**Minute No. 494**
**Report – Standing Policy Committee on Infrastructure Renewal and Public Works – June 28, 2016**

**Item No. 4 Functional Design for the CPR Yards Crossing Study**

COUNCIL DECISION:

Council concurred in the recommendation of the Standing Policy Committee on Infrastructure Renewal and Public Works and adopted the following:

1. That the Functional Design for the CPR Yards Crossing Study be received as information.

2. That preliminary design work be authorized and continued in order to progress from a Class 4 cost estimate to a Class 3 cost estimate, pursuing the design alternative of a new bridge over the CPR Yards on a similar alignment as the current Arlington Street Bridge.

3. That the Public Service be authorized to commence negotiations with the CP Rail Company including removal of their "L-Lead" spur line.

4. That, should Council subsequently authorize funding of the main construction project, that the CAO have in place (be delegated) the authority for single source negotiations and award related to professional consulting services for the Arlington Bridge Replacement, for either;

    A. Detailed design and contract administration if the project is delivered using traditional design – bid – build implementation; or,

    B. Owner's engineering services if the project is delivered using alternative delivery methods such as design – build or a Public-Private Partnership (P3) mechanism.

5. That the proper officers of the City be authorized to do all things necessary to implement the intent of the foregoing.

**Report – Standing Policy Committee on Infrastructure Renewal and Public Works – June 28, 2016**

DECISION MAKING HISTORY:

Moved by Councillor Lukes,

That the recommendation of the Standing Policy Committee on Infrastructure Renewal and Public Works be adopted.

Carried

Councillor Wyatt asked to be recorded as having voted in opposition to the item in accordance with Rule 47.7 of the Procedure By-law.

EXECUTIVE POLICY COMMITTEE RECOMMENDATION:

On July 6, 2016, the Executive Policy Committee concurred in the recommendation of the Standing Policy Committee on Infrastructure Renewal and Public Works and submitted the matter to Council.

STANDING COMMITTEE RECOMMENDATION:

On June 28, 2016, the Standing Policy Committee on Infrastructure Renewal and Public Works concurred in the recommendation of the Winnipeg Public and submitted the matter to the Executive Policy Committee and Council.

# ADMINISTRATIVE REPORT

**Title:** Functional Design for the CPR Yards Crossing Study

**Critical Path:** Standing Policy Committee on Infrastructure Renewal and Public Works – Executive Policy Committee – Council

## AUTHORIZATION

| Author | Department Head | CFO | CAO |
|---|---|---|---|
| L. Escobar, P.Eng., PTOE | L.P. Deane, P. Eng. | B. Holsten-Boyer A/CFO | D. McNeil |

## RECOMMENDATIONS

1. That Council receives as information the Functional Design for the CPR Yards Crossing Study.

2. That Council authorize that preliminary design work be continued in order to progress from a Class 4 cost estimate to a Class 3 cost estimate, pursuing the design alternative of a new bridge over the CPR Yards on a similar alignment as the current Arlington Street Bridge.

3. That the Public Service be authorized to commence negotiations with the CP Rail Company including removal of their “L-Lead” spur line.

4. That, should Council subsequently authorize funding of the main construction project, that the CAO have in place (be delegated) the authority for single source negotiations and award related to professional consulting services for the Arlington Bridge Replacement, for either;

    a. Detailed design and contract administration if the project is delivered using traditional design – bid – build implementation; or,

    b. Owner’s engineering services if the project is delivered using alternative delivery methods such as design – build or a Public-Private Partnership (P3) mechanism.

5. That the proper officers of the City be authorized to do all things necessary to implement the intent of the foregoing.

## REASON FOR THE REPORT

The Arlington Bridge over the CPR Yards is nearing the end of its useable service life. This report responds to the direction given to the Public Service by Council to conduct a functional study to develop a functional transportation plan to be implemented after the removal of the existing Arlington Bridge.

In the context of decommissioning the existing Arlington Bridge, Council approval of a new crossing at the Arlington Street location, as an immediate requirement, is necessary for the Public Service to begin the preliminary design phase and commence negotiations with the CP Rail Company.

That the results of the technical analysis and public engagement can be presented to Council to demonstrate the importance the Arlington Bridge crossing to the transportation network in the north west quadrant of the City and to support healthy communities in the proximity of the bridge.

In accordance with B1.1 of the Administrative Standard No. FM-002, the approval of the Executive Policy Committee is required for any single source negotiation for consultant services where the estimated value relating to capital projects exceeds $100,000.00 in total, including all phases of any given project.

Pursuant to B8.2 of the City of Winnipeg's Materials Management Policy, the Chief Administrative Officer is delegated the authority to award a contract where the value of the contract does not exceed $5,000,000 and there are sufficient funds in a budget approved by Council. Therefore Council must approve a delegation of authority to the Chief Administrative Officer to award a contract that exceeds $5,000,000. Pursuant to The City of Winnipeg Charter, Council has authority to delegate certain administrative powers, duties or functions to an employee.

## EXECUTIVE SUMMARY

The Arlington Bridge is nearing the end of its functional life and is proposed for decommissioning around 2020. Over the last year and a half, through both a collaborative planning proces and public engagement process, a functional plan was developed to determine the best possible plan to move people and goods safely and efficiently across the CPR Yards when the Arlington Bridge closes.

The functional study looked at a broad area that was bounded by Inkster Boulevard, McPhillips Street, Notre Dame Avenue and Salter Street. The study also included reviewing the traffic associated with the Main Street crossing of the CPR Mainline.

The project team which worked through a collaborative planning process with a Project Advisory Committee (PAC,) was asked to identify the best and most practical options for providing long term connectivity across the CPR Yards. Nine concepts options were developed and of those, five were further developed and evaluated. Of these, two functional options were further developed and presented to the public. The two options are presented graphically in Appendix 'A'.

Based on the traffic analysis of the various options and from input from the public and surrounding communities, it was recognized early in this study that the Arlington Bridge provided a vital link for the local community in daily activities for all modes of transportation and was also required to sustain today's traffic capacity needs.

If the recommendations of this report are approved, the Public Service will continue to plan and engineer the replacement of the Arlington Bridge that is consistent with the Project Visions and Goals of the CPR Yards Crossing Study that were developed in collaboration with stakeholders, surrounding communities and the general public. The Public Service will strive to develop engineering plans that will reduce the duration of the full closure of the crossing to all modes of transportation to approximately one construction season, with priority given to the west side of the existing bridge.

The Class 4 project cost estimate is $300 million, which assumes a construction start date of 2020, and that the Public Service will prepare a Class 3 estimate during the next phase of engineering design that can be used for budgetary purposes. The basis for the class 4 estimate is included in Appendix 'B'.

As the existing CPR Yards crossings are almost at capacity with today's traffic volumes crossing the yards and as Winnipeg grows, additional crossing capacity will be required. Therefore the two short-listed options presented to the public included two phases. Phase 1 for both options included replacing the Arlington Bridge in the short term. Phase 2 is a future plan to provide the additional required capacity to accommodate projected growth beyond 2030. There was not a clear choice for a Phase 2 solution as both options have significant impacts to the CP Rail Company and the community. Phase 2 crossing options are to either expand the McPhillips Street Underpass or provide a new connection between McGregor Street and Sherbrook Street.

A comprehensive Public Engagement process completed as part of the Study enabled Winnipeggers to provide input through:

- Face-to-face meetings
- Dialogue groups
- Community workshops
- Open houses
- Online and telephone surveys

To summarize the key findings arrived at through the CPR Yards Crossing Study:

- The Arlington Bridge is critical to the health of the surrounding communities to keep people connected.

- Community members prefer the Arlington Bridge location to the other area crossing locations as a critical link for activities such as work, shopping and appointments because of its convenience, connections, and multi-modal accommodation.

- From a city-wide perspective, the existing transportation network would not be sustainable if this crossing were to be removed and not replaced in some form.

Due to the distant horizon related to Phase 2, a review of long term-needs should be conducted after completing the replacement of the Arlington Bridge that considers the following:

- Performance of the new Arlington Bridge;
- The future of the CPR Yards;
- Population growth and transportation demand;
- Changes in method of transportation (automobile, bicycle, pedestrians, Transit);
- Land development in the surrounding area;
- That no clear direction was given through the public engagement process.

## IMPLICATIONS OF THE RECOMMENDATIONS

The total costs for all future phases of professional engineeringis estimated to be in the range of $20 million.

An approved crossing location and alignment will allow more detailed engineering design of roadways, bridges and associated works to proceed and a Class 3 project estimate to be prepared.

If the L-Lead line (please see Appendix ‘A’, page 18) is not removed the Arlington Bridge would have to be replaced in line with its existing location and the transportation connection at this location would not be available for the entire construction period. If the L-Lead line is removed and the bridge is constructed to the west, off-line, then it is anticipated that the crossing would need to be closed for about one construction season. Further reducing the duration of the connection closure to less than one construction season could result in between 15% to 30% increase in cost which is based on experience with the Osborne Bridge Rehabilitation and the Disraeli Freeway Bridge Replacement. Therefore the Public Service is recommending allowance of one construction season if the L-Lead line can be removed and the bridge can be built off line.

Continuous progression in the engineering and planning is necessary to develop the optimal engineering solutions which require keeping the public engaged and uninterrupted discussions with CP Rail Company.

Assuming other levels of government will participate in funding the replacement of the Arlington Bridge, it can be expected the City will require an increase in revenue to pay for the City’s increased debt payments resulting from this project.

## HISTORY

On November 16, 2011, City of Winnipeg Council adopted the Transportation Master Plan (TMP) which identified the Arlington Bridge location as a medium-term major road network improvement.

The 2013 Capital Budget adopted by Council on January 29, 2013 included funding for the CPR Yards Functional Crossing Study – between McPhillips Street and Main Street in the amount of $1,500,000.

The 2016 Capital Budget adopted by Council on March 22, 2016 included funding for the CPR Yards Functional Crossing Study – between McPhillips Street and Main Street in the amount of $2,000,000 for the Preliminary Design of the recommended crossing of the CPR Yards Crossing Study.

## DISCUSSION

A summary of drawings excerpts from the Functional Design Study report is enclosed in Appendix 'A'

### SCOPE OF FUNCTIONAL WORK COMPLETED

The functional design report includes the following key components:

- Topographic Survey
- Geotechnical Investigations
- Traffic Analysis
- Traffic Growth Projections
- Crossing Location Determination
- Intersection Capacity Evaluation
- Conceptual and Functional Design of the Proposed Crossing(s)
- Environmental Planning
- Stakeholder Consultation
- Public Engagement
- Functional Design of New Crossing
- Rail Impact Evaluation
- Property Impact Evaluation
- Conceptual Landscape Design
- Preliminary Design of Arlington Bridge Decommissioning
- Project Cost Evaluation
- Final Report and Recommendations.

**PUBLIC ENGAGEMENT**

The public and stakeholder were engaged throughout the functional design process. A Public Advisory Committee ("PAC") was formed to assist with the project using a collaborative planning approach. Eight meetings were held throughout the process with the PAC. Members from the following organizations formed the PAC:

- Health Sciences Centre
- Rossbrook House
- Jejomar Bakeshop
- Winnipeg Boys & Girls Club
- Bike Winnipeg
- Dufferin School
- City of Winnipeg Access Advisory Committee
- Centennial Residents' Association
- Winnipeg Regional Health Authority
- King Edward School,
- Kemel Cartons
- Transportation Options Network for Seniors (TONS)
- Economic Development Winnipeg
- Nor'West Co-op Community Health Centre
- Dufferin Residents Association of Wpg/William Whyte Residents Association
- Ndiniwe
- Gordon Goldsborough Manitoba Historical Society
- Winnipeg Housing Rehabilitation Corporation

The general public also had many opportunities to be engaged and provide input throughout the process:

- Stakeholder Workshop #1 and Bus Tour (over 40 participants)
- Dialogue groups
    - Dufferin Residents Association
    - Centennial Neighborhood Improvement Zone
    - Mayor's Access Advisory Committee
    - Roberston, Faraday and Burrows Central Residents Associations
- Stakeholder Workshop #2 (over 70 participants)
- On-line Public Engagement and interactive website (total web views over 6000)
    - Virtual Open Houses (133 respondents)
    - Online questionnaires (110 respondents)
    - Interactive mapping and discussions (2499 interactions)
- Open House(s) #1 (159 attendees)
- Open House #2 (72 attendees)
- Telephone Survey by Probe Research (400 samples)

The public also had many opportunities to be informed about the project:

- Coverage by all major media outlets through-out the project
- Multiple media release by The City of Winnipeg
- Two informative publications (newsletters)
- Open Houses were widely marketed through the PAC, posters, media advertisements, email lists, social media, etc.

A project vision was established early in the process:

**Having a safe, convenient and well-situated crossing(s) that:**

**• Connects the north and south communities**
**• Manages traffic-flow and supports economic stability & growth, social interaction and healthy living**
**• Offers accessible, connected transportation options for all ages and abilities**

Project goals were established and refined throughout the public engagement process to ensure that the public expectations and input would be reflected and represented through the technical process. The key goals are:

1. To be technically sound
2. To be environmentally responsible
3. To be cost effective
4. To reflect the needs of the local community
5. To be understood and accepted by those affected.

Throughout the public engagement process the follow key themes were prevalent:

- Lead planning and design decisions in concert with the project vision and goals
- Build a convenient, connected, safe and accessible crossing that meets users' daily needs
- Plan and design individually for each mode of transportation
- Support the goal of healthy communities
- Continue to consult and communicate.

The public and community have advised the project team and the Public Service that they are happy with the public engagement work to date and they feel that they have been listened to. It is important the communities, stakeholder and public continue to be engaged throughout the remaining phases of the project.

**KEY FINDINGS**

The Arlington Bridge off alignment to the west of the existing bridge is recommended as it best meets the projects goals and is the preferred option from the community. There is negligible costs implications anticipated for constructing the bridge off-line and keeping traffic open for two

of the three construction years if the L-Lead line can be abandoned, relative to the option of building on the existing alignment and closing the crossing for the entire construction period.

The recommended lane configuration on the new bridge is two lanes northbound and one lane southbound with uni-directional protected bike lanes on either side of the bridge. The bridge should be sufficiently wide to accommodate 4 lanes in the future as the structure life is 75 years.

Replacing the existing Arlington Bridge alone will not sustain the long term growth of the City therefore improvements to other existing crossing(s) or a new crossing (Phase 2) may be required beyond 2030.

It is recommended that Phase 2 be re-evaluated upon completion of Phase 1 to confirm traffic projections and monitor development and population growth. Also any CPR Yards reconfigurations, operational changes, yard or mainline relocations shall be monitored and re-evaluated for impacts on the proposed Phase 2 connection.

**KEY ELEMENTS OF DESIGN AND THE NEXT DESIGN PHASE**

The project would have the following major elements and more information is shown graphically in Appendix 'A':

- Public Transit will be able to improve existing routing with in the study area and utilize the new bridge. New Transit stops and amenities would be included in the implementation.
- The new bridge will have three lanes with a centre median. The traffic barriers can be removed to permit four travel lanes in temporary or emergency situations.
    - The intersection enhancements at Logan Avenue and Selkirk Avenue will offer a high level of operating service and safety for motorists. Only one lane is required in the southbound direction on the proposed bridge, but two is required in the northbound direction. If only one lane was provided northbound there would be minimal improvement to the levels of congestion currently at the Logan Avenue intersection for people driving home from work in the afternoon.
- The Logan Avenue intersection would accommodate all movements and provide increased traffic capacity.
- The new bridge could accommodate trucks.
- The approach grades of the new bridge would be gentler and the infrastructure would meet universal design requirements.
- The project includes significant road reconstruction on Arlington Street from McDermot Avenue to Selkirk Avenue and at least 300m of Logan Avenue east and west of Arlington Street in addition to many other minor street tie-ins. The concept limits of roadworks are show in Appendix 'A'.
- Wide sidewalk will be provided on the new structure to permit wheel chair to pass.
- Protected bicycle facilities will be provide along Arlington Street within the project limits and tie into the Flora neighborhood greenway, the Alexander neighborhood greenway

and the proposed protected bike lanes on McDermot Avenue. Bicycle signals would be incorporated where necessary.
- A community public/green space

Major elements to highlight for the preliminary design phase will include:

- An integrated public art design approach
- A comprehensive value engineering exercise
- A further refined detailed plan for removal of the existing bridge
- A further refined construction staging plan
- A Class 3 estimate
- Continued consultation with the PAC, stakeholder and the general public
- Continued consultation with the construction and material supply industry
- A value for money exercise to review conventional infrastructure delivery mechanisms versus alternative delivery mechanisms so that the Public Service can provide informed recommendation to bodies of Council for implementation.
- A development concept for the lands that will remain following the construction of a new bridge that will be consistent with City policies.

**MAJOR PROJECT RISKS**

*Financial Risks*

- Prolonging the maintenance of the existing bridge and infrastructure
- Removal of the existing bridge and no funding for replacement

*Transportation Risks*

- Insufficient transportation facilities to support current and projected growth
- Current insufficient redundancy in crossing of the CPR Yards

*Community Health Risks*

- Removal of the existing bridge without a replacement will have significant socio-economic impacts on communities surrounding the bridge

*Project Risks*

- The ability to remove the L-Lead spur line is necessary for the project to move forward into preliminary design. Inability to remove L-Lead spur line will result in the inability to construct a new bridge off-line resulting in increased traffic disruptions and in-direct costs. It would also limit the type of bridge structures possible. CP Rail has suggested

they would like to negotiate the removal of the line however nothing has been formalized in writing.

**PROPERTY IMPACTS AND CONSULTATIONS WITH POSSIBLE IMPACTED PROPERTY OWNERS**

The functional design report shows the possible impacted properties for a new Arlington Bridge, a new crossing between McGregor Street and Sherbrook Street and upgrading of the McPhillips Street crossing.

Property is required to replace the Arlington Bridge for the following reasons:

- A new structure would be wider to accommodate additional lanes of traffic, wider sidewalks, a median and protected bicycle facilities
- A new structure would have approach ramps that meet or exceed Universal Design requirements.
- Channelization is required at the Logan Avenue intersection to improve capacity.
- For the decommissioning, significant space will be required to remove and disassemble the existing structure.
- A new structure will require significant space to construct, and this will vary slightly based on the structure type selected.

The Public Service will seek authority to negotiate with affected property owners following the completion of the preliminary design phase and closer to the establishment of a project through the Capital Budget process.

The Public Service sent registered mail to all possibly impacted land owners for all three crossing locations and held a meeting with the Arlington Street location land owners. The project manager, manager of engineering, and manager of real estate were all present to describe the project process to date and next steps. The public services committed to proactively maintaining open lines of communication with all impacted land owners through the process from now until 2023. The project and process was well received.

Following completion of a new Arlington Bridge, significant land will remain available for development. The Planning, Property and Development Department, in collaboration with the Public Works Department, will develop a strategy for the effective development of that land that is consistent with the needs of the community to support economic development and community health and meets the objectives of City policies.

**PROJECT COSTS AND AFFORDABILITY**

The Class 4 Project Estimate for the design approach being approved by Council in this report is $300 million, with an expected level of accuracy of -30% to +60%. This includes all items such as removing the existing bridge, inflation, property, road works, engineering, utilities, interest and overheads. A detailed Basis of Estimate summary is provided in Appendix ‘B’. Major assumptions in this estimate are a commencement of construction in 2020 and construction inflation of 5%.

Following approval of this report, the preliminary design phase will further refine the cost estimate to a Class 3 Estimate, with an expected level of accuracy of -20% to +30%. For clarity, approval of this report does not authorize the $300 million construction budget, which will have to be approved by Council at a later date (once the Class 3 Estimate is in place).

Assuming participation of other levels of government under existing funding programs, the City's expected share of the project cost would be approximately 40% of the total project costs (or $115 million). It is also assumed that the City's share of project costs would be funded by the issuance of debt, requiring annual debt serving of $8.7 million per year. In addition to assuming other levels of government will participate in funding the replacement of the Arlington Bridge, it can be expected the City will require an increase in revenue to pay for the City's increased debt payments resulting from this project.

Council has approved a Debt Strategy establishing self-imposed debt limits meant to ensure the City's current credit rating of AA, as defined by Standard and Poor's, is preserved. As at the date of this report, there is approximately $200 million of additional debt room left until the City reaches the self-imposed maximum under the Debt Strategy. As there are currently other Major Capital Projects also under consideration by the City at this time, projects will need to be prioritized at a later date in order for the City to remain within the self-imposed maximum set out in the Debt Strategy.

**PROJECT TIME LINE CONCEPT**

A Project Time Line concept is enclosed in Appendix 'C'. Utilizing alternative delivery methods will likely lengthen the projects schedule but those implications will be determined during the preliminary design phase. A publically issued Request for Proposal for Professional Consulting Services for the Preliminary Design will be issued this summer that will state the City will negotiate with successful proponent for future phases. A project of this magnitude will require on-going engineering and collaboration with CP Rail, the public, and other stakeholders. Therefore, retaining the successful proponent for services throughout the future phases (whether it be a conventional or alternative delivery) it will reduce the project risk.

## FINANCIAL IMPACT

**Financial Impact Statement** **Date:** June 3, 2016

**Project Name:**

**Functional Design for the CPR Yards Crossing Study**

**COMMENTS:**

There is no financial impact associated with the recommendations of this report.

Costs associated with professional consulting services will be identified at the time the award of service is made.

"Original signed by D. Stewart, CA"
D. Stewart, CA
Manager of Finance & Administration

## CONSULTATION

Winnipeg Transit
Planning Property and Development
Corporate Finance – Infrastructure Planning

## OUR WINNIPEG POLICY ALIGNMENT

The 2011 City of Winnipeg Council approved the Transportation Master Plan (TMP) which identified the Arlington Bridge location as a medium-term major road network improvement.

The works proposed within this study align with the City Building goals of OurWinnipeg. Specifically OurWinnipeg recognizes:
•that "ensuring mobility for people of all ages and abilities and for goods and services is an important part of improving our social, environmental and economic sustainability";
•the importance of mobility options "like enhanced public transit and active transportation routes that support walking, cycling and other human powered forms of transportation" (01-1) .

A new Arlington bridge will be designed to meet the demands and expectations of today's user by expanding travel choices and comfort over the crossing.

The study also aligns with the goals of Complete Communities. The following is a key direction of Complete Communities aimed at supporting the completion of Areas of Stability:
•"Promote a quality public realm with a high level of accessibility to community services and amenities and opportunities for gathering and social interaction" (04 Direction 1).

A new Arlington bridge will not only provide a better connection between the mature neighbourhoods on either side of the Yards, but will be designed as a community landmark that will contribute to the vibrancy of the neighbourhoods in which it is situated, including opportunities for gathering and social interaction.

## SUBMITTED BY

**Department:** Public Works Department
**Division:** Transportation
**Prepared by:** S.R. Suderman, P.Eng.
**Date:** Jun 16, 2016
**File No.:**

**Attachment:** Appendix 'A' – Summary Drawing Excerpts from Draft Functional Study Report
Appendix 'B' – Basis of Estimate
Appendix 'C' – Project Timeline Concept

**Appendix 'A' – Summary Drawing Excerpts from Functional Study**

Winnipeg

CP

CPR Yards Crossing Study



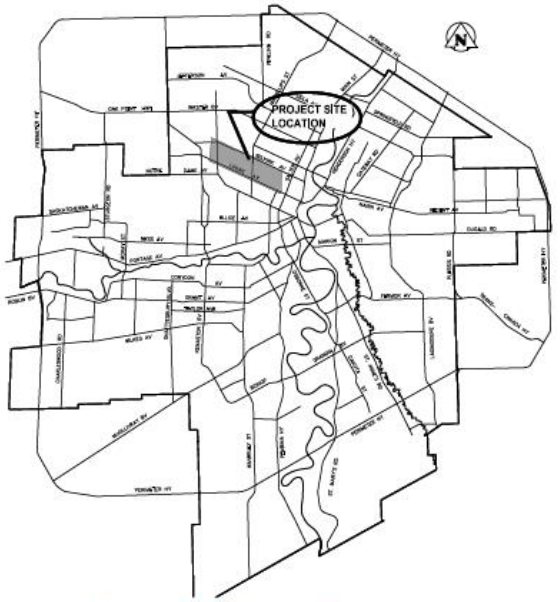
# THE CITY OF WINNIPEG

PUBLIC WORKS DEPARTMENT

# 467-2014 CPR YARDS CROSSING

FUNCTIONAL DESIGN STUDY



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MORRISON HERSHFIELD

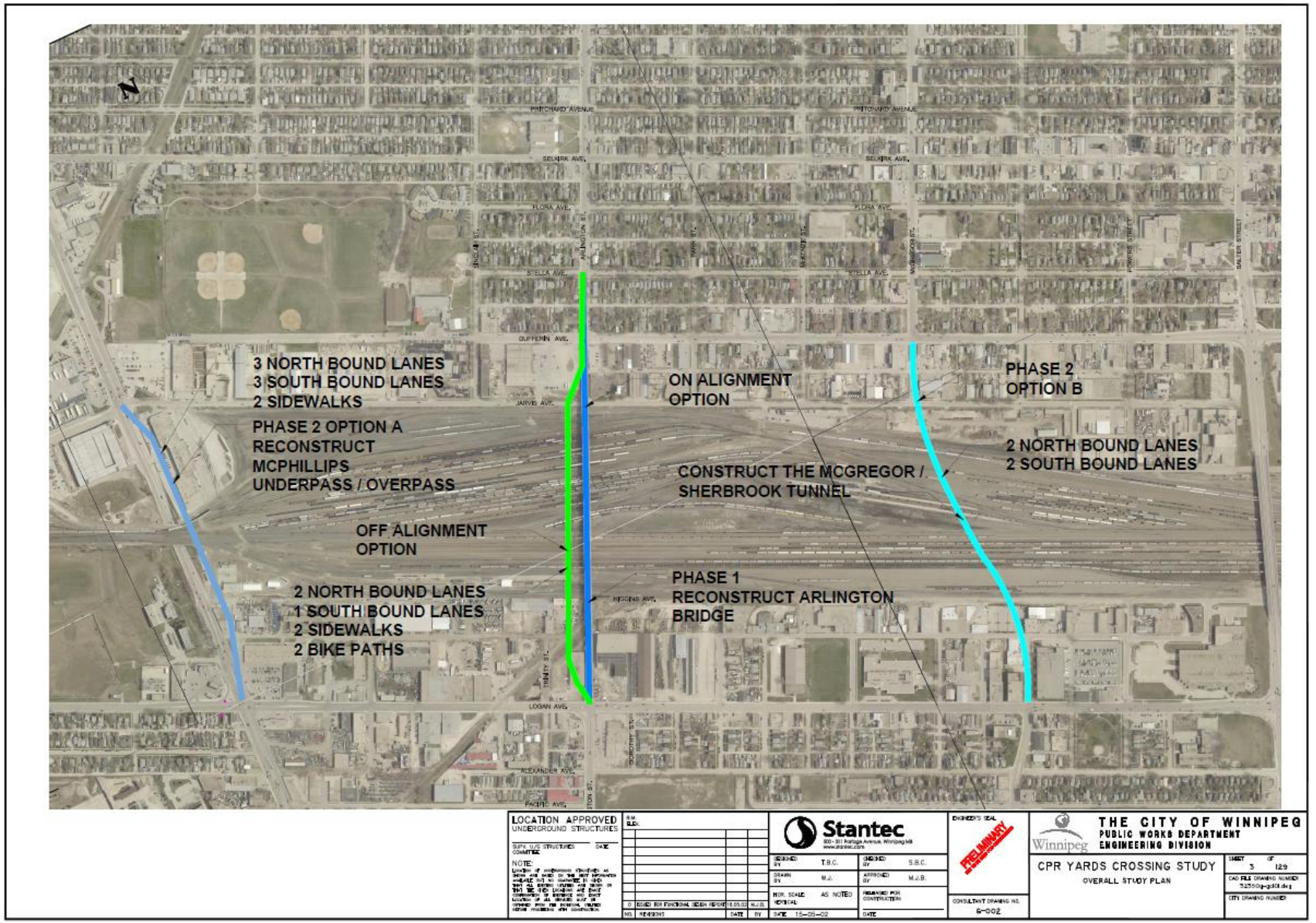
HTFC PLANNING & DESIGN

URBAN systems

Freig & Associates

Stevenson Advisors

Stantec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PHASE 2 OPTION A
RECONSTRUCT
MCPHILLIPS
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OPTION
2 NORTH BOUND LANES
1 SOUTH BOUND LANES
2 SIDEWALKS
2 BIKE PATHS
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BRIDGE
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SHERBROOK TUNNEL
PHASE 2
OPTION B
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LOCATION APPROVED
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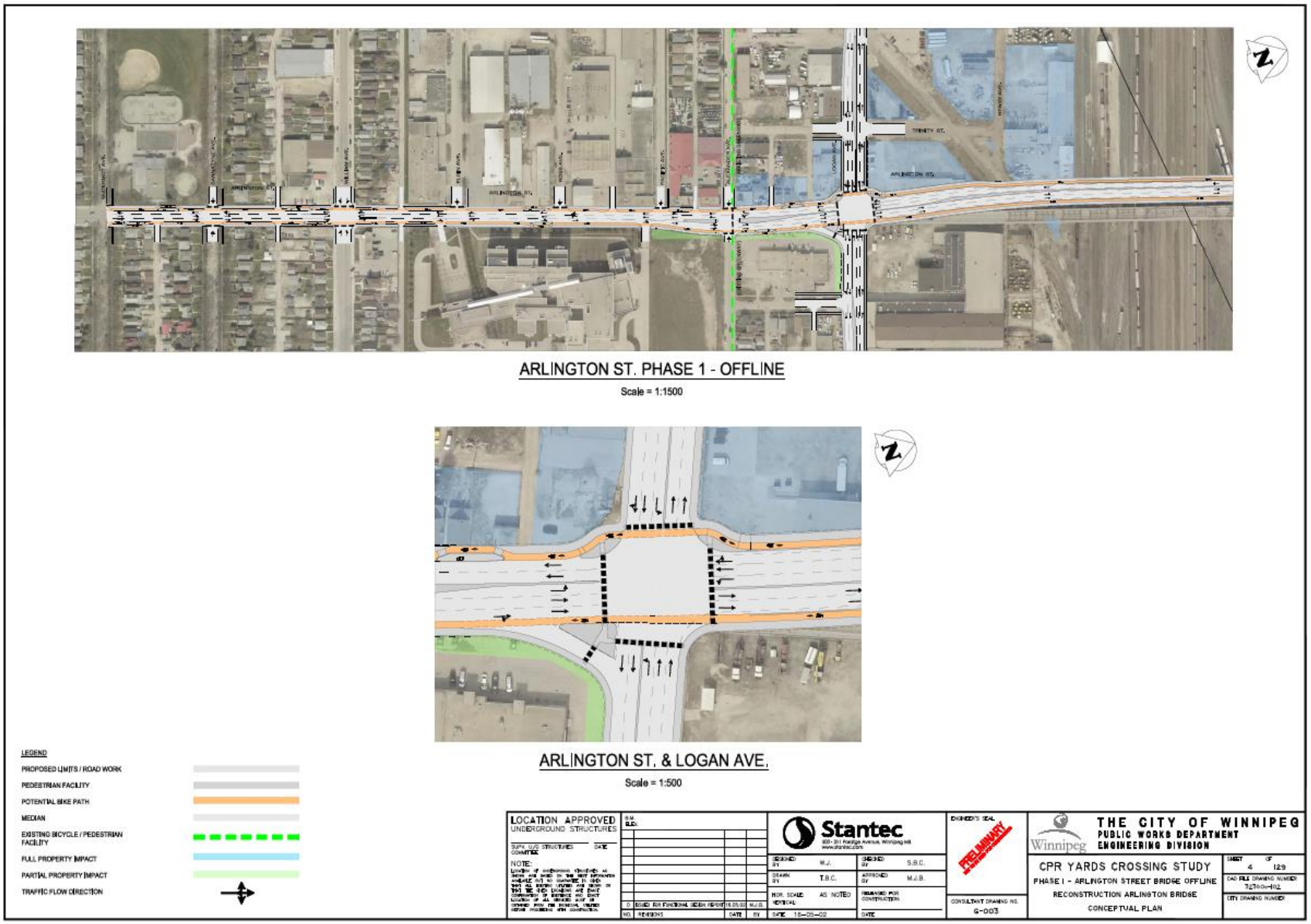
PRELIMINARY
THE CITY OF WINNIPEG
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
CPR YARDS CROSSING STUDY
OVERALL STUDY PLAN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Stantec
THE CITY OF WINNIPEG
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
CPR YARDS CROSSING STUDY
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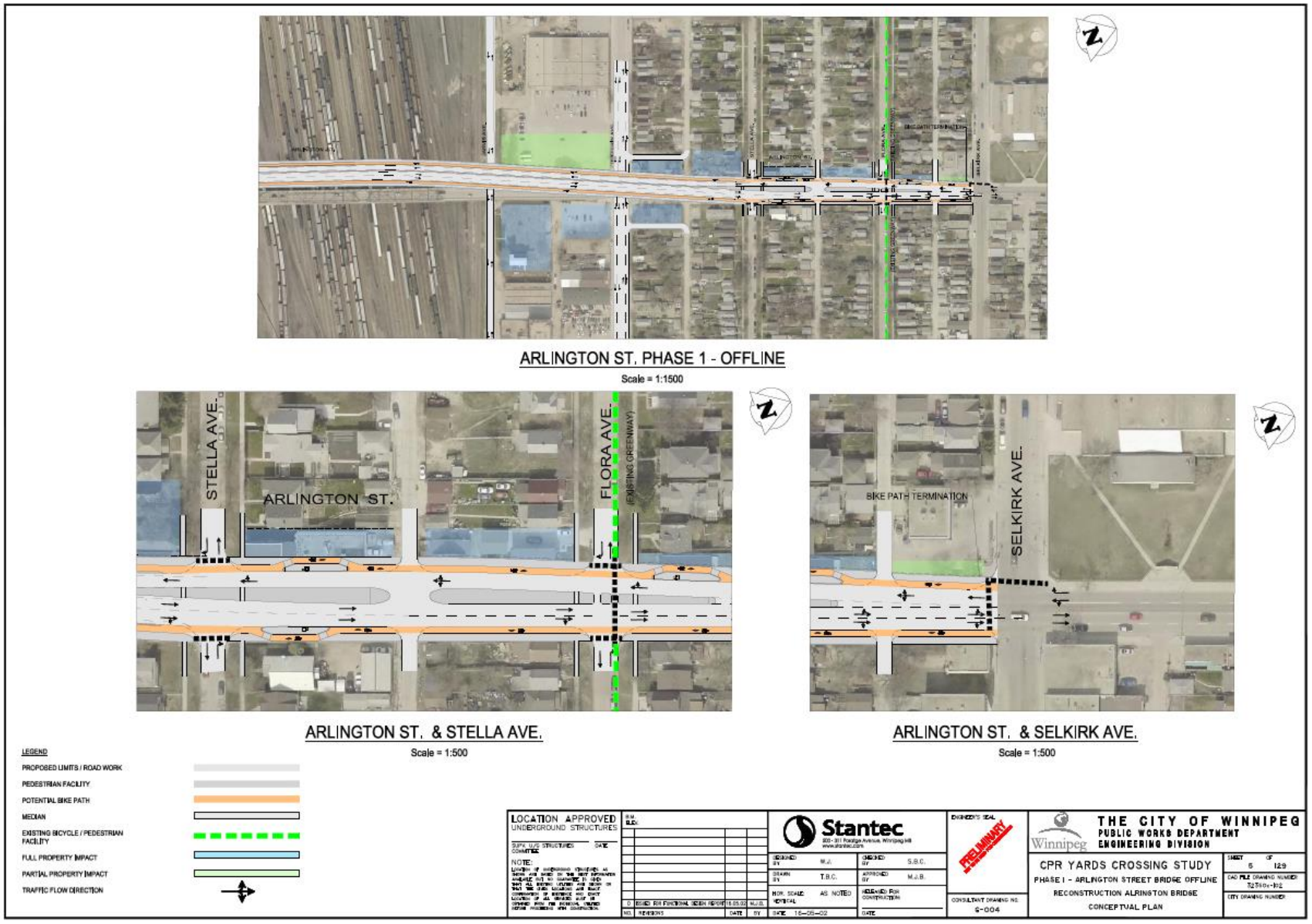
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MEDIAN
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FULL PROPERTY IMPACT
PARTIAL PROPERTY IMPACT
TRAFFIC FLOW DIRECTION
LOCATION APPROVED
UNDERGROUND STRUCTURES
Stantec
PRELIMINARY
THE CITY OF WINNIPEG
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
CPR YARDS CROSSING STUDY
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RECONSTRUCTION ARLINGTON BRIDGE
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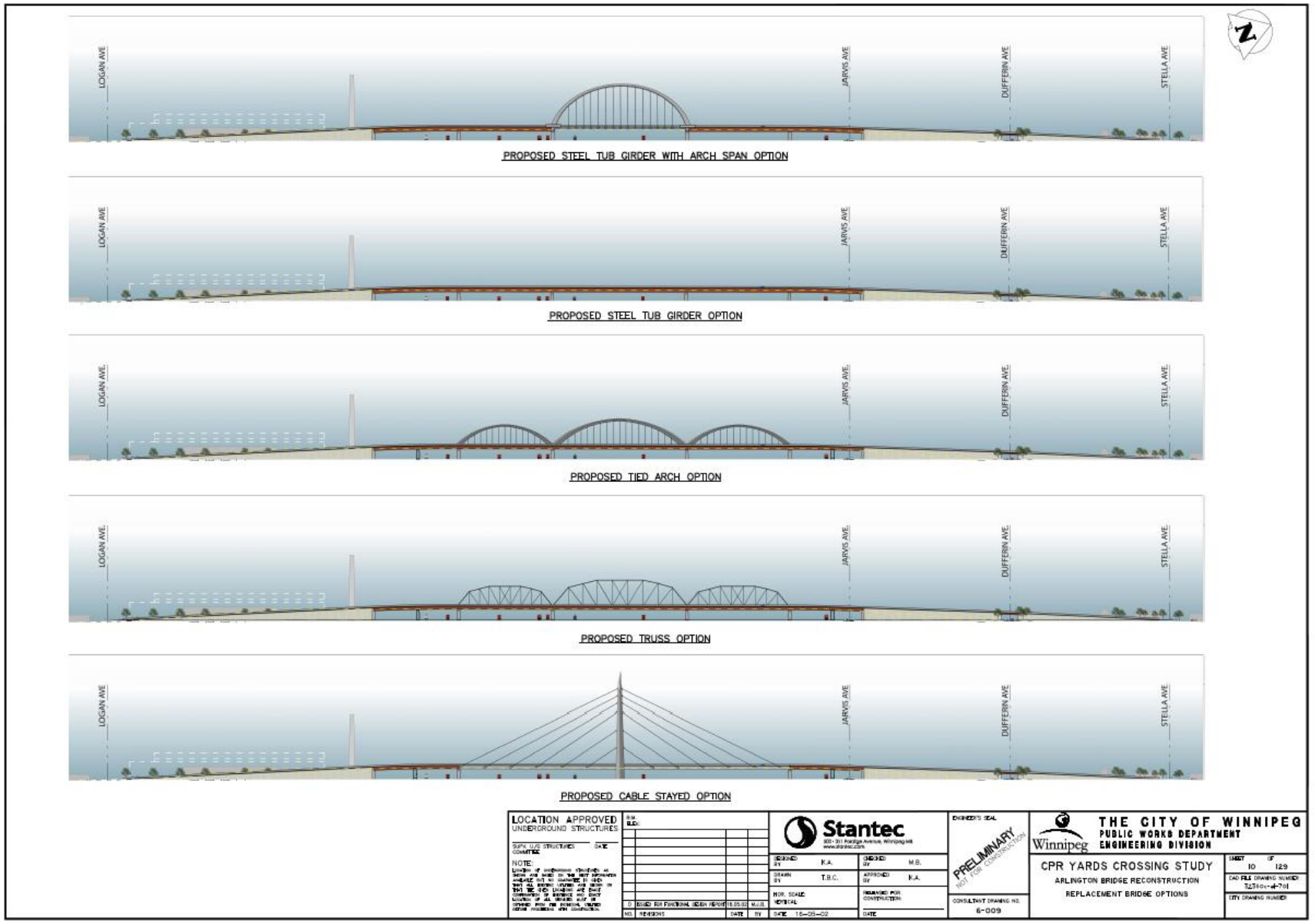
S-004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JARVIS AVE
DUFFERIN AVE
STELLA AVE
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LOCATION APPROVED
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THE CITY OF WINNIPEG
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ENGINEERING DIVISION
CPR YARDS CROSSING STUDY
ARLINGTON BRIDGE RECONSTRUCTION
REPLACEMENT BRIDGE OPTIONS
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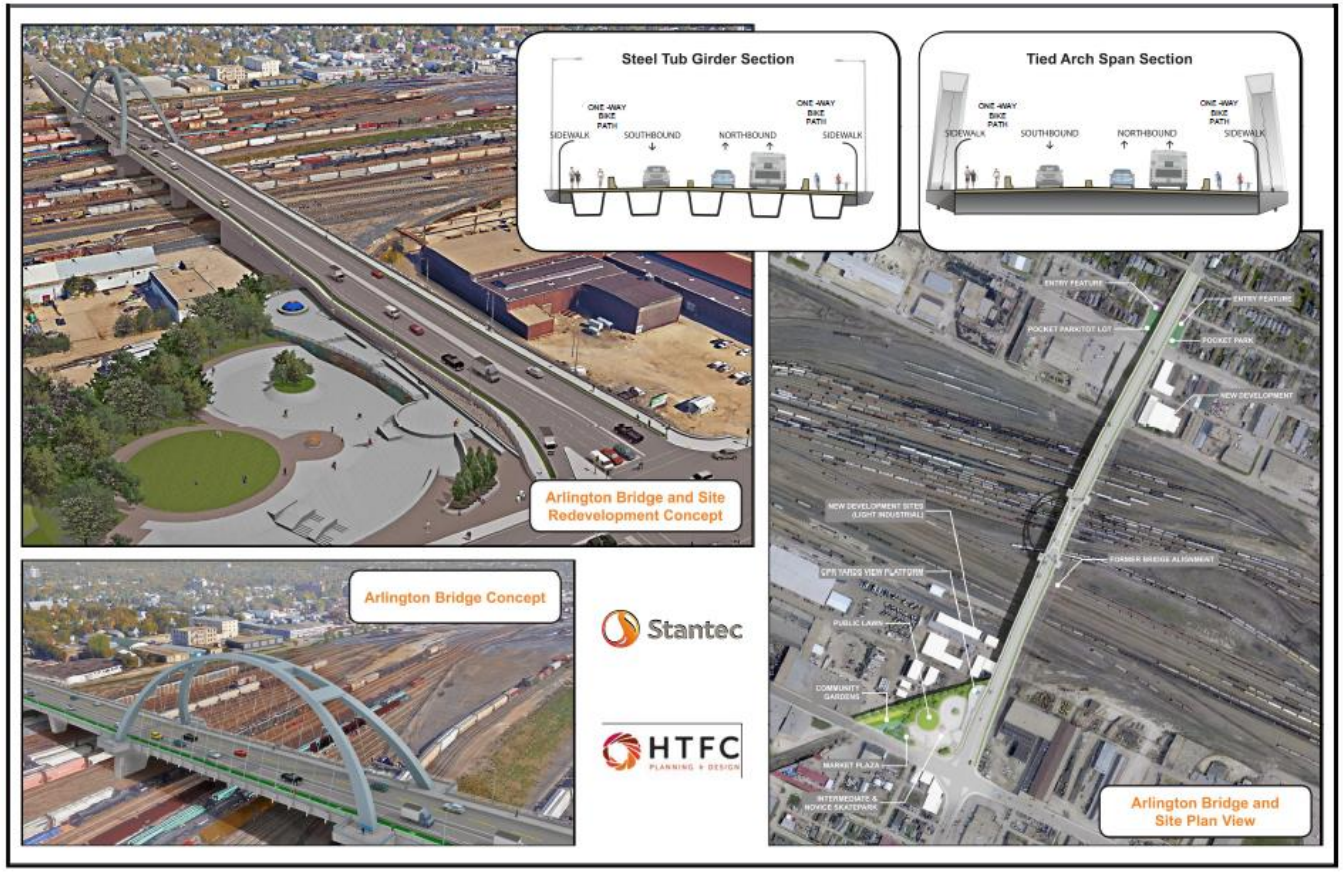



ARLINGTON BRIDGE RECONSTRUCTION CONCEPT

LOCATION APPROVED
UNDERGROUND STRUCTURES

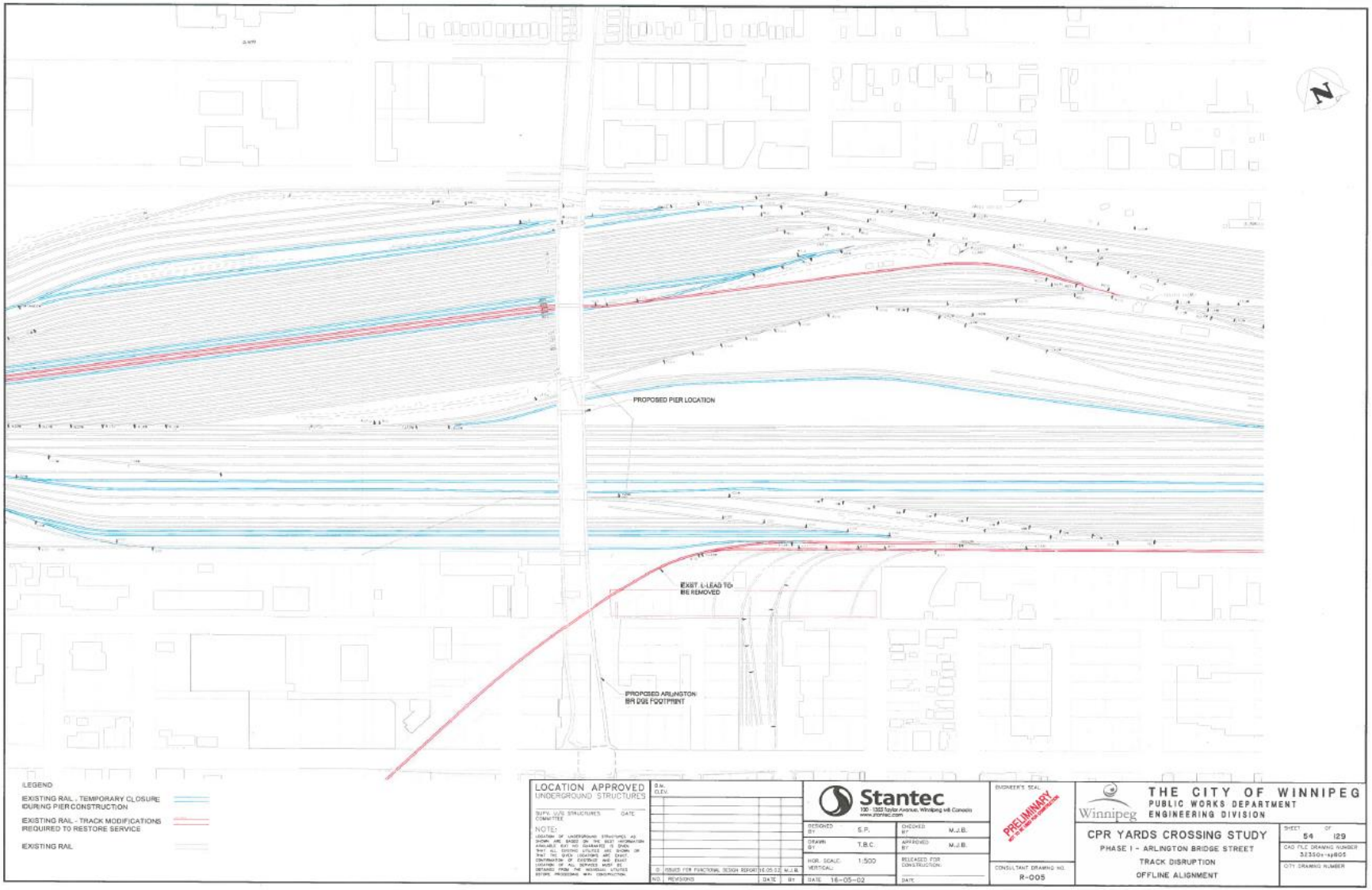
Stantec
600 - 311 Portage Avenue, Winnipeg MB
www.stantec.com

PRELIMINARY
NOT FOR CONSTRUCTION

THE CITY OF WINNIPEG
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

CPR YARDS CROSSING STUDY
ARLINGTON BRIDGE RECONSTRUCTION
REPLACEMENT BRIDGE OPTION
CONCEPTUAL RENDERING

CONSULTANT DRAWING NO. G-010


PROPOSED PIER LOCATION
EXIST. L-LEAD TO BE REMOVED
PROPOSED ARLINGTON BR DSE FOOTPRINT
LEGEND
EXISTING RAIL , TEMPORARY CLOSURE DURING PIER CONSTRUCTION
EXISTING RAIL - TRACK MODIFICATIONS REQUIRED TO RESTORE SERVICE
EXISTING RAIL
LOCATION APPROVED
UNDERGROUND STRUCTURES
Stantec
PRELIMINARY
THE CITY OF WINNIPEG
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
CPR YARDS CROSSING STUDY
PHASE I - ARLINGTON BRIDGE STREET
TRACK DISRUPTION
OFFLINE ALIGNMENT
R-005

# Appendix 'B' – Basis of Estimate

## Basis of Estimate Cost Detail

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Investment | Arlington Bridge Replacement - Off Alignment | | | | | | | | | Estimate Date | May 30, 2016 | | | | | | | | |
| | Class of Estimate | 4 | | | | | | | | | | | | | | | | | |
| | Cost Escalation / Construction Inflation | | 5% | 5% | 5% | 5% | 5% | | | | | | | | | | | | |
| ($ millions) | | Estimate Year | | | | | | | | | | % of Project Work Undertaken | | | | | | | Check |
| Estimate Detail | % of Const. | 2016 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | Total | | | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | | Total % |
| **Construction Costs** | | | | | | | | | | | | | | | | | | | |
| Decommissioning | 8% | $9.7 | $0.0 | $0.0 | $1.2 | $11.7 | $0.0 | $0.0 | $12.9 | | | | | 10% | 90% | | | | 100% |
| Vehicular Bridges | 64% | $80.2 | $0.0 | $14.6 | $40.9 | $43.0 | $5.6 | $0.0 | $104.2 | | | | 15% | 40% | 40% | 5% | | | 100% |
| Roadworks | 9% | $11.9 | $0.0 | $0.0 | $3.0 | $11.2 | $1.7 | $0.0 | $15.9 | | | | | 20% | 70% | 10% | | | 100% |
| Municipal Utilities | 2% | $2.5 | $0.0 | $0.0 | $0.0 | $3.4 | $0.0 | $0.0 | $3.4 | | | | | | 100% | | | | 100% |
| Retaining Walls | 7% | $9.4 | $0.0 | $0.0 | $2.4 | $8.8 | $1.3 | $0.0 | $12.5 | | | | | 20% | 70% | 10% | | | 100% |
| Rail Work | 4% | $5.0 | $5.8 | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | $5.8 | | | 100% | | | | | | | 100% |
| Landscaping | 2% | $2.5 | $0.0 | $0.0 | $0.0 | $0.0 | $3.5 | $0.0 | $3.5 | | | | | | | 100% | | | 100% |
| PST (50% of certain construction) | 3% | $4.4 | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | | | | | | | | | | 0% |
| | 0% | | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | | | | | | | | | | 0% |
| | 0% | | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | | | | | | | | | | 0% |
| | 0% | | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | | | | | | | | | | 0% |
| Sub-total | 100% | $125.6 | $5.8 | $14.6 | $47.6 | $78.0 | $12.2 | $0.0 | $158.2 | 26% | | | | | | | | | |
| **Engineering Costs** | % of Const | | | | | | | | | | | | | | | | | | |
| Detailed Design | 3% | $4.0 | $1.4 | $2.4 | $1.0 | $0.0 | $0.0 | $0.0 | $4.8 | | | 30% | 50% | 20% | | | | | 100% |
| Contract Administration | 7% | $9.0 | $0.0 | $0.0 | $2.9 | $4.8 | $4.4 | $0.0 | $12.1 | | | | | 25% | 40% | 35% | | | 100% |
| Post Construction | 1% | $1.0 | $0.0 | $0.0 | $0.0 | $0.0 | $1.4 | $0.0 | $1.4 | | | | | | | 100% | | | 100% |
| Owner's Engineer | 4% | $5.0 | $2.3 | $0.9 | $1.3 | $1.3 | $0.4 | $0.0 | $6.2 | | | 40% | 15% | 20% | 20% | 5% | | | 100% |
| Sub-total | 15% | $19.0 | $3.7 | $3.3 | $5.2 | $6.2 | $6.2 | $0.0 | $24.6 | 29% | | | | | | | | | |
| Construction & Engineering Sub-total | | $145 | | | | | | | | | | | | | | | | | |
| **Utility Costs** | % C&E | | | | | | | | | | | | | | | | | | |
| Hydro | 4% | $6.0 | $0.0 | $0.0 | $0.0 | $2.0 | $4.2 | $1.5 | $7.7 | | | | | | 25% | 50% | 25% | | 100% |
| Communication - MTS | 0% | | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | | | | | | | | | | 0% |
| Communication - Shaw | 0% | | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | | | | | | | | | | 0% |
| | 0% | | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | | | | | | | | | | 0% |
| Sub-total | 4% | $6.0 | $0.0 | $0.0 | $0.0 | $2.0 | $4.2 | $1.5 | $7.7 | 29% | | | | | | | | | |
| **Other Costs** | % C&E | | | | | | | | | | | | | | | | | | |
| Land Acquisition | 10% | $15.0 | $17.4 | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | $17.4 | | | 100% | | | | | | | 100% |
| CPR Costs | 3% | $5.0 | $1.2 | $1.2 | $1.3 | $1.3 | $1.4 | $0.0 | $6.4 | | | 20% | 20% | 20% | 20% | 20% | | | 100% |
| | 0% | | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | | | | | | | | | | 0% |
| | 0% | | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | | | | | | | | | | 0% |
| | 0% | | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | | | | | | | | | | 0% |
| Sub-total | 14% | $20.0 | $18.5 | $1.2 | $1.3 | $1.3 | $1.4 | $0.0 | $23.8 | 19% | | | | | | | | | |
| Project Costs before Contingencies Sub-total | | $170.6 | $28.0 | $19.2 | $54.1 | $87.5 | $24.0 | $1.5 | $214.3 | 26% | | | | | | | | | |
| **Contingencies Costs** | % Proj Cost | | | | | | | | | | | | | | | | | | |
| 23% Construction | 16.4% | $28.0 | $0.0 | $0.0 | $7.1 | $26.3 | $3.9 | $0.0 | $37.4 | | | | | 20% | 70% | 10% | | | 100% |
| Rail Yard Utilities | 0.6% | $1.0 | $0.5 | $0.0 | $0.0 | $0.8 | $0.0 | $0.0 | $1.3 | | | 40% | | | 60% | | | | 100% |
| 24% Engineering | 2.9% | $5.0 | $1.2 | $1.2 | $1.3 | $1.3 | $1.4 | $0.0 | $6.4 | | | 20% | 20% | 20% | 20% | 20% | | | 100% |
| 26% Land Acquisition | 2.3% | $4.0 | $4.6 | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | $4.6 | | | 100% | | | | | | | 100% |
| Environmental | 1.2% | $2.0 | $0.0 | $2.4 | $0.0 | $0.0 | $0.0 | $0.0 | $2.4 | | | | 100% | | | | | | 100% |
| Geotechnical | 0.6% | $1.0 | $0.0 | $1.2 | $0.0 | $0.0 | $0.0 | $0.0 | $1.2 | | | | 100% | | | | | | 100% |
| Material sourcing | 5.9% | $10.0 | $0.0 | $0.0 | $6.4 | $6.7 | $0.0 | $0.0 | $13.1 | | | | | 50% | 50% | | | | 100% |
| Contractor Availability | 0.6% | $1.0 | $0.0 | $0.0 | $0.6 | $0.7 | $0.0 | $0.0 | $1.3 | | | | | 50% | 50% | | | | 100% |
| CPR | 0.6% | $1.0 | $0.2 | $0.2 | $0.3 | $0.3 | $0.3 | $0.0 | $1.3 | | | 20% | 20% | 20% | 20% | 20% | | | 100% |
| Sub-total | 31% | $53.0 | $6.5 | $5.1 | $15.7 | $36.0 | $5.6 | $0.0 | $69.0 | 30% | | | | | | | | | |
| | | | | | | | | | | % increase from base | | | | | | | | | |
| Project Sub-total before Charges | | $223.6 | $34.5 | $24.3 | $69.8 | $123.6 | $29.6 | $1.5 | $283.2 | | | | | | | | | | |
| **Summary of Interest and Admin Overhead Charges** | | | | | | | | | | | | | | | | | | | |
| Overhead / Admin Charges | | $2.6 | $0.5 | $0.3 | $0.9 | $1.5 | $0.4 | $0.2 | $3.8 | | | | | | | | | | |
| Corporate Interest | | $0.0 | $0.8 | $1.8 | $3.4 | $6.9 | $8.2 | $0.0 | $21.1 | | | | | | | | | | |
| | | | | | | | | | | % increase over base | | | | | | | | | |
| **Total Project Cost** | | $226.2 | $35.8 | $26.4 | $74.0 | $132.0 | $38.3 | $1.7 | $308.1 | 136% | | | | | | | | | |

### Administrative Overhead Charges Detail

| | | | | | | | | | Total | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Project Costs | | $223.6 | $34.5 | $24.3 | $69.8 | $123.6 | $29.6 | $1.5 | $283.2 | | | | | | | | | | |
| 3rd Party Share of Project Costs | 60% | $134.1 | $20.7 | $14.6 | $41.9 | $74.2 | $17.8 | $0.9 | $169.9 | | | | | | | | | | 0% |
| City's Share of Project Costs | | $89.4 | $13.8 | $9.7 | $27.9 | $49.4 | $11.8 | $0.6 | $113.3 | | | | | | | | | | |
| **Overhead & Administrative Charges** | | | | | | | | | | | | | | | | | | | |
| Departmental | 2.00% | $1.8 | $0.3 | $0.2 | $0.6 | $1.0 | $0.3 | $0.1 | $2.5 | | | | | | | | | | |
| Corporate Admin (max $100,000) | 1.25% | $0.1 | $0.1 | $0.0 | $0.0 | $0.0 | $0.0 | $0.0 | $0.1 | | | | | | | | | | |
| Research (SMIR) (Const only) | 0.50% | $0.7 | $0.1 | $0.1 | $0.3 | $0.5 | $0.1 | $0.1 | $1.2 | | | | | | | | | | |
| Overhead & Admin Charges Sub-total | 2.91% | $2.6 | $0.5 | $0.3 | $0.9 | $1.5 | $0.4 | $0.2 | $3.8 | 3.35% | | | | | | | | | |

### Financing Charges

| | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Corporate Interest | | $0.0 | $0.8 | $1.8 | $3.4 | $6.9 | $8.2 | $0.0 | $21.1 | | | | | | | | | | |

### Operating Budget Impact Detail

| | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 |
|---|---|---|---|---|---|---|---|---|---|---|
| Salaries and Benefits | | | | | | | | | | |
| Materials, Parts and Supplies | | | | | | | | | | |
| Other | | | | | | | | | | |
| Total Operating Impact | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| City Total (Debt) | $13.80 | $9.71 | $27.90 | $49.43 | $11.84 | $0.60 | $113.29 | | | |
| Interim Financing (City Funding Portion) | $0.0 | $0.8 | $1.4 | $2.3 | $4.6 | $3.7 | $12.7 | assume July 1 long term | | |
| interim rate | | 2.0% | 2.5% | 3.0% | 3.0% | 3.0% | | | | |
| long term rate | | 5.5% | 6.0% | 6.0% | 6.0% | 6.0% | | | | |
| External Debt Interest Charges | $0.0 | $0.0 | $0.4 | $1.1 | $2.2 | $4.6 | $8.3 | assume July 1 long term | | |
| Total | $0.0 | $0.8 | $1.8 | $3.4 | $6.9 | $8.2 | $21.1 | | | |

| Operating Budget Impact | | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2024 |
|---|---|---|---|---|---|---|---|---|---|
| Interest | 6.00% | | $0.00 | $0.00 | | | | | $6.80 |
| Principal | 1.64% | | $0.00 | $0.23 | $0.39 | $0.84 | $1.65 | $1.86 | $1.86 |
| Operating Budget Sub-Total | | | $0.00 | $0.23 | $0.39 | $0.84 | $1.65 | $1.86 | $8.66 |

**Appendix 'C' – Project Timeline Concept**

