- Widening of Highway 417 lanes between Nicholas Street Ramp and Ottawa Road 174
- Project to be completed by 2018
- Project to meet all approved budget requirements
- Project to advance Ottawa's sustainability and TOD strategies
- Life safety will be governed by NFPA and other jurisdictions applicable.

Project Objectives

The Project planning objectives of Phase 1, Increment 1- OLRT Project are as follows:

- Increase Transit Ridership and Mobility
- Enhance Ottawa's Urban Character and National Stature
- Stimulate Smart Growth
- Create Successful Rapid Transit Stations
- Provide Safe and Efficient Linear Infrastructure
- Provide a Safe and Efficient Tunnel and Compatible Portals
- Be Compatible With Adjacent Communities
- Maintain or Improve Natural and Physical Environments
- Showcase Sustainable Design Best Practices
- Manage Construction Disruption, Mobility and Risk, and
- Result in a Wise Public Investment

Further details relating to the Project objectives are outlined in other documentation created by Transit Services, the Rail Implementation Office as well as other city departments. Further detail is contained in documents such as in Section 7 of the Environmental Project Report, the Economic Development Strategy, the OLRT Sustainability Plan, the Traffic Demand Mobility Strategy, etc.

Project Benefits

The City of Ottawa's LRT Project will provide the following benefits to the City of Ottawa:

Environmental Benefits

- A reduction of 94,000 tonnes of greenhouse gas (GHG) emissions and
- 4600 tonnes of criteria air contaminants (such as volatile organic compounds, nitrous oxides, sulphur oxides and particulate matter) by 2031, valued at $36 billion.
- Reduced fuel consumption by 10 million litres annually.
- Reduction of over 5600 tonnes of road salt per year in winter maintenance of the Transitway.

Economic Benefits

- Operating savings at Transit Services beginning in 2018.
- LRT construction will inject $3.3 billion into the Ottawa economy and create 20,000 person-years of employment.
- By 2021 the OLRT system will produce a net savings of $16M a year versus attempting to provide the equivalent bus service through downtown
- Implementation of the LRT in the downtown will allow the avoidance of more than $51 million in annual bus costs to achieve the same level of mobility through the core by 2021
- Transportation user benefit estimate of $3 billion in present value over the 30 year analysis period including:
    - $1.1 billion in vehicle operating savings
    - $1.5 billion in time savings
    - $4 billion in accident avoidance savings
- Transit-oriented development along the LRT route will help the City achieve its targets for increased intensification and protection against urban expansion pressure

Public Transit

- The OLRT project will provide a substantial increase in carrying capacity through the core and is expected to contribute to the following significant ridership increases:

  - More than 40% of all transit trips taken in the City will use the OLRT project for all or part of their journey
  - Annual ridership through the four downtown stations is expected to double to 50 million by 2031
  - Cumulative 156 million new trips between opening in 2018 and 2031
- A typical ride will save up to 15 minutes daily commute time. The tunnel is the primary factor for improved travel times through downtown; LRT will avoid the 14 traffic signals, and reduce conflicts with surface traffic, service vehicles and pedestrian crossings.
- OLRT will remove more than 50% of buses currently in the downtown core, including more than 2000 daily bus trips along the Wellington/Rideau St. corridor.
  - The LRT rider experience will be enhanced by more efficient boarding, improved levels of comfort and service and reduced wait times as 'every train is my train'
- The grade-separated downtown tunnel will result in reduced roadway congestion, allowing for improvement of the pedestrian and cycling environment
- Urban Design Guidelines
- Public Art Project
- Transportation analysis calculates that the OLRT project will result in 13,750 fewer vehicles on the road, leading to a saving of 9,600 person hours in the am peak

4. DESIGN CRITERIA

Design Principles

The design principles are the overarching principles that apply to all elements of the Project and whose objectives are related to the successful delivery of the Project. The design principles will in all instances support the following Design Objectives and Vision Statement:

Design Objectives and Vision Statement:
The City of Ottawa's Light Rail Transit system will strive to be efficient, universally accessible and provide residents and visitors with a convenient link to a variety of communities and specific destinations. The system will be attractive, with every station respecting and capitalizing on its context, incorporating public art and showcasing the City's local, national or international significance – both historical and contemporary. The system will focus on being enjoyable, comfortable and safe for its patrons and offer an easy-to-use, reliable, sustainable transportation option for residents and visitors. Over time, the system will anticipate change, evolve and integrate well with its environment through conversion of existing transit corridors and development of new routes according to Council policy and funding decisions.

Design Review Process
The Rail Implementation Office (RIO) will be responsible for coordinating the review and approval of all stages of project design. Centres of expertise from other City departments and, where appropriate, consultants, will be brought in by the RIO as required through the design review and approval process. Specific design submission requirements are as set out in the agreement between the City and the design team. Where stations affect or are located on Federal Government land, additional review and approval by relevant federal agencies will be required. The NCC is the point-of-contact for stations on Federal land.

Codes, Standards and Best Practices
The Project shall be delivered in accordance with all applicable codes, standards and best practices in the shortest timeframe possible. All designs must meet OLRT and City design standards, applicable Federal and Provincial codes, regulations and municipal by-laws, including applicable occupational health and safety legislation.

Life Safety
Provision of life safety features and systems will be governed predominately by standards developed by the National Fire Protection Association (NFPA). This includes fire detection and voice alarm systems, smoke control and ventilation systems, communications systems, firefighting equipment and fire fighters facilities, emergency lighting, and construction materials. NFPA 130: Standard for Fixed Guideway Transit and Passenger Rail Systems – 2007 (NFPA 130) provides fire and life safety requirements for passenger railway stations and runningways.

LEED Design and Sustainability
The City of Ottawa is committed to a sustainable existence and strives to reduce the environmental impacts of its operations. In recognition of the potential negative impacts associated with the design, construction and operation of the civic building inventory, Council adopted in September 2005 the Ottawa Green Building Policy (OGBP) for the construction of corporate buildings. Under the policy, new city buildings are to be designed and delivered in accordance with the 'Certified' performance level of the Leadership in Energy and Environmental Design – Canada (LEED™ - Canada) Building Rating System.

The light rail stations, due their nature and characteristics, will not be eligible under the LEED™ building rating system. The Maintenance and Storage Facility will be eligible for LEED™ certification and will obtain 'Certified' performance. Regardless of the fact that the light rail stations will not be eligible for LEED™, the principles of LEED™ and sustainability will be implemented in the design of the stations as well in all aspects of the project.

Public Consultation

The importance of public consultation cannot be underestimated throughout the life of the Project. At a minimum the following groups will be consulted with:

- City Urban Design Review Panel
- City Accessibility Advisory Committee
- City Arts, Culture and Heritage Committee
- City Roads and Cycling Committee
- City Pedestrian and Transit Committee
- Technical Advisory Committee
- Public Advisory Committee
- Government of Ontario
- Government of Canada
- National Capital Commission

The following activities will have a consultation component:

- Industry outreach
- Federal and Provincial environmental assessments
- Transportation Master Plan
- Functional Design
- First Nations outreach and consultation
- Procurement Strategy
- Public Art Project
- Business Development Strategy

The Business Development Strategy will allow for consultation with business and property owners, within a catchment area of 400 metres surrounding each station, to encourage participation and investment in mutually beneficial projects. The Rail Implementation Office will also be reaching out to multiple external stakeholders throughout the life of the project to identify areas of common interest.

Relevant Design Policies, Guidelines, Projects and Studies

The following is an outline of the Design Policies, Guidelines and Studies that have been adopted for the delivery of the Ottawa Light Rail Transit (OLRT) Project.

Ottawa Official Plan

The Ottawa Official Plan (OP) contains Council-approved policies that support, among many other initiatives, the creation of a more "liveable" city and balanced transportation system. The OP emphasizes improved urban design, public transit, cycling and walking facilities to improve human health and to protect the environment.

Ottawa Transportation Master Plan

The approved Ottawa Transportation Master Plan (TMP) identifies the transportation facilities, services and policies that the City of Ottawa will implement to serve a projected population of 1.14 million people by 2031.

Transit-Oriented Development Guidelines

Transit-Oriented Development (TOD) is generally defined as a mix of moderate to high-density transit-supportive land uses, located within an easy walk of a rapid transit stop or station. The guidelines ensure that future developments are undertaken with a focus on transit and creation of liveable communities within the urban core.

Downtown Ottawa Urban Design Strategy

City Council approved the Downtown Ottawa Urban Design Strategy 20/20 - Phase 1 on March 10, 2004. This document establishes a broad urban design framework that will help create an attractive and lively downtown.

Corporate Sustainability Project
The City of Ottawa's Corporate Sustainability Project seeks to uphold the four pillars of sustainability: economic, environmental, social, and cultural. The Sustainability Project strives to integrate all four of these dimensions into the City's policies, procedures, and decision-making processes.

Ottawa Environmental Strategy
The City of Ottawa's Environmental Strategy addresses the need to protect and strengthen local ecological features and processes, and to reduce the city's environmental impact at the local, national, and global levels. The Environmental Strategy will contribute to the guiding principles outlined in the City of Ottawa's Official Plan with a central focus on achieving four main goals:

- To be a Green city where greenspace is preserved and enhanced
- Development takes place in harmony with nature through better ecosystem planning
- Focus on walking, cycling, and transit to encourage sustainable transportation choices
- Clean air, water, and earth from resource use, waste, emissions, and energy reductions

Choosing Our Future
Choosing Our Future is a joint Project between the City of Ottawa, City of Gatineau, and the National Capital Commission. The Project's central goal is to integrate sustainability, resiliency, and liveability into all aspects of the communities of the National Capital Region. Choosing Our Future will achieve these ends by promoting long-term thinking, system integration and cooperation, along with a broader outlook on the environmental impact of the Nation's Capital.

Ottawa Cycling Plan
The approved Ottawa Cycling Plan (OCP) is a long-term strategy that consists of two phases: 10 year and 20 year. The Cycling Plan will assist in guiding station designers in the formulation of the Pedestrian & Cyclist Movement Study.

Ottawa Pedestrian Plan
The approved Ottawa Pedestrian Plan is supported by the Ottawa Official Plan and Transportation Master Plan. The primary goals of the Pedestrian Plan are to:

1. Increase the pedestrian modal share across the City
2. Assist in guiding future city development in such a way that encourages creation of a high quality pedestrian environment
3. Develop and strengthen the "culture of walking" in Ottawa.

Public Art Plan
In keeping with the Corporate Public Art Plan, Public art will play a significant role in shaping the design theme of all stations that are constructed as part of the light rail project.

Integrated Street Furniture Project
The approved City of Ottawa Integrated Street Furniture Policy and Design Guidelines, August 2009 (ISFP) contains direction for the establishment of coordinated street furniture in the City.

Transit Station Technical Design Guidelines
The Transit Station Technical Design Guidelines will incorporate Transit Services standards, details and requirements for common elements of transit stations.

Ottawa Right-of-Way Lighting Policy
The October 2007 approved Ottawa Right-of-Way Lighting Policy (RLP) contains required methods for lighting streets and sidewalks in new and existing communities for the entire City of Ottawa.

Ottawa Green Building Policy
The City of Ottawa is committed to a sustainable existence and strives to reduce the environmental impacts of its operations. In recognition of the potential negative impacts associated with the design, construction and operation of the civic building inventory, Council adopted in September 2005 the Ottawa Green Building Policy (OGBP) for the construction of corporate buildings. Under the policy,

new city buildings are to be designed and delivered in accordance with the 'Certified' performance level of the Leadership in Energy and Environmental Design – Canada (LEED™ - Canada) Building Rating System.

Crime Prevention through Environmental Design
The City of Ottawa Official Plan endorses the use of Crime Prevention through Environmental Design (CPTED) as part of the wider Crime Prevention Policies.

City of Ottawa Accessibility Requirements
The City of Ottawa works with the community of people with disabilities to ensure everyone can benefit and take part in all that the City has to offer. Stations are to be designed therefore to ensure the comfort, security and experience of public transit usage for people with disabilities is successful.

Downtown Ottawa Transit Tunnel – Recommended Plan
The approved Downtown Ottawa Transit Tunnel Recommended Plan, January 2010 sets out the preliminary design for system alignment, the number, location and the basic design of stations and the storage and maintenance facility. It also contains important preliminary information on project implementation, operation and costs. The recommended plan will be used as a starting point for building on system design. Refinements to the various design elements to achieve cost savings and improve system efficiencies are likely to occur through preliminary and final engineering designs and design-build innovations.

Required Background Studies
In support of the design guidelines the following studies, when completed by the design team, shall be incorporated in the delivery of the Project:

- Advertisement Location Strategy
- Station Design Signature
- Signage & Information Standards
- Pedestrian & Cyclist Movement Study
- Public Art Plan
- Transit Station Technical Design Guidelines
- Urban Design Guidelines – Exterior of Stations and Areas Surrounding
- Sustainability Plan
- Traffic Management Plan
- Transportation Demand Management Strategy

STATION ELEMENTS

Station Overview
Thirteen (13) stations are proposed along the OLRT line. Of these, three (3) will be located underground within the downtown transit tunnel. The other ten (10) stations will be conversions of existing Transitway stations. Tunney's Pasture, Campus, Lees, St. Laurent and Cyrville will be conversions of existing BRT platforms to accommodate LRT technology, some stations will be more complex, such as, reconstruction to accommodate connections to future LRT lines (Bayview), integrate into NCC development lands (LeBreton), accommodate major bus-rail passenger transfers (Hurdman, Blair) or provide an improved alignment for rail operations (Train). Stations along the line will have the following general elements in common.

Design Guidelines for Light Rail Stations
The draft **Design Guidelines for Light Rail Stations** (DGLRS) informs about the design process, from the start of preliminary engineering to final design, for all stations within the light rail project. It sets out certain existing guidelines, policies and regulations and establishes new guidelines that will affect station design. The intended audience for this document is the design team involved in the various stages of light rail system design. It will also assist the public in better understanding the various aspects of design for

light rail station facilities in their communities. The DGLRS document is to be finalized by the PE team in consultation with the City as part of the PE process.

The Design Guideline contains five sections, ranging from providing general to more station specific design guidance. The Guideline must be read in conjunction with applicable documents as well as those set out in the design guideline as follows:

- Section 1 is the Introduction
- Section 2 is Relevant Design Policies, Guidelines, Projects and Required Studies
- Section 3 provides guidance on matters that affect the design of the exterior of stations and areas immediately surrounding the station
- Section 4 deals with the design of the interior of stations
- Sections 3 and 4 apply to the design of all stations except as otherwise noted
- Section 5 provides station-specific design information and, importantly, provides the designer with a synopsis of station contextual issues that may affect station design and function within the community

Station Integration
The OLRT understands the benefit of integrating stations into existing adjacent facilities where operational, practical and financially beneficial.

Station Entrances
This subject is covered in more detail in the Design Guidelines for Light Rail Stations – Station entrances provide access from surrounding streets and buildings to the LRT platform. Entrances can be stand-alone facilities or integrated into existing or future buildings. At underground stations, a minimum of two separate entrances providing access from the surface to platform level will be provided, in accordance with NFPA 130 requirements. Station entrances will be provided with combinations of stairs, escalators and elevators, in order to provide safe, effective and efficient access to the mezzanine level LRT platforms.

Station OLRT Branding and Design Signature
Transit Services is currently undertaking work on an overall transit system branding that will inform the LRT design process. The City is also undertaking, in the first part of PE, a study looking at overall transit system "image" that will inform the LRT station design process

Outdoor Landscaping & Streetscape Development
Planting outside of stations should be used to define spaces, provide shade and reduce wind speed on bus platforms and to help direct pedestrians safely between public streets and station entrances. Importantly, landscaping should be designed to be harmonious with the architecture and scale of the station. Landscaping outside of stations shall be coordinated with sight line locations for security. Fencing will be required in proximity to stations to prevent public access to the track corridor

Bicycle Facilities
Provision shall be made for parking / storage of bicycles adjacent to all at grade stations. Station design, including entrances to underground stations, must accommodate convenient bicycle access to platforms while not compromising safe and efficient movement of pedestrians.

Lighting
All bus platforms and other areas external and immediately adjacent to stations that are accessible to the public shall be well lit to provide improved safety and security. In particular, bicycle parking areas, station entrances (and pedestrian routes through the station up to and including the platform areas) should be brightly lit. Lighting styles on external parts of stations shall be coordinated / complimentary with light styles inside of the station. Only fixtures that are energy efficient, low-maintenance and allow for cleaning and re-lamping without special equipment will be selected. Use of natural light sources shall be considered in all station designs. External station lighting shall seek not to cause sky glow, glare or light spillage onto adjacent residential areas. Emergency lighting systems are required that meet or exceed all regulatory code requirements.

Station Accessibility
All stations will be designed to provide barrier free access, according to or exceeding governing building codes and statutory requirements in accordance with the City of Ottawa's Accessibility Policies.

Ventilation Shafts
Fire ventilation shafts are incorporated into underground stations to provide for emergency exhaust in case of an underground fire.

5. PROJECT INTEGRATION

Project Management Guiding Principles

The project team, RIO, will employ the following guiding principles when overseeing the project:

Respecting Existing Agreements

This Project Management Plan builds upon the concepts and principles established in existing agreements as follows:

- Contribution Agreements
- Approval-in-Principle (AIP) agreements with funding partners
- Memorandum of Understanding Between Ontario Infrastructure and Lands Corporation and the City of Ottawa for the Ottawa LRT Project
- Delegation Agreement from Transport Canada regarding Railway Regulations
- Letter of Commitment (NCC and City of Ottawa)
- Memorandums of Understanding
- Real Property Agreements (Access Agreements, etc.)
- Highway 417 Agreement

Throughout the development and implementation of this Project, all stakeholders will aim to work together in a shared team approach, towards the achievement of the Project scope and all Project objectives, and to this end, fully participate in a partnership of mutual support and sharing of relevant Project information related to Project scope, cost/funding and schedule. All stakeholders will be encouraged to cooperate to expedite resolution of issues.

Communications and Status Reporting

The Project Office will use an established status reporting system to track the OLRT Project progress to completion. This will enable transparency, increased accountability for Project completion and success outcomes, and ensure that the value of OLRT Project is clearly understood

All public communication will be managed through the Communications and Outreach Unit of the Rail Implementation Office. A detailed communications plan will be outlined in the Project Plan.

Public Interest

All stakeholders will be encouraged to protect the public interest in the planning and implementation of the Project by promoting accessibility, sustainability, economy, efficiency and effectiveness. All stakeholders and staff shall work in a partnership of mutual support and collaboration embodying professional and ethical values, and shall share information relevant to the Project subject to respective policies and regulations.

Processes and Policies

The following City of Ottawa Policies, which are made available on the city internal website, will be employed on the project:

Policy Name	Description
Audit Management Procedure	This procedure applies to all City of Ottawa and Office of the Auditor General staff involved in managing Council approved audits and Fraud and Waste audits conducted by the Office of the Auditor General.
Cash Handling Policy	The City shall ensure proper and consistent cash handling, and establish a system of strong internal controls for cash collections to prevent mishandling of funds, to safeguard against loss, and to ensure security of staff and protect employees from allegations of misuse or misappropriation of City funds by defining responsibilities in the cash handling process.

Policy Name	Description
Cash Handling Procedures	These Procedures apply to all City of Ottawa staff and volunteers who accept funds on the behalf of the City and whose financial transactions are captured within the City's financial systems. They do not apply to petty cash funds or change floats (see the City's Petty Cash and Change Float Procedures).
City Owned Property Insurance Claim Corporate Procedures	To provide information and describe policy and procedures for making and settling insurance claims arising from the damage or loss of City owned property and assets.
City Owned Property Insurance Claim Policy	To provide information and describe policy and procedures for making and settling insurance claims arising from the damage or loss of City owned property and assets.
Enhanced Risk Management Policy	The objectives of Enhanced Risk Management are to: embed risk management into the culture of the City; reduce events or conditions that create uncertainty; and ensure that unplanned events are managed effectively.
Ethical Purchasing Policy	The Ethical Purchasing Policy ensures that purchasing activities are aligned with the City's values by seeking to ensure workplaces producing products for the City of Ottawa, respect human and workers rights, as specified in the Supplier Code of Conduct.
Green Buildings Policy	All newly constructed buildings that are eligible for LEEDTM with a footprint greater than 500 square metres (5,400 square feet) must be designed, delivered and certified by the Canada Green Building Council (CaGBC) as being LEEDTM - Canada "Certified" at minimum
Job Evaluation (Management Group)	All management jobs will be evaluated under the Management Group Job Evaluation Project.
Occupational Accident & Illness reporting procedures	These procedures provide direction on reporting work related injuries and illnesses involving City employees
Occupational Health and Safety - Policy	The City of Ottawa is committed to create and maintain a safe and healthy workplace environment for all employees, contractors and visitors while complying with all applicable Occupational Health and Safety (OH&S) legislation.
Organizational Unit and Position Management Delegated Authority Policy	The purpose of this policy is to provide managers with a clear definition of delegated authority for the approval of changes to organizational units and positions within the City of Ottawa.
Ottawa Option Policy	The primary objective of the Ottawa Option Policy is to permit the City to receive and consider unsolicited proposals from private sector parties in a manner that eliminates the perception of bias, and ensures transparency, fairness and best value for the City. The Policy also provides a private sector party with a prescribed process to approach the City with unsolicited proposals that protects their proprietary trade information.
Payment with Reference to a Contract Procedures	This document outlines the parameters for the use of Payment with Reference to a Contract payment method, and consequently the creation of the Financial Support Unit Purchase Order (FPO).
Payment without Reference Procedures	This document outlines the parameters for the use of payments without reference.
Petty Cash Funds and Change Floats	This procedure applies to all staff involved with the custody or administration of petty cash funds/change floats, as well as staff who may require the use of petty cash funds for the re-imbursement of certain minor business expenses.
Purchasing Card Procedures	The objective of the Purchasing Card Project is to establish an efficient and cost effective method of procuring and paying for low dollar value goods and services, while maintaining acceptable levels of control and accountability.
Real Estate Acquisitions	The purpose of this Policy is to ensure that a consistent and equitable framework is followed in the Acquisition of Real Property interests in support of Council approved projects, Projects and policies.

Policy Name	Description
Records Management Policy	The City of Ottawa recognizes that the effective management of the records in its custody, or under its control, is one of its fundamental obligations as a public organization, critical to assuring the protection of the public's rights and essential for the City's accountability.
Recruitment and Staffing	This policy establishes guiding principles for the recruitment and hiring practices for the City of Ottawa.
Temporary Help Agencies Policy	The purpose of this policy is to provide a mechanism whereby managers can meet their short term staffing needs in order to effectively respond to ongoing operational requirements
Temporary Help Agencies Procedures	These Procedures outline the steps required to seek and utilize the services of a temporary help agency.

Table [SEQ Table * ARABIC]: Applicable City Policies

Respect of Approved Baselines
All stakeholders are expected to respect approved baseline budget, scope, timeline limits as approved and are expected to maintain economies with respect to the design and selection of project solutions. These baselines may be updated from time to time based on approved changing parameters associated with the Project.

Respect of Project Management Process
All stakeholders are expected to respect project management processes utilized by the RIO and are expected to work cooperatively to manage project risks as outlined in the Project Risk Plan.

Direct and Manage Project Execution

"Pending financial close of the Request for Proposal (RFP). To be drafted in accordance with the contractual terms between ProjectCo and the City of Ottawa."

Monitor and Control Project Work

"Pending financial close of the Request for Proposal (RFP). To be drafted in accordance with the contractual terms between ProjectCo and the City of Ottawa."

Close Project

"Pending financial close of the Request for Proposal (RFP). To be drafted in accordance with the contractual terms between ProjectCo and the City of Ottawa."

Commissioning and Hand over

The Commissioning Process is a series of discrete activities for achieving, verifying and documenting that the performance of the LRT overall system, facilities and its various systems meet the design intent, as well as, the OLRT and users' operational needs. These activities or processes extend through all phases of a project from concept to construction, occupancy and full operation.

Commissioning will focus on the operation and maintenance of
all systems as an integrated whole. It takes the project from a static condition to a fully operational status, and provides a bridge between construction activities and ongoing operation and maintenance. It also provides the necessary technology transfer tools for operation and maintenance (O&M) activities to be performed properly for the entire service life of the facility.

An approach will be defined that will be used for commissioning and will be provided with a detailed description of the extent of the commissioning activities taking into account whether the project will be owned operated or leased and the complexity of the project systems.

The commissioning process must have the following key features:

- Be appropriate for the size, scope and complexity of the project undertaken
- Ensure quality management and knowledge transfer throughout all phases of the project
- Implement phased commissioning activities
- Ensure that systems are installed, functionally tested and capable of being operated and maintained in conformity with the original design
- Produce commissioning documentation that can be used for re-commissioning throughout the life cycle of the system
- Ensure the system meets the needs of the owner and the occupants, that the system operates satisfactorily under all weather and occupancy conditions, and that the evaluation report has been written and accepted

Commissioning is a planned project of activities that advances built works from the earliest phases of the project identification stage to a condition of full operation, meeting all objectives of commissioning as defined herein. The commissioning process starts in the Project Identification stage and ends when the delivered, fully occupied facility has been proven to operate satisfactorily under all weather and occupancy conditions and the evaluation report has been written and accepted. Commissioning addresses not only technical systems requirements and the functional and operational needs of the occupants and the Owner including health and safety, security, comfort, and cost effectiveness of operations and maintenance but also protection of the architectural character of new buildings and the heritage character of historical buildings.

The proper commissioning of the OLRT System, buildings and facilities ensures that when the built works are handed over to its owner, or operator as an operating entity, it will meet all requirements as described in the Request for Proposal (RFP) and the Project Concept. It requires coordinated efforts on the part of the Project Planning Team, the PE Design Team, the Commissioning Team, the Construction Team and the Project Management Team. During construction, commissioning applies to the implementation phase of the project delivery stage in which systems and environmental performances are verified, and the project is moved from a static form to a dynamic state and the facility is accepted for occupancy.

Commissioning Process

The PE will ensure the commissioning process:

- Provides a bridge between construction activities and ongoing operation and maintenance
- Provides the necessary technology transfer (training) tools for O&M activities to be performed properly for the entire service life of the facility
- Focuses on the operation of all systems as an integrated whole and verifies the performance and interaction of all systems operating together under a full range of operating conditions with simulated full occupancy

The objectives of commissioning process are to:

- Document the design intent of the overall project, including the architectural characteristics (in the case of new buildings), protection of the heritage features and character (in the case of historical buildings) and the proposed building systems and components and to verify and demonstrate that all functional and operational requirements have been correctly interpreted in the design solution

- Minimize O&M costs through the careful selection of design solutions (for economy, reliability, durability, accessibility, maintainability, etc.), construction materials, installation practices and performance verification procedures
- Verify that selected design solutions and the resultant built works protect the safety, health, welfare and comfort of occupants, users and O&M personnel
- Define responsibility areas for meeting these operational requirements in the contract documents and include a process to demonstrate compliance
- Demonstrate that the OLRT client, end users and the various City department's requirements are met during the project implementation and commissioning phases of the project and to support quality management of construction and installation through verification of vehicle components, building components, systems and environments
- Provide performance testing verification and demonstrate that all systems operate consistently at peak efficiencies, under all normal load conditions, and within the specified energy budget
- Provide comprehensive documentation of the operational, maintenance and building management
- Implement a comprehensive activation, training and operator familiarization program
- Transfer the completed works to qualified and trained personnel

System Documentation

This ensures the provision of accurate and useful historical records is assured. Such records provide important data for O&M efforts as well as for future renovations, upgrades or repairs. Technical reports and other commissioning documents serve as benchmarks for future system testing, re-commissioning and for maintenance, upgrade or renovation activities.

Systems Performance Verification

Commissioning extends into the project delivery stage, close-out phase, in order to verify performance under a full range of operating conditions. This practice aims to provide a “no surprises" operation cycle for both OLRT and O&M staff. A thorough system performance verification process will help to avoid unforeseen or hidden O&M expenses later.

6. PROJECT GOVERNANCE

Governance Principles

Governance is the framework of authority for an organization within which its institutional objectives are pursued. Principles that guide good governance include:

- **Accountability:** Taking responsibility for the actions of the RIO
- **Leadership:** Setting the tone at the top to establish good governance
- **Integrity:** Instilling high standards of professionalism at all levels
- **Stewardship:** Maintaining or improving capacity to serve public interest over time
- **Communication:** Decisions and actions are open; accurate and clear information is made available
- **Transparency:** Open and clearly communicated decision making

Governance Structure

Day to day management of the project will be coordinated by the RIO Director, with direction from the Deputy City Manager (DCM) and City Manager, and with assistance from Infrastructure Ontario (IO).

The Project will be governed by the following governance structure that will be kept apprised of all project activities, provide guidance and direction on issues resolution, and provide approvals for the release of contingencies and reserves as laid out by the roles and responsibility matrix.

1. Rail Implementation Office
    - Director
    - RIO Managers
    - Staff
    - IO Project Manager
2. OLRT Internal Coordination Committee
    - DCM, PIP
    - General Managers
    - Directors
    - IO Project Manager
3. OLRT Executive Steering Committee
    - City Manager
    - DCM, PIP
    - DCM, CO
    - City Solicitor
    - City Treasurer
    - Director, RIO
    - GM, Transit Services
    - IO Senior VP, Civil Infrastructure
    - IO VP, Civil Infrastructure
4. Financial and Economic Development Committee
5. City Council

Issues resolutions will be brought to the regular monthly OLRT Internal Coordination Committees meetings. Where financial approvals are required the OLRT Executive Steering Committee will subsequently bring recommendations to City Council for approval.

Change management and approvals will be governed by a formalized delegated level of authority.

The Project Charter ([HYPERLINK "https://cueap07.city.a.ottawa.ca/bimsp/idcplg?IdcService=GET_FILE&dID=589488&dDocName=ERM

PROD_481463&RevisionSelectionMethod=LatestReleased" \t
"_self"]) contains additional governance-related information and graphics.

RIO Project Team

The RIO Project team provides the oversight and accountability of the three element of the project's focus: project functionality, management of mobility, and transit-oriented development. The main focus areas of the team are geared to lead the PE process and construction and to ensure the property and vehicle procurement is done fairly and equitably. The PE team will report into the RIO team through the PE Project Manager. The RIO Engineering & Maintenance, Business Services & Communications, Property, Planning, Procurement & Funding, Project Controls Branches, and legal will form an integral part of the RIO office and assist in deliverables required to implement the Project.

RIO will manage the project schedule and budget and will undertake an audit role to ensure processes are being properly managed.

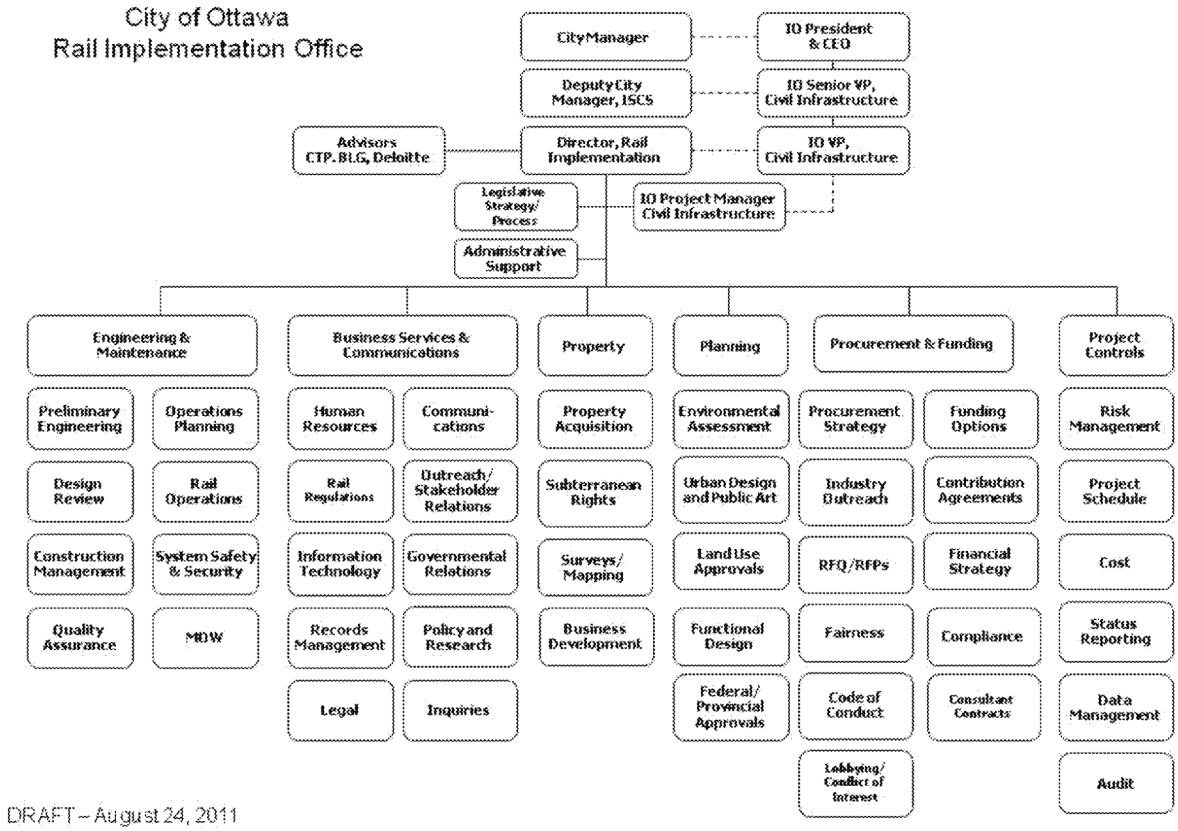

Figure [SEQ Figure * ARABIC] - Responsibilities of Rail Implementation Office

Role of Preliminary Engineering

The procurement of the Preliminary Engineering services has been managed through a competitive RFP process including a prequalification requirement to procure the services of a firm to complete the following time phased activities:

- Work Package 1.1: Develop Work Plan
- Work Package 1.2: Needs Analysis

- Work Package 1.3: Preliminary Engineering Design to 30% design level
- Work Package 1.4: Site Plan Review
- Work Package 1.5: Output Specifications
- Work Package 1.6: Cost Estimates
- Work Package 1.7: Implementation Strategy & Master Schedule
- Work Package 1.9: Procurement Support Services
- Work Package 1.10: Project Management Services
- Work Package 1.8: Final Report and Presentation

As of September 2010 the City of Ottawa engaged the Capital Transit Partners, a joint venture of consulting engineering firms with extensive LRT infrastructure and tunnelling experience, to deliver the Preliminary Engineering component of the project.

Work Package 1.1 – Develop Work Plans
A detailed Work Plan, including detailed work breakdown structures and schedules, is submitted prior to each Work Package phase. Work commences upon authorization of the Work Plan.

Work Package 1.2: Needs Analysis
The Needs Analysis identifies all design requirements and gaps for the further development of the Design Elements contained in the Design Concept, taking into consideration operational and maintenance requirements, design and maintenance standards, life cycle asset management concepts, safety, and security functions. The Needs Analysis will confirm and/or supplement the Design Concept. The Needs Analysis is revised as required during the Preliminary Engineering project.

Work Package 1.3: Preliminary Engineering Design to 30% design level
The Preliminary Engineering Design deliverable is based on the DOTT Recommended Plan functional design baseline and includes preliminary designs for horizontal and vertical alignment plans for LRT tracks and/or runningways, options and plans identifying facilities for all operational and design requirements, and various studies. The preliminary designs will include civil, architectural, mechanical and property requirements.

Work Package 1.4: Site Plan Review
The Site Plan Review deliverable includes all drawings, reports and presentation materials which may be required to support the review and approval by the City, the NCC and/or the public of OLRT stations subject to a site plan review.

Work Package 1.5: Output Specifications
The Output Specification deliverables includes the products of the design and study of critical OLRT technical elements such as architectural, civil, tunnelling, electrical mechanical design, maintenance storage facility design, station design, and street reconstruction design.

Work Package 1.6: Cost Estimates
Cost estimate deliverables are detailed cost estimates prepared using the approved Work Breakdown Structure (WBS) and address engineered equipment, detailed quantity surveys, current market unit rates, adjustments for staging, construction equipment, constraints and all applicable general items, overheads and taxes. Itemized estimates will be based on based on current year dollars and include, where applicable, supplier quotes, escalation, contingency factors.

Work Package 1.7: Implementation Strategy & Master Schedule
The Master Schedule deliverable is a consolidated, integrated master schedule created using either Primavera or MS Project and reflecting all design elements and associated activities, including preliminary and detailed design, permits and approvals temporary facilities, demolition, staging construction and commissioning. This deliverable also includes detailed construction staging plans and traffic management plans.

Work Package 1.8: Final Report and Presentation
The Final Report deliverable includes all the work package deliverables after customer comments have been satisfactorily addressed.

Work Package 1.9: Procurement Support Services
The Procurement Support Services deliverable comprises the provision of services associated with preliminary planning, preliminary construction document development, and RFP preparation support. Included in this deliverable are the preliminary CADD documents, draft master specification, preliminary contract drawings.

Work Package 1.10 – Project Management Services
The Project Management Services deliverable is the provision of qualified personnel to the OLRT Project. These positions include Deputy Project Manager and Project Leads for Procurements and Agreements, Project Controls, Risk Management and Construction. Project Management Services are currently confined to Preliminary Engineering but may also include at a later date the additional Work Packages:

- Work Package 2.1: Procurement Support, Proposal Development
- Work Package 2.2: Construction Administration Support
- Work Package 2.3: Commissioning Testing and Activation Support
- Work Package 2.4: Project Closeout
- Work Package 2.5: Project Management Services

Construction

The winning proponent for the construction of the Light Rail will be managed by the Rail Implementation Office with the assistance provided by a Project Management Services Consultant. The Rail Implementation Office will continue to act in the same project management role as previously with the Project Management Services consultant assisting in managing construction. The work packages assigned to the consultant include:

- Work Package 2.1: Procurement Support, Proposal Development
- Work Package 2.2: Construction Administration Support
- Work Package 2.3: Commissioning Testing and Activation Support
- Work Package 2.4: Project Closeout
- Work Package 2.5: Project Management Services

Stakeholders

Numerous stakeholders have been identified with respect to the OLRT. Input from the stakeholders will be sought throughout the project. The process for consultation is detailed in the communications plan. A detailed list of stakeholders can be found in the RAID Stakeholders track at [HYPERLINK "https://olrt.alceatech.com/"].

Roles and Responsibilities

Project roles and responsibilities have been specified as part of the project plan that establishes the level of authorities, input and review of the team members and the various stakeholders involved with the Project. Appendix C of the Project Charter ([HYPERLINK "https://cueap07.city.a.ottawa.ca/bimsp/idcplg?IdcService=GET_FILE&dID=589488&dDocName=ERMPROD_481463&RevisionSelectionMethod=LatestReleased" \t "_self"]) outlines the roles and responsibilities of the OLRT Director, Internal Coordination Committee (ICC) and Executive Steering Committee (ESC).

Approval Assignment Matrix
A comprehensive matrix containing the responsibilities of individuals who are part of the RIO Team as well as the PIP Deputy City Manager and the City Manager, is provided in Appendix D of the Project Charter and can be found on BIMS under [HYPERLINK

"https://cueap07.city.a.ottawa.ca/bimsp/groups/public/@riogeneral/documents/basicelectronicrecord/ermprod_481463.docx" \t "_self"]

7. CONFIGURATION MANAGEMENT

Configuration Management focuses on maintaining the consistency of the system or product's performance, function and form. Configuration Management further controls and traces all changes to the product and/or system and verifies final deliverables against all approved requirements. Configuration Management includes four areas:

- **Configuration Identification**
  Configuration identification is the process of identifying and describing the aspects of the system or product. The system or product is recorded in the configuration documentation and baselined. Baselining forces all changes to be formalized through the change control process.

- **Configuration Change Control**
  Configuration change control is the process in which changes to the system and product are formally created and approved.

- **Configuration Status Accounting**
  Configuration status accounting is the ability to record and report on the configuration baselines associated with each configuration item at any moment of time.

- **Configuration Reviews**
  Configuration Reviews are broken down into functional and physical reviews. Functional reviews ensure that changes to the configuration do not affect the overall function and performance of the system or product. Physical reviews ensure deliverables and products are created in accordance with the Configuration Identification.

Configuration Identification, Configuration Status Accounting and Configuration Reviews can be found in BIMS under [HYPERLINK "https://cueap07.city.a.ottawa.ca/bimsp/groups/public/@0010000008001008291000100832 04/documents/basicelectronicrecord/ermprod_510330.docx" \t "_self"].

Configuration Change Control

Changes to the OLRT Project scope will be managed through a Change Management process consistent with City of Ottawa policies, and approved through delegated authority established during the PE phase of the Project.

The change order request (COR) will be reviewed based on scope impact, schedule and budget by either the PE or RIO depending on which scope of work is impacted. Once the change has been assessed, logged and is recommended to pursue, it will be passed on to the Manager for review and comment and if applicable to users as well. The cost of the change impacts the level where it can be approved. If it exceeds the thresholds held by the RIO management or allowable project budgets and contingencies it will be passed on to the Director of RIO and if that position's authority is exceeded it will be forwarded to the Governance body for approval. Once approved, it will be converted to a Change Order and will be issued with the appropriate supporting documentation for execution. All changes, approved or rejected are logged with supporting reasons in the Change Request Log. A flow chart depicting this process follows:

[EMBED Visio.Drawing.11]

Figure [SEQ Figure * ARABIC] - Change Request Flow Chart

8. CLAIMS MANAGEMENT

The prevention, mitigation and resolution of contract claims with consultants, contractors and suppliers during the planning and implementation of the Project will positively impact the overall cost, schedule and implementation. It is recognized that claims are an integral part of the construction industry. The goal of effective claims management is to minimize RIO claims exposure and to fully resolve and document all claims. The basis for claims from the Construction Contractors would most commonly be in the following areas:

- Unforeseen conditions,
- Right-of-Way availability,
- Delays due to delivery of owner provided information or owner decision,
- Delays caused by changed requirements for maintenance of traffic within the corridor
- Non-agreement on cost or time pertaining to a change in scope

Claims Prevention

- **Design:** Many claims result from deficient plans and specifications. RIO will use staff and consultants to review the design work during the detailed design phase. The design submittals will be subjected to review. The result of these coordinated and reviewed documents is to assure compliance with contract requirements and to minimize claims exposure to RIO and the City of Ottawa.

- **Contract Clauses:** Another step taken to minimize RIO claims exposure is to use specific contract clauses designed to minimize risks and clearly establish the responsibilities of the parties. Contract provisions specifying schedules and requirements for maintaining progress, suspensions of work, change order procedures, extensions of time, notices of potential claims, disputes, termination clauses, and liquidated damages reduce the likelihood of claims being filed.

- **Claims Avoidance During Construction:** The baseline schedule is prudently developed with the goal of having all right-of-way available before the start of construction. These areas have historically been the basis for delays. Claims may arise during construction in the case of delays caused by unforeseen conditions and review response time. During the construction phase, timely review of submissions will be the best manner to avoid claims.

- **Claims Dispute Resolution and Administration:** The goal of the claims resolution process is prompt settlement of all claims after careful and fair analysis of facts. The prevention, mitigation and resolution of contract claims with consultants, contractors and suppliers during the planning and implementation of the Project will positively impact the overall cost, schedule and implementation. RIO will develop at the outset in consultation with the PE a proactive methodology on the management of contractual disputes and/or claims.

Disputes between RIO and Consultants, Design Builder or Suppliers will primarily be resolved by mutual consultation and cooperation. If this method proves unsuccessful the dispute will follow the escalating procedures developed in the General Conditions of the Contracts.

The claims management methodology will be based on:

Prevention

- Reduce the incidence of Claims by identifying and managing risk exposures at key stages of the delivery process,
- Ensure good communication with the Design Builder,
- Establish a clear and timely resolution ladder
- Track potential claim issues relating to schedule by implementing an effective issues tracking tool
- Build preventative measures within contracts ensuring the most competent Service Providers,

- Ensure there is a contractual basis for each claim,
- Ensure prompt enforcement of contract clauses when delay occurs,
- Consider each claim on its own merit,
- Retain the services of a mutually acceptable independent fairness advisor

Claims Mitigation and Resolution

- Engage in direct communication/discussion with claimant,
- Analyze and evaluate each claim within the team environment,
- Resolve claims promptly in a fair and reasonable manner,
- Ensure the rights and obligations of the contractor are properly covered,
- Ensure the rights of PWGSC to counter claims are not overlooked,
- Consider claims based on the reasonableness of information provided.

The claims management process is depicted in the following diagram:

[EMBED Visio.Drawing.11]

Figure [SEQ Figure * ARABIC] - Claims Process

9. ENVIRONMENTAL MANAGEMENT

Environmental Management Principles

The City of Ottawa is committed to a sustainable existence and strives to reduce the environmental impacts of its operations. RIO environmental management will be aligned with City of Ottawa policies, and funding stakeholders agreed to guidelines.

The OLRT Project's goal in addition to facilitating and improving the Public Transport capability is to reduce emissions and impact on the environment. With respect to the stations, in recognition of the potential negative impacts associated with the design, construction and operation of the civic building inventory, Council adopted in September 2005 the Ottawa Green Building Policy (OGBP) for the construction of corporate buildings. Under the policy, new city buildings are to be designed and delivered in accordance with the 'Certified' performance level of the Leadership in Energy and Environmental Design – Canada (LEED™ - Canada) Building Rating System.

Sustainable Development

The design will also employ leading edge sustainable design principles; including storm water management, water efficient landscaping, energy management, construction waste management; and indoor environmental quality. Innovative strategies, such as the recapturing of brake energy from the trains and electrical transformer vault energy, will also be explored.

The following principles, goals and actions that are outlined in the OLRT Sustainability Plan will be integrated in the management, Project development, implementation and operations.

- Towards Transit Oriented Communities
- Reduce Car Dependency
- Celebrate Culture, Diversity and Heritage
- Integrated Bicycling
- System Flexibility and Resiliency
- Public Engagement
- Modal Integration
- Educational Outreach
- Enhanced Safety and Comfort
- Universal Accessibility and Inclusion
- Stormwater Management
- Protect and Restore Biodiversity
- Prioritize Brownfield Development
- Optimize Energy Use
- Renewable and Low Embodied Energy Production
- Enhance Outdoor Air Quality
- Control Indoor Air Quality
- Construction Activity Pollution Prevention
- Appropriate Material Selection
- Commuter Waste and Recycling Resource Management
- Construction Debris Diversion
- Water Efficiency

10. OFFICE MANAGEMENT

Legal Services

The Rail Implementation Office has contracted the services of a legal firm to assist with all legal areas encountered during the Project. Currently the legal firm is involved in the following areas which will expand as the Project progresses.

- BLG Project Coordinator
- Canada & Ontario Contribution Agreement
- Capital Railway
- Confidentiality / Access to Information
- Funding Agreements
- General
- National Research Council (NRC)
- Preliminary Engineering RFQ/RFP
- Procurement and Governance Models
- Professional Services Contracts
- Project Agreement
- Project RFP
- Project RFQ
- Property Support
- Rail Regulatory Matters
- Real Property Matters
- Request For Information to Vehicle Manufacturers

Approvals Management

RIO with support from the PE will be responsible for identifying and obtaining all approvals required by the project. These approvals will be identified early on in the development stage of the project and an approval matrix will be developed to identify what approvals are required, by when and who holds the responsibility for seeking these approvals. This matrix will be reviewed monthly to ensure there is no slippage.

The following approvals in support of the OLRT Projects have been identified:

- Letter of understanding NCC and City of Ottawa
- Federal AIP
- Provincial "Green Light" letter
- Environmental Assessment approval -Provincial
- Environmental Assessment approval –Federal
- Municipal land use approvals
- Railway Regulations
- Federal Land Use Agreements (FLUA)
- Federal Design Approval Treasury Board
- Memorandum of Understanding with Algonquins of Ontario
- City of Ottawa approval of:
  - Transportation Master Plan
  - Procurement model
  - Property Acquisition and Expropriation
  - Business development strategy
  - Contribution Agreements
  - Final Contract with Consortium
  - Design Review approval
  - Any other outstanding motions relating to the OLRT

Internal Approval

Documents intended for external release will be required to go through an internal approvals management system. This system will be managed through SharePoint Workflows. Workflows will help the Project team to collaborate on documents and manage project tasks by implementing business processes on documents in SharePoint. Workflows will enable the Project team to concentrate on performing the work rather than managing the workflow. SharePoint Workflow will automate the movement of documents through a sequence of actions based upon a set of instructions that specifies and controls the actions that happen to a document.

As an example, a workflow can be set up that will route a document to a group of people for approval. When the document author starts this workflow on a document, the workflow creates document approval tasks, assigns these tasks to the workflow participants, and then sends e-mail alerts to the participants with task instructions and a link to the document to be approved. While the workflow is in progress, the document author or the workflow participants can check the Workflow Status page to see which participants have completed their workflow tasks. When the workflow participants complete their workflow tasks, the workflow ends, and the workflow owner is automatically notified that the workflow has completed.

An example of an approval workflow can be found in the following illustration.

[EMBED Visio.Drawing.11]

Figure [SEQ Figure * ARABIC] - Approval Workflow Example

Transmittals

It is crucial that all documentation transmitted externally follows the transmittal process. The transmittals process is a safeguard to ensure documentation leaving RIO are both accurate and ready to be released. The transmittal process applies to all members of the Rail Implementation Office (RIO).

The transmittal process ensures that all documents transmitted externally by RIO are not only tracked but reviewed by the appropriate manager/director before their release. The manager's/director's approval of the transmittal indicates that they have reviewed the transmittal and the document(s) and found them to be acceptable.

The coordination of the transmittals process will be handled by RIO Transmittals Coordinator. Transmittals to Capital Transit Partners will be handled through a separate streamlined process.

All managers are responsible to ensure the RIO staff is aware of the transmittal process. Project Controls will monitor the process to ensure compliance.

Document that Require Transmittals

Not all documents require transmittals. As a general rule documentation leaving the City and being sent to a consultant or party that does not have a contract with RIO requires a transmittal. Documents that have a risk of becoming public also require a transmittal.

The exception to the general rule is that if the documentation being sent is a working document that both RIO and the external party will be working on collaboratively then only the final document requires a transmittal. In this instance the document should clearly be represented as a draft working copy with RIO's Standard Document Header and Footer as per Program Directive #3.

In addition to the rule above documentation being transmitted that contains a particularly sensitive or confidential piece of information may warrant a transmittal, even if the document is being sent to a group within the City of Ottawa. A sensitive piece of documentation could include a document that could have legal consequences, create media attention or indicate an important decision or direction of RIO.

A categorized list of groups that do and do not require a transmittal are shown in the table below. This table is not an exhaustive list.

Requires a Transmittal	Does Not Require a Transmittal
National Capital Commission*	City of Ottawa Staff
Federal or Provincial Agencies	Consultants hired by RIO**
Media	Draft collaborative Documents***
Other consultants hired by the City	Public Documents

*Requires approval from Director, Rail Implementation before documents can be transmitted
**Documents transmitted to the Preliminary Design Consultant and future Design-Build Contractor requires a transmittal using a separate process.
***All draft documents must include the RIO Standard Header and Footer.

Process to Request a Transmittal

To request a transmittal provide the RIO Transmittals Coordinator with a completed Transmittal Details Template (BIMS [HYPERLINK "https://cueap07.city.a.ottawa.ca/bimsp/idcplg?IdcService=GET_FILE&dID=532803&dDocName=ERMPROD_439168&RevisionSelectionMethod=LatestReleased"]) by email with the standard subject of "OLRT Transmittal – Topic/Subject – Receiving Party". The transmittal request should also be copied to the approval authority to expedite the transmittal process.

Responsibilities of the RIO Transmittals Coordinator

The RIO Transmittals Coordinator will create the requested transmittal on SharePoint using the information provided. The RIO Transmittals Coordinator will obtain the necessary approvals from the appropriate manager/director to transmit the information and ensure the document complies with the RIO Standard Header and Footer. He will also request of the RIO Team Lead Rail Procurement to confirm if the Code of Conduct or Non-disclosure agreement is required and, if so, has been signed. If possible, when it is known that RIO will be communicating with a new external party, advance notice should be given to RIO Team Lead Rail Procurement to facilitate the creation of an NDA.

Please note that information will not be transmitted unless the RIO Transmittal Coordinator has ensured the code of conduct/ non-disclosure agreement has been signed and the manager/director approves of the transmittal of the information. It is the individual requesting the transmittal's responsibility to ensure adequate time is available to complete the transmittal process.

The RIO Transmittal Coordinator will transmit the information to all parties and track receipt of the information. Only the RIO Transmittal Coordinator may transmit information externally. The method utilized to transmit the documentation is under the RIO Transmittals Coordinators discretion. The RIO Transmittal Coordinator will track, record and manage all transmittals.

The RIO Transmittals Coordinator is also responsible to ensure a copy of the transmitted information is located on BIMS.

Special Case 1: In cases where a Code of Conduct or Non-disclosure agreement has not been signed the required form will be sent out requesting signature before the information can be released. In most cases the Non-disclosure agreement will be required. The Non-disclosure agreement is a customized document. The RIO Transmittals Coordinator will direct the individual requesting the transmittal (or their supervisor) to the RIO Team Lead Rail Procurement in the creation of the Non-disclosure agreement. The created Non-disclosure agreement will then be sent and after it has been signed (and manager approval obtained) the information will be transmitted.

In cases where the external party refuses to sign the RIO Transmittals Coordinator will notify the responsible manager/ director asking direction to send the information despite the refusal. If the manager agrees to send the documentation the RIO Transmittals Coordinator will transmit the information otherwise the external party will be notified that the information will not be transmitted. Unless specified otherwise a manager giving his approval in this regard approves all future transmittals to the same external party.

The following wording will also be attached to the transmittal:
"This document contains information which is confidential and proprietary to the City of Ottawa and its unauthorized release may be injurious to the City of Ottawa. This information is provided to the intended recipient solely for the purpose of ***[Enter Purpose]*** *directly connected to the City of Ottawa's Light Rail Transit (OLRT) project, and for no other purpose. This information may not be released, disclosed or further disseminated to any person other than the intended recipient, including pursuant to freedom of information, access to information or other applicable laws, without the prior written consent of the City of Ottawa. The intended recipient shall limit access to the information to those individuals who require such information for the purpose permitted hereby, provided that such persons are similarly obligated to keep such information confidential and the intended recipient shall remain responsible for enforcing the foregoing terms as to such persons."*

The [Enter Purpose] is to protect the City from a potential claim if the information is distributed or used for a non intended purpose. The purpose will be defined by the manager or their delegate for each transmittal.

Special Case 2: In cases where the documentation is being transmitted by hand or included as part of a descriptive email the RIO Transmittal Coordinator will delegate an individual from RIO to both transmit to

and obtain a signature of receipt from the recipient. The RIO Transmittal Coordinator will provide the delegate a copy of the transmittal for this purpose.
Special Case 3: Until the financial close of the Request for Proposal the Manager of Rail Funding & Procurement, Dan Farrell, will be kept informed on all external transmittals.

Responsibilities of Managers and Delegation of Authority

RIO managers have the following responsibilities in the transmittal process.

- To ensure staff are fully aware and comply to the transmittal process
- Approve information to be transmitted
- Identify if the review and approval of the director, John Jensen, is required before the information can be released.

Managers have the ability to delegate their authority for transmittal approval to their staff. When delegating authority the RIO Transmittals Coordinator should be informed via email. Regardless if a staff member has been given delegated authority, only a manager can determine if an external party does not require a Code of Conduct or Non-disclosure agreement as outlined in special case 2.

Urgent Transmittals and Levels of Service

In instances where a transmittal is needed to be sent urgently a transmittal can be designated as urgent. Designating a transmittal as urgent will expedite the transmittal process but also disrupt regular RIO business. For urgent transmittals the RIO Transmittals Coordinator has the authority to enter ongoing meetings to obtain approval from managers or delegated staff.

If a tight deadline in anticipated for a transmittal, a notification can be sent to the RIO Transmittals Coordinator early which will allow the transmittal to be created and Code of Conduct/ Non-disclosure Agreement verified while documents are being prepared. This early notification will help reduce the transmittal processing time.

The levels of service for regular and urgent transmittals are as follows:

- Urgent – 1 Business Hour
- Regular – 8 Business Hours

Transmittals to CTP

The transmittal of documentation to CTP involves the upload of the documentation to the SharePoint site. Documentation is uploaded to "RIO Deliverable Processing" in the "Controlled Deliverables" section of the site.

If formal RIO mark-ups/comments are being provided a Comments and Review Log should be uploaded with the original document to the "RIO Deliverable Processing" site.

Once the document(s) have been uploaded the Document Controls Coordinator will create the transmittal, request any information required to complete the transmittal, transfer the information to the appropriate location on the SharePoint site and notify CTP of the transfer.

Financial Management

Over the duration of the OLRT Project, RIO will provide estimates and cash flow forecasts to ensure funding is available before commencing work. RIO will continuously perform budgeting, forecasting and reporting of project expenditures, complete time sheets and update percentage of completion. RIO will certify services rendered from consultants and contractors engaged on the project, authorize payment of invoices and ensure all potential scope changes are reviewed for impact on cost, schedule and quality - and appropriately approved.

The capital costs of the Project are proposed to be funded jointly by the City of Ottawa, the Province of Ontario, and the Government of Canada. On September 1, 2011 the Province of Ontario signed a

Contribution Agreement for $ 600M. On June 8, 2010 the Federal Government announced funding contribution of $ 600M All additional required funding will be provided by the City of Ottawa (currently estimated at $ 900M).

Detailed costing of the Project has been carried out based on the Recommended Plan. Costing information includes an estimate for property acquisition, design, Project management, construction, vehicles, and contingency. The capital cost estimate for this Project is $2.1B, in construction dollars. The project estimate is subject to refinement as the project progresses through subsequent design phases, such as preliminary engineering and approval of a procurement model.

The Rail Implementation Office, with the assistance of the PE, will develop monthly budgetary cash flow projections to illustrate estimated expenditures over time at Project level based on cash flow input provided by each of the projects in the Project. The actual cash draws will be mapped against the forecasted cash flow as a means of monitoring project performance. These forecasted and actual cash flows will be used to determine the Capital Budget Ask as determined by Project requirements.

RIO will track expenditures against predicted cash flow, and identify and resolve variances as they arise. RIO will provide a report to Committee and Council for approval as well as any required reporting to funding partners relating to financial commitments. A summary of funding approval activities is provided below:

Funding Milestone	Approval Date	Approval Authority
Provincial Funding	Dec-09	*approved*
Federal Funding	Jun-10	*approved*
Funding AIP	Aug-10	*approved*
New Council Intake Briefing	Nov-10	*approved*
Confirmation of City Funding	Jul-11	*approved*
Provincial Funding CA Ratification	Sep-11	*approved*
Federal Funding CA Ratification	Mar-11	

Table [SEQ Table * ARABIC]: Funding Milestones

Payments

For the contracts which are lump sum or unit price contracts, payments will be made based on the contract's Terms & Conditions. Where no explicit Terms & Conditions exist, payments will be made monthly based on progress and earned value. For contracts that are time and material based, the Consultant/Supplier/Contractor shall invoice RIO monthly. Each invoice should clearly state the hours worked and resources utilized.

Under the payment process the RIO Administrator receives and logs each incoming invoice and forwards it to RIO Project Controls, where it is analyzed for contract compliance, adequacy of backup information, alignment with spending profile and availability of funds. The invoice is routed through financial, legal, stakeholder and RIO managerial authorities to determine if the invoice will be addressed through invoice payment, invoice resubmission, PO amendment or Change Request. The invoice review process determines the funding source (budget or contingency), and ensures appropriate stakeholder notification. Throughout the invoicing process, RIO Project Controls will maintain a Cost Tracking Log where all cost transaction details are recorded, in addition to current budget and forecast data. The detailed and summary Invoice Review and Approval process is presented in the following flow chart:

[EMBED Visio.Drawing.11]

Figure [SEQ Figure * ARABIC] - Accounts Payable Automated System

Release of Funds:
Initially, the City will fund 100% of project expenses. Upon City Council ratification of Federal and Provincial Contribution Agreements and confirmation/commitment of the City's share of funding, both old and new eligible project expenses will be funded approximately one third by each funding partner up to the limit established in the Contribution Agreements.

[EMBED Visio.Drawing.11]

Figure [SEQ Figure * ARABIC] - Invoice Review Procedure

11. RECORDS MANAGEMENT

RIO Records Management methodology will be:

- Aligned with City of Ottawa records management policies
- Aligned with the established construction and transport related industry standards
- Strive to facilitate communications and retrieval
- Strive to facilitate exchange with Consultants, Contractors, Public, etc.
- Designed to maintain confidentiality, security and privacy.

Key Documents such as drawings, contract and specifications will be controlled by a formalized naming and revision control system. These records will be securely retained in both hard copy and digitally for use by the project team. Capital Transit Partners will be responsibility for establishing an internet accessible document control process that can be used by all team members.

SharePoint, Microsoft's content management system, will be used as the main collaboration tool for the Rail Implementation Office. SharePoint will be the central location for collaboration and storage of all work and project files. With the implementation of a GIS software package, SharePoint will also be the central storage of all geographic information. The structure of the SharePoint site will be set up by the Preliminary Engineering Team to be an efficient and effective tool. It will be utilized by the Project office, consultants and contractors. At the completion of the Project, provided SharePoint does not become an official records management system, all files will be removed from SharePoint and filed by the Project team. Documents deemed to be Official Business Records (as classified by the City) including legacy documents will be stored on either Business Information Management System (BIMS) or Records Management System (RMS). Official business records that are already stored on an official records management system will not need to be archived at the completion of the project

The SharePoint site will be initially stored on a server hosted by the Preliminary Engineer, outside the City's network. The City will review the security of the server to ensure it meets all IT requirements. If and when required, the content stored on the SharePoint site may be transferred to the City's server. Regardless of where the site will be hosted all Official Business Records created during the Project will be archived at its completion to the City's official records management system.

The City's official records management systems are BIMS for electronic records and RMS for physical records. As such, all documents will be categorized in the same manner as they would if they were filed on one of these official systems. This will ensure that any files can be easily transferred into to an official records system for archival. Electronic records created by the Rail Implementation Office (RIO) Team should be stored on BIMS when they are final or complete. Physical records will be recorded in RMS. Non-official documents that are related to Project activities only can also be stored on BIMS as transitory documents. Filing of non-official documents on BIMS enables easier RIO team collaboration as well as version control and server backup.

To facilitate the risk management process RIO makes use of a web-based application called RAID (Risks, Actions, Issues, Database –Meetings & Stakeholders). RAID will contain all of the Project's Risks, Actions, Issues, Meeting information and Stakeholder data for the duration of the project. These items are not to be stored in SharePoint. RAID is to act as the sole database for the collection of these items. Information stored on RAID will be transferred to BIMS upon completion of the project.

[EMBED Visio.Drawing.11]

Figure [SEQ Figure * ARABIC] - RAID- System

RIO will manage the deliverable submission process according to the level of approval required and degree of stakeholder interest. Documents intended for council review or public domain will be routed to RIO Director for approval. Documents requiring review and approval of OLRT stakeholder other than the RIO will be sent to that stakeholder for approval. Deliverables not requiring council or stakeholder approval will be forwarded to the RIO Manager.

Documentation to be maintained in the BIMS database will be identified and subject to a formal transmittal process, so that origin, approval and date information can be stored with the document item.

Documents that will be controlled and maintained:

- Contracts
- Memorandum of Understandings
- Specifications
- Drawings
- Shop drawings
- Reports
- Letters
- Decisions
- Change orders
- Site instructions
- Requests for information
- As built drawings
- Operations Manuals
- Monthly reports
- Meeting minutes
- Schedules
- Budgets
- Cash flows
- Risk matrix

Financial information will be maintained via the SAP of the City of Ottawa. (See section on financial management) Copies of invoices will not be formally maintained by the team.

12. HEALTH & SAFETY MANAGEMENT

Rail Implementation Office Health and Safety
Department Heads and Directors shall ensure that policies, procedures and safe work practices are established to achieve departmental compliance with applicable health and safety legislation, and that departmental objective and performance indicators are established, maintained and assessed to compliment corporate objectives.

Managers and supervisors are accountable for the health and safety of staff under their supervision, and are responsible for ensuring that all employees receive adequate training in their specific job duties. All employees shall work in accordance with applicable health and safety legislation, and established policies and procedures. The Employer shall work with employees and any established Health and Safety Committee(s) to identify and address hazardous working conditions and practices.

All responsibilities and obligations required by the Contractor or "constructor" under the provisions of applicable health and safety legislation or regulations shall be assumed by the contractor including all costs for services and materials required to fulfil these obligations shall be included in the Contract price quoted.

13. QUALITY MANAGEMENT

The Quality Management Plan defines how quality requirements are achieved throughout the lifecycle of the Ottawa Light Rail Transit Project. The plan includes the following three sections:

1. **Quality Planning** – Defines the requirements for the major deliverables of the Project. These requirements will be used as metrics to ensure the prescribed requirement are being met. This gives the project team and the city a common expectation of what is required for each deliverable to be accepted.

2. **Quality Assurance** – Defines the process used to create deliverables. It's used to guarantee the overall processes used to create the deliverable are of high quality.

3. **Quality Control** – Defines how to record and track the ongoing activities that the project team will perform. This would include consultant and internal audits, checklists to ensure all parts of a process were completed and deliverable approvals.

The plan will also define the roles and responsibilities of the Preliminary Engineering Team and RIO Project Team with respect to those sections.

Quality Planning

The role of managing the quality of the Project is ultimately the responsibility of the RIO Project Controls team reporting directly to the RIO Director. However, the management of quality with respect to engineering and construction has been delegated to the Preliminary Engineering Team and is an integral part of the project management services they provide. The role of the RIO Project Controls is to ensure quality is being met by Preliminary Engineering Team as well as the RIO team.

Preliminary Engineering Work Packages

As part of the project management services the Preliminary Engineering Team has the following work packages assigned as part of their scope of work. It is the responsibility of RIO to ensure these work packages meet quality. A detailed description of these work packages can be found in the Request for Proposal for Preliminary Engineering and Project Management Services. This description includes the interim and final deliverables of each work package. These deliverables well be monitored and measured against requirements to ensure they meet quality. The Preliminary Engineering Team scope of work includes:

- 1.1: Develop Work Plan
- 1.2: Needs Analysis
- 1.3: Preliminary Engineering Design to 30% design level
- 1.4: Site Plan Review
- 1.5: Output Specifications
- 1.6: Cost Estimates
- 1.7: Implementation Strategy & Master Schedule
- 1.8: Final Report and Presentation
- 1.9: Procurement Support Services
- 1.10: Project Management Services

Some work packages do not have any final deliverables as they are support services. Work packages 1.9 and 1.10 are support services and therefore quality will be monitored and measured differently than other work packages. In this instance quality will be measured against meeting operational requirements or/and their recurring activities instead of meeting final deliverable requirements.

The Preliminary Engineering Team scope of work may also include the following work packages at a later date:

- Work Package 2.1: Procurement Support, Proposal Development
- Work Package 2.2: Construction Administration Support
- Work Package 2.3: Commissioning Testing and Activation Support
- Work Package 2.4: Project Closeout
- Work Package 2.5: Project Management Services

Quality for these work packages will be monitored and measured the same as other work packages.

Preliminary Engineering Deliverables

Each work package has a set list of interim and final deliverables to be completed. The following is a summary of the major deliverables of each of the work packages that will be monitored to ensure quality is being met.

- Draft, interim and final Needs Analysis Reports including any risk assessment reports;
- Facility Property Requirements Report, including drawings and other presentation materials as may be required in support of property acquisition and municipal or provincial approvals;
- Interim Scope Review Submission and Final Scope Design Review Submission, including, but not limited to:
    - Track alignments
    - Runningway structures (at-grade and elevated)
    - Station plans, elevations and sections for all station in the OLRT system
    - Maintenance Facility plans, elevations and sections
    - Grading and drainage
    - Roadway alignments and access
    - Temporary and permanent property requirements
    - Landscaping
    - Construction schedules and staging plans
    - Risk Management documentation
    - Environmental controls, mitigation and remediation plans
    - Identification of long lead items and/or specialized equipment
    - Mechanical requirements
    - Tunnelling requirements
    - Geotechnical Requirements
    - Electrical load requirements
    - List of assumptions and constraints
    - Draft and Final Site Plan Review Approval applications with supporting reports
    - Draft and Final Hydrology/Storm water Management Reports
    - Draft and Final Traffic Impact Assessment Reports
    - Draft and Preliminary Air Quality Study Report
    - Draft and Preliminary Noise Study Report
    - Draft and Final Advertisement Study
    - Draft Theme/Image/Branding Study
    - Draft and Final Pedestrian & Cyclist Movement Study
    - Draft and Final Public Art Plan
    - Draft and Preliminary Signage and Information Standards
    - Draft and Final Project Implementation Schedules, including long lead items
    - Draft and Final Cost Estimates
    - Draft and Final Presentations
    - Detailed Monthly Progress Reports and Cost Summaries
    - Bi-Weekly electronic progress reports
    - Meeting minutes for all meetings
    - Completed Work Plans for each phase and/or Work Package

Preliminary Engineering Lead for Quality

As part of the Project Management Services, a Preliminary Engineering Lead for Quality will be assigned and will provide a Quality Management Plan for the Engineering and Maintenance branch. The objective of the Preliminary Engineering Quality Management Plan is to assure that track-work, signals, communications systems, structures, and facilities and other works are designed, procured, and constructed in accordance with established design, engineering, and quality requirements. These requirements provide the controls for design, procurement, construction, and inspection, which will

ensure that the quality necessary for safe and reliable operation. Under this Quality Management Plan the Preliminary Engineering Lead for Quality will be responsible for ensuring quality for all Engineering and Maintenance deliverables.

Rail Implementation Office

Other than the deliverables associated with Engineering and Maintenance, the RIO Project Controls will monitor the quality associated with the other sections of RIO. These sections include:

- Rail Planning
- Rail Property
- Project Controls
- Business Services
- Procurement and Funding
- Infrastructure Ontario

These deliverables are outlined in the Internal Responsibilities Matrix and in the Roles and Responsibility Matrix. These deliverables can be found in the Project Charter and Project Management Plan. Project Controls will be responsible to ensure that the deliverables are reviewed and approved and that stakeholders are informed as planned. A highlight of some of these deliverables can be found below:

- Purchase of required right to property
- 12.5 km of track
- 2.5 km of tunnel
- 10 above ground LRT stations
- 3 underground LRT stations
- Vehicle purchase
- Art integration
- Maintenance and Storage facility
- Maintenance spares
- Business Cases/ Feasibility Studies

Quality Assurance

The purpose of the Quality Assurance is to ensure that the Project processes are suitable for their intended purpose and reduce or eliminate mistakes that could arise from a poor process. The processes outlined within the Project Management Plan and how they interact with other processes will reviewed on an as needed bases to ensure the processes are still relevant and to provide the opportunity to make improvements to processes we are already doing well.

Quality Control

The Rail Implementation Office is responsible for completing internal audits for the processes associated with all section excluding Engineering and Construction. The procedures are outlined in the Audit Plan which contains a list of all processes to be audited, how they will be audited, as well as the forms to be completed for each audit. The audit includes the procedures for recommending corrective actions and preventative actions.

In addition to the audit of the procedures in the Project management plan, progress reports and deliverables completed by the Preliminary Engineering Team will be reviewed to ensure that they meets requirements as they were described in the Request for Proposal.

As some of the work packages the Preliminary Engineering Team will produce are not deliverable oriented, work packages that are service oriented will be monitored against recurring deliverables. The

key deliverable that will be monitored will be the Preliminary
Engineering Monthly Report. The report will be reviewed monthly by the Project Controls team and will follow an informal approval process where non-conformances will be tracked on the Audit Observation Log (AOL). Counter to the other information stored in the AOL, both major and minor non-conformances will be tracked.

The Quality Control responsibilities assigned to the Preliminary Engineering Project Lead of Quality are as follows:

- Perform or participate in quality management audits of design, procurement and construction activities.
- Identify inspection and testing requirements from specifications and other codes and provide guidance in the development of inspection and test plans and inspection checklists.
- Monitor construction material testing on site and at QC testing laboratories.
- Perform and report on field quality surveillance of site construction, installation and quality control. Monitor work for conformance to requirements of the appropriate codes, specifications, drawings and Inspection and Test Plans.
- Identify and ensure acceptable disposition of non-conformances and corrective action.
- Advise and inform Deputy Project Manager – Project Management on quality issues.
- Assist in quality system training and orientation Projects for project management personnel.

It is the Preliminary Engineering Project Lead's responsibility to track, record and correct non-conformances. If the situation warrants, an OFI can be created by either Project Controls or the Preliminary Engineering Project Lead to address non-conformances.

Audit Management Plan
RIO will assume the role of Auditor on this project. In this capacity ensure that the processes laid out by the Project are being followed correctly and that all steps and procedures are being executed. This process will include review of all records of documentation.

Non-conformances noted during the an audit, or any aspect of the quality control process, will result in either an Opportunity for Improvement (OFI) or note in the Audit Observation Log. OFI's are the principal means of recording, evaluating and correcting non-conforming conditions that are of a significant nature. The Audit Observation Log is used to record non-conformances that require tracking, but don't warrant the administrative time required to issue and close an OFI.

An OFI will be created as an action in RAID and will contain a concise description of the problem and including all relevant references such as identifying the non- conformance, procedures or specifications etc., as well as the recommended action. The individual to whom the OFI is issued must advise when action is taken to close out the OFI. The action will be reviewed and indicated whether or not it is acceptable. If the action taken is acceptable the OFI/ action will be closed. OFIs can only be closed by RIO Project Controls.

Minor non-conformances are recorded in the Audit Observation Log. The AOL will be kept up to date by Project Controls. These minor non-conformances will be notified to the individual responsible for the process audited. It is the responsibility of the individual to ensure that the observations are corrected in a timely manner. The Audit Observation Logs are reviewed as required to identify trends.

The Audit Plan can be found in BIMS under [HYPERLINK "https://cueap07.city.a.ottawa.ca/bimsp/groups/public/@0010000008001008291000100832O4/documents/basicelectronicrecord/ermprod_510332.doc" \t "_self"].

14. SCOPE MANAGEMENT

Scope management of the OLRT Project will ensure that all the required work and only the required work is performed to complete the Project successfully. RIO will be defining and controlling what is included in the Project the planning of the Project scope, consistent with that set forth in the OLRT Project Charter, development and approval of the Project Work Breakdown Structure, and scope control, through a change management process.

The interrelationship of these activities is illustrated below.

Scope Planning

The scope definition forms the basis for future project decisions including, in particular, the criteria used to determine if a project or phase has been completed successfully.
The high level components of the Project scope are:

- **Consultation** – Agency, Business and Public Consultation Groups are provided, through a variety of consultation methods, with the opportunity to participate in and comment on Project activities, issues and concerns.

- **Approvals** – Federal, provincial and municipal agency approvals of key technical, schedule and financial reports and deliverables and briefings are key milestones in the OLRT Project

- **Preliminary Engineering** - The Recommended Plan Design will be advanced to much more detailed level through the procurement of professional consulting and project management services.

- **Property Procurement** – Although most of the property involved in the OLRT Project involves the existing Bus Rapid Transit route, additional land will need to be procured for both temporary and permanent Project needs.

- **Project Construction** – The existing BRT line from Tunney's to Blair will be converted to Light Rail technology, and the stations along this route, as well as a Maintenance & Storage Facility, will either be constructed new, or converted from existing BRT stations.

- **Vehicle procurement** – the vehicles are procured in a transparent process that brings the best value to the organization. A single vehicle will need to be purchased early in the process for use in testing and training.

- **Commissioning & Operations** - The commissioning of the OLRT System, buildings and facilities ensures that when the built works are handed over to the operating entity all of the Project Concept requirements are met.

Scope Definition

Scope Definition involves subdividing the major project deliverables into smaller, more manageable components in order to improve the accuracy of cost, time and resource estimates, define a baseline for Project performance reporting and facilitate responsibility assignments.

The primary result of the scope definition is the Project Work Breakdown Structure. The WBS forms the basis for Project reporting of cost and schedule. A high level WBS, organizes the activities or work packages in a logical manner that supports the Project control functions of cost, schedule and scope management. A high level WBS can be found below.

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Figure [SEQ Figure * ARABIC] - High Level Work Breakdown Structure (WBS)

Scope Control

Scope verification is the process in which key deliverables are verified against the original scope. This can be carried out with the stakeholders at key project milestones, and signed off by the Director and any required users/ stakeholders. Scope verification is a good practice to catch any potential problems concerning project expectations by users/ stakeholders that are not in keeping with the results of planning and design. Approvals will be documented through a SharePoint Workflow process.

Proposed scope changes may be initiated by Managers, Stakeholders or any member of the project team. All change requests will be submitted to the Manager of Project Controls who will then evaluate the requested scope change. The Manager of Project Controls can approve changes that increase the budget by up to 2% but stay within the contract's contingency or increase the schedule up to 5%. Changes impacting the project budget or schedule by greater than these amounts require the approval of the Director of the Rail Implementation Office.

Upon either approval or rejection the Manager of Project Controls will update all project documents and communicate the scope change (or rejection of change) to all stakeholders. The scope change process will be handled and documented using a SharePoint Workflow process. This workflow process is further described in the Configuration Management section.

The Manager of Project Controls will work to control the scope of the project during planning and design. The contractor is required to only perform the scope of work described in the tender documents unless directed by a Change Order or Change Directive.

As with all projects the balancing act must be maintained between Cost, Schedule, Scope and Quality. For this project Cost will be the deciding factor. Scope changes will be assessed against available funds only and opportunities such as Value Engineering will be employed to ensure that the most cost effective solutions will be found.

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Figure [SEQ Figure * ARABIC] - Scope-Schedule-Cost Diagram

15. TIME MANAGEMENT

RIO will perform the OLRT Project activity definition, schedule development and schedule control. Time Management at the Project level is tightly linked to the schedule definition and control of the Preliminary Engineering Project Work Plan activities, which determines the schedule baseline of the individual work packages and phases of design and construction of the OLRT.

RIO will perform the detailed activity definition and sequencing of the OLRT Project throughout the preliminary engineering period, arriving at a baseline OLRT Project Schedule. RIO has currently identified major Project milestones in the Project Charter.

Using the milestone schedule as a guideline, and the draft WBS as input, RIO will proceed to identify the detailed tasks and activities to be performed to achieve the milestones, creating a detailed Project schedule. The activities will include all the development, review and approval tasks associated with reaching the milestones.

Oracle Primavera P6 will be used to capture the project schedule model. RIO will monitor schedule activities using the OLRT project schedule as a baseline. RIO will deploy trend analysis methodology to monitor deviations of the overall project schedule as well as reviewing Earned Value impact on the various project schedules subset to the top-level project which are using that methodology.

The Manager, Project Controls will be responsible for managing and reporting on the project's schedule throughout the duration of the project. The schedule will, at a minimum, be reviewed on a monthly basis at the bi-weekly schedule/budget/risk meeting. The Preliminary Engineering firm will be responsible for project Earned Value calculations and these calculations will also form part of the schedule review. The Manager, Project Controls is responsible for accounting for deviations and presenting options for bringing the schedule back on track.

With assistance from the Preliminary Engineering firm, the Manager, Project Controls will be responsible for assessing the magnitude of variation to the original baseline, variances in total float, changes to the critical path and risks or indications of future variances. It is the responsibility of the Manager, Project Controls to identify any corrective or preventative actions to reduce significant schedule impacts and schedule risk. Schedule Crashing is not to be used as a corrective measure if it adds significant cost to the project. Schedule impacts will be considered significant under the following situations:

- The impact increases critical path duration greater than 3 weeks
- The duration of an activity on the critical path increases more than 15%
- The critical path consistently increases three days or more for 3 consecutive months
- Schedule Performance Indicator is greater than 1.1 or less than 0.9
- Schedule Performance Indicator is consistently above 1.05 or below 0.95 for 3 consecutive months

Category	Milestone Description	Forecasted Dates
Funding & Approvals	Provincial Funding announcement	Dec 2009
	Federal Funding announcement	Jun 2010
	Capital Budget request	Aug 2010
	Federal and Provincial Funding letters	Aug 2010
	New Council Intake Briefing	Nov 2010
	Supporting Design Studies	Dec 2010
	Funding CA Received - Provincial	Sep 2011
	Confirmation of City Funding	Oct 2011
	Funding CA Received - Federal	Nov 2011
	Federal Approval CEAA	Apr 2012
Planning & Property	Functional design /Recommended Plan	Dec 2009
	MOE EA Approval	Aug 2010
	Start Property Acquisition	Sep 2010
	Business Development Strategy Completed	Ongoing
	Railway Regulations	Oct 2011
	Draft FLUA NCC Approval	Dec 2011
	All property acquired	Dec 2012
	Signed FLUA	Feb 2013
Procurement	Fairness Commissioner	2009
	Financial Services	2009
	Legal Services	2010
	Tunnel Geotechnical Award	Mar 2010
	Preliminary Engineering Award	Sept 2010
	Procurement Option Approval	May 2011
	Implementation RFQ issued	June 2011
	Infrastructure Ontario involvement	July 2011
	Implementation RFP issued	Oct 2011
	Implementation contract award	Dec 2012
Preliminary Engineering	Tunnel Geotechnical Complete	Aug 2011
	Interim Scope Review Submission	Jul 2011
	Phase 1 Complete (30% Design)	Dec 2011
Construction Commissioning Operational	Construction start	Jan 2013
	Maintenance & Storage Facility Complete	2016
	Vehicle Delivery (training)	2016
	Commissioning vehicles delivered	3Q 2017
	Construction Complete	4Q 2017
	In Revenue Service/System Operational	2Q 2018

Table [SEQ Table * ARABIC]: Example of Project Milestones

Significant schedule impacts will be documented in RAID as an issue. Identified schedule risks will be documented in RAID as a risk. The Schedule Control Board will review these risks and issues during the bi-weekly management meeting. Should a schedule impact have a large and immediate impact on the

project schedule an emergency meeting with the Schedule Control Board may be raised. An emergency meeting should be held under the following situations:

- Impact to the critical path has increased by 2 weeks over a one month period.
- Schedule Performance Indicator is greater than 1.2

The following diagram depicts the process for relating to time management.

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Figure [SEQ Figure * ARABIC] - Schedule Management

16. COST MANAGEMENT

The Cost Management Plan clearly defines how the costs on a project will be managed throughout the project's lifecycle. It sets the format and standards by which the project costs are measured, reported and controlled. The Cost Management Plan identifies the following:

- Who is responsible for managing costs
- Who has the authority to approve changes to the project or its budget
- How cost performance is quantitatively measured and reported upon
- Report formats, frequency and to whom they are presented

The Manager, Project Controls is responsible for managing and reporting on the project's cost throughout the duration of the project. During the schedule/budget/risk bi-weekly meeting, the Project Manager will meet with management to present and review the project's cost performance to date. The Preliminary Engineering firm is responsible for project Earned Value calculations on a monthly basis and these calculations form part of the bi-weekly discussion. The Manager, Project Controls is responsible for accounting for cost deviations and presenting options for getting the project back on budget.

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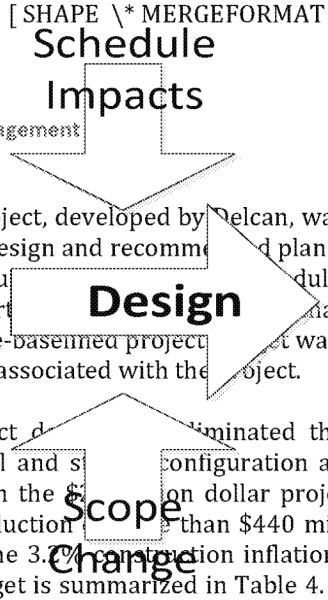

Figure [SEQ Figure * ARABIC] - Cost Management

The original budget for the OLRT Project, developed by Delcan, was a Class D estimate. (+/- 25%). It was established based on the functional design and recomm d plan. Further budget refinement took place during the PE phase, taking into accou dule requirements. Similarly a budget has been established for the property, ar at falls under the responsibility of RIO rather than the PE. In July 2011, a re-baselined project t was approved by Council and will become the foundation for all fiscal decisions associated with the oject.

Council approved a modified project d minated the previously approved cross-country alignment, replacing it with a tunnel and s configuration along Queen Street. This modification allowed the project to remain within the $ on dollar project budget including inflation. In real terms this was an overall budget reduction than $440 million from the original estimate as the new budget absorbed the effect of the 3.2% construction inflation that was not included in the original $2.1 billion estimated cost. The budget is summarized in Table 4. This estimate is subject to refinement as the project progresses through subsequent design phases.

	OLRT - Cost Estimate Construction Dollars
City Costs	
1	Property, Procurement & Planning
2	Program Management (Project Office, Preliminary Engineering & Project Management)
3	Retained Risk Contingency
CITY Subtotal	
Constructor Costs	
4	Construction
a)	Tunnel
b)	Stations
c)	Maintenance and Storage Facility
d)	Track Work
e)	LRT Systems (power, signals, ventilation, etc) and Vehicles
f)	Civil Works (structures, detours, utility relocations, etc.)
Constructor Subtotal	
Total	

Table [SEQ Table * ARABIC]: OLRT Class D Estimated Construction Cost

Over the course of the OLRT project, new projects and/ or phases of the Project may be defined. The RIO will ensure that the overall OLRT budget is maintained by ensuring that that the budgets associated with the new projects (including contingency) roll up to the baseline Project WBS and that the consolidated budget roll-up remains unchanged unless approvals have been given for addition of new scope and the baseline re established.

Cost Monitoring

RIO will control costs at Project level and at specific project levels where appropriate against the project baseline. The costs under the control of the RIO are managed in SAP for the City of Ottawa under a unique project identifier and are consolidated in reports developed by RIO.

Wherever possible, performance of the project will be measured using Earned Value Management and is a responsibility of the Preliminary Engineering firm. The following four Earned Value metrics will be used to measure the project performance:

- Schedule Variance (SV)
- Cost Variance (CV)
- Schedule Performance Index (SPI)
- Cost Performance Index (CPI)

Threshold values of SPI and CPI will be established, which will then dictate what corrective action (if any) should be taken to bring the project performance back to acceptable levels.

An account has been set-up in SAP and assigned an account code. In addition, a PS Module has been created that adds an array of project work breakdown structure (WBS) elements. This improved traceability gives the project better budget insight and clarity. Costs associated with PE and Construction work will be reviewed by RIO before proceeding to the City of Ottawa for payment and processing through SAP.

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Figure [SEQ Figure * ARABIC] - Cost Processing Workflow

As actual costs are reported through and from SAP, RIO can identify the variance between budget and actual costs based on their reporting tools. If the project reaches the CPI control threshold, a Cost Variance Corrective Action is required. The Manager, Project Controls will present to the Management team, options for corrective actions within five business days from when the cost variance is first reported. Within three business days from when the Management Team selects a corrective action option, the Manager, Project Controls will present a formal Cost Variance Corrective Action. The Cost Variance Corrective Action will detail the actions necessary to bring the project back within budget and the means by which the effectiveness of the actions in the plan will be measured. Upon acceptance of the Cost Variance Corrective Action it will become a part of the project plan and the project will be updated to reflect the corrective actions.

[EMBED Visio.Drawing.11]
Figure [SEQ Figure * ARABIC] - Cost Management

Cash Flows
RIO, with the assistance of the PE, has developed budgetary cash flow projections to illustrate estimated expenditures over time at Project level based on cash flow input provided by each of the projects in the Project. The actual cash draws will be mapped against the forecasted cash flow as a means of monitoring project performance.

Contingency
Contingencies are added to the elements of the cost estimate to reflect the risk associated with the item. These risks can include fluctuations in price in the market, uncertainty related to how the item is delivered and installed or the risks associated with the method of construction. Some elements carry more than one risk, but in general the elements in the cost estimate have been divided into three categories; high risk, medium risk and low risk. Each of these risk levels has been assigned a contingency based upon a Monte Carlo risk analysis. Sensitivity analyses on the range of total project costs that could be expected with different contingency levels were tested and formed part of the decision to include a Director's Contingency.

Contingencies developed at all levels of the WBS, based on the risk assessment of individual WBS elements, are rolled up to a Project-wide contingency budget, which is managed by the RIO.

The total contingency will be sub-divided into two basic categories:
- Construction – This contingency will be allocated for construction works
- Risk – This contingency will be allocated to execute risk plans or fund risk events

Tracking and Reporting
Cost reports for the project are generated monthly to identify activity relative to budget. The reports show actuals and commitments as well as variance against the baseline budget. Cost reports for executive distribution include only high-level summaries, indicating assessed risk of the phase or Project, performance against budget presented as % variance, and corrective action highlights, if necessary.

Reporting for cost management is included in the monthly project status report. The Monthly Project Status Report includes a section labelled, "Budget". This section contains the Earned Value Metrics identified in the previous section. All cost variances outside of the thresholds (to be determined) are reported on including any corrective actions which are planned. Change Requests which are triggered based upon project cost overruns will be identified and tracked in this report.

Cost Breakdown	Baseline Budget (BB)	Budget Revisions (BR)	Current Budget (CB = BB + BR)	Committed to Date (COM)	Value of Work Done (VWD)	Estimate to Complete (ETC)	Estimate at Completion (EAC)	Variance (CB-EAC)
Property, Procurement & Public Art								
Program Management: • Office • Preliminary Engineering • Project Management								
Retained Risk Contingency								
Construction								
TOTAL								

Table [SEQ Table * ARABIC]: Budget Reporting Spreadsheet

17. HUMAN RESOURCE MANAGEMENT

RIO is a long term Project which will exist for almost 10 years. It is important to ensure human resources are recruited when required and retained for the duration of their role. This plan focuses on the planning, budgeting, recruitment, retention, and knowledge transfer to ensure Project needs will be met.

The Human Resource Management Plan should result in the following desirable outcomes:

- A reduction in the number of vacancies and the time required to fill vacancies
- A demonstrated improvement in the delivery of training and in development activities for RIO personnel
- A demonstrated improvement in the planning of future needs for recruitment and staffing
- A demonstrated improvement in internal communication concerning human resource matters.

The Human Resources Plan includes the following sections and can be found in detail in BIMS under [HYPERLINK "https://cueap07.city.a.ottawa.ca/bimsp/groups/public/@0010000008001008291000100832 04/documents/basicelectronicrecord/ermprod_510331.doc" \t "_self"].

Workforce planning

The human resources management will ensure that adequate resources are planned and obtained to allow RIO to meet its objectives in a timely manner as outlined in the Project schedule. Workforce planning is the important step to identify the required resources. Workforce planning encompasses both immediately required resources and well as future anticipated resources. Proper planning ensures the team has adequate capacity to complete all tasks in a timely manner. The key documents for the planning of resources will be the RIO Functional Chart, RIO Organization Chart and the Project schedule.

Personnel cost planning

The costs associated with human resources as outlined in the organization chart should be included in the Project budget. Anticipated future resources that may or may not be identified in the organization chart should also be reflected in the budget.

Recruitment and Staffing

The City is committed to providing quality services by establishing a workforce that reflects the diverse population it serves. To reflect this commitment, the City has developed a policy for recruitment and staff.

Recruitment Methods

Several recruitment methods are available to the RIO team. These methods are Internal Competition, External Competition, Short-term Contract, Temporary Help Contract and Consultant Contract. Of these available methods the preference for filling a long-term position is:

1. Internal Competition
2. External Competition
3. Consultant Contract

Collective Agreements

The Rail Implementation Office (RIO) in conjunction with the Human Resources Department must ensure compliance with the Collective Agreements of the various unions that provide work or services for or on behalf of RIO. Some of the Collective Agreements that apply to RIO are CIPP, CUPE503 inside and outside, ATU 279, ATU 1760, CUPE550, MPE, and SAS.

Training and development

Human resources assigned to positions require initial and possibly periodic training and development. Training and development will allow the resource to both stay current as well as improve their skills and knowledge to the benefit of the Project.

Administration

Personnel administration for the most part involves the recording of documentation created during the recruitment process but also involves the performance review process.

Retention and Knowledge Transfer

The long term nature of the Project warrants the implementation of retention and knowledge transfer procedures so that resources are retained until the completion of their role, which for most will be almost 10 years. Proper knowledge transfer will be important to reduce the impacts of resource migration.

For resources that migrate to other roles it is important that their knowledge, work, documents and emails be transferred to the next individual whom will fill the position. The successful transfer of knowledge improved by:

- A strong records management procedures which includes email filing,
- Succession planning
- Experience bridging

18. STAKEHOLDER ENGAGEMENT & COMMUNICATION MANAGEMENT

Stakeholder engagement is critical and fundamental to the success of the Ottawa Light Rail Transit project. Creating and sustaining relationships with identified stakeholders is effective in establishing a robust and collaborative approach to stakeholder engagement while ensuring the best interests of the project are maintained.

Specific communication approaches will be developed in support of this engagement strategy and linked to the Communications Plan. In all cases, these approaches must be augmented with a personalized approach that determines its relevance and impact for the target stakeholder and directly addresses the needs and expectations of each particular stakeholder.

All stakeholders identified in this strategy have unique expectations for how the OLRT project will service their own needs and priorities. Successful stakeholder engagement requires the Rail Implementation Office (RIO) seek mutually beneficial common ground wherever possible. Not only must RIO look inward at its own needs, but it must also acknowledge the beliefs and values of its stakeholders.

This strategy is used as an outline to identify:

- Objectives of stakeholders who may affect or be affected by the project;
- Potential conflicts or risks that could jeopardize the project;
- Leverage opportunities and build relationships that can benefit the project;
- Groups that should be encouraged to participate in different stages of the project; and,
- Ways to reduce negative impacts on vulnerable and disadvantaged groups.

There are five stages of stakeholder engagement. During the Identification stage, this outline will assist with Analyzing and Creating a Stakeholder Profile to ensure that the stakeholder interests and concerns are effectively addressed during the Implementation and Monitoring stages. These essential steps are outlined in the below figure and can be found in the OLRT Stakeholder Engagement Strategy (BIMS - [HYPERLINK "https://cueap07.city.a.ottawa.ca/bimsp/groups/public/@riogeneral/documents/basicelectronicrecord/ermprod_328376.pdf" \t "_self"]).

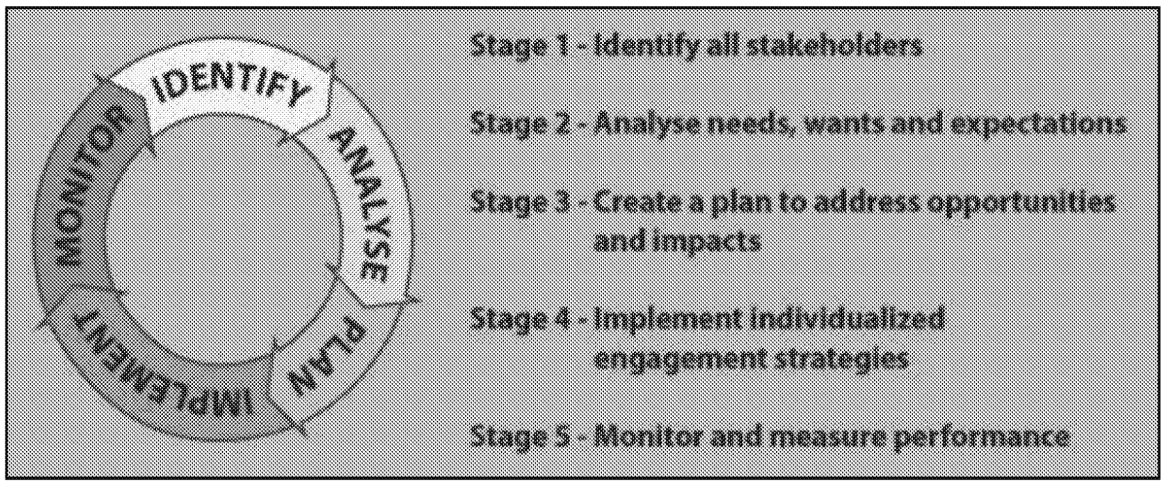

Figure [SEQ Figure * ARABIC] - Five Stages for Effective Stakeholder Engagement

19. RISK ISSUE MANAGEMENT

This Risk Management Plan (RMP) establishes the process for implementing proactive risk management as part of the overall management of the OLRT project. The purpose of risk management is to identify potential problems before they occur, so that risk-handling activities may be planned and invoked as needed across the life of the project to mitigate adverse impacts on achieving objectives. Risk management is a continuous, forward-looking process that addresses issues that could endanger achievement of critical objectives and includes early and aggressive risk identification through the collaboration and involvement of relevant stakeholders.

The risk management approach is tailored to effectively anticipate and respond to the risks that have a critical impact on project objectives. It considers both internal and external sources for cost, schedule and technical risks.

The Risk Management process includes the following activities:

- Understand project objectives
- Identify risk events and risk owners
- Evaluate risks with respect to likelihood and consequences
- Identify the potential cost of risks
- Assess the options for and develop risk response plans
- Track risk response plan efforts
- Conduct periodic reassessment of project risks and compare them against project objectives

Strategically, the goal of applying risk management is to significantly improve the ability to deliver and manage the OLRT Project. The goals of risk management are to:

- Proactively assess what could go wrong with the Project
- Determine which risks are important to deal with
- Implement strategies to deal with those risks

City of Ottawa Enhanced Risk Management Policy

The City's Enhanced Risk Management (ERM) Policy was developed with the intent to enhance public confidence and avoid unexpected/undesired outcomes through the promotion of a risk-aware corporate culture where the management of risks is integrated into the operations and administration of the City. The ERM's three main objectives are:

- Embed risk management into the culture of the City
- Reduce events or conditions that create uncertainty
- Ensure that unplanned events are managed effectively

The Rail Implementation Office has adopted a risk management process based on the City of Ottawa's ERM Policy. The risk management process is broken down into the following five steps: identification, assessment, evaluation, risk response planning and monitoring.

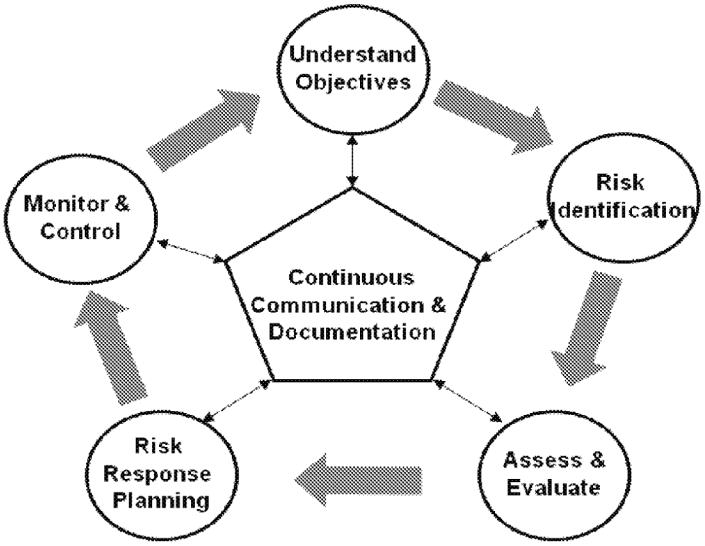

Figure [SEQ Figure * ARABIC] - City of Ottawa's Risk Management Model

To facilitate the risk management process RIO makes use of a web-based application called RAID (Risks, Actions, Issues, Database – Meetings and Stakeholders). RAID Process: Each risk is logged in RAID. This risk status is set to "pending" until such a time as it is reviewed by the Risk Control Board at its next scheduled meeting. The board will then make the decision to formally open the risk or not.

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Figure [SEQ Figure * ARABIC] - RIO's Risk Management Process

Risk Identification

Risk identification is the process of examining all project elements in detail to identify and describe potential issues, hazards, threats and vulnerabilities that may adversely affect the Project. This process must begin early and continue throughout the project life cycle. RIO utilizes several methods to identify risks, namely:

- Examination of the Work Breakdown Structure to uncover risk areas
- Risk meetings with internal/external stakeholders of various levels
- Risk Control Board Meetings
- Identification by project team members

Risk Assessment and Evaluation

Risk assessment is the process of analyzing known risks and prioritizing them based on their threat to the attainment of project goals. The Risk Control Board analyzes each risk to identify the following:

- root cause and/or triggers
- type of impacts (e.g. schedule, cost, environmental, etc.)
- probability of occurrence (on a scale of 1 to 5)
- severity of impact (on a scale of 1 to 5)
- risk cost (i.e. total estimated risk cost * risk score %)

Each risk is ranked and mapped on a 5x5 matrix as per the product of its probability and impact (*see Figure 4 – Sample 5x5 Risk Matrix)*. The ranking of risk by risk score allows RIO management to focus its

resources and efforts on those areas needing the most attention first (i.e. risk that fall into the red category).

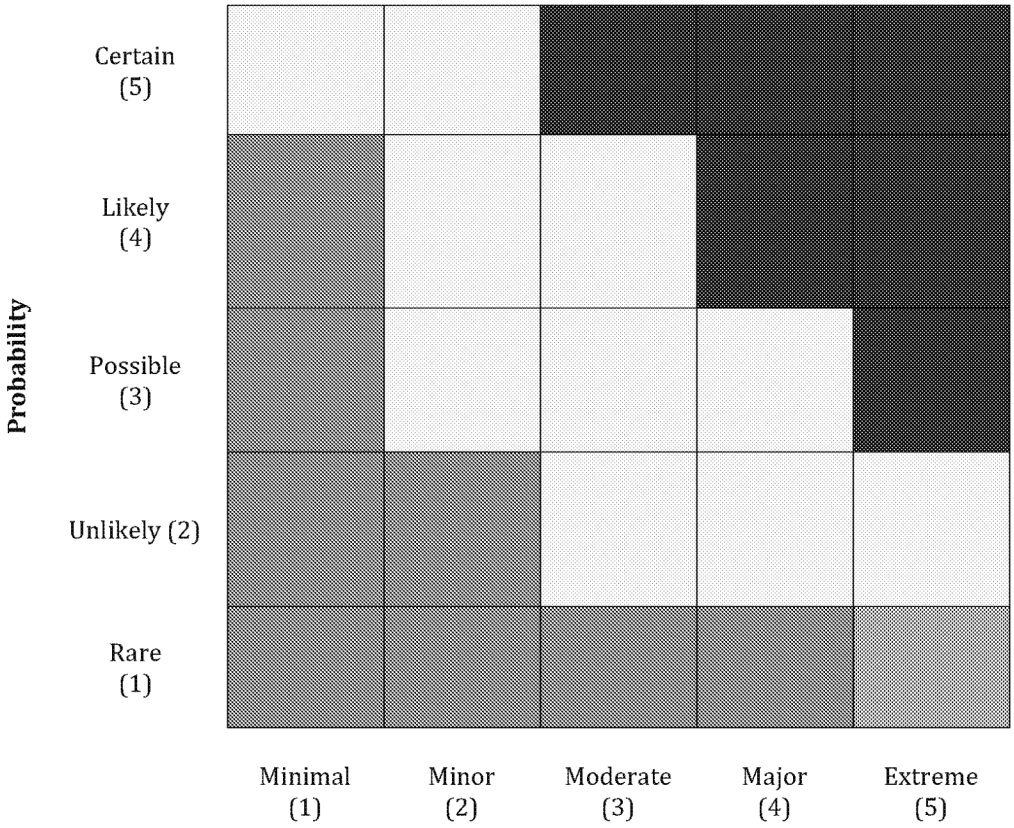

Figure [SEQ Figure * ARABIC] - Sample 5x5 Risk Matrix

Over the course of the project a risk's probability and impact scores can change either negatively or positively, as such a regular review of these scores for accuracy and relevancy will be undertaken at the Risk Control Board's monthly meeting.

Risk Response

This is the process that identifies, evaluates and selects the best option to manage a risk with a goal of reducing its impact and/or uncertainty. This includes the specifics on what should be done, when it should done and who is responsible for ensuring that it does get done. These details are stored and updated through the risks track in RAID.

Options for managing risks include:

Mitigate – Risk mitigation implies taking steps to reduce the probability and/or impact of a risk in order that should it occur the effects would fall within an acceptable threshold limits. Taking early action to reduce the probability and/or impact of a risk is often more effective than trying to repair the damage after the risk has occurred.

Avoid – Risk avoidance involves changing the project management plan to eliminate the threat entirely. Some risks that arise early in the project can be avoided by clarifying requirements, obtaining information, improving communication or acquiring expertise.

Absorb/Accept – This strategy indicates that the project team has decided not to change the project management plan to deal with the risk, or is unable to identify any other suitable response strategy. This strategy is adopted because it is seldom possible to eliminate all threats from a project.

Transfer – Risk transfer requires shifting some, or all, of the negative impact of a threat, along with ownership of the response, to a third party. Transferring the risk simply gives another party responsibility for its management – it does not eliminate it.

Risk Monitoring

To effectively control and manage risks during the project, regular monitoring and evaluation of risk response plans is conducted to ensure it will produce the desired end results. If necessary, revisions to a risk response plan can be made with the Risk Control Board's approval.

Risk Control Board

The Risk Control Board has the overall responsibility for risk management on the project. It is responsible for:

- Facilitating and approving the creation and assessment of new project risk items
- Reviewing risk response plans for completeness, feasibility and adequacy
- Creating and assigning "Actions" in RAID as required per the risk response plan

Risk Manager

The Risk Manager, as a member of RIO's Project Controls Branch, has the responsibility for:

- Coordination of the Risk Control Board's monthly meetings
- Identification of risk or actions items needing immediate attention
- Maintaining and ensuring the accuracy of the RAID risk management database
- Monitoring risk response plans and their actions
- Reporting on the progress of risk response plans
- Maintaining the Risk Management Plan
- Providing risk management training

Team members

RIO team members have the responsibility for:

- Identifying and inputting new risks into RAID with a status of '*pending*'

- Participating in risk assessments
- Participating in the development of risk response plans

Management of Risk Reserve contingency
See Financial Management Plan

Communications and Reporting
Communication and reporting of risks will be done through the Monthly Progress Report (for internal City use) and by way of the Quarterly Progress Report (for external use). For further details see the Communication and Reporting plans

20. PROCUREMENT MANAGEMENT

Procurement Principles
The procurement process will follow the City of Ottawa Purchasing By-law as well as any other established procedures applied to the specific requirements of this Project of works. The procurement process will be driven by the principles of Openness, Fairness and Transparency. The procurement process will be aligned with established industry practice for this Project of works. A workflow summarizing the City of Ottawa Purchasing By-law with additional Project requirements is shown on the following page.

Infrastructure Ontario shall be engaged by the City as its Commercial Procurement Lead for the procurement of the Project, and shall perform such other functions as set out in the MOU.

IO has extensive experience in procuring large infrastructure projects and preparing Value for Money (VFM) assessments. In addition, they have significant project financing expertise, including experience with institutional lenders that is particularly valuable in a private finance procurement model, as is being recommended to Council. The City's analysis outlined a number of advantages that IO has demonstrated in past projects:

- Date-certain delivery at a fixed cost
- Determining appropriate risk transfer to the private sector, thus reducing public sector retained risks and creating value for money
- Private sector familiarity in IO's processes and documents, and confidence that projects procured by IO will proceed and reach completion, which encourages bidder participation
- Experience applying the Alternative Finance Procure (AFP) approach to many of the Province's largest public projects
- Rigor and discipline brought to the procurement process and particularly to the Project Agreement based on the experience it has gained and the opportunity to enhance the City's capacity to implement the project

As a result of this analysis and market soundings, City staff are confident that IO would provide significant value to the OLRT project and recommend that the City engage them as the Commercial Procurement Lead for the OLRT project.

In this role, IO representatives will lead the procurement phase of the OLRT project up to financial close and will report to the Director, Rail Implementation. The City will retain final approval authority on all decision-making. The OLRT project's procurement and overall implementation is overseen by the City's OLRT Executive Steering Committee. This reporting arrangement will ensure the City benefits from the advantages of IO involvement during the procurement process while ensuring the City's objectives are met.

After contract award, it is recommended that Infrastructure Ontario (IO) remain as part of the project team in an advisory role for contract interpretation and enforcement during the construction phase. Ultimately, IO would transition to a support role for contract interpretation and enforcement on a request basis during the maintenance period.

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Figure 21 - Procurement Process

Assignment
Any contract awarded for professional consulting services for preliminary engineering and project management services may be assigned by the City to another entity, including Infrastructure Ontario

Procurement methodology

In support of the procurement principles the following methodology will be established:

- Procurement Planning: Determining what to procure, how and when;
- Solicitation Planning: Documenting product or services requirements and identifying or qualifying potential sources;
- Solicitation: Obtaining quotes, bids, offers or proposal as required for goods or services;
- Source Selection: Choosing from among the potential suppliers;
- Contract administration: Managing the relationship between the project team and the seller;
- Contract closeout: Completion and settlement of the contract including resolution of any open issues and/or claims.

Procurement details

As of September 2010 the City of Ottawa engaged the Capital Transit Partners, a joint venture of consulting engineering firms with extensive LRT infrastructure and tunnelling experience, to deliver the Preliminary Engineering component of the project.

During OLRT Project execution, RIO will assess new procurement requirements through a Needs Analysis and generation of a SOW and Specification to detail the need. RIO will determine if the requirement will be addressed through a Standing Offer, Sole Source or Competitive Procurement model and proceed with the purchase accordingly. If the transaction is determined to be a Low Dollar Purchase, authorization will be sought from RIO Business Services and the purchase will be completed with an RIO Procurement card or (if the transaction value is less than $75), a cash request from RIO Business Services.

Property acquisition process

With an aim to acquire all necessary properties by the end of 2012 the Rail Property branch will initially assess the values of the properties concerned and initiate contact with affected property owners immediately after the municipal election (October 25, 2010.) Initially an attempt will be made to acquire properties through "friendly" negotiations based on fair market value. Should progress not be made through these negotiations the Rail Property branch will initiate the expropriation process at the appropriate time to maintain the end of 2012 target date. The following is the process that will be followed for the property purchases.

RFP In-Market Period process

During the in-market phase of the Project, document and information exchange between the proponents, Infrastructure Ontario and the RIO will be in accordance with the RFP In-Market Period process located in BIMS - **[HYPERLINK "https://cueap07.city.a.ottawa.ca/bimsp/idcplg?IdcService=GET_FILE&dID=589841&dDocName=ERMPROD_551319"]**

[EMBED Visio.Drawing.11]

Figure 22- Expropriation Process

Vehicles

As part of the RFP Process, the City will require that each Pre-Qualified Respondent procure a single systems and a single vehicle provider/manufacturer that conforms to the requirements and qualifications to be set out in the RFP.

Early in the RFP Process, the City will review and provide feedback to each Pre-Qualified Respondent related to the compliance and qualifications of its proposed System & Vehicle(s) that it presents in the commercially confidential design presentation meetings, and through a mandatory interim compliance submittal.

Art

A Public Art Plan shall be developed early in the project as part of the preliminary engineering phase of design. All stations must integrate a component of public art, however some stations due to their strategic location may be identified to be "themed" (i.e. Contextually Thematic Design) and/or receive a greater share of the $10M public art funding approved to the project. The full process for public art integration in the OLRT project will be lead by a Public Art Consultant, who will work closely with the Art Selection Committee (ASC), under the guidance of City staff.

The ASC will evaluate artwork proposals, from short-listed respondents to an Expression of Interest, and make recommendations for matching artists with station design architects. At this time, the approved public art funds will be apportioned accordingly by the City and the ASC. The following is the draft process for the procurement of public art.

[EMBED Visio.Drawing.11]

Figure 23 - Public Art Process

21. PROJECT REPORTING

Report Type	Report Description	Timeframe	Recipients
RIO Monthly Report	Provides all RIO staff with analysis of the schedule, budget, and major risks associated with the project. Also, provides critical insight into developing problems and the compliance with project controls processes. The monthly report is also critical for distributing information about the achievements and specific concerns of every single RIO Branch.	Every Month	RIO Managers for review and RIO staff for information
Schedule Report	Means of updating the schedule to reflect the views of all RIO Branch Managers on a regular basis and disseminating this information to keep RIO staff aware of where the project stands at regular intervals.	Every Month, increasing to bi-weekly after construction begins	RIO Managers for review and RIO staff for information
RIO Quarterly Report	Compilation of the most important pieces of information and key trends that were contained in the RIO Monthly Reports during that quarter.	Every Quarter	OLRT Executive Steering Committee
Key Indicators Report	Brief schedule report outlining the rate of achievement for the project's major milestones and the rate of achievement of minor milestones. All with a goal of providing City Council with a snapshot of the project's status following the completion of key milestones.	At Specific Project Milestones (milestones to be determined)	City Council

Table [SEQ Table * ARABIC]: Project Reporting

22. PROJECT REFERENCES

Light Rail Transit Project: Tunney's Pasture to Blair Station: Transforming our Nation's Capital – The Benefits of Light Rail - 2010

- [HYPERLINK "http://www.ottawalightrail.ca/media/pdf/The%20Benefits%20of%20Light%20Rail%20-%20Web.pdf"]

Environmental Project Report: Downtown Ottawa Transit Tunnel: Tunney's Pasture to Blair station via Downtown OLRT Tunnel

- [HYPERLINK "http://www.ottawalightrail.ca/en/project-plan/environmental-project-report"]

Business Case: Downtown Ottawa Transit Tunnel Project: Tunney's Pasture to Blair Station via a Downtown Transit Tunnel – 2010

- **[HYPERLINK "http://www.ottawalightrail.ca/media/pdf/Final%20DOTT%20Business%20Case.pdf"]**

OLRT Project Charter

- BIMS – **[HYPERLINK "https://cueap07.city.a.ottawa.ca/bimsp/idcplg?IdcService=GET_FILE&dID=589488&dDocName=ERMPROD_481463&RevisionSelectionMethod=LatestReleased" \t "_self"]**

OLRT Configuration Identification, Configuration Status Accounting and Configuration Reviews

- BIMS - [HYPERLINK "https://cueap07.city.a.ottawa.ca/bimsp/groups/public/@001000000800100829100010083204/documents/basicelectronicrecord/ermprod_510330.docx" \t "_self"]

OLRT Audit Plan

- BIMS - [HYPERLINK "https://cueap07.city.a.ottawa.ca/bimsp/groups/public/@001000000800100829100010083204/documents/basicelectronicrecord/ermprod_510332.doc" \t "_self"]

OLRT Human Resources Plan

- BIMS - [HYPERLINK "https://cueap07.city.a.ottawa.ca/bimsp/groups/public/@001000000800100829100010083204/documents/basicelectronicrecord/ermprod_510331.doc" \t "_self"]

OLRT Stakeholder Engagement Strategy

- BIMS - [HYPERLINK "https://cueap07.city.a.ottawa.ca/bimsp/groups/public/@riogeneral/documents/basicelectronicrecord/ermprod_328376.pdf" \t "_self"]

RFP In-Market Period Process

- BIMS – **[HYPERLINK "https://cueap07.city.a.ottawa.ca/bimsp/idcplg?IdcService=GET_FILE&dID=589841&dDocName=ERMPROD_551319"]**

OLRT Transmittal Details Template

- BIMS **[HYPERLINK "https://cueap07.city.a.ottawa.ca/bimsp/idcplg?IdcService=GET_FILE&dID=532803&dDocName=ERMPROD_439168&RevisionSelectionMethod=LatestReleased"]**

Memorandum of Understanding between Ontario Infrastructure and Lands Corporation and the City of Ottawa for the Ottawa LRT Project (effective 26 October 2011)

Memorandum of Understanding between the Province of Ontario, as represented by the Ministry of Transportation, and the City of Ottawa regarding the Highway 417 Widening Project