Agenda – Council – April 26, 2018

Report – Standing Policy Committee on Infrastructure Renewal and Public Works – April 6, 2018

Item No. 1 Criteria and Weighting for the Eastern Corridor Study

STANDING POLICY COMMITTEE RECOMMENDATION:

On April 17, 2018, the Executive Policy Committee concurred in the recommendation of the Standing Policy Committee on Infrastructure Renewal and Public Works and submitted the following to Council:

1. That the report be received as information.

Report – Standing Policy Committee on Infrastructure Renewal and Public Works – April 6, 2018

DECISION MAKING HISTORY:

EXECUTIVE POLICY COMMITTEE RECOMMENDATION:

On April 17, 2018, 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 April 6, 2018, the Standing Policy Committee on Infrastructure Renewal and Public Works concurred in the recommendation of the Winnipeg Public Service and submitted the matter to the Executive Policy Committee and Council.

ADMINISTRATIVE REPORT

Title: Criteria and Weighting for the Eastern Corridor Study

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

AUTHORIZATION

Author	Department Head	CFO	CAO
D. Patman	G. Ewankiw	N/A	D. McNeil

EXECUTIVE SUMMARY

The Eastern Corridor Study is a project currently underway, scheduled for completion in 2018. It is a functional study which includes as a primary element a rapid transit corridor between the downtown and eastern Winnipeg.

This report outlines the proposed criteria and weightings that will be used to evaluate options. Multiple criteria are being used, and a process known as AHP (Analytical Hierarchical Process) has been used in the weighting process. AHP is a well-known decision-making tool that has been in use on major projects globally for the past 20 years, including in various City departments. In addition to AHP, two additional metrics will be used which incorporate a cost lens into the analysis.

This report is an update for the Standing Policy Committee on Infrastructure Renewal and Public Works, the Executive Policy Committee, and Council, to share information. This update, or “checking in”, is a mechanism that has been used in other cities to promote transparency in the decision-making on a project, and to ensure that as the project progresses, the decision-making regarding selection of an option is not done in isolation.

RECOMMENDATIONS

That this report be received as information.

REASON FOR THE REPORT

Bid Opportunity 555-2015 for the Eastern Corridor Study included a requirement that the project team keep appropriate City decision-makers apprised of project developments, and share and

discuss the criteria and weightings being used in the evaluation of route segments for the Eastern Rapid Transit Corridor.

This update is a mechanism that has been used in other cities to promote transparency in the decision-making on a project, and to ensure that as the project progresses, the decision-making regarding selection of an option is not done in isolation.

The Steering Committee for the project recommended that the Standing Policy Committee on Infrastructure Renewal and Public Works, EPC and Council receive this information for consideration.

IMPLICATIONS OF THE RECOMMENDATIONS

There is no financial impact associated with this report as it is reporting on an interim step in the progress of the Eastern Corridor Study, a project already underway.

HISTORY / DISCUSSION

Project Background

The Eastern Corridor Study is a multi-departmental, multidisciplinary project led by Winnipeg Transit in Winnipeg. It is a functional study, and it is the first step in the process of implementing a rapid transit corridor between the downtown and eastern Winnipeg. The Eastern Corridor is the second rapid transit corridor to be investigated, one of six the City is considering for implementation in the future.

The study will:

- Determine the most suitable route for providing rapid transit service between downtown Winnipeg and eastern Winnipeg (see Figure 1).
- Identify neighbourhood development opportunities along the route, and particularly at transit stops.
- Identify related transportation network improvements for pedestrians, cyclists, transit users and motorists.
- Determine preferred locations for river crossings and an appropriate future for the Louise Bridge.

This project is ongoing, and it is anticipated that it will be completed in 2018.

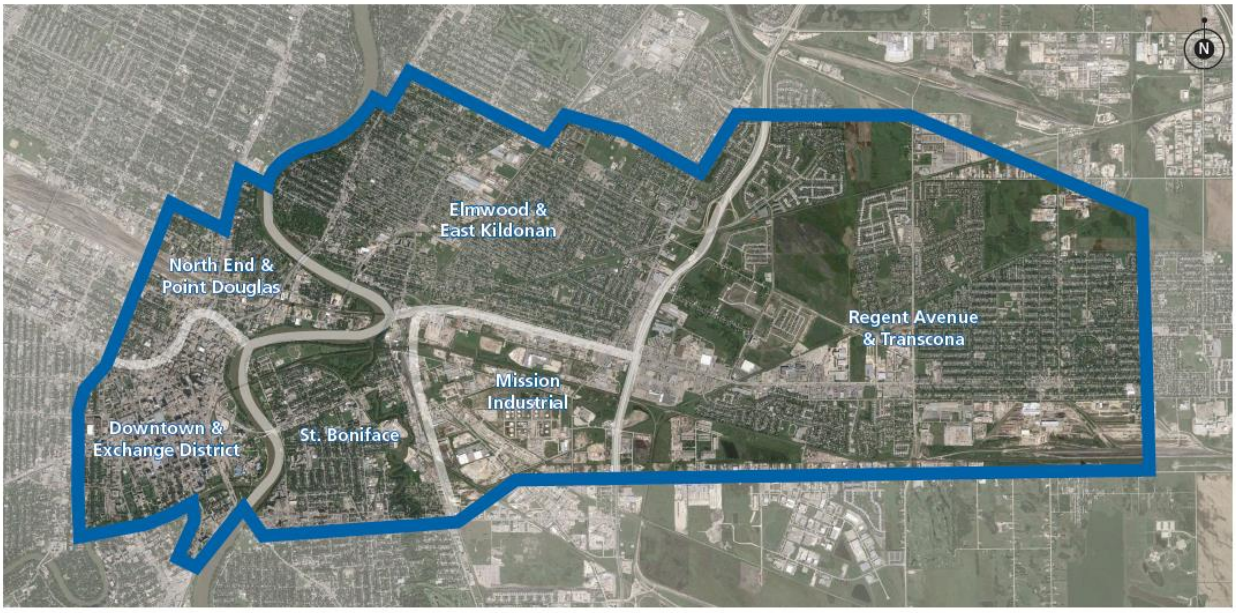

Figure 1: Study Area for Eastern Corridor

The study area is large, and there are multiple options for the alignment of the corridor through the study area. The alternatives must be reviewed and the "best" alignment selected for the final recommendation that will be brought to Council in 2018.

Evaluation of Options Using Analytical Hierarchical Process (AHP)

On projects where a decision must be made amongst competing options, typically criteria are used to evaluate those options, rating their performance from multiple standpoints, such as least expensive, least impact on the environment, most efficient, etc. An issue when performing such evaluations is that it is challenging to determine how to weight the various criteria. Are all of the criteria equally important, or should some be given a heavier weighting, so that it is more important to consider cost than environmental impact, etc. And if so, then by how much? Different stakeholders bring different perspectives to the table, and disagreement can occur about weighting.

A process called *Analytical Hierarchical Process* or AHP can be employed to make the process of setting these weightings more of a consensus-building exercise and less of a battle of wills. It is a step-by-step process where individual criteria and sub-criteria are compared to one another, with priorities between each pair being inserted into a matrix which then calculates the weightings based on that decision-making.

The attached memo from the consultant outlines the process that the project team followed and the results that were generated. AHP was used to develop the weighting of the criteria that will ultimately be used to evaluate various options for components of the Eastern Rapid Transit Corridor.

The six categories proposed for use in evaluation of the corridors are:

1. Connectivity
2. Performance
3. City Building
4. Financial Feasibility
5. Social Equity
6. Environmental Impact

The weighting of the criteria is outlined in detail within the attached memo (Memo – Eastern Corridor Study – AHP Methodology). Overall the proposed weightings are as follows:

Criteria	**Weighting**
Connectivity	28%
Performance	28%
City Building	18%
Financial Feasibility	13%
Social Equity	7%
Environmental Impact	6%
Total	100%

These criteria weightings were developed through discussion between City staff as well the technical experts on the consultant team (WSP). Significant consensus-building and debate took place to arrive at these weightings.

- Connectivity and Performance were weighted most heavily, as it was seen that such an investment needs to both connect useful locations within the City, and also provide a solid "boost" beyond regular service. The service provided must be reliable, must operate throughout the day (not just for peak-period commuters), must be frequent, and not be overcrowded. It must be safe and easy to use, and ideally, operate with reduced delay compared to existing transit offerings.
- The corridor also has the ability to act as a catalyst for city-building, it can connect communities with destinations, employment, etc., and encourage higher-density development that is less dependent on automobiles for travel.
- The other factors are considerations as well, although the design will in all instances seek to minimize environmental impact and provide service with an eye on social equity.
- Cost will be a significant factor in the final decision-making regarding the corridor; see "**Additional Evaluation Metrics**" on page 5.

Public input is also important. The criteria for evaluation were initially shared with the public, who were able to provide commentary regarding the choice of criteria. The public responded well to the list of criteria that were developed, indicating that they generally were in agreement with the choice of criteria. Subsequently, public engagement regarding the weightings took place in late 2017; the public were asked to consider the decision-making process and to make comments. This input was carefully considered and resulted in some minor changes being made to the criteria weighting.

Additional Evaluation Metrics

The Project Team reviewed the evaluation protocol that was initially established since cost, which is typically a major criterion in the decision-making process for project evaluation, was not heavily weighted in the AHP criteria and weightings.

The project team reviewed other jurisdictions' best practices to develop two additional evaluation tools to incorporate cost into the study in a nuanced way, while not losing the benefit of the AHP process.

As the public is not yet aware of these additional metrics, there will be a need to address this with the public at a future round of public engagement.

Additional Metric #1

A straightforward approach to incorporate cost into the discussion by decision-makers is to determine the ratio of AHP to overall project cost: the AHP scoring is divided by each alternative's cost to derive an AHP/Cost ratio. This is essentially a variant of a benefit/cost (B/C) ratio where the AHP process defines each alternative route's benefits. (Note that benefit / cost was already a task to be calculated as part of the Eastern Corridor Study's scope of work.)

Additional Metric #2

The following is an approach that is being used by New Brunswick's Department of Transportation and Infrastructure. Using this approach, cost is clearly incorporated into the comparison of options.

The evaluated options are plotted on an X-Y axis in the following way (See Figure 2):

- Benefit / Cost is on Y-Axis (as noted, this was standard calculation used in multiple projects)
- AHP criteria is on X-Axis (right now, this has approximately 13% allocated towards cost and finance related elements.) The AHP rating considers multiple factors and comes out with a score.)
- Project budget is the size of the plotted point.

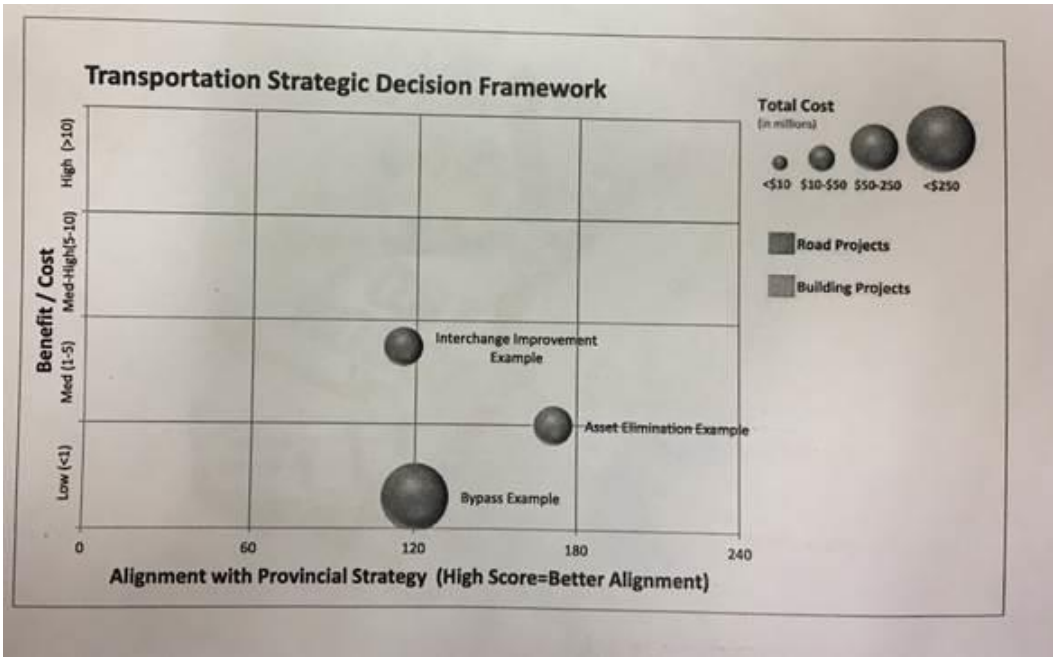

Figure 2: Multi-factor Evaluation of Transportation Projects

The "best" projects will have a high benefit cost, a high rating for the AHP metrics, and a relatively small overall cost. Plotting the alternatives will avoid simply selecting a project that is low cost, or only high scoring, etc.

Conclusion

With multiple metrics to evaluate the options, alternatives can be looked at from multiple perspectives, including from a cost lens. This will benefit decision-makers when making a decision based on the project team's recommendations and analysis.

FINANCIAL IMPACT

Financial Impact Statement **Date:** March 6, 2018

Project Name:

Criteria and Weighting Recommendations for Eastern Corridor Study

Comments:

There is no financial impact associated with this report as it is provided for information purposes only. The Eastern Corridor Study itself has already been financed and is underway.

Original signed by
Laurie Fisher, CPA, CA
Manager of Finance & Administration

CONSULTATION

This Report has been prepared in consultation with the departments listed below, and they concur with its content.

The City project team for the Eastern Corridor Study, including representatives from Transit, Public Works and PP&D participated in the AHP process. The AHP process was recommended for this project by Public Works, who have used it on other City projects.

OURWINNIPEG POLICY ALIGNMENT

The purpose of the Eastern Corridor Study is to set the stage for the eventual construction and operation of this leg of rapid transit, providing sustainable transportation options for the public and accommodating growth, which are both cornerstones of OurWinnipeg.

This report is intended to show the steps in a key component of the decision-making, to help make the decision-making process related to the selection of the optimal options for the Eastern corridor alignment more transparent and open.

SUBMITTED BY

Department	Transit
Division	Service Development
Prepared by:	David Patman, Senior Transit Planner
Date:	March 6, 2018

Attachment:
Memo – Eastern Corridor Study – AHP Methodology