City Auditor's Office

Transportation Infrastructure – Construction Project Audit (West 17th Avenue Main Street)

April 12, 2022

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The City Auditor's Office conducted this audit in conformance with the *International Standards for the Professional Practice of Internal Auditing.*

Executive Summary

A Main Street is a cultural, social, and economic focal point of a community. The vision for the City of Calgary's (The City) Main Streets Program (Program) is to create spaces for citizens to enjoy and coalesce as a community. The Main Streets Program aims to build resilient, adaptable, and attractive public spaces to support a wider variety of uses and mixed housing options to empower citizens to travel less and live more by providing the things needed in their own communities.[1] The City has committed to an initial $60M for capital investment in the Main Streets Program, and there are $301M of unfunded Main Street Projects planned for future years.[2]

The West 17th Avenue Main Streets Project (Project) is one of the Main Streets Projects funded for construction. The Project is located on 17th Avenue SW, between Crowchild Trail Bridge and 37th Street SW and is a busy vehicle-oriented street corridor that links to Calgary's downtown.[3] The scope of the Project involves streetscape improvements and infrastructure upgrades and places a special emphasis on placemaking, pedestrian comfort, safety, and other citizen and business owner interests.

The audit focused on evaluating controls in place to manage risks to project schedule, costs, and construction quality. We also assessed the effectiveness of the internal communication of project roles, responsibilities, and project status in support of the Program delivery. Good project management practices are important in delivering a quality project on time and on schedule, and we referenced The City's Corporate Project Management Framework, the Project Management Institute's Project Management Body of Knowledge, and Transportation Infrastructure Quality Management System as guidance on good practices in project management.

Overall, processes were generally designed and operating effectively to mitigate risks related to project schedule, cost, and quality. Good project management practices were applied to the Project as a baseline budget and schedule dates were established, cost estimates were refined, a cost savings analysis was completed, and annual schedules for the 2020 and 2021 construction seasons were developed. Also, Project costs were tracked through an Excel cost tracking log, scheduling updates were provided from the service provider, and monthly status reports included a summary of the Project's cost and schedule status. Baseline construction quality was established through quality plans from service providers and was monitored through quality testing and a quality non-conformance issue resolution process.

There were also processes in place to support the effective internal communication of project roles, responsibilities, and project status, as we confirmed that a governance structure was developed and

[1] City of Calgary. *Main Streets: Creating Resilient, Adaptable and Attractive Public Spaces*. Retrieved from the City of Calgary website: https://www.calgary.ca/pda/pd/main-streets/main-streets.html
[2] City of Calgary. Priorities and Finance Committee (2020). Planning & Development Report to Priorities and Finance Committee. December 1, 2020. PFC2020-1245. Retrieved from The City of Calgary website: https://pub-calgary.escribemeetings.com/FileStream.ashx?DocumentId=147641
[3] City of Calgary. *Main Streets Program: 17th Avenue SW Streetscape Master Plan – Crowchild Trail to 37 Street SW.* Retrieved from the City of Calgary website: https://www.calgary.ca/content/dam/www/pda/pd/documents/main-streets/local-area-maps/17-avenue-sw-streetscape-master-plan.pdf

roles and responsibilities were expanded in the Project Charter, Project Plan, and the Project RASCI[4] chart. There were also various internal communication channels and a lesson learned session to support internal communication within the Project team.

Our audit work identified two recommendations that we believe will add value to future Projects within the Program. Firstly, while there was a construction schedule developed for the Project, a work breakdown structure for the full duration of the Project schedule was not completed at the time of the audit. While this was an intentional decision by the Project team to support the management of stakeholder risk, developing a breakdown of tasks during the planning phase of the Project supports effective monitoring and decision making and reduces the risk of schedule overruns and delays that could impact the timely delivery of the Project. Secondly, we identified an opportunity to enhance quality management and monitoring controls by completing the Project Quality Plan checklist, obtaining additional quality documentation from service providers, and updating quality related roles and responsibilities in the Project RASCI chart. Completing these tasks would support the monitoring of Project quality risks and reduce the risk of performance issues and rework.

Transportation Infrastructure has agreed to our recommendations and has indicated in their responses a commitment to implement these actions between June 30, 2022, and September 30, 2022. This timing supports both addressing risk exposure on this specific Project prior to the completion of construction, and additionally provides benefit to future Projects within the Program. The City Auditor's Office will monitor the status of commitments as part of its ongoing recommendation follow-up process.

[4] Responsible, accountable, provide support, consulted, or informed.

1.0 Background

The City's website describes a Main Street as the cultural, social, and economic focal point of a community. A Main Street is vibrant by design and allows for a wider variety of residential and retail uses. The City's Main Streets Program has the goals of laying the groundwork for private investment and supporting development activity to bring more people and new jobs to the community and aims to make the area more attractive for local businesses and residents.[5] The Main Streets Program Principles and Goals are:

Principle	Goal
Principle 1: Social and Healthy Environment	Positively impact the social environment of the community; including human and environmental health. Connect people to people and promote physical activity.
Principle 2: Mobility and Functionality	Balance multi-modal transportation options, focusing on a year-round pedestrian friendly environment. Connect people to destinations safely.
Principle 3: Character and Identity	Create streets that establish a unique sense of place and offer memorable experiences for both residents and visitors. Create a sense of ownership and pride for the community from day one.
Principle 4: Economic Vitality	Promote economic vitality in the vicinity of the Main Street by encouraging redevelopment opportunities, promoting investment, and bringing more people to The City's Main Streets through streetscape design and community activation.

The City has committed to an initial $60M for capital investment in the Main Streets Program and there are $301M of unfunded Main Street Projects planned for future years.[6] With the initial $60M, six Streetscape Masterplans were completed, five are funded for detail design and construction documents, three are currently fully funded for construction, and two are partially funded for construction.

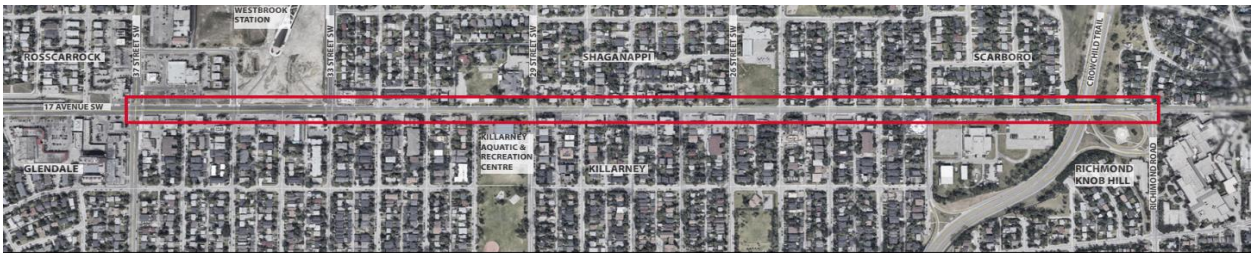
One of the three fully funded projects is situated on 17th Avenue SW, between Crowchild Trail Bridge and 37th Street SW (as shown in Figure 1), a busy vehicle-oriented street corridor that links to Calgary's downtown and was identified as a high priority project within the Program.[7] The scope of

[5] City of Calgary. Creating Resilient, Adaptable, and Attractive Public Spaces: Main Streets. Retrieved from The City of Calgary website: https://www.calgary.ca/pda/pd/main-streets/main-streets.html
[6] City of Calgary. Priorities and Finance Committee (2020). Planning & Development Report to Priorities and Finance Committee. December 1, 2020. PFC2020-1245. Retrieved from The City of Calgary website: https://pub-calgary.escribemeetings.com/FileStream.ashx?DocumentId=147641
[7] City of Calgary. Main Streets Program: 17th Avenue SW Streetscape Master Plan: Crowchild Trail SW to 37 Street SW. Retrieved from The City of Calgary website: https://www.calgary.ca/content/dam/www/pda/pd/documents/main-streets/local-area-maps/17-avenue-sw-streetscape-master-plan.pdf

the West 17th Avenue SW Main Streets Project involves streetscape improvements and infrastructure updates, and places an emphasis on placemaking, pedestrian comfort, and safety to include work such as:

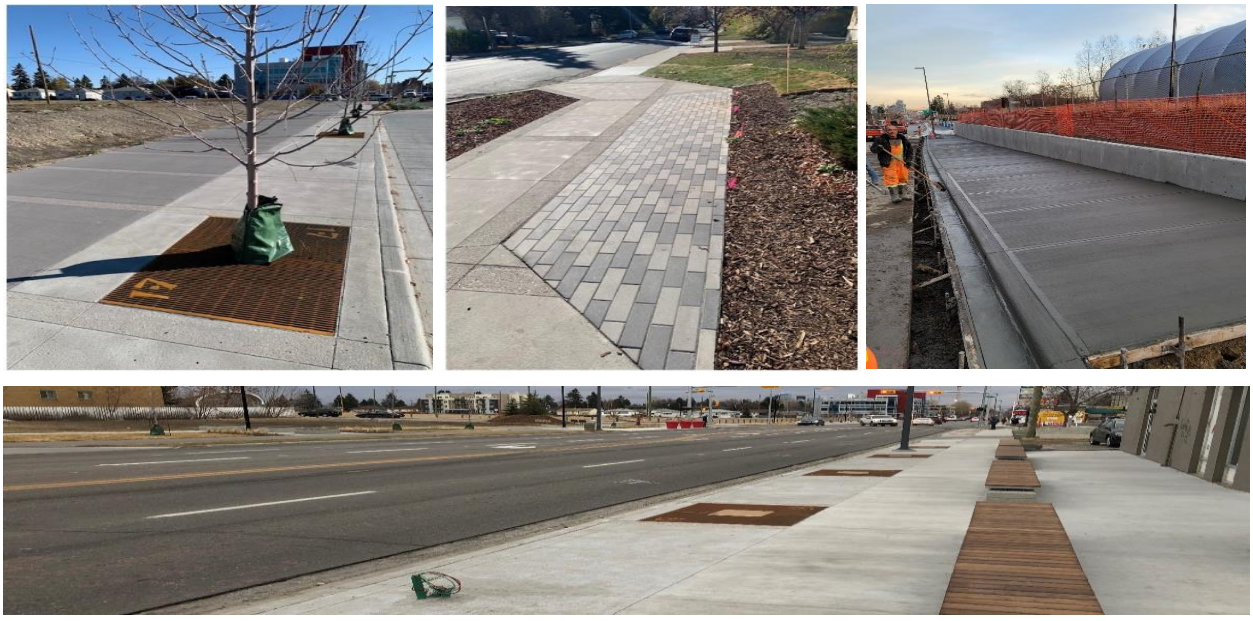
- Curb extensions and signal updates to improve pedestrian crossings.
- Narrowing of carriage way.
- Sidewalk improvements, a multi-use pathway, and wheelchair ramps.
- New resilient soft landscaping.
- New street lighting for vehicles and pedestrians.
- New pageantry elements such as banner poles, unique planters, branding of guard rails.
- Wider sidewalks on both sides of the bridge over Crowchild Trail at 17th Avenue.
- A new pedestrian connection on the south side from 24 Street to Richmond Road across from Crowchild Trail.[8]

Figure 1: Aerial View of Project Area



Source: Main Streets Program: 17th Avenue SW Streetscape Master Plan

Figure 2: Examples of the Work Completed for the Project



Source: CAO Site Visit and January 2022 Major Projects Review Presentation

[8] City of Calgary. *West 17 Avenue and 37 Street Main Streets construction.* Retrieved from The City of Calgary website: https://www.calgary.ca/pda/pd/main-streets/west-17ave-37st.html

The City's Main Streets website notes that public engagement, land use redesignations, local plan amendments, and a streetscape Master Plan (high-level design concept) are developed prior to detailed design and construction and as such, a multi-disciplinary approach across numerous areas of focus was taken. The Project is being delivered by Urban Initiatives in partnership with Transportation Infrastructure to utilize their respective areas of expertise. Urban Initiatives was responsible for the 30% and aspects of the 60% design stages before transitioning responsibility to the Transportation Infrastructure team. Transportation Infrastructure continues to be responsible for the construction of the Project.

The Transportation Infrastructure Project Manager works with the Project team to ensure that the Project is delivered within the approved timeframe and budget. The budget for the Project was $17.9M and construction started July 2020 and is expected to be completed in 2022.[9]

2.0 Audit Objective, Scope and Approach

2.1 Audit Objective

The objectives of this audit were to:

- Assess the effectiveness of the design and operation of processes that mitigate the Project's schedule, cost, and quality risks; and
- Assess the effectiveness of internal communication of project roles, responsibilities, and project status in support of the Program delivery and in accordance with the Program Charter.

2.2 Audit Scope

The scope of the audit focused on the Project controls to manage the project schedule, construction quality and cost, and communication processes that contribute to the success of the delivery of the Program at the project level.

The audit was not a technical quality audit and did not test the quality of materials used or provide assurance on the quality of the completed Project. Operational management once the Project is completed, and communication with external stakeholders are also outside the scope of this audit.

2.3 Audit Approach

The audit approach focused on evaluating the design and operating effectiveness of key controls supporting the construction of the Project and successful delivery of the Program. We reviewed the following:

- Baselines established for the Project schedule, construction quality, and cost;
- Monitoring processes for the Project schedule, construction quality and cost; and
- Processes in place to clarify roles and responsibilities and to coordinate communication with internal stakeholders within the Project team.

[9] City of Calgary. *West 17 Avenue and 37 Street Main Streets construction.* Retrieved from The City of Calgary website: https://www.calgary.ca/pda/pd/main-streets/west-17ave-37st.html

We assessed the controls by reviewing project management documents and reports and interviewed Transportation Infrastructure and Urban Initiatives staff supporting the West 17th Avenue SW Main Streets Project. We referenced The City's Corporate Project Management Framework (CPMF), Transportation Infrastructure Quality Management System (TI QMS), and the Project Management Institute's Project Management Body of Knowledge (PMBOK) as standards of good practice in project management.

3.0 Results

Our audit work identified that processes are designed and operating effectively to mitigate the risks related to cost and schedule management (Section 3.1), Project construction quality (Section 3.2), and to support internal communication of Project roles, responsibilities, and Project status (Section 3.3). Our focus in conducting this audit was both on mitigating risks related to this specific Project and identifying opportunities for improvement that will support future Main Streets Program Projects. We identified two opportunities to enhance processes:

- Supporting current and future project schedule risk mitigation through the development of work breakdown structures; and
- Enhancing quality risk mitigation processes.

In addition, as part of continuous improvement, we identified low risk opportunities for process enhancement that could benefit future Main Streets Projects. Low risk opportunities include enhancing the change management process documentation, including earned value performance measures, a summarized listing of common quality assurance tests and their testing frequencies, the delivery of project-level metrics, and incorporating lessons learned from the Project in the RASCI chart. We shared these opportunities with the project management team.

3.1 Project Cost and Schedule Management

The baseline cost and schedule have been established for the Project and overall, processes are designed and operating effectively to monitor the Project costs and schedule. We made a recommendation to support the development of a detailed work breakdown structure aligned to the baseline schedule for the remaining duration of the Project, which will further support the monitoring of the Project schedule.

Based on our review of the Project documentation and discussions with Project team members, we confirmed that good project management practices are in place as baseline budget and schedule dates have been established, cost estimates are developed, and annual schedules for the 2020 and 2021 construction seasons are completed. In addition, costs for the Project are tracked through an Excel cost tracking log, scheduling status updates are provided from the service provider, and monthly status reports are completed.

Initial cost estimates were developed in 2019 and refined in 2020 as the Project design progressed. A session was held in February 2020 with members of Transportation Infrastructure, Urban Initiatives, and the design consultant for the Project to determine whether cost savings could be achieved to mitigate the risk of the lowest contractor bid being higher than the baseline budget. The cost reduction exercise identified approximately $1.9M in projected cost savings and were reflected in the design drawings included as part of the tendering process. A class one cost estimate was completed (final design/pre-tender phase) and was within the CPMF noted accuracy range.

The baseline budget was established, and The City's contingency tool was utilized to provide a standardized approach in estimating the percentage of contingency to assign for the Project based on the Project complexity, constraints, and information quality. The Project budget, costs, and projected costs were tracked through an Excel cost tracking log by the Transportation Infrastructure Project Manager. We also reviewed two change orders and

noted that a change order process was established, where change orders were logged, analyzed, and funded through the Project's contingency reserves.

The Project baseline schedule dates were established, and the contractor developed project schedules annually for the 2020 and 2021 construction seasons, which noted a breakdown of tasks, and the duration and resources required to complete the tasks by street. A project staging plan was also developed, which outlined the construction completed by street to date, and the remaining construction that was scheduled for 2022. Weekly monitoring will continue ahead of the 2022 construction season through a weekly schedule status update from the contractor to support the ongoing monitoring of the Project. The weekly updates include information on the percentage of construction completed, scheduled, and estimated completion dates, pedestrian access dates, road closure status, and notes on any delays for streets under construction. There were also bi-weekly construction progress meetings between The City and the service providers for the Project which included schedule progress discussions to assist with the monitoring of the schedule for the Project.

At the time of the audit, a work breakdown structure had not been developed to support the full duration of the Project schedule and the Transportation Infrastructure Project Manager indicated that the contractor will develop an annual schedule for the 2022 construction season. The Project team indicated that the development of an annual construction schedule supported by weekly monitoring was an intentional approach, with the aim of supporting the management of stakeholder risk. Creating a work breakdown structure for the full duration of the Project aligned to the baseline schedule supports the Project team to monitor scheduling for the entire project and to take appropriate action as needed to restore the Project back to the baseline schedule dates in a timely manner. (Recommendations 1a and 1b)

The Transportation Infrastructure Project Manager prepares a Transportation Infrastructure Status Report for the attendees at the Major Projects Review meetings. We obtained three monthly Transportation Infrastructure Status Reports and they contained a summary of the Project's financial (such as the budget, actual costs, and estimated cost at completion) and schedule status (such as upcoming milestones and the associated planned, revised, and completion dates).

3.2 Project Quality Management

Our audit work confirmed that the construction quality baseline and monitoring are designed and operating effectively. We raised one recommendation to strengthen the quality processes to enhance the management and monitoring of the Project quality risks.

Based on our review of the Project documentation and discussions with Project team members, we confirmed that good project management practices are in place as baseline construction quality has been established through quality plans from the service providers and is monitored through quality testing and a quality non-conformance remediation process.

The contractor (and an associated sub-contractor) and additionally the sub-contractor for the bridgework conducted the quality control testing and provided quality plans to establish the quality construction baseline for the Project and included their general construction quality information and quality control testing plans. Third party, independent consultants were also hired by The City to review the quality control testing completed to ensure tests were being performed as per the quality plans. We obtained two examples of quality non-conformance as part of the non-conformance remediation process and issues were logged and assessed,

ownership to address the issue was assigned, approved, and discussed at construction meetings with the service providers and Project team.

We reviewed an example of quality control tests related to asphalt, concrete, compaction, and for the bridgework to confirm that these tests as noted in the quality plans were being performed for the Project. There was also an attestation provided by the consultants indicating that they had reviewed and confirmed the quality records. Additional quality management plans and documentation supporting the attestation such as the quality records reviewed and whether the quality control tests adhered to the frequencies noted in the quality control testing plans can be obtained to assist the team in determining whether the work completed for the Project meets quality standards (Recommendations 3a and 3b).

Quality assurance tests were also completed by The City (or a third party on behalf of The City) for asset owners to ensure compliance with The City's standards and we obtained an example for asphalt, concrete, and compaction to evidence the performance of quality assurance tests.

The Project Plan noted that as part of the quality management for the Project, the Project Quality Plan (PQP) checklists were to be completed as part of the TI QMS. While there were sections of the PQP checklist that were completed (e.g., 60% and 90% design, contractor procurement, and notice to proceed and construction initiation), we noted that there were stages of the PQP checklist that were not completed, and both the completed and incomplete checklists were not signed off by the project sponsor to evidence review and to finalize the completed stages of the checklist. Updating quality related roles and responsibilities in the Project's RASCI[10] chart (a model laying out project roles and responsibilities), such as the completion of the PQP checklist, can assist with clarifying the resources and roles associated with the quality deliverables. We recommend completing the TI PQP checklist (or an alternative equivalent process) for future Main Streets Projects and updating quality related roles and responsibilities in the Project's RASCI chart. Completing these activities can assist with meeting the Project quality objectives (Recommendations 2 and 3c).

3.3 Internal Communication of Project Roles and Responsibilities, Project Status

Our audit work confirmed that processes are in place to support the effective internal communication of project roles and responsibilities and project status in accordance with the Program Charter.

Based on our review of the Project documentation and discussions with Project team members, we confirmed that good project management practices are in place as a governance structure was developed and roles and responsibilities were refined in the Project Charter, Project Plan, and RASCI chart. There are also various communication channels to support internal communication within the Project team.

A governance structure flow chart in the Program Charter (which is referred to in the Project Charter) for the Main Streets Program depicts the information flow and two-way internal communication between the Program and Project, and design and construction phases. In addition, the governance structure flow chart identifies roles in the design and construction phases of the Project and Program, and the Project roles and responsibilities are expanded on in the Project Charter and Plan. The Project Plan also defined the authorities for the Project

[10] Responsible, accountable, provide support, consulted, or informed.

and both the Project Charter and Plan were completed and obtained the required sign off as per the CPMF.

A RASCI chart was completed by the Transportation Infrastructure Project Manager for the Project and was referenced in the Project Plan. The RASCI chart noted a team member and their role in the work activity for the Project. Role definitions were included in the RASCI chart, and tasks were grouped by stages in the Project. The RASCI chart demonstrated the transition of responsibilities within the design stage of the Project from Urban Initiatives to Transportation Infrastructure.

The Project has an executive sponsor, project sponsor, and project manager from Urban Initiatives (for their knowledge with historical community engagement) and Transportation Infrastructure (for their expertise in project construction) to complement their areas of expertise. The RASCI chart for the Project noted that responsibilities generally transitioned from Urban Initiatives to Transportation Infrastructure during the 60% design stage and one individual was responsible for a task, unless collaboration and input in their area of expertise was needed (e.g., afterhours media spokesperson, lessons learned). As noted by the Project Plan, the project sponsors acted as a first point of contact on escalated matters. Key risks and issues can also be presented at the Major Projects Review meeting, as needed.

The governance structure, Project Charter and Plan, and Stakeholder and Communication Plan for the Project were also completed and collectively provided an overview of information regarding communication approach, channels, and internal stakeholder requirements. Internal communication to support the Project delivery occurred through:

- The Transportation Infrastructure Project Manager preparing a Transportation Infrastructure Status Report for attendees at the Major Projects Review meeting, where members of the Project, Program, and internal stakeholders at the senior management level attend.
- Meetings between members of Urban Initiatives and Transportation Infrastructure teams to discuss projects under construction for the Main Streets Program where members of the Project and Program team attend.
- Meetings between members of The City's Project team and the Project service providers to discuss the status of Project construction.

In addition, members of the Project team participated in a lesson learned session held in November 2020. A presentation summarizing the lesson learned sessions was also provided to the project sponsors. Project observations were documented in meeting minutes and noted successes, challenges, and improvement opportunities for the Project. In addition, examples were provided of where lessons learned had been applied in the 2021 construction season. At the time of the audit fieldwork, another lesson learned session was scheduled for the end of November 2021.

We would like to thank staff from Transportation Infrastructure and Urban Initiatives for their assistance and support throughout this audit.

4.0 Observations and Recommendations

4.1 Project Construction Schedule

A work breakdown structure has not been developed to support the full duration of the Project schedule. Developing a baseline schedule, supported by a breakdown of tasks during the planning phase of the Project supports effective monitoring and decision making and reduces the risk of schedule overruns and delays that could impact the timely delivery of the Project.

A project schedule identifies the time and resources required to complete a project and its deliverables. The CPMF indicates that initial project schedules are developed to identify milestones or key deliverables at a high level. As a schedule is developed, a breakdown of tasks required to achieve the deliverables is performed. The breakdown provides additional details, including key activities, planned dates, and the duration and sequencing of individual tasks. Project baseline milestone dates are established in the Project Plan and should be reflected in the schedule. A project team can then track and monitor the current performance against the baseline dates in the schedule.

A Project staging plan has been developed that outlines the construction by street to date, and remaining construction scheduled for 2022. The contractor developed annual construction schedules for 2020 and 2021 that identified and sequenced tasks by street, duration of tasks, and provider responsible for the task. The Transportation Infrastructure Project Manager indicated that the contractor will develop an annual construction schedule for 2022 ahead of the construction season and continue weekly monitoring of the immediate next tasks once construction season commences.

The Project team indicated that the development of an annual construction schedule supported by weekly monitoring was an intentional approach, with the aim of supporting the management of stakeholder risk. Nevertheless, where a work breakdown structure is not in place supporting the full duration of the baseline schedule, monitoring is less effective as it takes place on a short-term horizon, and appropriate action to restore the Project back to baseline schedule may not be identified and taken in a timely manner.

Recommendation 1

a) The Transportation Infrastructure Project Manager to coordinate the development of a detailed work breakdown structure aligned to the baseline schedule for the remaining duration of the Project to monitor the construction progress against the baseline schedule dates.
b) The Program Manager and Manager, Transportation Infrastructure Special Projects to evaluate and consider alternatives for creating a detailed work breakdown structure for the full construction period for subsequent Main Streets Projects.

Management Response:
Agreed.

Action Plan	Responsibility
a) The construction sequence of the blocks has been reviewed and	a) Lead: Transportation Infrastructure Project Manager

Action Plan	Responsibility
approved for the 2022 construction season. The contractor will initiate the development of the work breakdown structure and the baseline construction schedule for execution for The City's and consultant's review and approval. The work breakdown structure will be aligned to the baseline construction schedule to monitor progress. b) The Main Street Projects are unique in nature as it involves 'block by block' construction ensuring business access and pedestrian connectivity is always maintained. The lessons learned from the 17 Avenue SW Main Street Project will be used to develop a detailed work breakdown structure for the full construction period for subsequent Main Streets Projects.	Support: Prime Contractor and Prime Consultant Commitment Date: March 31, 2022 b) Lead: Manager, Transportation Infrastructure Special Projects Support: Program Manager, Urban Initiative Project Managers and Transportation Infrastructure Project Managers Commitment Date: September 30, 2022

4.2 Quality Management Processes

The Project Management team can enhance the management of Project quality risks and mitigate the risk of rework by completing the activities in the Transportation Infrastructure Project Quality Plan (PQP) checklist, obtaining additional quality documentation from service providers, and updating the quality-related roles and responsibilities.

The CPMF notes that a quality management system may be used to monitor and control the quality of products. The Transportation Infrastructure Quality Management System (TI QMS) governs the team's quality program and is complementary to the standards in the CPMF. A RASCI chart can also be completed to provide guidance for project team members on their roles and responsibilities through the Project's phases and by project deliverable.

During our review, we noted that there were stages of the PQP checklist that were not completed (stage initiation, consultant procurement, feasibility, preliminary 30% design). In addition, both the completed and incomplete checklists were not signed off by the project sponsor to evidence review and to finalize the completed stages of the checklist.

The TI QMS provides content consideration for quality management plans from contractors and consultants, and to confirm general information on their quality programs and their inspection and testing processes, service provider quality plans should be obtained. The Transportation Infrastructure Project Manager also noted that the independent third-party engineering consultant and sub-consultant for the bridgework were responsible for reviewing quality records completed by the contractor and sub-contractor for the bridgework.

Quality management plans were obtained from the prime contractor and the sub-contractor for the bridgework. However, the quality plan was not obtained by The City for independent third-party engineering consultant. In addition, quality plans from the independent third-party engineering sub-consultant for the bridgework and for certain sub-contractors (electrical, underground construction, and landscaping) can also be obtained by The City to ensure quality objectives are met for the Project.

The independent third-party engineering consultants have also attested to reviewing the quality reports completed by the contractor and sub-contractors as part of the monthly progress payment process. Obtaining the quality management plan from the consultants allows the Project team to better understand the quality processes in place to support the consultants attestation and to incorporate enhancements to the Project teams process, such as including a list of quality reports and checklists reviewed and whether the frequency of the contractor testing adheres to their quality management plan, would assist the Project team in determining whether the work completed for the Project meets quality standards.

A RASCI chart was completed for the Project and can be updated to assist in completion of quality tasks, such as the PQP checklist, by clarifying the resources and roles associated with the quality deliverable.

Recommendation 2

The Manager, Transportation Infrastructure Special Projects to coordinate with the Program Manager to design and implement a process to complete PQP checklists (or alternate equivalent process) for future Main Streets Projects.

Management Response:

Agreed.

Action Plan	**Responsibility**
Transportation Infrastructure PQP checklist will be shared with Urban Initiatives. All previous PQP checklists will be filled out irrespective of the current stage the Main Street Project is at. This exercise will help identify gaps that have occurred during the design stages and provide an opportunity to mitigate them prior to construction starting.	Lead: Manager, Transportation Infrastructure Special Projects Support: Program Manager, Urban Initiative Project Managers and Transportation Infrastructure Project Managers Commitment Date: June 30, 2022

Recommendation 3

The Transportation Infrastructure Project Manager to:

a) Prioritize and coordinate obtaining quality management plans from The City's independent third-party engineering consultant, sub-consultant, and sub-contractors using a risk-based approach as it relates to the quality risks for the Project.
b) Obtain listing of tests reviewed, and the frequency of the quality control tests to support the attestation provided by the contractor and sub-contractor from prior and future periods.

c) Update the RASCI chart for quality related activities, as required.

Management Response:
Agreed.

Action Plan	Responsibility
a) and b) For the engineering consultant and sub-consultant, since this is the last year of construction, there is limited value of obtaining quality management plans from them as the current process on how quality is managed on the project is satisfactory. However, the following steps will be implemented to strengthen the process and improve documentation. • Review the current list of quality control (QC) and quality assurance (QA) tests required and their frequency as per The City's specifications and double-check completeness of the list. • All QC and QA tests will be submitted and recorded as a 'submittal'. • The consultant's team will review and attest the test results (i.e., acceptable vs un-acceptable). • For unacceptable tests, the consultant will be required to confirm if this needs to be noted as a deficiency that will be corrected at a later date or requires opening of a non-conformance report (NCR) requesting corrective measures. • The consultant to provide an inspection report for landscaping work documenting the review and approval of the pre-work required prior to installing trees and sod. The QMP for the sub-contractors that are missing in Prime Contractor QMP will be requested and added to Prime Contractor QMP.	a) and b) Lead: Transportation Infrastructure Project Manager Support: Prime Contractor and Prime Consultant Commitment Date: June 30, 2022 c) Lead: Transportation Infrastructure Project Manager Support: Manager, Transportation Infrastructure Special Projects, Program Manager and Main Street Program Lead Commitment Date: June 30, 2022

Action Plan	Responsibility
c) As part of the action plan for recommendations 3(a) and 3(b), the RASCI chart will be reviewed and updated as needed to reflect quality related activities and who will be responsible.	