Adelaide Street North Underpass

Risk & Opportunity Management Plan

A red and black logo

Description automatically generated

Project Risk and Quality

MGMT-6062-(01)-24W

|  |  |
| --- | --- |
| S M Rakibul Basher  Gihan Shamike Liyanage | 1168369  1142109 |

Submitted for: Prof. Noel Hayes

Submitted Date: 09/02/2024

## Prepared by

|  |  |
| --- | --- |
| Document Owners | Gihan Shamike Liyanage (1142109)  S M Rakibul Busher (1168369) |

## Risk & Opportunity Management Plan Version Control

|  |  |  |  |
| --- | --- | --- | --- |
| Version | Date | Author | Change Description |
| 1.0 | 24/02/08 | Gihan Shamike Liyanage |  |
|  |  |  |  |

Table of Contents

[Prepared by 2](#_Toc158400666)

[Risk & Opportunity Management Plan Version Control 2](#_Toc158400667)

[Adelaide Street North Underpass Risk & Opportunity Management Plan 5](#_Toc158400668)

[1. Introduction 5](#_Toc158400669)

[2. Methodologies 5](#_Toc158400670)

[2.1 Risk Identification Methodologies: 5](#_Toc158400671)

[2.2 Risk Assessment Methodology: 6](#_Toc158400672)

[2.3 Risk Mitigation Methodology: 6](#_Toc158400673)

[2.4 Data Sources: 6](#_Toc158400674)

[3. Roles and Responsibilities 7](#_Toc158400675)

[3.1 Lead Team Members: 7](#_Toc158400676)

[3.2 Support Team Members: 7](#_Toc158400677)

[3.3 Risk Management Team Members: 7](#_Toc158400678)

[3.4 Responsibilities: 8](#_Toc158400679)

[4. Budgeting 8](#_Toc158400680)

[4.1 Budget for Risk & Opportunity Management 8](#_Toc158400681)

[4.2 Protocol for Deriving Contingency and Management Reserves: 9](#_Toc158400682)

[4.3 Protocol for Budget Exceedance: 9](#_Toc158400683)

[5. Timing 9](#_Toc158400684)

[6. Risk Categories 11](#_Toc158400685)

[6.1 Project Risks: 11](#_Toc158400686)

[6.2 External Risk: 11](#_Toc158400687)

[7. Opportunity Categories 11](#_Toc158400688)

[7.1 Project Opportunities: 11](#_Toc158400689)

[7.2 External Opportunities: 12](#_Toc158400690)

[8. Stakeholder Preferences 12](#_Toc158400691)

[8.1 Qualitative Analysis: 12](#_Toc158400692)

[8.2 Quantitative Analysis: 12](#_Toc158400693)

[9. Definitions of Terms 13](#_Toc158400694)

[10. Reporting formats / Tracking 14](#_Toc158400695)

[10.1 Documentation: 14](#_Toc158400696)

[10.2 Analysis: 14](#_Toc158400697)

[10.3 Communication: 14](#_Toc158400698)

[10.4 Audit: 14](#_Toc158400699)

[10.5 Responsibilities: 14](#_Toc158400700)

[11. Conclusion 15](#_Toc158400701)

# Adelaide Street North Underpass Risk & Opportunity Management Plan

## Introduction

The Adelaide Street North – CP Grade Separation project, known as the "Adelaide Underpass," represents a significant undertaking by the City of London to enhance transportation infrastructure and safety within the community. This project aims to reconstruct Adelaide Street North from Elias Street to 80 meters north of McMahen Street, as well as Central Avenue from William Street to Elizabeth Street. The central feature of the project is the construction of an underpass beneath the CP Rail tracks, eliminating the existing at-grade crossing. In addition to the underpass, the project encompasses intersection improvements and the establishment of active transportation connections, including wide multi-use paths along Adelaide Street North. Aligned with the principles of Complete Streets, these enhancements are designed to improve amenities for pedestrians, cyclists, and transit users, fostering a more accessible and inclusive urban environment.

The Adelaide Underpass project is not only aimed at improving safety and reliability by eliminating the at-grade crossing but also seeks to reduce cut-through traffic in neighboring areas, enhance emergency service response times, and improve transit reliability. Supported by funding commitments from the Government of Canada and the Province of Ontario as part of their investment in transit and transit-supportive projects, this initiative represents a collaborative effort to address critical infrastructure needs and improve the overall quality of life for residents. In this Risk and Opportunity Management Plan, we outline strategies to identify, assess, and mitigate potential risks while also identifying opportunities to enhance project outcomes. By proactively managing risks and leveraging opportunities, we aim to ensure the successful delivery of the Adelaide Underpass project, ultimately contributing to a safer, more efficient, and sustainable transportation network for the City of London.

## Methodologies

The methodology section outlines the systematic approaches, tools, and data sources utilized for risk management in the Adelaide Street North – CP Grade Separation project, encompassing risk identification, assessment, mitigation, and the key data sources driving decision-making processes.

### 2.1 Risk Identification Methodologies:

* Stakeholder Engagement: Engage with project stakeholders including local residents, businesses, government agencies, and project team members to identify potential risks based on their expertise and perspectives.
* Document Review: Review project documentation, including design plans, environmental assessments, and construction schedules, to identify potential risks related to project scope, timeline, and environmental factors.
* Historical Data Analysis: Analyze historical project data and lessons learned from similar infrastructure projects to identify common risks and challenges that may arise during the Adelaide Underpass project.
* Expert Consultation: Consult with subject matter experts in transportation engineering, construction management, and risk management to identify potential risks specific to the project's scope and context.

### 2.2 Risk Assessment Methodology:

* Probability and Impact Matrix: Assess the likelihood and potential impact of identified risks using a probability and impact matrix to prioritize risks based on their severity and likelihood of occurrence.
* Qualitative Analysis: Conduct qualitative risk analysis to evaluate the qualitative factors such as project complexity, stakeholder attitudes, and regulatory requirements that may influence the likelihood and impact of identified risks.
* Quantitative Analysis: Where feasible, conduct quantitative risk analysis using statistical methods and modeling techniques to estimate the probability and potential impact of specific risks on project objectives such as cost, schedule, and quality.
* Sensitivity Analysis: Perform sensitivity analysis to identify the most critical risks that have the greatest potential to impact project outcomes and determine appropriate risk response strategies.

### 2.3 Risk Mitigation Methodology:

* Risk Response Planning: Develop risk response plans to mitigate, transfer, accept, or avoid identified risks based on their prioritization and potential impact on project objectives.
* Contingency Planning: Establish contingency plans and reserve funds to address unforeseen risks and mitigate their impact on project schedule, budget, and quality.
* Risk Monitoring and Control: Implement a robust risk monitoring and control process to track the status of identified risks, monitor the effectiveness of risk response strategies, and initiate corrective actions as necessary to manage emerging risks and prevent delays or cost overruns.
* Communication and Reporting: Establish clear communication channels and reporting mechanisms to keep stakeholders informed about the status of identified risks, risk response strategies, and any changes to the project risk profile.

### 2.4 Data Sources:

* Project Documentation: Design plans, environmental assessments, construction schedules, and other project documentation.
* Stakeholder Feedback: Input from project stakeholders including local residents, businesses, government agencies, and project team members.
* Historical Project Data: Lessons learned from similar infrastructure and historical project data.
* Expert Input: Subject matter experts in transportation engineering, construction management, and risk management.
* Industry Best Practices: Best practices and guidelines from industry associations and regulatory agencies related to infrastructure project risk management.

## Roles and Responsibilities

In this section, the roles, and responsibilities for the Adelaide Street North – CP Grade Separation project are defined, delineating the lead, support, and risk management team members, along with their specific responsibilities, to ensure a structured and collaborative approach to the risk and opportunity management plan.

### 3.1 Lead Team Members:

Project Manager:

* Responsible for overseeing the overall risk and opportunity management process.
* Leads the risk identification, assessment, and mitigation efforts.
* Coordinates with stakeholders and ensures timely implementation of risk response strategies.

Risk Manager:

* Leads the risk management team and oversees the execution of risk management activities.
* Conducts risk assessments, analyzes data, and develops risk mitigation plans.
* Monitors the project risk register and updates it regularly.

### 3.2 Support Team Members:

Technical Experts:

* Provide specialized expertise in areas such as transportation engineering, construction management, and environmental compliance.
* Assist in identifying technical risks and developing appropriate mitigation strategies.

Financial Analyst:

* Supports the risk management process by providing financial analysis and cost estimation for risk mitigation measures.
* Assists in budgeting and resource allocation for risk response activities.

Communications Specialist:

* Responsible for developing communication plans and materials related to risk and opportunity management.
* Ensures effective communication with stakeholders regarding project risks, opportunities, and mitigation efforts.

### 3.3 Risk Management Team Members:

Risk Analysts:

* Assist in identifying, assessing, and prioritizing project risks.
* Collect and analyze data to quantify risk likelihood and impact.
* Support the development of risk response strategies.

Project Team Members:

* Identify project risks based on their knowledge of project scope, objectives, and stakeholder relationships.
* Collaborate with the risk manager and other team members to develop and implement risk response plans.
* Monitor project activities and report any emerging risks or issues to the risk management team.

### Responsibilities:

|  |  |  |
| --- | --- | --- |
| **Lead Team Members** | **Support Team Members** | **Risk Management Team Members** |
| * Provide guidance and direction to support team members. * Ensure that risk management activities are aligned with project objectives and timelines. * Facilitate communication between different stakeholders and team members. | * Provide expertise and support to lead team members in their respective areas of specialization. * Assist in data collection, analysis, and reporting for risk management activities. * Collaborate with other team members to develop comprehensive risk response strategies. | * Assist in identifying, assessing, and prioritizing project risks. * Support the development and implementation of risk response plans. * Monitor and report on the status of identified risks and the effectiveness of risk response strategies. |

By delineating roles and responsibilities, the risk and opportunity management plan ensure clarity and accountability within the project team, facilitating effective risk management throughout the project lifecycle.

## Budgeting

### 4.1 Budget for Risk & Opportunity Management

The project's total budget was initially set at $58.3 million. However, due to unforeseen circumstances and changes in project scope, an additional $29.3 million is now required. This brings the lowest possible total budget to $87.6 million. The allocated budget for Risk & Opportunity Management in the Adelaide Street North – CP Grade Separation project is $30 million.

This Risk & Opportunity Management budget encompasses costs associated with risk identification, assessment, mitigation, and opportunity exploitation activities, including personnel, tools, and resources required for effective risk management throughout the project lifecycle. By adhering to established protocols for budgeting, contingency planning, and change management, the project team can effectively manage financial risks and uncertainties, ensuring the successful delivery of the Adelaide Street North – CP Grade Separation project within budgetary constraints.

### 4.2 Protocol for Deriving Contingency and Management Reserves:

**Contingency Reserve:** A contingency reserve of 25% of the total project budget is allocated to address unforeseen risks and uncertainties encountered during project execution. This reserve is established based on historical data, expert judgment, and risk analysis to ensure sufficient resources are available to mitigate identified risks without impacting project objectives.

**Management Reserve:** A separate management reserve of 20% of the total project budget is designated to address emergent risks or opportunities that may arise beyond the scope of the contingency reserve. This reserve is held at the discretion of the project manager and is utilized for unexpected changes in project scope, schedule, or requirements.

### 4.3 Protocol for Budget Exceedance:

In the event that the allocated budget for Risk & Opportunity Management is exceeded due to unforeseen circumstances or changes in project scope, the project manager is responsible for initiating a formal change request process. The change request includes a detailed explanation of the reasons for the budget exceedance, an assessment of the impact on project objectives, and a proposed plan for reallocating resources or securing additional funding to mitigate the budget shortfall.

The change request is reviewed and approved by the project sponsor and relevant stakeholders, ensuring transparency and accountability in managing project finances. Upon approval, necessary adjustments are made to the project budget, contingency reserves, and management reserves to accommodate the revised budgetary requirements, thereby ensuring continued adherence to project objectives and timelines.

By adhering to established protocols for budgeting, contingency planning, and change management, the project team can effectively manage financial risks and uncertainties, ensuring the successful delivery of the Adelaide Street North – CP Grade Separation project within budgetary constraints.

## Timing

The timing and frequency of risk and opportunity management processes are structured to align with key project phases and milestones, ensuring a systematic and proactive approach throughout the project lifecycle. By adhering to below structured timeline and frequency, the project team ensures that risk and opportunity management processes are effectively integrated into project activities, contributing to project success, and mitigating potential threats to project objectives.

|  |  |  |
| --- | --- | --- |
| Processes | When | Frequency |
| Risk Identification | Initiation and Planning Phases | Initial workshops and stakeholder consultations are conducted during the initiation phase to identify potential risks. Ongoing identification activities continue throughout the planning phase to capture new risks arising from detailed project planning. |
| Risk Assessment | Planning and Execution Phases | Qualitative risk assessments are conducted at key project milestones during the planning phase. Quantitative risk assessments may be performed as needed to evaluate high-priority risks. Reviews and updates are conducted regularly to adapt to changing project conditions |
| Risk Mitigation | Planning and Execution Phases | Risk response planning is conducted during the planning phase, with ongoing implementation and monitoring throughout project execution. Response plans are reviewed and updated as necessary to address evolving risk conditions. |
| Risk Monitoring and Control | Execution Phase | Continuous monitoring and control activities are conducted throughout project execution. Regular reviews and updates to the risk register and response plans are performed to track risk status and the effectiveness of mitigation strategies. |
| Opportunity Management | Throughout the Project Lifecycle | Opportunity identification, assessment, and exploitation activities are integrated into project planning and execution processes. Regular reviews and updates ensure that emerging opportunities are swiftly capitalized upon to enhance project outcomes. |

## Risk Categories

In grouping risks for the Adelaide Street North Underpass project, a dual approach will be employed to ensure comprehensive coverage of both internal project-specific risks and external environmental factors.

### 6.1 Project Risks:

Risks will be categorized according to major Work Breakdown Structure (WBS) activities, aligning with key project phases and components such as design, construction, and implementation.

This grouping allows for a focused assessment of risks associated with specific project tasks and activities, enabling targeted risk management strategies to be developed and implemented.

### 6.2 External Risk:

External risks resulting from environmental factors will be classified according to the STEEPLE framework, encompassing Social, Technological, Economic, Environmental, Political, Legal & Regulatory, and Ethical categories. While all seven categories will be considered, emphasis may be placed on those most relevant to the project context. For instance, social, economic, and environmental factors may be of particular significance given the project's impact on the community and surrounding environment. Risks within each category will be identified, assessed, and prioritized based on their potential impact on project objectives, allowing for targeted mitigation strategies to be developed in response to specific external influences.

By grouping risks according to both project-specific activities and external environmental factors, the risk management approach for the Adelaide Street North – CP Grade Separation project aims to provide a comprehensive understanding of potential threats and opportunities, enabling proactive mitigation and optimization of project outcomes.

## Opportunity Categories

In aligning with the approach used for risk categorization, opportunities for the Adelaide Street North Underpass project will also be grouped into internal project-specific opportunities and external environmental opportunities.

### 7.1 Project Opportunities:

Similar to the categorization of risks, project opportunities will be categorized based on major Work Breakdown Structure (WBS) activities.

This approach enables a focused examination of opportunities associated with specific project tasks and components, facilitating targeted strategies to leverage these opportunities for enhanced project outcomes.

### 7.2 External Opportunities:

External opportunities stemming from environmental factors will be classified according to the STEEPLE framework, encompassing Social, Technological, Economic, Environmental, Political, Legal & Regulatory, and Ethical categories. While all seven categories will be considered, priority may be given to those most pertinent to the project's context and objectives. For instance, social, economic, and environmental factors may present significant opportunities for community engagement, cost savings, and sustainable development. Opportunities within each category will be identified and assessed based on their potential to enhance project success and achieve broader societal benefits. Strategies will then be devised to capitalize on these opportunities, contributing to the project's overall success and stakeholder satisfaction.

By categorizing opportunities according to both project-specific activities and external environmental factors, the opportunity management approach for the Adelaide Street North – CP Grade Separation project aims to identify and exploit potential avenues for value creation and positive impact, ultimately maximizing project benefits for all stakeholders involved.

## Stakeholder Preferences

### 8.1 Qualitative Analysis:

Risk Progression: Risks will move forward in the qualitative analysis process based on the severity of their potential impact and the likelihood of occurrence. Risks with high impact and high probability will receive priority attention as they pose a greater threat to project objectives. Qualitative analysis will consider stakeholders' perceptions of the importance and urgency of specific risks, influencing the decision-making process.

Opportunity Progression: Opportunities will advance based on the perceived positive impact they can have on project objectives. Stakeholder preferences will be taken into account to identify opportunities aligned with their priorities and expectations. Qualitative analysis will involve assessing the feasibility and desirability of exploiting specific opportunities to enhance project success.

### 8.2 Quantitative Analysis:

Risk Progression: The Expected Monetary Value (EMV) of risks, considering both cost and time, will influence their progression in the quantitative analysis. Risks with higher EMV, indicating potential higher losses, will receive heightened attention in risk prioritization. Stakeholder preferences regarding the acceptable level of risk exposure will guide the determination of thresholds for cost and time impacts that trigger further analysis.

Opportunity Progression: The Expected Monetary Value of opportunities, considering both cost savings and time gains, will drive their progression in the quantitative analysis. Opportunities with higher EMV, indicating substantial benefits, will be prioritized in quantitative assessments. Stakeholder preferences for specific types of benefits or gains will be considered to establish thresholds for triggering further analysis and implementation of opportunity exploitation strategies.

By integrating qualitative and quantitative analyses, the risk and opportunity management process for the Adelaide Street North – CP Grade Separation project will be attuned to stakeholder preferences, ensuring that decisions align with their risk tolerance levels and expectations for project success.

## Definitions of Terms

* **Probability**: Probability in risk assessment refers to the chance that an event will transpire within a specified time frame. It determines the probability that a risk event will occur that might compromise the goals of a project, business, or system.
* **Impact**: Within the framework of risk assessment, "impact" denotes the potential outcomes or ramifications that might arise from a certain risk event. Determining the right risk management techniques and evaluating the magnitude of hazards need an understanding of their effect.
* **Probability score**: A probability score is a numerical depiction of the possibility or likelihood that an event will take place. Probability scores are used in risk management to measure how likely it is for certain risk events or scenarios to occur within a specified amount of time. Stakeholders may use these scores to evaluate the degree of uncertainty surrounding certain risks and to assist them decide on risk reduction and management tactics.
* **Impact score**: In the context of risk management, an impact score is a numerical depiction of the possible outcomes or impacts that might follow the occurrence of a certain risk event. With the use of the impact score, stakeholders may rank the risks according to importance and severity and choose which need to be addressed first for effective risk management.
* **Risk score**: A risk score is a numerical representation that evaluates the overall magnitude or severity of a risk occurrence by combining its likelihood and effect. It aids in risk prioritization and efficient resource allocation for risk management initiatives among stakeholders. By giving businesses a quantitative foundation for decision-making, the risk score enables them to prioritize tackling the most important issues first.
* **Contingency plan**: A contingency plan is a proactive approach designed to anticipate and address possible risks, crises, or unforeseen circumstances that could interfere with regular projects or business operations. It lists predetermined steps, protocols, and tools to lessen the effects of unfavorable occurrences and guarantee company continuity. In the case of a disaster, contingency planning helps firms reduce downtime, financial losses, and reputational harm. It is an essential part of risk management.
* **Trigger**: A trigger is an event, circumstance, or threshold that, when paired with risk management and contingency planning, initiates preset response plans or actions. Early warning indicators of impending disasters, emergencies, or high-risk events are known as triggers. They assist companies in responding quickly and appropriately to minimize the impact of negative events and preserve business continuity.
* **Fallback plan**: A backup plan, often referred to as a contingency plan or fallback strategy, is an additional course of action or strategy that people or organizations use in case their main plan fails or faces unforeseen circumstances. In the face of difficulty, it acts as a safety net to lessen the effects of interruptions and guarantee the continuation of operations, projects, or activities.
* **Mitigated ranking**: In the context of risk management, "mitigated ranking" refers to the updated evaluation or reordering of risks following the use of risk treatment plans or mitigation methods. It displays the most recent level of risk exposure taking into account the efficiency of risk controls and the measures taken to mitigate risks in order to lessen its impact or possibility.

## Reporting formats / Tracking

### 10.1 Documentation:

* Risk Register: A comprehensive risk register will be maintained to document identified risks, their potential impacts, likelihood, and assigned ownership.
* Opportunity Register: An opportunity register will be maintained to document identified opportunities, their potential benefits, feasibility, and assigned ownership.
* Risk Response Plans: Detailed risk response plans will be developed to outline mitigation strategies, responsibilities, timelines, and success criteria.
* Opportunity Exploitation Plans: Action plans will be developed to exploit identified opportunities, outlining implementation steps, responsibilities, and expected outcomes.

### 10.2 Analysis:

* Qualitative Analysis: Regular qualitative analysis will be conducted to assess the significance of identified risks and opportunities, considering their impact, likelihood, and alignment with project objectives.
* Quantitative Analysis: Quantitative analysis, including Expected Monetary Value (EMV) calculations, will be performed to quantify the potential financial impacts of risks and opportunities on project cost and schedule.

### 10.3 Communication:

* Stakeholder Updates: Regular updates on risk and opportunity management activities will be communicated to project stakeholders through status reports, meetings, and presentations.
* Project Team Meetings: Risk and opportunity management will be a standing agenda item in project team meetings, facilitating ongoing discussion, decision-making, and action planning.
* Formal Reports: Periodic formal reports will be prepared to summarize risk and opportunity management activities, including progress, issues, trends, and recommendations for improvement.

### 10.4 Audit:

* Internal Audits: Internal audits will be conducted periodically to review the effectiveness of risk and opportunity management processes, ensuring compliance with established procedures and standards.
* External Audits: External audits may be conducted by independent auditors to provide objective assessments of risk and opportunity management practices, validating the integrity and reliability of reported information.

### 10.5 Responsibilities:

By documenting, analyzing, communicating, and auditing risk and opportunity management processes in a systematic and transparent manner, the project team ensures that risks are effectively managed, opportunities are capitalized upon, and project objectives are achieved successfully.

|  |  |
| --- | --- |
| **Role** | **Responsibility** |
| Project Manager | Overall responsibility for overseeing risk and opportunity management processes, including documentation, analysis, communication, and audit coordination. |
| Risk Manager | Responsible for maintaining the risk and opportunity registers, conducting qualitative and quantitative analysis, and facilitating communication with stakeholders. |
| Project Team Members | Responsible for identifying, assessing, and responding to risks and opportunities within their areas of expertise, providing input for risk and opportunity management activities. |
| Stakeholders | Responsible for actively engaging in risk and opportunity management processes, providing input, feedback, and support to ensure project success. |

## Conclusion

In conclusion, the risk and opportunity management plan for the Adelaide Street North Underpass project outlines a comprehensive framework for identifying, assessing, mitigating, and exploiting risks and opportunities throughout the project lifecycle. By employing a structured methodology, clear roles and responsibilities, and robust reporting and tracking mechanisms, the project team aims to proactively address potential threats and capitalize on opportunities to enhance project success and stakeholder satisfaction. Through qualitative and quantitative analyses, risks and opportunities will be systematically evaluated based on their impact, likelihood, and alignment with project objectives. Stakeholder preferences and feedback will inform decision-making processes, ensuring that resources are allocated effectively to address high-priority risks and exploit valuable opportunities.

Effective communication and collaboration among project stakeholders will be key to the success of the risk and opportunity management process, facilitating transparency, accountability, and informed decision-making. Regular reporting and auditing will provide ongoing visibility into risk and opportunity management activities, enabling timely adjustments and continuous improvement. By integrating risk and opportunity management into project planning, execution, and monitoring processes, the project team aims to mitigate potential disruptions, optimize resource allocation, and maximize project outcomes. Through proactive risk management and strategic opportunity exploitation, the Adelaide Street North – CP Grade Separation project will deliver enhanced transportation infrastructure while improving safety, reliability, and quality of life for the community.

# References

*Adelaide Street North – CP Grade Separation ("Adelaide Underpass")*. (2023). Retrieved from getinvolved.london.ca: https://getinvolved.london.ca/adelaide

Baxter, M. (2023). *Adelaide Street underpass project a breath of fresh air for London residents*. Retrieved from canada.constructconnect.com: https://canada.constructconnect.com/dcn/news/infrastructure/2023/09/adelaide-street-underpass-project-a-breath-of-fresh-air-for-london-residents

(n.d.). *City of London | Adelaide Street North - Canadian Pacific Railway Grade Separation Class Environmental Assessment Study Report.* City of London.

CityofLondonOntario. (2022). *Adelaide Underpass Construction Public Update Meeting*. Retrieved from youtube.com: https://www.youtube.com/watch?v=hmVhqVJR8Wc

Garfield Dales, P. D. (2022). *Contract Award: Tender RFT 21-97 Adelaide Street North CPR.* London, ON: City of London.

*Module 2 - MGMT 6062 - PROJECT RISK AND QUALITY*. (2023). Retrieved from fanshaweonline.ca: https://www.fanshaweonline.ca/d2l/le/content/1558568/viewContent/14845266/View

*Module 3 MGMT 6062 Identify Risks & Opportunities*. (2023). Retrieved from fanshaweonline.ca: https://www.fanshaweonline.ca/d2l/le/content/1558568/viewContent/14069186/View

*Module 4 MGMT 6062 Qualitative Risk & Opportunity Analysis*. (2023). Retrieved from fanshaweonline.ca: https://www.fanshaweonline.ca/content/23F/1558568-MGMT-6062-(01)-24W/PowerPoints/Module%204%20Qualitative%20risk%20analysis.pdf?isCourseFile=true&ou=1558568

*Module 5 MGMT 6062 Quantitative Risk & Opportunity Analysis*. (2023). Retrieved from fanshaweonline.ca: https://www.fanshaweonline.ca/content/23F/1558568-MGMT-6062-(01)-24W/PowerPoints/Module%205%20Quantitative%20risk%20analysis.pdf?isCourseFile=true&ou=1558568

*Module 6 MGMT 6062 Plan Risk & Opportunity Responses*. (2023). Retrieved from fanshaweonline.ca: https://www.fanshaweonline.ca/d2l/le/content/1558568/viewContent/14069196/View

Prastowo, T. &. (2020). *Risk management on railway projects: A literature view. Facta universitatis - series: Architecture and Civil Engineering.*

Simon, A. (2023). *Adelaide Street North to be closed as of Wednesday for underpass rail lift*. Retrieved from globalnews.ca: https://globalnews.ca/news/9912091/adelaide-street-north-closure-london/

Stacey, M. (2022, Dec). *The big dig: An inside look at the massive Adelaide underpass project*. Retrieved from lfpress.com: https://lfpress.com/news/local-news/the-big-dig-an-inside-look-at-the-massive-adelaide-underpass-project

Stacey, M. (2023). *Sticker shock: Cost of Adelaide Street underpass balloons by 50%*. Retrieved from lfpress.com: https://lfpress.com/news/local-news/sticker-shock-cost-of-adelaide-street-underpass-balloons

The official website for the City of London, O. (2022). *Adelaide Street North Underpass*. Retrieved from london.ca: https://london.ca/projects/adelaide-street-north-underpass

Vincenzo Marchettaa, A. D. (2022). *A methodology for introducing the impact of risk analysis in local railways improvements decisions.*