Southeast LRT Corridor Analysis

Final Report

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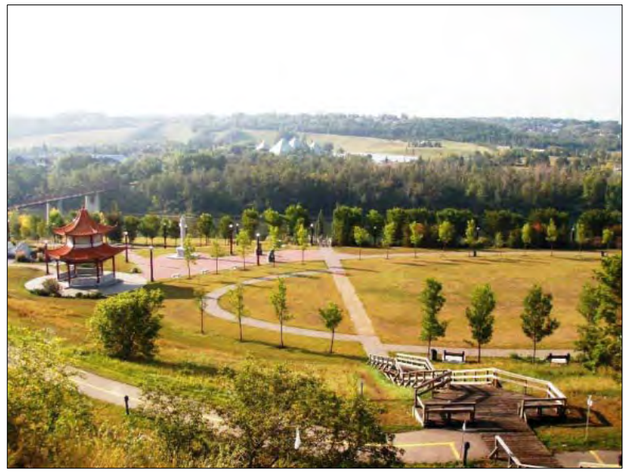
Executive Summary

Beginning in late 2008, the City of Edmonton (the City) conducted an extensive process to determine a recommended light rail transit (LRT) corridor, connecting the downtown to the Mill Woods neighbourhood in southeast Edmonton.



The Southeast Light Rail Transit (SE LRT) project is one corridor, in a multi corridor LRT expansion currently planned by the City. The future LRT network will ultimately link key destinations in the City with LRT and enhanced bus transit service. A critical goal of the system expansion seeks to provide simple, accessible, and sustainable transportation alternatives for the City's residents. As the City continues to grow the existing transportation infrastructure will be pushed beyond its capacity. Transit is one method to move more people, more efficiently, within the constraints of the urbanized areas of Edmonton. The SE LRT is also planned to operate as an urban-style LRT system, with more stations spaced closer together in conjunction with the development of transit-supportive communities. This includes the introduction of low floor LRT trains to the City. Following a detailed examination of different train technologies that was done as part of the network study, low floor LRT was selected to allow smaller scale stations and to best integrate LRT into the existing neighbourhoods. Low floor trains can operate with less station infrastructure, similar to enhanced bus stops where appropriate.

The City of Edmonton Transportation Department led the SE LRT study engaging with the full range of City departments, as well as public and citizen stakeholders. The multi step approach set out to develop general consensus on this recommended LRT corridor through a structured decision making process. Key project activities included:

- Confirmation of the decision making process
- Development of a project purpose statement
- Identification of project issues and objectives
- Development of criteria to compare potential corridor options against one another
- Identification of the full range of corridor options to extend LRT from the downtown to Mill Woods
- Basic design layouts of corridor options
- Technical analysis on key project challenges

- Two levels of screening to remove corridors from consideration and only advance those corridors that were the most promising for further analysis
- Consideration of the City's LRT Network planning to inform the corridor selection
- Activities to inform and obtain input from project stakeholders to help shape the decision process
- Identification of the recommended corridor with approval by City Council

This thoughtful approach allowed time to work through potential issues and develop general consensus at each step before the project was advanced to the next. Through the process, the full range of potential options was analyzed. Through detailed analysis, screening, and public consultation the team continued to narrow down the corridor options to just the most promising. Two primary corridors were advanced into the second level of screening analysis for final consideration. These corridors included the Connors Road corridor and the Dawson Bridge corridor. (Exhibits 5-2 and 5-3 provide graphic representations of the two corridors.) Both corridors represented strong options for the recommended corridor and the final analysis demonstrated only incremental differences. These slight differences speak directly to the merit of the final corridors. Ultimately, the technical studies (screening), public input, the LRT Network Studies, the City policy documents, and finally the City Council review identified the Connors Road corridor as the preferred. (Exhibit 7-1 provides a graphic image of the recommended corridor.) The recommended corridor preformed incrementally better under various criteria for its consistency with the City's policy direction on land use and redevelopment, as well as its direct connection between the downtown and Mill Woods.

The Connors Road corridor:

- Better aligns with goal of promoting compact urban form
- Is the most direct corridor, resulting in faster travel time
- Results in strong potential ridership (similar to Dawson)
- Reinforces current major transit patterns from downtown to Mill Woods
- Results in slightly less impacts to programmed park areas
- Showed an advantage over the Dawson Bridge corridor serving redevelopment areas

The adoption of the recommended corridor by City Council set the general location of the project's path from the downtown to Mill Woods. The next steps in the project are to refine the corridor and identify the specific track and station locations and layouts. This process will involve ongoing consultation with the local communities where the recommended corridor is located.

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1 Introduction

1.1 Purpose of the Report

This report details the decision-making process conducted by the City of Edmonton (the City) to determine the recommended corridor for the Southeast Light Rail Transit (SE LRT). This report explains the project structure, alternatives identification, screening process, evaluation criteria, and a summary of the technical analysis key points that resulted in the recommended SE LRT corridor extending from downtown Edmonton to Mill Woods.

To assist the reader, the following list of acronyms is provided:

ARP	Area Redevelopment Plan	**ROW**	right-of-way
CPR	Canadian Pacific Railway	**SE LRT**	Southeast Light Rail Transit
LOS	level of service	**TMP**	Transportation Master Plan
LRT	light rail transit	**TOD**	Transit Oriented Development
MDP	Municipal Development Plan	**PNR**	park and ride
O/M	operations and maintenance		

Please note, the terms "route" and "corridor" are used interchangeably throughout the report.

1.2 Background

The City has taken a different approach to the SE LRT project compared to past LRT expansions. Based on public interest and an increased emphasis on sustainability, recent City policy has begun to look differently at Edmonton's development patterns, the transit network, and development of major transportation infrastructure. With this recent policy direction as a backdrop, the SE LRT study began in June 2008. The SE LRT study was given a directive to identify an appropriate LRT corridor that moves citizens efficiently, helps to shape the land use and form of the City in a more sustainable fashion, and integrates into established neighbourhoods with less impact.

1.3 Decision Making Structure

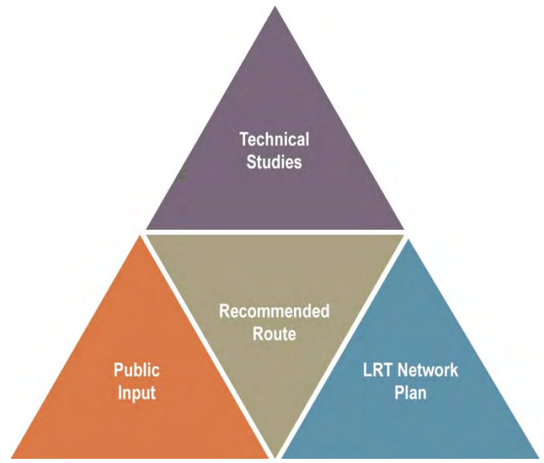
The SE LRT study was led by the City of Edmonton Transportation Department to determine a recommended LRT corridor. The department developed a cohesive project team including internal decision makers from the wide range of City departments involved in the project. Team members were selected to represent the positions of each of their departments. This blended group of City department representatives and consultants formed the "project team". Given the diverse perspectives of the team members, the objective was to reach consensus among the project team members on key decisions. Consensus refers to concurrence and not unanimous agreement. The team included representatives from the following branches/departments:

- Transportation Planning
- Transportation Operations
- Planning and Development
- Office of Natural Areas
- Parks and Recreation
- Edmonton Transit: Light Rail Transit, Service Development
- Capital Construction: LRT Design and Construction, LRT Expansion

The project team and its technical studies were one piece in a triad of influences that would ultimately determine the SE LRT corridor recommended to City Council. Exhibit 1-1 graphically displays the relationship of the following three key elements:

- Technical Studies – SELRT technical work was completed and reviewed by the internal City project team. Project team representatives were responsible for conveying the work of the group back to their respective departments and obtaining input from their departments at each decision milestone.
- Public Input – The public involvement process was conducted in parallel with the technical studies to understand the impact and benefit to local stakeholders and the public at large.
- LRT Network Plan – The separate study conducted to examine the future growth and direction of the Edmonton LRT System as a whole. The SE LRT is one component of this larger system.

EXHIBIT 1-1
LRT Route Planning Process



The public involvement process included individual stakeholder meetings, on-line comment opportunities, workshops and information sessions. The first public workshops were held on June 9 and 10, 2009, to present and describe the Level 1 analysis and the Level 2 corridor options. A second round of public information meetings were held on September 21 and 23, 2009, to present and describe the recommended corridor. City Council reviewed and debated the corridors in public hearings and approved the recommended corridor on December 15, 2009. Additional details on the public involvement and specific input received is included later in Section 6.

As noted previously, the recommended corridor was influenced by other studies and policy documents, such as the LRT Network Plan. The City has also conducted studies involving the desired future development patterns and the land use benefits of Transit Oriented Development (TOD). The potential land use effects and TOD opportunities were considered in the decision-making process and the evaluation criteria. Other key policy documents, including the Transportation Master Plan (TMP) and the Municipal Development Plan (MDP) , established the City's strategic vision on how citizens of Edmonton will live in and move throughout the City in the future. These plans clearly informed the SE LRT study. The bullets below provide specific excerpts from these plans that were considered in the decision-making process.

Transportation Master Plan

- Provide a comprehensive transit system as a cornerstone of the transportation system, offering travel choice and encouraging a shift in the public's mode of transportation
- Expand LRT to all sectors of the City to increase ridership and spur the development of compact, urban communities
- Integrate transportation and land use to optimize transportation investment and create an accessible, efficient, and urban form
- Provide an effective regional transportation system, including transit, for the movement of people and goods

Municipal Development Plan

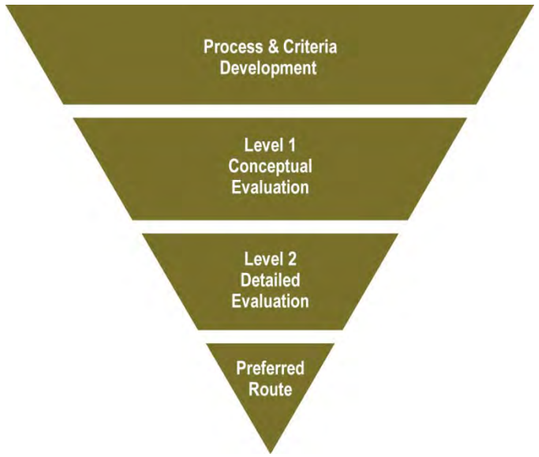
- Accommodate a 2040 population of over 1 million people
- Manage growth to become a sustainable, healthy, and compact City
- Grow within an evolving regional context
- Design complete, healthy, and livable communities
- Align medium and higher density development with key transit node and corridor locations including LRT
- Protect, preserve, and enhance the natural environment

1.4 Analysis Approach

The City of Edmonton Transportation Department chartered the project team to implement the multi-step decision-making process. Exhibit 1-2 details the steps in the process, including the City's internal team steps and public consultation. The project team met in a series of six team workshops during 2008 and 2009. Each workshop focused on a specific step or decision milestone in the process of identifying the preferred corridor. The process served to identify the range of potential corridors from the downtown to Mill Woods. Multiple criteria were developed that represented the guiding principles of the project.

The project team developed Criteria for two levels (Level 1/Level 2) of screening the corridor options. The criteria were developed organically using the objectives and challenges identified during development of the purpose and need statement and is consistent with approaches used in Canada and United States. The project team prioritized the objectives and challenges and worked through an exercise to convert these into specific, measurable criteria.

EXHIBIT 1-2
LRT Route Alternatives Analysis Process



Screening involves comparing each of the corridors against one another. In many cases, the corridors comparisons were very close based on the criteria, and one corridor was just incrementally better than another. The criteria became increasingly more detailed as the screening advanced. The criteria helped to screen out those corridors that did not compare favourably and advanced the most promising corridors for additional consideration. The process and criteria were presented to City Council for review and approval in December 2008.

1.5 Project Purpose and Need

The project team developed a purpose and need statement. The project purpose statement identified the key elements and reasons for completing the project. The statement also includes a series of supporting principles that addressed specific issues or objectives. The purpose statement is intended to be specific enough to include the key project elements, while being broad enough to ensure that the team developed a reasonable range of corridor options.

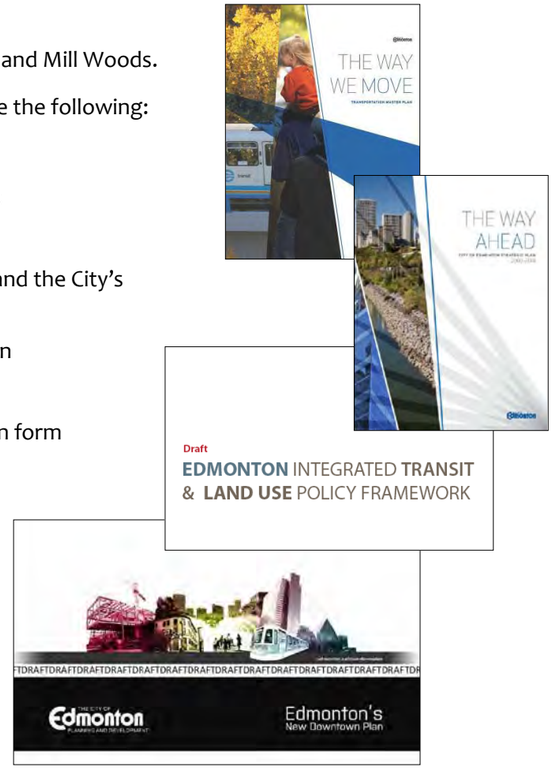
The project team brainstormed all of the potential opportunities and issues related to SE LRT project. Using these opportunities and issues as a basis, the team crafted the project purpose statement to identify the key points of focus for the project. The resulting project purpose statement for the SE LRT study was reached with the consensus of the entire project team:

Purpose Statement

Establish an LRT connection between the downtown and Mill Woods.

The guiding principles supporting this purpose include the following:

- Maximize cost effectiveness
- Maximize use of existing transportation corridors
- Connect existing and future activity centres
- Plan in a manner consistent with the TMP, MDP, and the City's Strategic Vision
- Provide opportunities for future system expansion
- Increase transit system effectiveness
- Shape land use to promote a more compact urban form
- Respect neighbourhoods
- Respect parklands, the river valley, and ravine systems
- Promote economic development and redevelopment



2 Initial Corridor Identification

2.1 LRT Network Plan

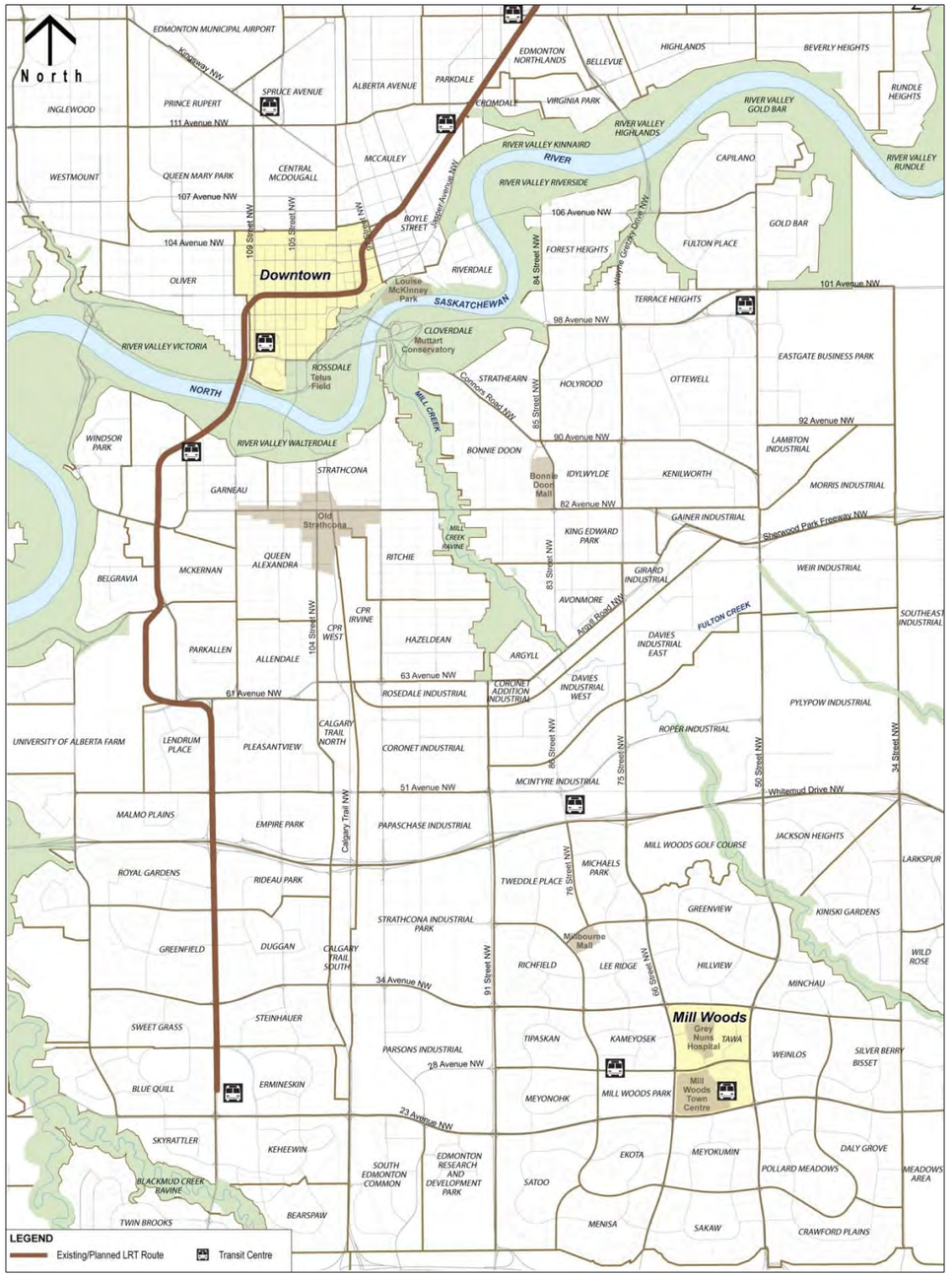
City staff is planning for the long-term mobility needs of Edmonton residents. Future mobility will include a mix of all modes, shifts in land use, and will ultimately provide Edmonton residents with multiple options to move in and around the city. LRT is a critical component of this vision. In response, city staff has developed an overall LRT Network Plan and a comprehensive technical review of its approach to LRT system planning and operation. This plan guides the future development of LRT. The LRT Network Plan was developed in tandem with the SE LRT project. As new information and direction was available from the LRT Network Plan, these results were integrated into the SE LRT project.

The LRT Network Plan identified the demand for an LRT connection between the downtown and Mill Woods, providing the basis for this project. Therefore, as noted in our project purpose, all corridors were required to connect these two termini. Additionally, the LRT Network Plan identified Edmonton LRT lines should move towards an urban-style LRT system, with more stations spaced closer together in conjunction with the development of transit-supportive communities. All of these factors were considered by the project team in the development of corridor options for the SE LRT.

2.2 Study Area

The project team identified a project study area. The SE LRT study area encompassed southeast Edmonton from the downtown area to the edges of Mill Woods. In general, the boundaries of the study were the downtown area to the north, 34 Street to the east, Anthony Henday Drive to the south, and the existing South LRT line to the west. Exhibit 2-1 provides a map of the study area and constituent neighbourhoods. The study area included major commercial centres at Bonnie Doon Mall, the Old Strathcona district, Mill Woods Town Centre, and Millbourne Mall. Major parkland and recreational landmarks in the area included the river valley, Louise McKinney Park, Connors Hill ski facilities, Gallagher Park, the Mill Creek Ravine, the Mill Woods Golf Club, and Mill Woods Park. Significant educational, transportation, and health facilities were also located within the study area. These facilities included the Millgate Transit Centre, Grant MacEwan University, Wagner School of Science and Technology, Canadian National/Canadian Pacific railway lines, the Inner Ring Road, and the Grey Nuns Community Hospital.

EXHIBIT 2-1
Study Area Overview



2.3 Initial Corridors Identified

The project team worked through various group exercises to identify all reasonable corridor options extending from the downtown to Mill Woods. The goal was to identify all reasonable options, even if some options may have significant challenges. The ability to document that all reasonable corridors were examined and why they were either advanced or removed from consideration was a key element of the process. Each team member also brought their unique knowledge of the study area and potential corridors. The interactive style of the corridor options development encouraged sharing of this information among the project team.

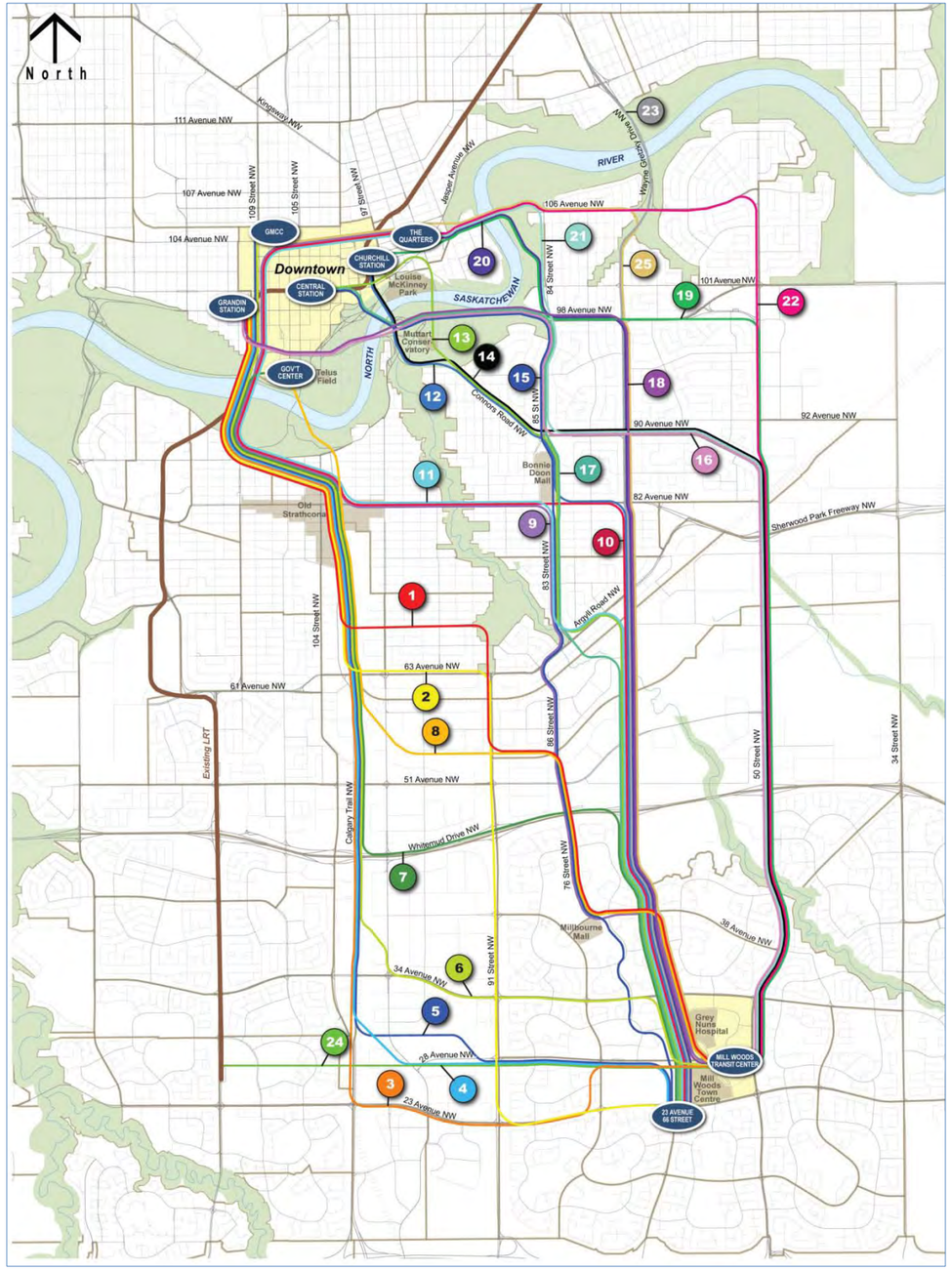
The team members were presented with the existing conditions within the study area including existing and future land use, zoning, geographic constraints, population, parks/river valley, existing transit, as well as other social and environmental data. This information provided the basic context for team members to develop the initial range of corridor options. The team also identified all of the potential existing and future activity centres throughout the project study area. Following this, each team member identified a specific corridor option linking the downtown to Mill Woods, with connections at the various activity centres. Team members continued to identify potential corridors until all options were exhausted. Twenty five initial corridors (with over 1000 potential permutations) were agreed upon and formally vetted through the public consultation process and advanced through the Level 1 screening process.

Significant discussion ensued among the project team regarding the positive and negative aspects of each corridor option:

- Some team members questioned whether traffic lanes on Whyte Avenue could be reduced. It was noted this is a major destination, but also a regional through route for travel to the University and University Hospital. It was noted that alternate corridors may be available to traffic.
- While corridors generally stayed within existing transportation corridors, one new river crossing was identified as a potential option. A tunnel could be developed to carry Gateway Boulevard under Saskatchewan Drive and emerge in the vicinity of the Kinsman Recreation Centre connecting to a new bridge crossing over the North Saskatchewan River that would replace the existing Walterdale Bridge.
- It was discussed that the High Level Bridge is owned by the City and that there is room for three tracks on the bridge. It was noted that this may also be a corridor for the future high speed rail.
- Team members identified that a connection could be made from the future LRT line at Century Park. It was discussed that this line would likely be at capacity when it opens and this connection may be difficult. However, the team determined the connection should be added and screening will determine its viability.

A graphic compilation depicting the initial corridors is presented in Exhibit 2-2. In some cases, similar corridors were combined or condensed.

EXHIBIT 2-2
Initial Corridors Considered



3 Level 1 – Corridor Screening

3.1 Screening Criteria (Level 1)

Level 1 criteria were included as a fatal flaw comparison, to remove corridors from consideration that did not meet the basic objectives of the project. Level 1 criteria were primarily qualitative, based on knowledge from past projects and the professional judgment of the project team's planners and engineers; as well as input received through the public involvement process. The Level 1 criteria were organized in three general categories of Feasibility, Community, and Environment. While there is considerable overlap in the categories, organizing the Level 1 criteria in this manner provided a simple format to present the criteria to the project stakeholders. The tables below presents the basic objectives the team was attempting to achieve, paired with the specific criteria used as the measurement of each objective.

Feasibility

Corridors were evaluated to determine if/how they met the basic technical needs of the project. The complexity of implementation and construction was considered for each corridor.

TABLE 3-1
Corridor Evaluation

OBJECTIVE	CRITERIA (METHOD OF MEASUREMENT)
Address the issue or purpose of the project.	Does the corridor meet the project purpose statement?
Constructability.	Is the corridor technically feasible?
Minimize private property impacts and cost.	Does the corridor use existing transportation corridors?
Minimize impacts to logistics of business and industry.	Does the corridor create irresolvable conflicts with goods movements?
Maximize connectivity and accessibility.	Does the corridor connect directly to major bus service?
	Does the corridor connect (direct or transfer) to the existing LRT system?
Minimize capital cost and constructability issues.	Does the corridor require significant length of structure or tunnel (20% or greater)?
	Is the corridor primarily within existing public ROW (80% or greater)?
Maintain viable options for future expansion.	Is the southern terminus aligned appropriately to not preclude a future extension south?
	Is the corridor aligned appropriately to not preclude a future extension east towards Sherwood Park?

Community

Corridors were evaluated for their ability to minimize neighbourhood and social impacts. Potential benefits to local communities were also considered through these criteria.

TABLE 3-2
Community Evaluation

OBJECTIVE	CRITERIA (METHOD OF MEASUREMENT)
Connect people to destinations where they live, work, and play.	Does the corridor connect to existing activity centres?
	Does the corridor connect to future activity centres?
	What is the existing/future population within 150 metres (m) of the corridor?
	What is the existing/future employment within 150 m of the corridor alignment?
Capitalize on land use plans and policies encouraging transit and density.	Do the future land use plans along the corridor include transit supportive policies and policies to encourage density?
Capitalize on land use plans and policies encouraging transit.	Is the corridor consistent with the TMP, MDP and the City's strategic direction?
Identify opportunities to enhance neighbourhood connectivity and cohesion.	Does the corridor create physical barriers for neighbourhood residents?
	Could stations be integrated and fit with the surrounding neighbourhood?

Environment

Corridors were evaluated for their ability to minimize impacts on the natural environment or to enhance the community.

TABLE 3-3
Environmental Evaluation

OBJECTIVE	CRITERIA (METHOD OF MEASUREMENT)
Minimize social and environmental impacts.	Does the corridor present irresolvable social and environmental impacts?
Minimize impacts to parks and open space, while maximizing access (where appropriate).	Is the corridor consistent with City plans, bylaws, provincial and federal regulations addressing parks, open space, and the river valley?
	What is the number of parks, open space, or river valley area adjacent to the corridor?
Support revitalization through LRT.	Does the corridor connect priority revitalization locations based on City plans and/or bylaws?

3.2 Corridor Screening (Level 1)

Level 1 screening was completed to remove from consideration those corridors that simply did not meet the purpose of the project or those corridors where the high level of impact or cost made them simply not viable. Each corridor identified in Exhibit 2-2 was compared to the Level 1 criteria. The project team debated the challenges and benefits related to each corridor.

For purposes of the Level 1 screening, the corridors were grouped by the primary option used to cross the North Saskatchewan River or their major roadway corridors. The groupings included:

- High Level Bridge – CPR: Corridors primarily follow the CPR ROW.
- High Level Bridge – Whyte Ave.: Corridors follow the CPR and then Whyte Ave.
- Connors Road: Includes reconstruction of the Low Level Bridge to include LRT or development of a new LRT structure adjacent. This grouping also included a crossing in the vicinity of the Cloverdale Footbridge in Louise McKinney Park. Each option follows segments of Connors Road.
- James MacDonald Bridge: Crossing the James MacDonald Bridge.
- Dawson Bridge: Included reconstruction of the Dawson Bridge to include LRT or development of a new LRT structure adjacent.
- Other: Included options crossing the Capilano Bridge, Walterdale Bridge, and the connection between Mill Wood and the Century Park Station.

Table 3-4 provides the details of the Level 1 screening and the project team's recommendations for advancing or not advancing specific corridors to Level 2. Significant overlap in corridors existed. Therefore, while a single corridor from end to end may not have been desirable in its current configuration, specific portions did have merit. Therefore, portions of several corridors were incorporated as design options into other corridors. These conclusions are reflected in Table 3-4.

TABLE 3-4
Level 1 Screening Summary

GROUPING	CORRIDOR	DECISION	PRIMARY CONCLUSIONS	
High Level - CPR	#1	Do not advance	Corridor is fatally flawed due to significant impacts to multi-use trail system, acquisition of parkland, and physical barrier created in the Hazeldean neighbourhood. Potential travel time issues given number of curves, resulting in slower speeds.	Potential out of direction travel for Mill Woods and longer travel time issues due to slightly longer corridor. Precludes future eastern connection to Sherwood Park (too far west).
High Level - CPR	#2	**ADVANCE** as sub-option to corridor #6	Corridor is technically feasible. May serve similar market as South LRT. Potential out of direction travel for Mill Woods and longer travel time issues due to slightly longer corridor.	Precludes future eastern connection to Sherwood Park (too far west).Impacts to Mill Woods Park Fewer property acquisitions. Other than downtown and Strathcona Junction, serves limited activity centres and areas of population.
High Level - CPR	#3	Do not advance	Corridor is fatally flawed due to redundancy with the South LRT. Out of direction travel for Mill Woods and longer travel time issues due to slightly longer corridor.	Precludes future eastern connection to Sherwood Park (too far west). Serves marginal population centres along the highly industrial rail corridor.
High Level - CPR	#4	Do not advance	Corridor is fatally flawed due to redundancy with the South LRT. Out of direction travel for Mill Woods and longer travel time issues due to slightly longer corridor. Precludes future eastern connection to Sherwood Park (too far west).	Impacts Mill Woods Park Serves marginal population centres along the highly industrial rail corridor.
High Level - CPR	#5	**ADVANCE** as sub-option to corridor #6	Corridor has similar issues to corridors #4 and #3. However, the east west component of this corridor follows a long planned LRT corridor through City owned property and along 28 Avenue. Given its history, this option will be tested through further screening. Serves the same travel market as the South LRT.	Out of direction travel for Mill Woods and longer travel time issues due to slightly longer corridor. Precludes future eastern connection to Sherwood Park (too far west). Impacts Mill Woods Park Serves marginal population centres along the highly industrial rail corridor.
High Level - CPR	#6	**ADVANCE**	Corridor is technically feasible. Incorporates corridors #2 & #5 as design options. Serves Strathcona Junction as a key activity centre. Serves existing neighbourhoods.	Most direct of CPR options. Precludes future eastern connection to Sherwood Park (too far west). May serve similar travel market as South LRT.

GROUPING	CORRIDOR	DECISION	PRIMARY CONCLUSIONS	
High Level - CPR	#7	Do not advance	Corridor is fatally flawed due to serving marginal population centres along the highly industrial rail corridor, as well as Whitemud Drive. The majority of this corridor is inaccessible to area neighbourhoods. Access to the system for this corridor would be primarily through park n ride.	Out of direction travel for Mill Woods and longer travel time issues due to slightly longer corridor. Precludes future eastern connection to Sherwood Park (too far west).
Other - New Walterdale Bridge	#8	Do not advance	Corridor is fatally flawed due to policy direction and technical feasibility. City Council determined a new auto bridge would be implemented to replace the existing Walterdale Bridge. City Council also directed the new bridge be constructed in the same location as the existing bridge.	Adding LRT to a low level crossing in this location would not be technically feasible due to grades and multiple other constraints.
High Level – Whyte Ave.	#9	**ADVANCE** as sub-option to corridor #10	Corridor is technically feasible. Directly serves neighbourhoods. However, the trade off for this corridor is potential additional property acquisitions and neighbourhood impacts. Serves higher density along Whyte Ave. corridor.	Multiple curves may result in slower speeds and longer travel time. Whyte Ave. traffic issues. Requires widening of the rail tunnel south of the high level bridge. Feasible future connection to the east.
High Level – Whyte Ave.	#10	**ADVANCE**	Corridor is technically feasible. Incorporates corridor #9 as a design option. Minimizes potential additional property acquisitions and neighbourhood impacts by following 75 St. However, the area along 75 St. is lower density and auto oriented. Serves higher density along Whyte Ave. corridor.	Whyte Ave. traffic issues. Requires widening of the rail tunnel south of the high level bridge. 75 St. good movement corridor and traffic issues. Feasible future connection to the east.
High Level – Whyte Ave.	#11	**ADVANCE** as sub-option to corridor #10	Corridor is technically feasible. Directly serves neighbourhoods. However, the trade off for this corridor is potential additional property acquisitions and neighbourhood impacts. Serves higher density along Whyte Ave. corridor. Multiple curves may result in slower speeds and longer travel time. Potential issues with S-curve near Wagner Road.	Potential parkland impacts. Whyte Ave. traffic issues. Requires widening of the rail tunnel south of the high level bridge. Feasible future connection to the east.
Connors Rd.	#12	**ADVANCE**	Corridor is technically feasible. However, requires significant earthwork to develop new low level bridge and tunnel connection to Churchill Station. Serves Bonnie Doon (potential redevelopment/activity centre) and surrounding neighbourhoods. Provides river valley access. Potential river valley impacts.	75 St. good movement corridor and traffic issues. Minimizes potential additional property acquisitions and neighbourhood impacts by following 75 St. However, the area along 75 St. is lower density and auto oriented. Feasible future connection to the east.
Connors Rd. – Louise McKinney	#13	**ADVANCE** as sub-option to corridor #12	Corridor is technically feasible. However, requires significant earthwork to develop new bridge crossing at the existing pedestrian crossing and tunnel connection to Churchill Station. Serves the Quarters redevelopment. Serves Bonnie Doon (potential redevelopment/activity centre) and surrounding neighbourhoods. Provides river valley access.	Potential river valley impacts. Avoids some property acquisitions and neighbourhood impacts by following 75 St. (South of Wagner Road). However, the area along 75 St. is lower density and auto oriented. Feasible future connection to the east.
Connors Rd.	#14	Do not advance	Corridor is fatally flawed due to travel time and cost issues. This corridor is considerably longer and serves very low density populations centres along 50 St. Growth is planned in these areas, but not at densities that support LRT.	Additional length of the corridor significantly adds to the project cost without the corresponding benefit of increased ridership. Creates out of direction travel to serve Mill Woods. Feasible future connection to the east.

GROUPING	CORRIDOR	DECISION	PRIMARY CONCLUSIONS	
Connors Rd.	#15	**ADVANCE** as sub-option to corridor #12	Corridor is technically feasible; however, it requires significant earthwork to develop new low level bridge crossing and tunnel connection to Central Station. Significant grade challenges along 98 Ave. Serves Bonnie Doon (potential redevelopment/activity centre) and surrounding neighbourhoods. Provides river valley access.	Potential river valley impacts. Feasible future connection to the east. Directly serves neighbourhoods; however, the trade off for this corridor is potential additional property acquisitions and neighbourhood impacts. This is specifically true where the corridor penetrates the curvilinear neighbourhood streets south of 38 Ave. (This portion of the corridor will not be advanced.)
James MacDonald	#16	Do not advance	Corridor is fatally flawed due to travel time and cost issues. This corridor is considerably longer and serves very low density populations centres along 50 St. Growth is planned in these areas, but not at densities that support LRT. Reconstruction of James MacDonald Bridge and significant tunnel connection to Grandin Station. Significant grade challenges along 98 Ave.	Additional length of the corridor significantly adds to the project cost without the corresponding benefit of increased ridership. Feasible future connection to the east. Creates out of direction travel to serve Mill Woods.
Connors Rd.	#17	**ADVANCE** as sub-option to corridor #12	All components of this corridor are included as design option to corridor #12. While this corridor as a whole has many technical challenges due to reconstruction of the low level bridge, its components are advanced for further consideration. Provides river valley access. Significant grade challenges along 98 Ave. Serves Bonnie Doon (potential redevelopment/activity centre) and surrounding neighbourhoods.	Potential property acquisition. Feasible future connection to the east. Potential river valley impacts Potential school impacts.
James MacDonald Bridge	#18	Do not advance	Corridor is fatally flawed due to circuitous approach to downtown. Corridor is technically feasible (based on current information). Potential property acquisition. Provides river valley access. Potential river valley impacts. Feasible future connection to the east.	Route bypasses downtown from east to west, only to enter downtown from the west resulting in substantial out-of-direction travel. Reconstruction of James MacDonald Bridge and significant tunnel connection to Grandin Station. 75 St. good movement corridor and traffic issues. Significant grade challenges along 98 Ave.
Dawson Bridge	#19	Do not advance	Corridor is fatally flawed due to travel time, cost, significant parkland/school impacts, and significant river valley impacts. This corridor is considerably longer and serves very low density populations centres along 50 St. Growth is planned in these areas, but not at densities that support LRT. Construction of bridge adjacent to Dawson Bridge and significant aerial track and tunnel connection to Churchill Station. Potential property acquisition.	Significant grade challenges along 98 Ave. Additional length of the corridor significantly adds to the project cost without the corresponding benefit of increased ridership. Creates out of direction travel to serve Mill Woods. Riverdale neighbourhood and access impacts. Feasible future connection to the east. Connects to the Quarters redevelopment.
Dawson Bridge	#20	**ADVANCE** as sub-option to corridor #25	Corridor is fatally flawed due to travel time, cost, significant parkland/school impacts, and significant river valley impacts. Construction of bridge adjacent to Dawson Bridge and significant aerial track and tunnel connection to Churchill Station. Potential property acquisition. Significant grade challenges along 98 Ave.	Additional length of the corridor significantly adds to the project cost without the corresponding benefit of increased ridership. Creates out of direction travel to serve Mill Woods. Riverdale neighbourhood and access impacts. Feasible future connection to the east. Connects to the Quarters redevelopment.

Grouping	Corridor	Decision	Primary Conclusions	
Dawson Bridge	#21	Do not advance	Corridor is fatally flawed due to travel time and cost. This corridor is considerably longer and serves very low density populations centres along 50 St. Growth is planned in these areas, but not at densities that support LRT. Construction of bridge adjacent to Dawson Bridge and significant aerial track and tunnel connection to Churchill Station. Corridor presents challenging grades on the east side of the river with potential for significant earthwork and river valley impacts.	Potential property acquisition. Additional length of the corridor significantly adds to the project cost without the corresponding benefit of increased ridership. Creates out of direction travel to serve Mill Woods. Riverdale neighbourhood and access impacts. Feasible future connection to the east. Connects to the Quarters redevelopment.
Dawson Bridge	#22	Do not advance	Corridor is fatally flawed due to travel time and cost. This corridor is considerably longer and serves very low density populations centres along 50 St. Growth is planned in these areas, but not at densities that support LRT. Corridor #22 follows 50 St. longer than any other option. Construction of bridge adjacent to Dawson Bridge and significant aerial track and tunnel connection to Churchill Station. Corridor presents challenging grades on the east side of the river with potential for significant earthwork and river valley impacts.	Potential property acquisition. Additional length of the corridor significantly adds to the project cost without the corresponding benefit of increased ridership. Creates out of direction travel to serve Mill Woods. Riverdale neighbourhood and access impacts. Feasible future connection to the east. Connects to the Quarters redevelopment and redevelopment along 106 Ave.
Other - Capilano Bridge	#23	Do not advance	Corridor is fatally flawed because it does not meet the basic purpose of the project to connect the downtown and Mill Woods.	Corridor #23 creates a connection to the existing LRT system at the Stadium Station, where passengers would connect or transfer to access downtown Edmonton. This out of direction travel negatively impacts potential ridership and the success of the LRT corridor.
Other - Century Park Connection	#24	Do not advance	Corridor is fatally flawed because it does not meet the basic purpose of the project to connect the downtown and Mill Woods. Corridor #24 creates a connection to the existing LRT system at the Century Park Station, where passengers would connect or transfer to access downtown Edmonton.	Capacity issues on the existing South LRT preclude this option. Additionally, corridor #24 would not improve mobility options for the majority of citizens in the project study area.
Dawson Bridge	#25	**Advance**	Corridor is technically feasible; however, tunnel with steep grades required to exit downtown. New bridge required adjacent to Dawson Bridge (or replace Dawson Bridge). Corridor presents challenging grades on the east side of the river with potential for significant earthwork and river valley impacts. Creates out of direction travel to serve Mill Woods.	Riverdale neighbourhood and access impacts. Feasible future connection to the east. Serves redevelopment area on 106 Ave. Connects to the Quarters redevelopment.

3.2.1 Overview of Key Issues for Each Corridor

The project team reviewed and discussed each corridor in depth, compared to the Level 1 screening criteria. Specific components of each corridor were questioned by the team for technical feasibility and merit to advance into Level 2 analysis. The sections below provide a summary of some of the key issues considered by the team in their screening analysis.

High Level – CPR Corridor

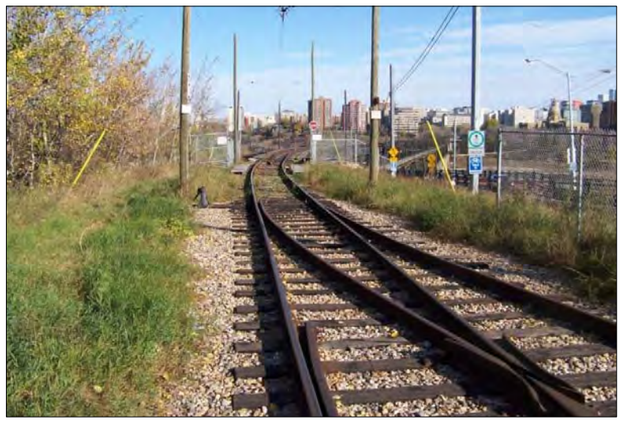
Grandin Station

Concern was expressed by the project team that the Grandin Station could not adequately serve as a transfer point from the new LRT line to the existing LRT. The transfer would occur from a surface station on the SE LRT to the existing underground Grandin Station. The existing Grandin Station was analyzed as being capable of handling train transfers of 2,000 people/per 3 minutes. There was not unanimous consensus with this assessment; however, there was no objection to corridors including Grandin Station from advancing further in the process.

High Level Bridge

Questions surfaced regarding the life span and structural integrity of the High Level Bridge to support LRT. The project team also considered the Alberta government's potential desire to utilize the High Level Bridge for a future high speed rail connection. The High Level Bridge was upgraded in 1994. The bridge's lead paint was removed and the structure repaired. The project team confirmed that the bridge is capable of carrying two LRT lines and, if required, the bridge could also accommodate the high speed rail line. It was noted this would need to be time-separated so that three tracks could operate over the bridge. Studies also indicated the remaining life span of the High Level Bridge should exceed 100 years, provided appropriate maintenance is completed.

Existing Tunnel



The project team discussed the existing tunnel located south of the High Level Bridge serving the High Level Bridge streetcar. This is a single track tunnel that runs below a residential apartment building parkade. The tunnel is approximately 4 meters wide. The project team presented the option of constructing a single track segment through the existing tunnel to minimize impacts. The project team confirmed that 5 minute headways could be maintained for trains to use the single track tunnel. Another option (or a future phase) was presented to develop a second tunnel adjacent to the existing tunnel. This would require reconstructing the parkade. Therefore, the tunnel for this corridor is not a fatal flaw.

Walterdale Bridge

The project team evaluated the various studies regarding new Walterdale Bridge crossing options. Grades on both sides of the river present significant challenges, especially for LRT which (in general) should not exceed a 4.5% grade for exposed sections. The project team considered developing a bridge with two decks (lower for autos and upper for LRT). A two deck bridge would require a 1 km tunnel north and south of the bridge to accommodate the grades. This option posed major challenges due to earthwork, neighbourhood disruptions, traffic impacts, and cost.

There was debate among technical committee members over using the High Level Bridge and removing the Walterdale Bridge option. The High Level Bridge offered the advantage of already being an existing river crossing with available capacity to accommodate the corridor and did not require extensive earthworks or grades to address.

A Walterdale Bridge corridor had the following disadvantages:

- High grades on both sides of the river would require tunneling on both sides of the river to tie the LRT line into the rest of the corridor.
- Connecting the LRT line into downtown from the new Walterdale Bridge would be costly. Significant tunneling would be required to extend the LRT north into downtown.
- First Nations lands exist on the North side of the proposed Walterdale Bridge that could be a fatal flaw for this option.

A new Walterdale Bridge corridor advantages included:

- This bridge would provide more possible connection points into the inner city and not be restrictive like the existing High Level Bridge that would connect into Grandin Station. Multiple transfer points for connection were a plus.
- More political support may exist since the LRT and the vehicle bridge can bring in more funding for the project as a whole.
- No possibility in conflicting with the Provincial Government's High Speed Transit plans with using the existing High Level Bridge.

Subsequent to the project team's discussions, City Council examined options for reconstruction of the Walterdale Bridge. City Council determined the Walterdale Bridge should be replaced in its current location, as an auto bridge. Given this decision, the Walterdale Bridge option was not technically feasible for LRT and was not advanced to Level 2 analysis.

CPR Right-of-Way

For purposes of the early analysis, the project team assumed the CPR ROW could be acquired or leased to develop the LRT. However, ongoing negotiations would be required with CPR regarding purchase or use of their ROW for the LRT line. Concern was also expressed that the majority of existing and future land uses along the CP corridors were primarily industrial and low density. While these corridors did connect to Whyte Ave. and Old Strathcona, the majority of the corridor was uninhabited or developed as auto oriented. The

team was concerned LRT in these areas would take much longer to develop over time, when compared to other parts of the city with a mix of land uses.

High Level - Whyte Ave. Corridor

The High Level – Whyte Ave. corridors included the same challenges described above for the Grandin Station, CPR ROW, High Level Bridge, and the existing tunnel.

Traffic

Concern was expressed by the project team regarding potential traffic impacts, specifically along 75 Street (north of Argyll Rd.) and Whyte Ave. This portion of 75 St. is categorized by the City as a major goods movement corridor.

The team examined basic traffic operations to determine what impacts may result. The examination looked at major intersections along 75th Street (inner ring road). In general, the analysis identified that introduction of the LRT on 75th St., north of 82nd St. would present significant traffic impacts at several intersections. It was noted that the other proposed corridor options can provide a corridor around the problem intersections along 75th St. The project team recommended that the portions of corridors utilizing 75th St. north of 82nd St. be removed from consideration.

Traffic patterns along Whyte Ave. would be directly impacted by the introduction of LRT. Primarily, full movements of north/south roadways would be limited to signalized intersections. The capacity of the corridor could be maintained if on street parking was removed. The project team determined that although there were impacts, corridors along Whyte Ave. were not fatally flawed and would require more detailed assessment in Level 2 screening.

Wagner Road Area

The project team also examined the LRT crossing near the Wagner School and adjacent park property. The team examined the drainage issues in the area and determined that Mill Creek is currently piped and does not present an issue. From the analysis, various options exist to cross over or under the existing CPR tracks, some adjacent roadways, and through the school property. It is likely that parkland would be acquired to implement this corridor option and appropriate mitigation would be required.

Connors Road Corridor

Certain design options associated with the Connors Road corridor presented challenges, including the Low Level Bridge crossing and the Cloverdale footbridge crossing.

Low Level Bridge Crossing

The analysis of the Low Level Bridge crossing demonstrated challenges with the steep elevations for the LRT when accessing downtown. Alternately, the grade could be flattened some if the new tunnel for downtown access were very deep. A tunnel could be developed west of the existing bridge, but would require significant earthwork.

Additionally, there are bank stability concerns north of the river in this area. The ramps and roads leading to the Low Level Bridge would require reconstruction to accommodate the LRT corridor. This readjustment would require considerable funding. It was noted that Connors Road grades are appropriate for LRT. On the north side a tunnel portal would be required. The project team agreed to remove the Low Level Bridge option due to the multiple technical challenges. The project team agreed that the earthwork, grades, cost, and visual impacts to the river valley required to accommodate LRT at the Low Level Bridge location would be too great to overcome (when compared to the other options available).

Cloverdale Footbridge Crossing

Development of an LRT river crossing at the existing pedestrian bridge would result in impact to the adjacent parkland and residential area. However, given the generally flat grades on the south side of the river, it would be possible to design a structure to minimize impacts and maintain accessibility along and across the river. The connection on the north side of the river would tunnel under 95th St. (approximately). The portal would be located east of the Louise McKinney Park. This corridor would provide a connection to the downtown Quarters redevelopment. The project team agreed that specific considerations must be incorporated to avoid impacts to the river valley residents in the downtown and Cloverdale neighbourhoods. The team discussed options to allow movement under the LRT structure for recreational users of the river valley. There was consensus to advance the pedestrian bridge crossing location as with connections to the Quarters redevelopment. The team agreed there are challenges and impacts associated with this option. However, this was the most direct connection and grades at this location are also more reasonable and would require less earth work in the river valley

Louise McKinney Park

The City has invested significant funds into parks in the Louise McKinney Park area. The north side of the bridge/tunnel portal is close to the existing rose garden and Chinese garden. The project team expressed concerns regarding the slope stability in the Louise McKinney Park area. A significant amount of geotechnical study has been completed in this area. This issue is not a fatal flaw, but will require consideration in the cost of design and construction.

Traffic

There were concerns expressed about displacing or disrupting traffic on Connors Road east of 92 Street. Connors Road ROW becomes very narrow at this point and widening would require property acquisition. Connors Road is a major traffic and transit connection into the downtown. The current and future volumes on Connors Road dictate that traffic impacts would be significant. The project team was directed to examine alternatives using 95 Avenue or other options.

James McDonald Corridor

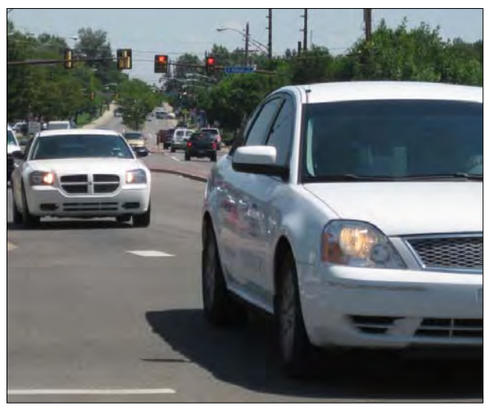
The project team examined the technical requirements of developing an LRT crossing near the James McDonald Bridge or utilizing the existing bridge.

James McDonald Bridge

The existing bridge would require significant reconstruction/strengthening for the LRT crossing. Additionally, 98 Ave. has 7.5 % grades and there are other slope challenges on a portion of 98 Ave. These grades are too steep for LRT and would require significant earthwork to climb 98 Ave.

Traffic

This corridor would also result in traffic impacts to the inner ring road. With the introduction of LRT the level of service (LOS) on the inner ring road would likely drop to LOS F, generally gridlock at peak periods. The project team emphasized that there would be significant challenges in protecting the existing service levels on the inner ring road. Analysis of the future conditions in 2041 shows that even with roadway expansion the LOS for the inner ring road would still fall to an F rating.



The team agreed that this entire corridor presents significant challenges without the benefits of the other comparable corridors. This corridor traveled out of direction (from east to west of downtown at Grandin). Most riders would be traveling to downtown and this longer corridor that traveled out of direction would not be the most efficient way to travel. The team agreed to remove the corridor from Level 2 consideration due to the out of direction travel, length of the corridor, and technical challenges.

Dawson Bridge Corridor

The project team examined the technical challenges of corridors using the Dawson Bridge crossing.

Traffic

The project team discussed the potential for high traffic impacts at intersections along 75th Street (north of Argyll Road) would occur.

Riverdale Neighbourhood and New Dawson Bridge

The project team identified major grade concerns on both sides of Dawson Bridge. The existing automobile bridge is scheduled for rehabilitation in 2010. Development of the LRT in this corridor would result in significant community impacts in the Riverdale neighbourhood. An 800 meter tunnel would be required to access downtown after crossing through/over the Riverdale community. Several access roads in the Riverdale neighbourhood would likely be severed. This crossing would have the highest cost of any new crossing considered in the analysis. By comparison to other corridors the length of a new bridge in this area would be prohibitively costly. Although the existing Dawson Bridge requires replacement developing a combined bridge for auto and LRT traffic would require a significantly longer and higher bridge when compared to other options.

Corridor Length

The Dawson Bridge corridors were the longest of the corridors proposed, resulting in longer travel time. This corridor is not as competitive as other options. However, the project team was concerned that eliminating this corridor would minimize possible strong connections to Sherwood Park. Therefore, the project team agreed the Dawson Bridge Corridor would be advanced to Level 2 for additional consideration.

Other Corridors

Capilano Bridge

The team examined a connection crossing the Capilano Bridge, connection to the existing LRT at the Stadium Station. However, this corridor was fatally flawed because it did not meet the basic purpose of the project to connect the downtown and Mill Woods. Passengers would be required to connect or transfer to access downtown Edmonton at the Stadium Station. This out of direction travel negatively impacts potential ridership and the success of the LRT corridor.

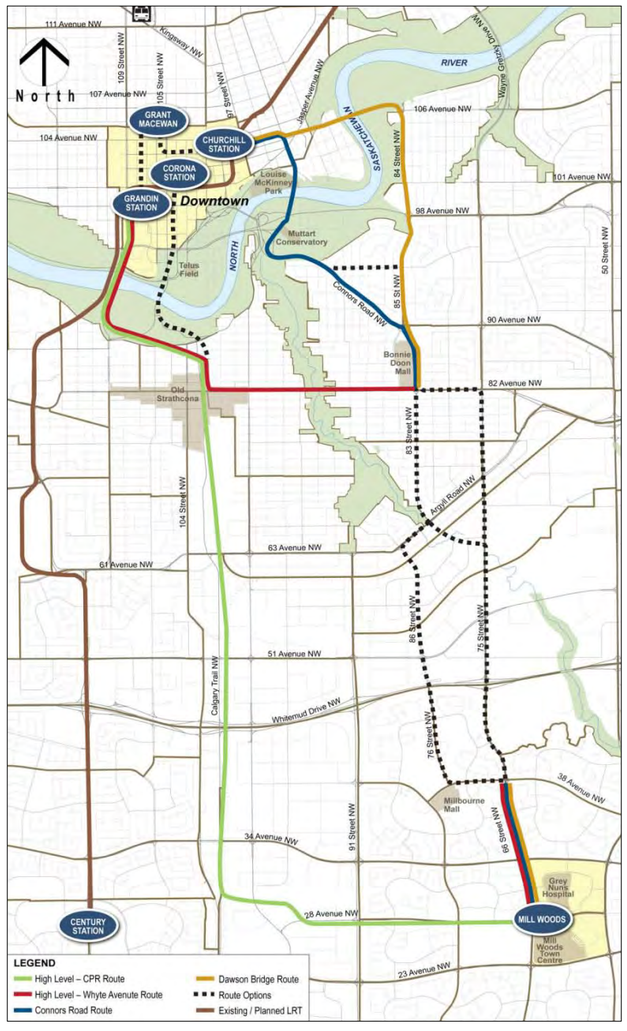
Century Park Connection

The team examined a corridor connection to the South LRT at the Century Park Station, where passengers would connect or transfer to access downtown Edmonton. Capacity issues on the existing South LRT preclude this option. This corridor was fatally flawed because it did not meet the basic purpose of the project to connect the downtown and Mill Woods. Additionally, this corridor fails to improve mobility options for the majority of the citizens in the project study area.

3.3 Level 1 – Summary of Results (Level 1)

Level 1 analysis resulted in four major groupings of corridors being advanced to Level 2 analysis. The shortlisted routes were rationalized against one another to ensure that all routes contained similar elements of the applicable design options to ensure a fair and consistent comparison. Other design options were removed when subjected to additional due diligence. For example, design options utilizing 75 Street, north of 82 Avenue were eliminated due to unacceptable traffic impacts from the Inner Ring Road. Exhibit 3-1 graphically displays these corridor groupings and their various options. These corridors are also described below.

EXHIBIT 3-1
Corridor Groupings



High Level – CPR Corridor

The corridor would exit the downtown crossing the North Saskatchewan River via the High Level Bridge or the Walterdale Bridge corridor. The corridor would enter the CPR ROW, exiting at approximately 28 Avenue and travelling east to Mill Woods Town Centre.

High Level - Whyte Avenue Corridor

The corridor would exit the downtown, crossing the North Saskatchewan River via the High Level Bridge or the Walterdale Bridge corridor. The corridor would enter the CPR ROW exiting at approximately 82 Avenue (Whyte Avenue). The corridor would travel east on 82 Avenue and turn south on 83 Street, crossing Argyll Road above ground to 75 Street; or turn east on 82 Avenue and then turn south on 75 Street. The corridor would continue down 75 Street to 66 Street. Alternatively, the corridor would travel along 86 Street to 76 Street with service to Millbourne Mall before turning along 38 Avenue and then to 66 Street. The corridor would then travel along 66 Street to Mill Woods Town Centre.

Connors Road Corridor

This corridor would exit the downtown through the proposed Quarters redevelopment. The corridor would go underground and turn south under 95 Street, exiting a portal on the eastern edge of Louise McKinney Park. The corridor would cross the North Saskatchewan River in the vicinity of the existing pedestrian crossing, travelling over 98 Avenue and climbing Connors Hill adjacent to Connors Road. The corridor would follow Connors Road to 83 Street or turn east on 95 Avenue, to 85 Street, to 83 Street. At 82 Avenue, the corridor continues south on 83 Street crossing Argyll Road above ground to 75 Street or turns east on 82 Avenue and then south on 75 Street. The corridor continues down 75 Street to 66 Street. Alternatively, the corridor would travel along 86 Street to 76 Street with service to Millbourne Mall before turning along 38 Avenue and then to 66 Street. The corridor would then travel along 66 Street to Mill Woods Town Centre.

Dawson Bridge Corridor

This corridor would exit the downtown through the proposed Quarters redevelopment. The corridor would go underground and exit in a portal adjacent to Rowland Road in the Riverdale neighbourhood. The corridor would cross the North Saskatchewan River via the Dawson Bridge corridor with a new LRT crossing or reconstructed Dawson Bridge (for roadway and LRT). The corridor would climb Rowland Road, turning south on 84 Street, to 85 Street, to 83 Street. At 82 Avenue, the corridor continues south on 83 Street crossing Argyll Road above ground to 75 Street; or turns east on 82 Avenue and then south on 75 Street. The corridor continues down 75 Street to 66 Street. Alternatively, the corridor would travel along 86 Street to 76 Street with service to Millbourne Mall before turning along 38 Avenue and then to 66 Street. The corridor would then travel along 66 Street to Mill Woods Town Centre.

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4 Preliminary Station Identification

Upon completion of the Level 1 screening, the project team identified potential station locations for each corridor. Stations were developed and vetted through various City departments, as well as other stakeholders through the public consultation process. The station identification process involved examining existing and future activity centres, appropriate station spacing for urban LRT operations, land use/zoning, population densities, transit centres, and active or potential redevelopment areas. The team considered various types of stations including mixed use stations, residential neighbourhood stations, employment centres, park-n-rides, etc. The station types follow the recommendations outlined the City of Edmonton's TOD Guidelines document. While LRT provides opportunities for densification and redevelopment in appropriate areas, not all LRT stations are anticipated to be TOD opportunities. Residential neighbourhood stations are proposed to serve established neighbourhoods that are not likely to experience significant land use changes. The station infrastructure itself is intended to be simple. As a low floor LRT system operating within an urban environment, stations would include a slightly raised platform with weather protection. Riders would board the LRT level with the platform, allowing efficient and fast boarding for all patrons.

The photo presented here demonstrates the low floor style of platform envisioned for this corridor. This basic station infrastructure allows stations to integrate into neighbourhoods and developed areas.

Table 4-1, on the following three pages, identifies each of the stations advanced forward for each corridor. The table depicts the station locations and provides text that describes many of the opportunities and challenges of each station location. The station locations presented represent the general location and not the exact site for station platforms. As the project progressed and more detailed were developed for the corridors, station locations evolved. Final station locations for the recommended corridor will be determined during the future design phase of the project.

As an example, the Mill Woods Town Centre location is shown here:

Mill Woods Town Centre

+ Service to Mill Woods Town Centre
+ Service to Active Treatment Hospital
+ Mixed land uses
+ Above average existing and future population density
+ Existing transit infrastructure

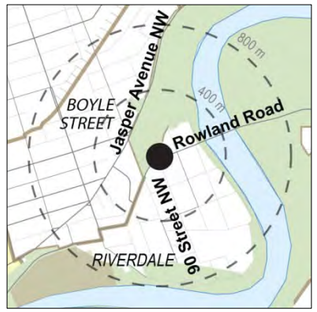
- Cross streets for the station location are provided in bold text
- Names of adjacent neighbourhoods are provided in italics and all capitals
- Activity centres are shaded a greyish-brown, with the name in brown text
- A "+" sign indicates an opportunity
- A "-" sign indicates a challenge

TABLE 4-1
Station Location, Opportunities and Challenges

Quarters Station

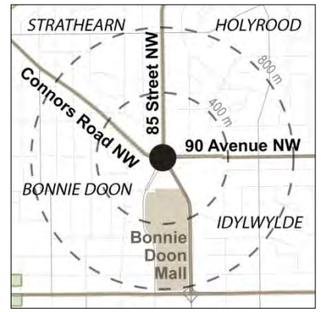
+ High redevelopment potential
+ Above average existing and future population and employment densities
+ Proximity to high density land uses
+ Mixed land uses
(The location of this station was adjusted to 102 Avenue to better support the Quarters redevelopment plans)

Rowland Rd / 90 St Station



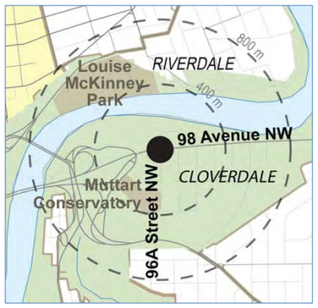
+ Service to traversed neighborhood
- High proportion of nearby parklands
- Below average existing and future population density
- Dominant nearby low density land use

Holyrood Station



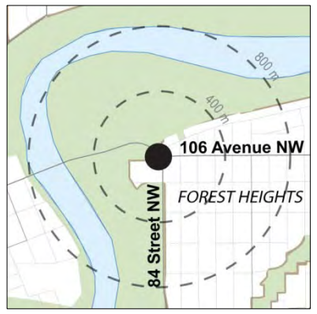
+ Service to high density redevelopment
+ Proximity to high density land uses
- Dominant nearby low density land use

Muttart Station



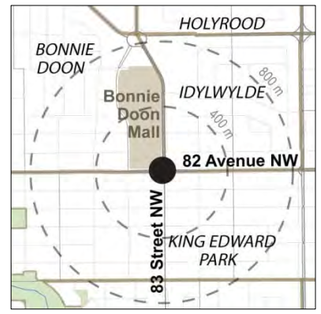
+ Special event service
+ Service to Muttart Conservatory
+ Service to traversed neighborhood
- Dominant nearby low density land use
- High proportion of nearby parklands
- Below average existing and future population density
(The location of this station was adjusted to the Muttart Conservatory to provide direct service and lessen impacts to the Cloverdale area)

106 Ave / 84 St Station



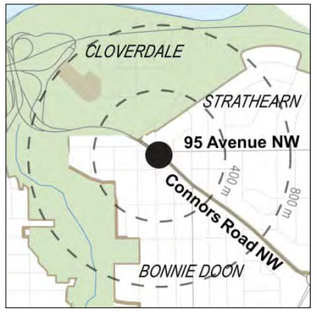
+ Service to future high density redevelopment
- Dominant nearby low density land use
- High proportion of nearby parklands
- Difficult design alignment

Bonnie Doon Station



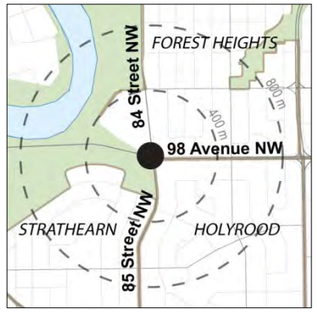
+ Service to Bonnie Doon Mall
+ Integration with existing East-West transit connection
+ Mixed land uses
+ Proximity to high density land uses

Connors / 95 Ave Station



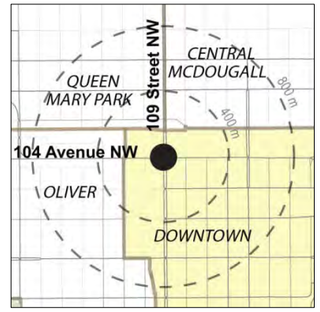
+ Service to high density redevelopment
+ Special event service
- High proportion of nearby parklands
- High proportion of nearby parklands
- Not accessible by the Cloverdale neighbourhood
(The location of this station was adjusted to 95 Ave. to better serve the Strathearn neighbourhood)

98 Ave / 85 St Station



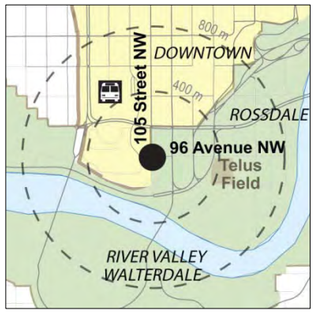
- High proportion of nearby parklands
- Dominant nearby low density land use

Grant MacEwan Station



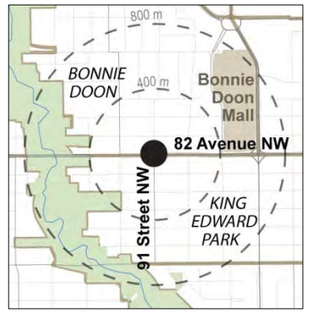
+ Service to major post secondary campus
+ Above average existing and future population and employment density
+ Proximity to high density land uses
+ Mixed land uses

Rossdale/Telus Field Station



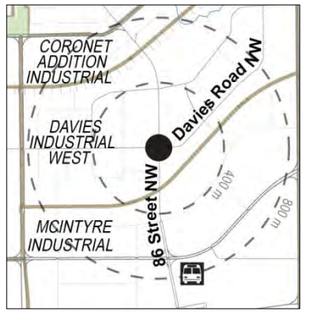
+ Special event service
+ Service to traversed neighbourhood
- Distance from high density land uses
- High proportion of nearby parklands
- Difficult design alignment

91 St / 82 Ave Station



+ Service to post secondary campus
+ Service to high density redevelopment
+ Mixed land uses

Davies Station



+ Adjacent to existing Transit Yard
- Below average existing population density
- Distance from high density land uses
- Low redevelopment potential
- Nearby industrial land use
- Physical barrier to Argyll neighbourhood

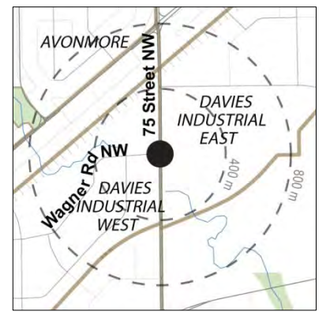
Saskatchewan Drive Station

+ Proximity to high density land uses
+ Service to future redevelopment
+ Mixed land uses
- High proportion of nearby parklands
- Difficult design alignment
- Difficult access to U of A

75 St and 76 Ave Station

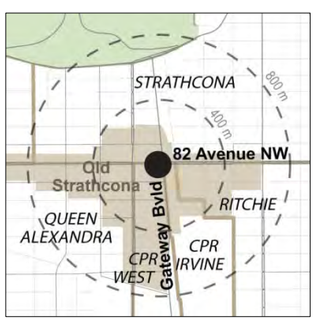
+ Service to high density redevelopment
+ Service for traversed neighbourhoods
- Below average existing population density
- Dominant nearby low density land use
- Industrial land use in catchment

Wagner Rd / 75 St Station



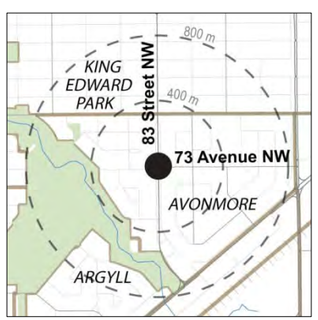
- Below average existing population density
- Distance from high density land uses
- Low redevelopment potential
- Nearby industrial land use
- Difficult access for Avonmore neighbourhood

Strathcona Station



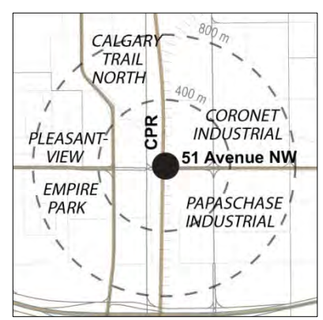
+ Proximity to high density land uses
+ Service to high density redevelopment
+ Above average existing and future population density
+ Mixed land uses

83 St / 73 Ave Station



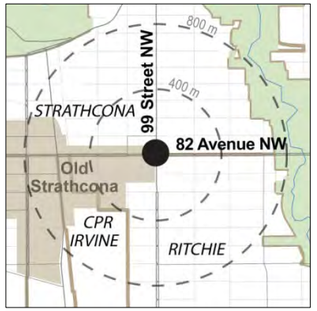
+ Service for traversed neighbourhoods
- Dominant nearby low density land use
- Below average existing population density
- Nearby industrial land use
- Large proportion of nearby parkland

Coronet Station



- Dominant nearby industrial land use
- Conflicts with existing South line
- Physical severance from Neighbourhood
- Distance from high density land uses
- Nearby industrial land use
- Physical barrier to Pleasantview neighbourhood

99 St / 82 Ave Station



+ Service to high density redevelopment
+ Mixed land uses

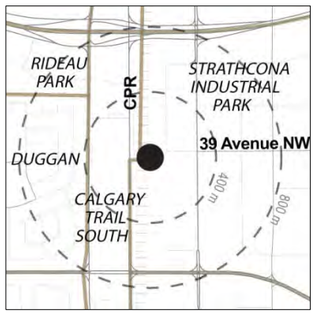
CPR Irvine Station

+ Service to post secondary campus
+ Service to high density redevelopment
+ Proximity to high density land uses
- Below average existing population density
- Physical severance from Hazeldean and Allendale neighbourhoods
- Nearby industrial land use

66 St / 38 Ave Station

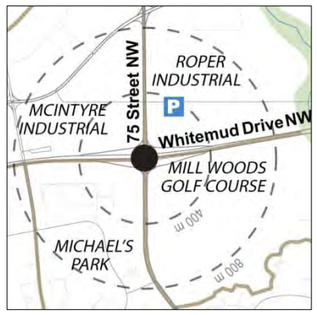
- Distance from high density land uses
- Dominant nearby low density land use

Intermodal Station



+ Potential connection to High Speed Rail
+ Park and Ride opportunity
- Low redevelopment potential
- Below average existing population density
- Conflicts with existing South line
- Physical severance from Pleasantview neighbourhood
- Distance from high density land uses
- Nearby industrial land use

Whitemud Station



+ Large parcel of vacant land nearby
+ Park and ride opportunity with freeway access
- Distance from high density land uses
- Physical severance from Michael's Park neighbourhood
- Low redevelopment potential
- Nearby industrial land use

Parsons Station

+ Park and Ride opportunity
- Below average existing population density
- Physical severance from Meyonohk and Tipaskan neighbourhoods
- Distance from high density land uses
- Nearby industrial land use

Millgate Station

+ Integration with existing transit infrastructure
- Below average existing population density
- No freeway access
- Distance from high density land uses
- Nearby industrial land use
- Physical barrier to Tweedle Place and Michael's Park neighbourhoods

Millbourne Station

+ High redevelopment potential
+ Mixed land uses
- Difficult design alignment

Lakewood Station

+ Service to post secondary campus
+ Mixed of land uses
+ Existing transit infrastructure

5 Level 2 – Corridor Screening

5.1 Screening Criteria (Level 2)

Level 2 criteria were applied at the second stage of the screening process. While Level 1 aimed to remove corridors from consideration by primarily identifying fatal flaws though qualitative analysis, Level 2 criteria were applied to specifically differentiate between corridors and provide more quantitative information.

The project team developed the initial Level 2 criteria weightings for review and consideration by City Council. The process and criteria were presented to City Council for review and approval in December 2008. However, these criteria apply not only to the SE LRT, but are now used as decision-making criteria for all new LRT corridor planning studies. The comparative evaluation criteria were grouped into six weighted categories. While City Council approved weightings for each category of criteria, they also recognized that all of the criteria are critically important. There was no single criterion that drove the final outcome. The recommended corridor was selected based on its performance related to a mix of all criteria; the criteria weightings reflect the strategic direction inherent in the City's policies. City policy direction is based on the direction City Council has been given by their constituents, the citizens of Edmonton.

The project team's screening was guided by its Purpose Statement and the ultimate goal to identify a recommended SE LRT corridor. Through the screening process, the project team worked to balance the key public and technical issues. The key issues included using land use to promote a more compact urban form; moving goods and people; technical feasibility and cost; impacts to parks and the river valley; and impacts to the social and natural environment. These issue areas are expressed by the Purpose Statement's guiding principles and the City Council approved criteria used to evaluate each corridor option.

Land-use and Promoting Compact Urban Form (Weighting = 4)

Land-use and promoting compact urban form was the highest weighted criteria. This represents the critical influence of land use and transportation on the cost and ultimate sustainability of the City. More efficient transit, in closer proximity to homes, businesses, and activity centres is necessary and demand will increase as the city continues to grow. These growth patterns minimize cost and improve efficiency in the provision of urban services, including transit. Additionally, more compact land use provides easier access (transit, walking, etc.) for citizens living in these neighbourhoods. Limiting urban sprawl by creating desirable urban neighbourhoods as an alternative creates environmental benefits through less consumptive land use patterns.

TABLE 5-1
Land Use Evaluation

OBJECTIVE	CRITERIA (METHOD OF MEASUREMENT)
Maintain important transit connections.	How many existing transit centers or park-n-ride locations are within 800 m of proposed stations?
Provide convenient transit service for riders.	What is the existing/future population density (population per ha) within 800 m of the station locations?
	What is the existing/future employment density (jobs per ha) within 800 m of the station locations?
Provide convenient transit service for riders.	What is the housing density (housing units per ha) within 800 m of the station locations?
	What is the existing mix of zoning types within 800 m of stations?
	What is the future mix of land use types within 800 m of stations?
	How many large development proposals are formally submitted for approval or under construction along the corridor?
	Number of existing and future activity centers connected by the corridor?
	Is the corridor consistent with the TMP, MDP, and the City's strategic direction?
Identify areas ripe for redevelopment.	How many ha of vacant and/or underutilized properties are located within 800 m of stations.
Clarify if redevelopment opportunities are real opportunities or more speculative.	Do the City land use plans and bylaws support development or redevelopment of the activity centers along the corridor?
	Would proposed activity centers development/redevelopment occur within a reasonable time frame (within 5 years)?

Movement of People and Goods (Weighting = 3)

These criteria represent the need to develop an LRT corridor that is frequent, efficient, and delivers riders to the locations where they live, work, and recreate. Also respects the need to accommodate goods movement adjacent to the LRT Corridor.

TABLE 5-2
People and Goods Movement Evaluation

OBJECTIVE	CRITERIA (METHOD OF MEASUREMENT)
Enhance efficiency and speed of transit.	What is the projected travel time for the corridor (downtown to/from Mill Woods)?
Maximize the potential success of the corridor to serve the most transit riders.	What are the projected opening day boardings?
	What are the projected 2041 boardings?
	What percentage of the corridor within existing public and railroad ROW?
Identify fatal traffic impacts.	What are the impacts to traffic?
Maximize connectivity and accessibility.	How does the corridor maximize transit integration?
	Does the corridor include existing and future bicycle and pedestrian facilities?
	Does the corridor allow for park-n-ride locations at 75 Street and Whitemud Dr, as well as 23rd Avenue and 66th Street?

Feasibility and Constructability (Weighting = 2)

These criteria consider the overall complexity of designing and constructing an LRT corridor within the unique geography and neighbourhoods of southeast Edmonton. Cost is directly correlated to the complexity of construction and was a major consideration for all corridors reviewed.

TABLE 5-3
Feasibility and Constructability Evaluation

OBJECTIVE	CRITERIA (METHOD OF MEASUREMENT)
Minimize cost.	What is the estimated capital costs per kilometre (km) for the corridor?
	What is the estimated annual operating costs per kilometre (km) for the corridor?
	What is the estimated cost per rider for the corridor?
Complexity of construction.	Does the corridor require new grade separations?
	How many km of the corridor are inside tunnel and protected from weather or other interference?
	How many km does the corridor require of track at grade, on structure, on retained fill, and in tunnel?
Minimize cost and improve transit efficiency.	To what extent is the corridor likely to impact the cost of supporting bus operations?
Consider long term LRT needs. Minimize cost, complexity of construction, and private property acquisition.	How complex would it be to expand the system south and east in the future?
Consider maintenance. Minimize cost, complexity of construction, and private property acquisition.	If the corridor directly connects with the existing LRT system, what is the distance to the Clareview Maintenance Facility?
Consider traffic impacts. Minimize cost, complexity of construction, and private property acquisition.	How many at grade crossings are located along the corridor?

Parks, River Valley, and Ravine System (Weighting = 2)

These criteria represent the importance of the various parks, river valley and ravine systems to the citizens of Edmonton. The river valley is a defining feature of Edmonton and was carefully considered through these criteria. The criteria not only examined impacts, but also identified the potential for increased access to active park spaces and the river valley.

TABLE 5-4
Parks, River Valley and Ravine Evaluation

OBJECTIVE	CRITERIA (METHOD OF MEASUREMENT)
Consider long term planning for parks and river valley.	Is the corridor consistent with City plans, bylaws, provincial and federal regulations addressing the river valley?
Maximize connectivity and accessibility to parks and river valley resources (where appropriate).	What are the benefits to parks, open space, and river valley accessibility (pedestrian, bike, vehicle, etc.)
Maximize connectivity and accessibility to parks and river valley resources (where appropriate).	To what extent would impact be likely to undisturbed vs. programmed/disturbed river valley areas?
Minimize acquisition of parks and river valley property.	How many ha of public park lands would be acquired for the corridor?

Natural Environment (Weighting = 2)

The criteria related to the natural environment are correlated closely with the parks, river valley, and ravine system. However, these criteria examined the natural and biological aspects and potential impacts.

TABLE 5-5
Natural Environment Evaluation

OBJECTIVE	CRITERIA (METHOD OF MEASUREMENT)
Minimize disturbance of riparian habitat.	How many ha of valuable riparian habitat would be acquired for the corridor?
Minimize water quality issues, disturbance of water resources, and aquatic habitat.	What are the number of stream/river crossings along the corridor?
Consider long term planning for natural areas.	Is the corridor consistent with City plans, bylaws, provincial and federal regulations addressing natural areas?
Minimize disturbance of natural areas.	What are the total ha of area disturbed during construction?

Social Environment (Weighting = 2)

The criteria related to social environment attempted to balance the potential benefits and impacts to neighbourhoods and residents.

TABLE 5-6
Social Environment Evaluation

OBJECTIVE	CRITERIA (METHOD OF MEASUREMENT)
Minimize the acquisition of private property.	How many hectares (ha) of private property (residential - single family/multifamily, commercial, and industrial) would be acquired for the corridor?
Provide benefits to neighbourhoods by maximizing connectivity and accessibility.	How many residences are located within 800 m of station sites that may benefit from increased property values?
Maximize potential employment benefits.	What are the potential temporary employment opportunities related to construction?
Minimize impacts to neighbourhoods.	Could neighbourhood impacts be avoided, minimized, or mitigated; or are they irresolvable?
Minimize noise and vibration impacts.	How many sensitive receptors are within 150 m of the corridor that may be impacted by noise or vibration impacts?

OBJECTIVE	CRITERIA (METHOD OF MEASUREMENT)
Minimize impacts to heritage sites.	How many known cultural resource/heritage sites are adjacent to the corridor?
Maximize connectivity and accessibility.	Does the corridor create physical barriers for neighbourhood residents?
	What is the post secondary student population within 800 m of proposed station sites?
	What is the high school student population within 800 m of proposed station sites?
	What is the number of low income, no car, and senior households within 800 m of proposed station sites?

5.2 Corridor Screening (Level 2)

Level 2 screening was conducted to provide a comparative analysis of the remaining four corridors and their design options. The goal for this activity was to identify the corridor that performed best under the more detailed Level 2 screening criteria.

In preparation for Level 2 screening, the project team completed basic design layouts to better understand the potential impacts, benefits, and constraints for each corridor. The design included preliminary layouts of track locations, roadway reconstruction, bridge structures, earthwork required, and station platform layouts. The preliminary layouts identified the overall area of potential impact, referred to as the impact "footprint". While the design was completed at a basic level, the impact footprints provided the appropriate level of detail to compare the corridors against one another. The impact footprints were used in the analysis of several quantitative Level 2 criteria, such as property acquisition and parkland acquisition.

As described previously, the Level 2 screening was completed by the internal City project team as one piece of the technical analysis and overall decision making process. The screening guided the decision making process, based on criteria related to key technical and stakeholder issues. This screening alone was not the only influence on the selection of the recommended corridor. The recommended corridor was balanced by other studies and policy documents, such as the LRT Network Plan. The City has also conducted studies involving the desired future development patterns and the land use benefits of TOD. The potential land use effects and TOD opportunities were considered in the decision-making process and the evaluation criteria. Other key policy documents, including the MDP and the TMP, established the City's strategic vision on how citizens of Edmonton will live in and move throughout the City in the future. These plans directly informed the SE LRT study and ultimately the selection of the recommended corridor.

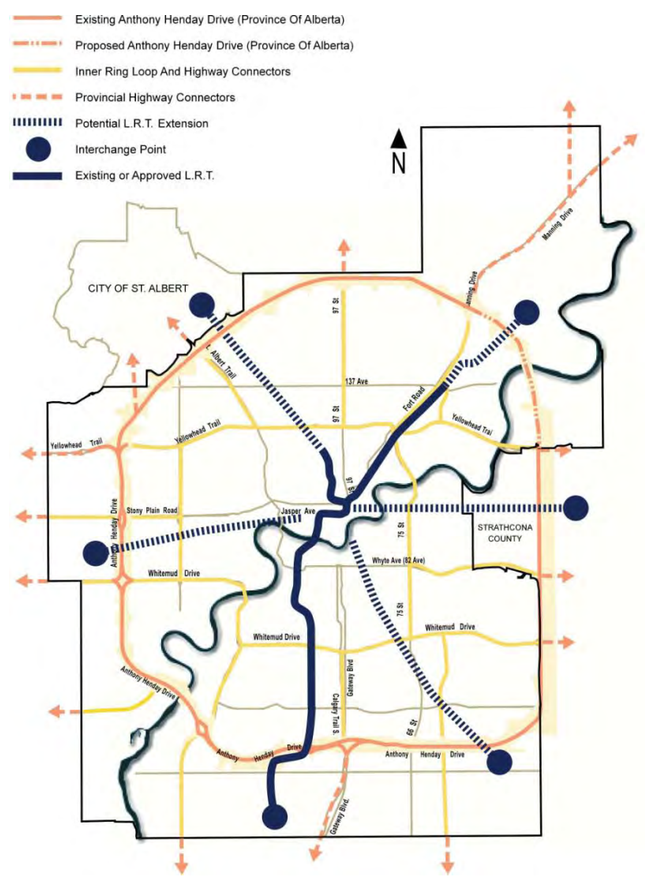
5.2.1 Influence of Final LRT Network Plan on SE LRT Screening

Initially, Level 2 screening included four primary corridors (High Level – CPR; High Level – Whyte Avenue; Connors Road; Dawson Bridge). However, analysis by the City introduced additional direction for the LRT network city-wide. Prior to completing the Level 2 screening, the City finalized the LRT Network Plan. The LRT Network Plan identifies LRT transit needs within the City and region when population approaches 3.2 million over the next century. The key elements of the LRT Network Plan, which were endorsed by City Council and that assist in the corridor LRT definition, include the following:

- System Style – The LRT system should ultimately evolve into an urban-style system with shorter stop spacing and more community-based stops.
- Technology – New LRT lines not tying in to the existing system should be developed with low-floor LRT vehicles.
- Central Area Circulation – An East-West LRT connection should be developed through the Strathcona area to provide greater overall operational flexibility and increase the carrying capacity of the network.

Implementing the recommended urban-style LRT system for the SE LRT corridor would result in shorter stop spacing, enhancing opportunities to serve multiple activity centres and mature communities. The LRT Network Plan recommended the SE LRT corridor connect with the proposed West LRT corridor.

EXHIBIT 5-1
LRT Network Plan



Additional direction was proposed for both corridors to utilize low-floor LRT technology and not interline with the existing LRT system. The combination of the low-floor technology and the urban style offers the ability to reduce the scale of infrastructure and create a more condensed LRT footprint.

The LRT Network Plan identified the central area, including the downtown and University, as the most transit-supportive area of the City. This area is a high density activity zone for both population and employment. All of the LRT corridors serve the central area and interconnect there to provide multiple transfer and destination opportunities. The LRT Network Plan identified that new corridors not interlining with the existing system will operate in the downtown at the surface (street level), with convenient walking connections to the exiting underground LRT stations. Additionally, an East-West LRT connection through the Strathcona area will provide an improvement in overall operational flexibility and can also increase the carrying capacity of the network.

The central area circulation element of the LRT Network Plan assisted the SE LRT planning process in terms of the corridors under consideration. Realizing that the long term network plan supports a system covering the eastern and western edges of the downtown, the corridors with western gateways into the downtown were removed from consideration in the SE LRT study. This removed the High Level – CPR and High Level – Whyte Avenue corridors from consideration, prior to Level 2 screening. These corridors with western gateways are less supportive of the Central Area Circulation plan, because if these corridors were selected, the LRT Network would not serve the eastern edge of the downtown. The western edge of the downtown is served with the existing system and the central circulation plan identifies additional service in the long term. Without an eastern entrance into the downtown, the central area circulation plan is incomplete. The SE LRT corridor entering the eastern edge of the downtown supports completion of the central area circulation system.

5.3 Screening Results (Level 2)

The final corridors advanced to Level 2 screening included the Dawson Bridge corridor and the Connors Road corridor. Level 2 screening, as described in Section 5.2, included quantitative and qualitative criteria to compare the corridors against one another. By advancing through Level 1 screening, LRT Network Plan considerations, and scrutiny by internal city stakeholders and the public, these corridors represented two viable options for the SE LRT. The goal of Level 2 analysis was to draw out the subtle differences between the corridors. Level 2 screening assisted the internal city team in making an informed recommendation regarding the preferred corridor to City Council. City Council was the ultimate decision maker, taking into account the technical analysis, public input, as well as the strategic direction and planning of the City.

Both the Connors Road and Dawson Bridge corridors included multiple design options (optional corridor choices). Each of these design options were considered on their own merits and analyzed through the Level 2 screening.

The following text describes the Level 2 corridors with design options. The corridors are described from north to south (downtown to Mill Woods). Most corridors have considerable overlap; therefore, they are described based on their corridor number (12 Connors Road and 25 Dawson Bridge). The corridors are presented by their primary corridor and design options at specific locations along the corridor. Exhibit 5-2 and 5-3 are graphic representations of each corridor and design option analyzed.

EXHIBIT 5-2
Connors Road Corridor (Corridor 12)

Connors Road Corridor (12) - This corridor would exit the downtown through the proposed Quarters redevelopment. The corridor would go underground and turn south under 95 Street, exiting a portal on the eastern edge of Louise McKinney Park. The corridor would cross the North Saskatchewan River in the vicinity of the existing pedestrian crossing, travelling over 98 Avenue and climbing Connors Hill adjacent to Connors Road. The corridor would follow Connors Road to 83 Street. The corridor would turn west on to Argyll Road and then south on 86 Street, crossing over the Whitemud to 76 Street. The corridor turns east on 38 Avenue, then south on 66 Street before terminating near Mill Woods Town Centre.

Connors Road Corridor (12C) – This corridor mirrors the Connors Road Corridor (12) described above, until the corridor reaches Argyll Road. At Argyll Road the corridor would cross Argyll Road above ground to 75 Street. The corridor continues down 75 Street to 66 Street to Mill Woods.

Connors Road Corridor (12D) - This corridor mirrors the Connors Road Corridor (12) described above, until the corridor (following 83 Street) reaches Whyte Avenue (82 Avenue). From 83 Street, the corridor turns east on 82 Avenue, then south on 75 Street. The corridor continues down 75 Street to 66 Street to Mill Woods.

Connors Road Corridor (12E) – This corridor mirrors the Connors Road Corridor (12) in all aspects, except one. When this corridor reaches the top of Connors Hill, the corridor turns east on 95 Avenue (as opposed to continuing down Connors Road). The corridor follows 95 Avenue, until turning south on 85 Street to the Holyrood traffic circle.

EXHIBIT 5-3
Dawson Bridge Corridor (Corridor 25)

Dawson Bridge Corridor (25) - This corridor would exit the downtown through the proposed Quarters redevelopment. The corridor would go underground and exit in a portal adjacent to Rowland Road in the Riverdale neighbourhood. The corridor would cross the North Saskatchewan River via the Dawson Bridge corridor with a new LRT crossing or reconstructed Dawson Bridge (for roadway and LRT). The corridor would climb Rowland Road, turning south on 84 Street, to 85 Street, to 83 Street. The corridor would then travel along 86 Street to 76 Street before turning along 38 Avenue and then to 66 Street. The corridor would then travel along 66 Street to Mill Woods Town Centre.

Dawson Bridge Corridor (25C) - This corridor mirrors the Dawson Bridge Corridor (25) described above, until the corridor (following 83 Street) reaches Whyte Avenue (82 Avenue). From 83 Street, the corridor turns east on 82 Avenue, then south on 75 Street. The corridor continues down 75 Street to 66 Street to Mill Woods.

Dawson Bridge Corridor (25D) – This corridor mirrors the Dawson Bridge Corridor (25) described above, until the corridor reaches Argyll Road. At Argyll Road the corridor would cross Argyll Road above ground to 75 Street. The corridor continues down 75 Street to 66 Street to Mill Woods.

Table 5-7 presents the final Level 2 scores by criteria grouping. These scores represent only incremental differences between the Level 2 corridors that guided the final recommendations by the internal city team. These slight differences speak directly to the merit of the final corridors. All Level 2 corridors were strong contenders and had both positive and negative aspects. However, the technical studies (screening), public input, the LRT Network Studies, the City policy documents, and finally the City Council review clarified the incremental differences between the corridors. The recommended corridor preformed incrementally better under various criteria for its consistency with the City's policy direction on land use and redevelopment, as well as its direct connection between the downtown and Mill Woods.

Several discriminators between the two corridors are bulleted below.

The Connors Road Corridor:

- Better aligns with goal of promoting compact urban form.
- Is the most direct corridor, resulting in faster travel time.
- Results in strong potential ridership (similar to Dawson).
- Reinforces current major transit patterns from downtown to Mill Woods.
- Results in slightly less impacts to programmed park areas.
- Showed an advantage over the Dawson Bridge corridor serving redevelopment areas.

The Dawson Bridge Corridor:

- Demonstrated slightly higher ridership potential.
- Is located in proximity to more low income, no car, and senior households.

The corridors were generally equal in:

- Capital and operating cost projections.
- Potential property acquisitions.
- Proximity to noise sensitive areas.

Sections 5.3.1 through 5.3.6 below provide additional narrative regarding the screening of each corridor by criteria category. Tables A-1 through A-6, in Appendix A display the raw data collected through the Level 2 screening process by each criteria category. This data, combined with the team's analysis and interpretation and public consultation, formed the basis for discussions and debates by the project team when scoring each corridor. Table 5-7 displays the ultimate scores associated with each corridor. These scores reflect the weightings applied by City Council to each criteria category. The project team considered the data in the context of each corridor's overall merits and potential impacts.

TABLE 5-7
Final Level 2 Screening Scores

	Connors Road Corridor				Dawson Bridge Corridor		
Criteria Grouping	12	12C	12D	12E	25	25C	25D
Land Use/Promoting Compact Urban Form	0.8	0.7	0.7	0.8	0.7	0.7	0.7
Movement of People/Goods	0.7	0.8	0.8	0.8	0.7	0.7	0.7
Feasibility/Constructability	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Natural Environment	0.3	0.3	0.3	0.3	0.2	0.2	0.2
Parks, River Valley, and Ravine System	0.4	0.4	0.3	0.4	0.4	0.3	0.3
Social Environment	0.4	0.3	0.3	0.4	0.4	0.4	0.4
Final Score	**3.0**	**2.9**	**2.8**	**3.0**	**2.8**	**2.7**	**2.7**

*Final totals vary slightly due to rounding.

5.3.1 Land Use/Promoting Compact Urban Form

When examining the most highly weighted criterion (land use and promoting a more compact urban form), the Connors Road corridor showed an advantage over the Dawson Bridge corridor. The project team's analysis of the land use criteria examined land use plans, aerial photography, growth and employment patterns, and future opportunities for TOD. This analysis concluded there are greater opportunities in the northern portion of the Connors Road corridor that may benefit from LRT transit and the associated land use benefits. Directly serving neighbourhoods surrounding the stations is critical to the success of LRT.

Both corridors would provide direct service to the planned Quarters redevelopment area on the eastern edge of the downtown. The Quarters Area Redevelopment Plan (ARP) calls for mixed residential, commercial, and employment uses and is envisioned as a plan to spur redevelopment. 96th Street through the Quarters is planned as the "Armature". The Armature is planned as a wide linear park linking the residential communities to the north with the river valley. Access to the LRT would be provided along the Armature along 102 Avenue. The introduction of LRT supports and enhances the potential success of the Quarters ARP, providing a critical LRT link in the eastern downtown area. The exact location of the station platforms in the Quarters will be determined in the next level of engineering design.

Both corridors would pass through established neighbourhoods; however, the Connors Road corridor would do a better job of directly serving more densely developed areas and areas of TOD infill opportunity. Providing LRT service to established areas and to potential TOD or infill areas also better achieves the land use goals of the City's policy documents. Serving established communities may also result in impacts to these neighbourhoods. However, impacts could be mitigated by utilizing the new urban design with low-floor technology to help better integrate the SE LRT into established neighbourhoods on existing City streets. Low-floor trains, with urban style operations, travelling at lower speeds, with minimal barriers other than raised curbs, provide the opportunity for a less intrusive LRT system.

The Strathearn neighbourhood is best served by LRT through the Connors Road corridor. Areas of mixed development, denser residential, and the Strathearn Heights redevelopment would be directly served by the LRT through the Connors Road corridor. Providing direct access to this community enhances transit options for residents and provides easy access. With the development of Strathearn Heights, it is unlikely that other large scale redevelopment would occur in the neighbourhood, given limited land availability. However, additional smaller scale infill development is likely to occur where older multifamily and single family units are converted to denser development, in scale with the existing neighbourhood.

The Connors Road corridor would also serve the existing Cloverdale neighbourhood with LRT service. Cloverdale is an established neighbourhood and the ARP for this area is essentially complete. While the LRT seeks to provide service to this area, encouraging new development in the area is not envisioned. The station in the Cloverdale neighbourhood is located at the Muttart Conservatory. This station would primarily serve the transit needs for special events at the Muttart and surrounding area such as the Edmonton Folk Music Festival and other events. The long term planning documents for the Muttart Conservatory were considered through this analysis to avoid conflicts with future expansion plans.

Direct LRT service to the Holyrood Gardens would support the plans for this redevelopment. Both the Connors Road corridor and Dawson Bridge corridor provide strong service to this area.

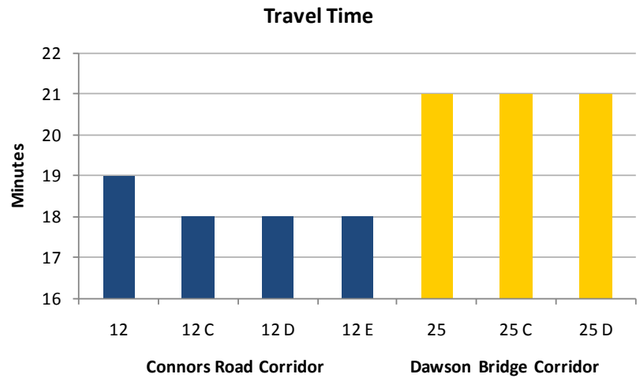
The Dawson Bridge corridor would provide direct service to the Riverdale neighbourhood. However, development of the LRT along Rowland Road would require adjustments in access to the neighbourhood street. This is an established neighbourhood and redevelopment or densification of the area is not envisioned.

A significant portion of the Dawson Bridge corridor is bounded by parkland and athletic facilities adjacent to the river valley along 84 Street. This is referred to as a "single loaded" corridor, where population accesses stations from just one side and the station does not have the opportunity to draw from a larger area of population. By comparison, the Hiawatha Corridor in Minneapolis is considered a single loaded corridor. This corridor began operations in 2004 along a former freight railroad corridor, adjacent to an existing roadway. The Hiawatha line has been successful; however, development has primarily occurred on the east side of the corridor due to the access and development constraints presented by the railroad corridor on the west. The northern end of the Dawson Bridge corridor presents similar constraints with parkland and athletic fields forming its western edge. The single loaded configuration does not take full advantage of the potential to provide access to stations within a full radius of the stations.

The two corridors primarily differ in their northern segments. As the corridors move south they essentially follow similar paths. Both corridors directly serve the Bonnie Doon Mall area. The City has initiated discussions with the owners of the Bonnie Doon Mall regarding their desires for LRT service. As the project moves into later design phases, options will be explored with the owners to integrate the Mall property. The LRT in this area has the opportunity to encourage land use changes on the Bonnie Doon Mall site.

5.3.2 Movement of People/Goods

Movement of people and goods examined key criteria including potential ridership, travel time, and traffic. The Connors Road corridor would perform better than the Dawson Bridge corridor based on travel time. The Connors Road corridor provides a more direct corridor between the downtown and Mill Woods and therefore would require slightly less physical infrastructure such as track and roadway reconstruction. For both the Connors Road and Dawson Bridge corridors, travel speed in denser, established neighbourhoods would likely be slower, travelling at or less than the speed of traffic. However, greater speeds could be achieved in the southern end of the corridor where the track would be located in wide roadway medians, physically separated from neighbourhoods. These speeds could make up for the slower travel times in the north end of the corridors. The "Travel Time" bar graph demonstrates the anticipated travel times for each corridor option. Both corridors offer similar ridership.

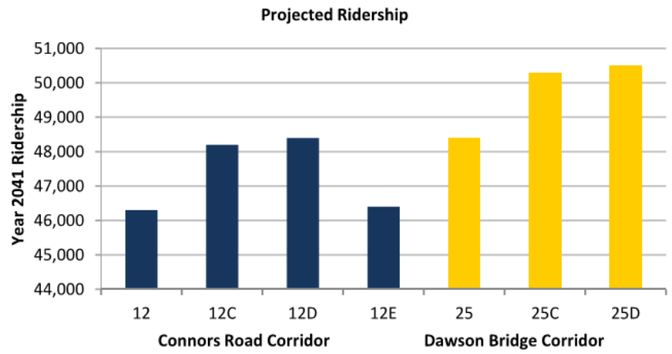


To compare the Connors Road and Dawson Bridge corridors, the project team completed an evaluation of potential impacts to traffic for each. With the basic level of engineering available on each corridor, the traffic analysis represented a high level examination of potential impacts. The project team utilized the City's existing and projected future traffic volumes available for major corridors. The team factored the frequency and speed of the trains for each corridor to determine potential impacts. While both corridors result in impacts to traffic, the Connors Road corridor performs incrementally better under this criterion. The Dawson Bridge corridor would result in impact to more intersections and significant roadway capacity constraints in 2041. By comparison the Connors Road corridor results in slightly less impact to intersection movements, access points, and roadway capacity.

Ridership Projections

Ridership projections were undertaken using an approach that considers three components to LRT patronage: the ability of adjacent land uses to support direct, walk-on trips; transfers from bus to LRT; and, park-n-ride users. The technique is well suited to corridor selection studies where a comparative evaluation of alternatives is required.

Usage patterns from Edmonton's existing LRT system, along with experience from other similar cities, were used to estimate bus transfer and Park and Ride usage. To estimate the direct walk-on patronage, future (2041) population and employment forecasts from the City's TMP were used. In consultation with the City staff, the population and employment growth from the relevant "zones" or communities within the City were concentrated around the potential stations, to reflect development patterns in the presence of LRT and supportive land use policies. To provide a conservative yet reasonable estimate, no induced population or employment growth was assumed beyond that already anticipated in the TMP (i.e. The City's 2041 population and employment growth forecasts were not increased or decreased, they were redistributed to respond to the introduction of LRT).

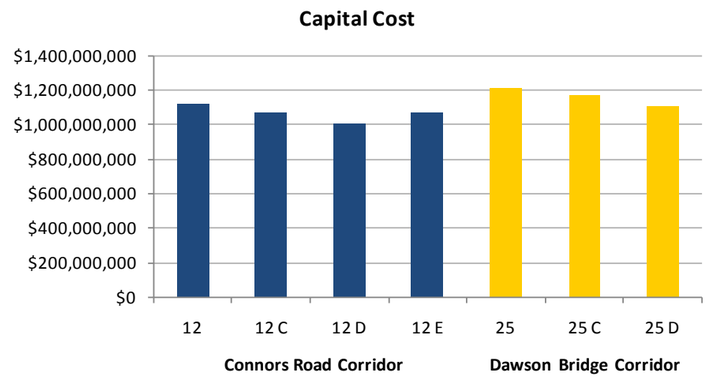


Existing population and employment were also considered to approximate the ridership that could be expected on opening day. This analysis resulted in a similar relative ranking of ridership among the corridor alternatives.

5.3.3 Feasibility/Constructability

Feasibility and constructability included various criteria to compare the corridors on the basis of cost, complexity of construction, future expansion capabilities, and potential to integrate with the existing transit network. The Connors Road corridor performed better based on its slightly lower capital cost.

The cost evaluation included civil construction for track, station platforms, electrification, drainage, improvements, tunnels, new bridge structures/grade separations, and all related roadway reconstruction. Costs do not include property requirements. Costs were verified through comparisons with other similar systems in North America and the current LRT expansion to NAIT. The estimates reflect 2009 costs for comparison.



The "Capital Cost" bar graph presents the initial capital cost estimates for each Level 2 corridor. The Connors Road corridor is slightly shorter than the Dawson Bridge corridor resulting in lower cost. Both corridors include complex segments of construction. Both corridors include new river crossings; however the Dawson Bridge corridor bridge over the North Saskatchewan River would be longer and require slightly more complex earthwork to tie in on the eastern side of the river. The Connors Road corridor and the Dawson corridor are very close in cost. Therefore, cost was not a key discriminator between the two corridors.

5.3.4 Natural Environment

Construction of either the Connors Road corridor or Dawson Bridge corridor would result in some impact to the natural environment. Both corridor alignments cross the North Saskatchewan River valley and would require new bridge structures over the river. The river valley area provides natural wildlife habitat and serves as a habitat corridor through the urbanized Edmonton area. This is an important function; however the previous human disturbance to the area does lessen the quality of the habitat. Wildlife is highly adaptable and can be sustained in urban refuges, like the river valley area. It is likely that a crossing for either corridor would not adversely impact wildlife in the river valley. In either case the new crossing would be developed to span the highest value habitat at the river's edge and to maintain both human and wildlife passage through the river valley. All of the potential corridor options result in disturbance of habitat through construction. The project team analyzed the earthwork (grading of land) in areas deemed valuable riparian habitat. While variations exist, both corridors were relatively close for this criterion and was not a direct discriminator of the alternatives. The Dawson Bridge corridor would result in more disturbances of the river valley land, but not necessarily more impact to valuable riparian habitat.

5.3.5 Parks River Valley and Ravine System

The Level 2 analysis also demonstrated an advantage for the Connors Road corridor related to river valley and parkland impacts. While both corridors cross the river valley and will result in some impacts, the Connors Road corridor would require less disturbance as it traverses less parkland. The Dawson Bridge corridor would require slightly more earthwork on the eastern side of the new river crossing, as it touches down and climbs Rowland road. The Riverside Golf Course area adjacent to Rowland Road would be directly impacted and would require relocation of at least one golf tee.

Much of the river valley has been disturbed through construction of roads, trails, river crossings, etc. The river valley is a defining feature and important amenity of the City of Edmonton. Through the project's technical analysis and throughout the public consultation process, the importance of the river valley to Edmonton residents was continuously expressed.

The river valley serves as a visual resource, a retreat from the urban environment of the surrounding neighbourhoods, as well as an active recreational amenity. Direct impacts by the corridors to river valley and ravine system property were analyzed for comparison. Additionally, impacts to actively programmed parks were also quantified. Impacts to parks actively used by citizens may be perceived by residents as a greater overall impact. The City of Edmonton Parks Branch was actively involved in the analysis comparing the final corridors. This group represented the long term interests of park, while balancing the need for the LRT expansion.

5.3.6 Social Environment

The analysis of social environment included criteria focused on impacts to neighbourhoods (noise, neighbourhood barriers, heritage sites, etc) as well as the potential benefits provided due to better transit access. The Connors Road corridor best serves neighbourhoods directly and provides the best pedestrian and cycling access opportunities to stations with an 800 meter radius. The low floor technology presented track and stations that are effectively integrated into local communities. Track is primarily following existing transportation corridors (city streets). Integration of the rail along city streets presents limited barriers to area neighbourhoods.

Both corridors would pass through established neighbourhoods; however, the Connors Road corridor would do a better job of directly serving more densely developed areas and areas of TOD infill opportunity. Serving established communities may also result in impacts to these neighbourhoods. However, impacts could be mitigated by utilizing the new urban design with low-floor technology to help better integrate the SE LRT into established neighbourhoods on existing City streets. Low-floor trains, with urban style operations, travelling at lower speeds, with minimal barriers other than raised curbs, provide the opportunity for a less intrusive LRT system.

6 Public Involvement

A key component of the corridor identification, analysis, and selection is public involvement. The City of Edmonton is committed to an open consultation process, where public input assists in shaping the outcome of the project. An extensive public involvement process was conducted to support Southeast LRT corridor selection. The public involvement objectives included:

- Identify community/institution/business-specific issues that may impact the evaluation of corridor options.
- Identify issues with respect to traffic and pedestrian impacts – within communities and with respect to the overall transportation network.
- Identify community, institutional, and/or business impacts that will affect the preliminary and detailed design.

The public involvement process included individual stakeholder meetings, on-line comment opportunities, public workshops and information sessions. The first public workshops were held on June 9 and 10, 2009, to present and describe the Level 1 analysis and the Level 2 corridor options. A second round of public information meetings were held on September 21 and 23, 2009, to present and describe the recommended corridor. City Council then considered the corridor recommendation in a series of public hearings on November 9 and 13, 2009 and December 15, 2009. At the latter public hearing, City Council formally approved the recommended corridor and adopted this corridor into the City of Edmonton Transportation Bylaw. This allows the City to continue advanced planning and design, aimed at implementing the SE LRT corridor.

Table 6-1 provides a basic timeline for the public consultation activities.

TABLE 6-1
Timeline of Public Consultation Activities

Date	Activity
March/April 2009	Questionnaires and interviews
May/June 2009	Online consultation
June 2009	Impacts workshop
September 2009	Information mailing
September 2009	Open house
November 2009	Public hearings

Public input provided was a key consideration by the project team when developing their recommendation and by City Council in their ultimate decision on the recommended corridor. Over the course of the project, 43 public consultation events were conducted with approximately 1,745 participants. The key themes of input were captured at each meeting and were incorporated, to the extent possible. The key themes are described in Table 6-2. Further detail on public consultation is available in the SELRT Corridor PI Report.

TABLE 6-2
Key Themes of Public Input

Key Public Involvement Theme	Project Consideration
Support for LRT as a means to encourage higher residential density and business revitalization.	Provide development and redevelopment opportunities at areas surrounding stations. Encourage various densities and strong pedestrian environments around stations locations. Implement city planning documents encouraging denser, more sustainable communities with direct transit access.
Recognize neighbourhood and business impacts (such as, property acquisition, noise, safety/security, parking)	Minimize private property acquisition through the use of city owned ROW on existing transportation corridors. Address noise impacts through appropriate operations and maintenance of the LRT. Maximize system safety through the use of safety through environmental design principles and safety audit procedures. Provide appropriate access for all modes of transportation (bus, pedestrian, cyclists, autos).
Consider impact on overall traffic network (cars aren't going away)	Certain corridors will focus on transit as a primary connection, while others will focus on moving auto traffic most efficiently. Transit has the opportunity to move more people in a more efficient manner than autos and will be a priority. Traffic will be managed along the LRT corridor and at stations to minimize impact and flow of traffic.
Plan for cyclist, pedestrian integration	Encourage various densities and strong pedestrian environments around stations. Provide appropriate access for all modes of transportation (bus, pedestrian, cyclists, autos).
Property acquisition, business and property value impacts	Minimize property acquisition through the use of City ROW, as much as possible. Minimize the width of the LRT to avoid property acquisition. Mitigate business impacts related to construction and access.
Neighbourhood barriers	Limit physical barriers along the LRT to only those locations where they are necessary for safety purposes. Educate the public on the urban style of LRT. Provide strong transit access for neighbourhoods.
Traffic Impacts	Minimize traffic impacts (to the extent possible) by keeping LRT in its own ROW. Allow appropriate traffic turning movements that avoid conflicts with LRT.
Safety	Create station environments with strong neighbourhood environments, considering pedestrians, cyclists, LRT trains, and vehicles.
Costs	Fit LRT into existing City ROW to avoid cost of property acquisition. Minimize costly structures and keep LRT on the surface (where feasible). Minimize cost by selecting a direct corridor connecting the downtown and Mill Woods.

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7 Identification of Recommended Corridor

The technical studies, the public input, and the LRT Network Plan all influenced the recommendation of the SE LRT corridor. Ultimately, the technical studies (screening), public input, the LRT Network Studies, the City policy documents, and finally the City Council review all identified the Connors Road corridors as the preferred corridor. This corridor preformed incrementally better under various criteria for its consistency with the City's policy direction on land use and redevelopment, as well as its direct connection between the downtown and Mill Woods. The adoption of this recommended corridor by City Council set the general location of the project's path from the downtown to Mill Woods. The recommended corridor presented by staff, and ultimately approved by City Council represented a hybrid of the Connors Road corridor options. The recommended corridor incorporated the 95 Avenue option (12E), to avoid significant property acquisition on Connors Road and to provide direct access to the Strathearn and Holyrood areas. Additionally, the Wagner Road option (12C) connecting to 75 Street was selected to improve travel time. The text below describes the thought process for each design option decision of the recommended corridor.

Connors Road or 95 Avenue

For the Connors Road corridor, the 95 Avenue option was selected over continuing directly down Connors Road. First, the 95 Avenue option has the potential to better serve the established Strathearn neighbourhood. Low-floor LRT with an urban-style operation, travelling at the speed of traffic, has the potential to be an amenity to this neighbourhood. Second, the existing Connors Road south of 95 Avenue is constrained with buildings directly adjacent to the roadway. Continuing directly down Connors Road would require a high level of private property acquisition between 95 Street and 89 Street. With the exception of the major turns, property acquisition is not anticipated on 95 Avenue. The team examined limiting Connors Road to one lane in each direction. However, 95 Avenue was deemed a better option due to less property acquisition, fewer traffic impacts, and the ability to better serve the local community with transit service.

83 Street or 75 Street (via 82 Avenue)

The corridor included an option between turning south on 75 Street or continuing south on 83 Street at 82 Avenue (Whyte Avenue). Developing a standard double track configuration through this constrained area of 83 Street would result in the acquisition of the first row of residences on the east side of 83 Street between 76 Avenue and 82 Avenue. This is a significant impact. The recommendation to follow 83 Street was based on the key land use and promoting compact urban form criterion.

While this option does result in greater impacts, it also serves an area of denser population when compared to 75 Street. Development surrounding 75 Street has focused away from the corridor and also must be maintained as a six-lane roadway for the Inner Ring Road facilitating goods movement around the City. Such an environment does not provide the optimum setting to maximize walkable, transit friendly neighbourhoods, and TOD opportunities.

The project team believes utilizing 83 Street would better serve the vision of a more compact and sustainable City than utilizing 75 Street. However, this must be balanced with the associated impacts to residents on 83 Street. The team is continuing to examine an option to provide only one lane of traffic in each direction on 83 Street, between 82 Avenue and 76 Avenue. It is possible this option may avoid significant property acquisition.

86 Street to 76 Street or Private Property to Wagner Road to 75 Street

Moving south of Argyll Road, the development patterns change significantly. They move away from the historic grid pattern neighbourhoods to industrial development and then (south of the Whitemud Drive) curvilinear residential areas. Many of the grid pattern neighbourhoods north of Argyll Road have a walkable and transit-friendly design that would benefit from low-floor, urban-style LRT operations. However, many of the neighbourhoods south of the Whitemud Drive developed with consideration of major transit on the major arterial roadways, fed through bus service in the neighbourhoods. Given these residential and industrial development patterns, the conclusion of the project team was that south of Argyll Road the corridor should use the wide medians of 75 Street and 66 Street to achieve high speeds and utilize bus service to feed stations along this corridor. Land use benefits such as TOD and infill opportunities would likely be limited to key activity centres (Mill Woods Town Centre, Grey Nuns Community Hospital, and so on). Millbourne Mall was identified as a potential area for future redevelopment; however, the potential of this site did not outweigh the lower neighbourhood impacts and benefits of faster travel times along 75 Street.

The 75 Street option would result in property acquisition impacts to the light industrial area south of Argyll Road. The 86 Street/76 Street option included some minor property acquisition where the track required more space for turns.

The 75 Street option includes a potential transit centre and Park and Ride at Whitemud Drive. The existing Millgate Transit Centre does not currently have freeway access. Future consideration would be given to moving Millgate Transit Centre to the Whitemud location to enhance transit and Park and Ride connections.

Grey Nuns Station

Prior to finalization of the recommended corridor, the team discussed additional options of the station near Grey Nuns Hospital. The team determined an additional station would be added near Grey Nuns Hospital to provide better access. The team also debated the merits of adjusting the alignment (south of 34 Avenue) to turn off of 66 Street and follow Youville Drive (Grey Nuns Hospital loop road) before entering Mill Woods Town Centre. While this option provides better service to the hospital and surrounding area, the team identified this detour would result in slower travel speeds and corresponding slower overall travel time. The team was unable to reach final consensus on this issue and determined the Grey Nuns station would remain in its current location. However, as design for these areas continues, additional options would be considered.

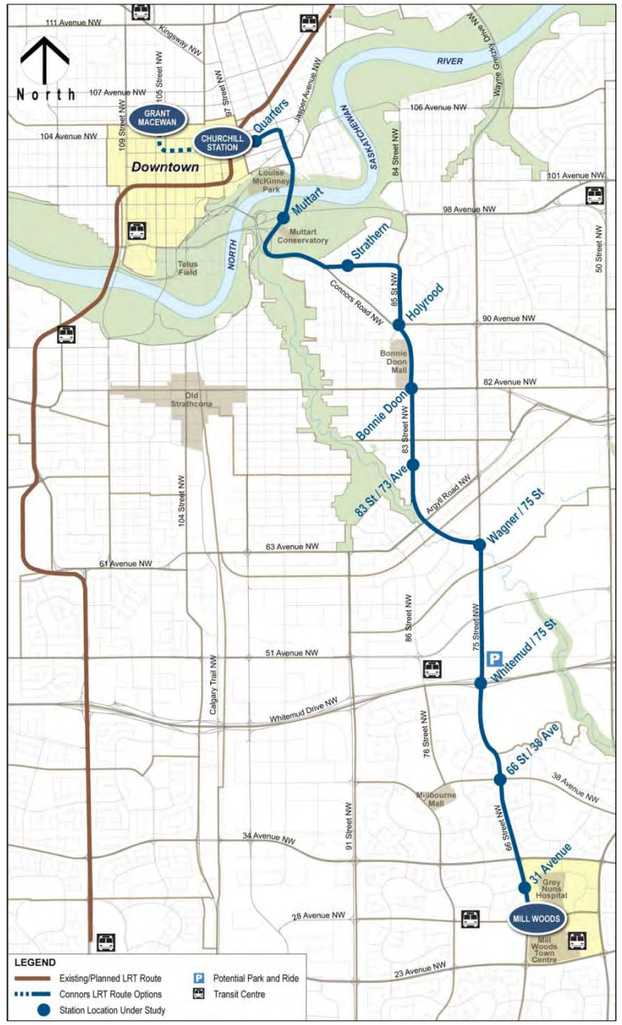
Recommended Corridor

The Connors Road corridor was approved by City Council as the preferred corridor for the SE LRT. This corridor would exit the downtown in a tunnel at approximately 102 Avenue and 95 Street. The tunnel would continue south under 95 Street. The corridor would exit the tunnel in a portal on the eastern edge of Louise McKinney Park. At approximately the location of the current Cloverdale pedestrian bridge, the corridor would cross the North Saskatchewan River and 98 Avenue. The corridor would touch down along the service road west of the Muttart Conservatory, and would then continue adjacent to Connors Road to the top of Connors Hill. The corridor would transition into 95 Avenue, and travel east until reaching 85 Street. The corridor would turn south on 85 Street, continue south through the traffic circle, and along 83 Street until Argyll Road. As the corridor approaches Argyll Road, it transitions to a bridge structure and crosses Argyll Road and the existing freight rail corridors, touching down just before Roper Road. The corridor then travels along 75 Street and across the Whitemud Drive. The corridor continues south along 66 Street to 31 Avenue. Various locations in the vicinity of Mill Woods Town Centre were examined as the terminus point. Additional engineering and analysis will determine the ultimate terminus point during the next phase of engineering design. The recommended corridor is primarily on the surface, potentially in the median of existing roadways. Exhibit 7-1 shows a map of the recommended corridor. Maps 1 through 6 in Appendix B provide the preliminary engineering layouts for the recommended corridor.

Given the potential residential property acquisition needed on the east side of 83 Street, between 82 Avenue and 76 Avenue, the team is continuing to examine options to minimize the impact (if possible). The team studied an option to reduce 83 Street in this area to one lane of traffic in each direction, and further analysis will be completed in the next phase of planning.

Exhibit 7-1 shows a map of the recommended corridor with station locations approved by City Council. As design of the recommended corridor is advanced, additional analysis and public consultation will be conducted to finalize the stations and design details.

EXHIBIT 7-1
Recommended Corridor



This recommended corridor was supported by strong rationale based the extensive analysis and debate by the project team, input from public stakeholders, and consideration by City Council. The process included examining both the benefits and the impacts of the Connors Road corridor in relation to the evaluation criteria and the City's strategic goals. In summary, the Connors Road corridor was selected as the preferred corridor for the following reasons:

- The corridor is consistent with Network planning objectives.
- The proposed urban-style LRT integrates well with and supports the mature and established neighbourhoods along the corridor. Urban-style LRT also provides the smallest impact footprint when traveling along existing transportation corridors and roadways
- The corridor best meets the highly weighted criteria related to land use and promoting a more compact urban form. The Connors Road corridor does the best job of directly serving areas of greater density, as well as areas of areas of future redevelopment or infill. The northern portion of the corridor would likely benefit from LRT transit and the associated land use benefits.
- The corridor provides the most direct connection between the downtown and Mill Woods, while best serving the established neighbourhoods and activity centres in between.
- The corridor provides a strong potential ridership along existing established transit corridors from the downtown to Mill Woods.
- The corridor results in the best balance of service between established neighbourhoods, potential infill opportunities, and planned redevelopment areas.

Appendix A - Raw Data by Category from Level 2 Screening Process

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Legend

- + positive performance against evaluation measure
- − negative performance against evaluation measure
- ~ not a discriminator

NOTE: This legend applies to all tables in this appendix.

TABLE A-1
Land Use/Promoting Compact Urban Form

		Connors Road Corridor				Dawson Bridge Corridor		
Criteria	Notes	12	12C	12D	12E	25	25C	25D
How many existing transit centers or park-n-ride locations are within 800 m of proposed stations?	Total within 800 m	~ 2 existing Transit Centers. No existing park-n-ride.	~ 2 existing Transit Centers. No existing park-n-ride.	~ 2 existing Transit Centers. No existing park-n-ride.	~ 2 existing Transit Centers. No existing park-n-ride.	~ 2 existing Transit Centers. No existing park-n-ride.	~ 2 existing Transit Centers. No existing park-n-ride.	~ 2 existing Transit Centers. No existing park-n-ride.
What is the existing/future population density (population per ha) within 800 m of the station locations?	Existing population per ha (800 m all stations)	~ 21 population/ha	~ 21 population/ha	~ 20 population/ha	~ 21 population/ha	~ 21 population/ha	~ 21 population/ha	~ 21 population/ha
	2041 population per ha (800 m all stations)	~ 33 population/ha	~ 33 population/ha	~ 33 population/ha	~ 33 population/ha	~ 33 population/ha	~ 34 population/ha	~ 34 population/ha
What is the existing/future employment density (jobs per ha) within 800 m of the station locations?	Existing employment per ha (800 m all stations)	+ 22 jobs/ha	~ 21 jobs/ha	+ 22 jobs/ha	+ 22 jobs/ha	~ 20 jobs/ha	− 19 jobs/ha	~ 20 jobs/ha
	2041 employment per ha (800 m all stations)	~ 28 jobs/ha	+ 30 jobs/ha	+ 30 jobs/ha	~ 28 jobs/ha	− 25 jobs/ha	~ 27 jobs/ha	~ 27 jobs/ha
What is the housing density (housing units per ha) within 800 m of the station locations?	Existing housing units per ha (800 m all stations)	+ 8 units/ha	~ 7 units/ha	~ 7 units/ha	+ 8 units/ha	+ 8 units/ha	~ 7 units/ha	~ 7 units/ha
What is the existing mix of zoning types within 800 m of stations?	Qualitative assessment	+ More institutionally zoned and medium density zoned properties. Low percentage of industrially zoned areas.	~ Mix of commercially zoned properties. Less high density residential zoning.	~ Mix of commercially zoned and industrially zoned properties. Less high density residential zoning.	+ More downtown mixed use zoned areas and institutionally zoned property. Lowest percent of industrially zoned areas.	~ Less industrially zoned properties. Fewer commercially zoned properties. High proportion of low density residential zoned areas.	~ Mix of low to medium density residential with some commercially zoned areas. Lowest proportion of institutionally zoned property.	~ Mix of higher density residential zoned properties with medium to lower density residential zoning. Lowest percent of downtown mixed use zoned and institutionally zoned properties.

		Connors Road Corridor				Dawson Bridge Corridor		
Criteria	Notes	12	12C	12D	12E	25	25C	25D
What is the future mix of land use types within 800 m of stations?	Qualitative assessment	+ Land use trends anticipate further downtown redevelopment (high density residential/ commercial). Mature neighbourhoods include a mix of high, medium, and low density residential. Potential for infill development and redevelopment of select areas. (Bonnie Doon, Holyrood, and Millbourne Mall).	~ Land use trends anticipate further downtown redevelopment (high density residential/ commercial). Mature neighbourhoods include a mix of high, medium, and low density residential. Potential for infill development and redevelopment of select areas. (Bonnie Doon, Holyrood). Corridor includes significant areas of auto oriented commercial and industrial development.	~ Land use trends anticipate further downtown redevelopment (high density residential/ commercial). Mature neighbourhoods include a mix of high, medium, and low density residential. Potential for infill development and redevelopment of select areas. (Bonnie Doon, Holyrood). Corridor includes significant areas of auto oriented commercial and industrial development.	+ Corridor best serves potential denser development within neighbourhoods. Land use trends anticipate further downtown redevelopment (high density residential/ commercial). Mature neighbourhoods include a mix of high, medium, and low density residential. Potential for infill development and redevelopment of select areas. (Bonnie Doon, Strathearn, Holyrood, and Millbourne Mall).	~ Land use trends anticipate further downtown redevelopment (high density residential/ commercial). Mature neighbourhoods include a mix of more medium and low density residential. Pockets of higher density do exist. Northern end of the corridor is characterized by park and school lands that would not likely redevelop. Potential for infill development and redevelopment of select areas. (Bonnie Doon, Holyrood).	~ Land use trends anticipate further downtown redevelopment (high density residential/ commercial). Mature neighbourhoods include a mix of more medium and low density residential. Pockets of higher density do exist. Northern end of the corridor is characterized by park and school lands that would not likely redevelop. Potential for infill development and redevelopment of select areas. (Bonnie Doon, Holyrood).	~ Land use trends anticipate further downtown redevelopment (high density residential/ commercial). Mature neighbourhoods include a mix of more medium and low density residential. Pockets of higher density do exist. Northern end of the corridor is characterized by park and school lands that would not likely redevelop. Potential for infill development and redevelopment of select areas. (Bonnie Doon, Holyrood).
How many large development proposals are formally submitted for approval or under construction along the corridor?	Number of proposals	+ 8 proposals	+ 8 proposals	+ 8 proposals	+ 8 proposals	~ 5 proposals	~ 5 proposals	~ 5 proposals
How many ha of vacant and/or underutilized properties are located within 800 m of stations.	Hectares	~ 50 ha	+ 75 ha	+ 80 ha	~ 50 ha	~ 50 ha	+ 75 ha	+ 80 ha
Total existing and future activity centers	Total activity centres	~ 20 centres	~ 20 centres	– 19 centres	~ 20 centres	+ 21 centres	+ 21 centres	~ 20 centres
Do the City land use plans and bylaws support development or redevelopment of the activity centers along the corridor?	Qualitative assessment	~ Yes, draft Downtown Area Redevelopment Plan (ARP), The Quarters ARP, South East Industrial Outline Plan, Mill Woods Town Centre Area Structure Plan	~ Yes, draft Downtown Area Redevelopment Plan (ARP), The Quarters ARP, South East Industrial Outline Plan, Mill Woods Town Centre Area Structure Plan	~ Yes, draft Downtown Area Redevelopment Plan (ARP), The Quarters ARP, South East Industrial Outline Plan, Mill Woods Town Centre Area Structure Plan	~ Yes, draft Downtown Area Redevelopment Plan (ARP), The Quarters ARP, South East Industrial Outline Plan, Mill Woods Town Centre Area Structure Plan	~ Yes, draft Downtown Area Redevelopment Plan (ARP), The Quarters ARP, South East Industrial Outline Plan, Mill Woods Town Centre Area Structure Plan	~ Yes, draft Downtown Area Redevelopment Plan (ARP), The Quarters ARP, South East Industrial Outline Plan, Mill Woods Town Centre Area Structure Plan	~ Yes, draft Downtown Area Redevelopment Plan (ARP), The Quarters ARP, South East Industrial Outline Plan, Mill Woods Town Centre Area Structure Plan
Would proposed activity centers development/redevelopment occur within a reasonable time frame (within 5 years)?	Qualitative assessment	~ Yes, at Churchill, Quarters, Connors and Holyrood	~ Yes, at Churchill, Quarters, Connors and Holyrood	~ Yes, at Churchill, Quarters, Connors and Holyrood	~ Yes, at Churchill, Quarters, Connors and Holyrood	~ Yes, at Churchill, Quarters, 95 Avenue and Holyrood	~ Yes, at Churchill, Quarters, 95 Avenue and Holyrood	~ Yes, at Churchill, Quarters, 95 Avenue and Holyrood
Is the corridor consistent with the TMP, MDP, and the City's strategic direction?	Qualitative assessment	+ Best meets the direction of City plans and strategic direction	~ Generally consistent	~ Generally consistent	+ Best meets the direction of City plans and strategic direction	~ Generally consistent	~ Generally consistent	~ Generally consistent

TABLE A-2
Movement of People and Goods

		Connors Road corridor				Dawson Bridge Corridor		
Criteria	Notes	12	12C	12D	12E	25	25C	25D
What percentage of the corridor within existing public and railroad ROW?	Public and Railroad ROW	~ 83% public ROW	+ 86% public ROW	~ 81% public ROW	~ 81% public ROW	~ 80% public ROW	~ 83% public ROW	– 75% public ROW
What are the projected opening day boardings?	2006 potential boardings	~ 33,700 boardings	~ 35,300 boardings	~ 35,400 boardings	~ 33,800 boardings	~ 34,700 boardings	~ 36,300 boardings	~ 36,400 boardings
What are the projected 2041 boardings?	2041 potential boardings	~ 46,300 boardings	~ 48,200 boardings	~ 48,400 boardings	~ 46,400 boardings	~ 48,400 boardings	~ 50,300 boardings	~ 50,500 boardings
What is the projected travel time for the corridor (downtown to/from Mill Woods)?	Minutes	~ 19 minutes	+ 18 minutes	+ 18 minutes	+ 18 minutes	– 21 minutes	– 21 minutes	– 21 minutes
What are the impacts to traffic?	Traffic assessment	+ Minor to moderate: two intersections with major capacity constraints, Connors Road already at capacity at 2041 without train impacts	~ Moderate: two intersections with major capacity constraints, moderate to significant impact on access for adjacent developments, Connors Road already at capacity at 2041 without train impacts	~ Moderate to significant: five intersections with major capacity constraints, moderate to significant impact on access for adjacent developments … Connors Road, 82 Avenue, and a segment of 75 Street already at capacity at 2041 without train impacts	+ Minor to moderate: two intersections with major capacity constraints, relatively high number of intersections and accesses impacted	~ Moderate to significant: two intersections with major capacity constraints, moderate to significant impact on access for adjacent developments, high overall number of intersections and accesses impacted	– Significant: four intersections with major capacity constraints, significant impact on access for adjacent developments, second highest overall number of intersections and accesses impacted … 82 Avenue (east of 83 Street), and a segment of 75 Street already at capacity at 2041 without train impacts	– Significant: four intersections with major capacity constraints, significant impact on access for adjacent developments, second highest overall number of intersections and accesses impacted … 82 Avenue (east of 83 Street), and a segment of 75 Street already at capacity at 2041 without train impacts
How does the corridor maximize transit integration?	Qualitative assessment	+ Follows existing major transit corridor from Mill Woods to downtown.	+ Follows existing major transit corridor from Mill Woods to downtown.	+ Follows existing major transit corridor from Mill Woods to downtown.	+ Follows existing major transit corridor from Mill Woods to downtown.	~ Corridor includes multiple transit corridors, but requires some out of direction travel for Mill Woods to downtown link.	~ Corridor includes multiple transit corridors, but requires some out of direction travel for Mill Woods to downtown link.	~ Corridor includes multiple transit corridors, but requires some out of direction travel for Mill Woods to downtown link.

Criteria	Notes	Connors Road corridor				Dawson Bridge Corridor		
		12	12C	12D	12E	25	25C	25D
Does the corridor include existing and future bicycle and pedestrian facilities?	Qualitative assessment	~ Corridor includes opportunities to connect to bikes and pedestrian trails of LRT alternatives, with five stations located near existing or future trails (Quarters, Muttart, Davies (12C), Millgate (12C), Wagner (12D), Whitemud PNR (12D), and Mill Woods.	~ Corridor includes opportunities to connect to bikes and pedestrian trails of LRT alternatives, with five stations located near existing or future trails (Quarters, Muttart, Davies (12C), Millgate (12C), Wagner (12D), Whitemud PNR (12D), and Mill Woods.	~ Corridor includes opportunities to connect to bikes and pedestrian trails of LRT alternatives, with five stations located near existing or future trails (Quarters, Muttart, Davies (12C), Millgate (12C), Wagner (12D), Whitemud PNR (12D), and Mill Woods.	~ Corridor includes opportunities to connect to bikes and pedestrian trails of LRT alternatives, with five stations located near existing or future trails (Quarters, Muttart, Davies (12C), Millgate (12C), Wagner (12D), Whitemud PNR (12D), and Mill Woods.	+ Corridor has good opportunities to connect to bikes and pedestrian trails of LRT alternatives, with nine stations located near existing or future trails (Quarters, 90 St/Rowland Road, 98 Avenue, 95 Avenue, Davies (25C), Millgate (25C), Wagner (25D), Whitemud PNR (25D), and Mill Woods.	+ Corridor has good opportunities to connect to bikes and pedestrian trails of LRT alternatives, with nine stations located near existing or future trails (Quarters, 90 St/Rowland Road, 98 Avenue, 95 Avenue, Davies (25C), Millgate (25C), Wagner (25D), Whitemud PNR (25D), and Mill Woods.	+ Corridor has good opportunities to connect to bikes and pedestrian trails of LRT alternatives, with nine stations located near existing or future trails (Quarters, 90 St/Rowland Road, 98 Avenue, 95 Avenue, Davies (25C), Millgate (25C), Wagner (25D), Whitemud PNR (25D), and Mill Woods.
Does the corridor allow for park-n-ride locations at 75 Street and Whitemud Dr, as well as 23rd Avenue and 66th Street?	Qualitative assessment	– No access to 75 St. or 23 Ave. 1 alternate park-n-ride location provided.	+ Access to park-n-ride at Whitemud/75 Str. No access to 23 Ave. 1 alternate park-n-ride provided.	+ Access to park-n-ride at Whitemud/75 Str. No access to 23 Ave. 1 alternate park-n-ride provided.	– No access to 75 St. or 23 Ave. 1 alternate park-n-ride location provided.	– No access to 75 St. or 23 Ave. 1 alternate park-n-ride location provided.	+ Access to park-n-ride at Whitemud/75 Str. No access to 23 Ave. 1 alternate park-n-ride provided.	+ Access to park-n-ride at Whitemud/75 Str. No access to 23 Ave. 1 alternate park-n-ride provided.

TABLE A-3
Feasibility/Constructability

		Connors Road Corridor				Dawson Bridge Corridor		
Criteria	Notes	12	12C	12D	12E	25	25C	25D
What is the estimated capital costs per kilometer (km) for the corridor?	Total estimated capital cost	~ $1,200,000,000	~ $1,200,000,000	~ $1,200,000,000	~ $1,200,000,000	~ $1,260,000,000	~ $1,260,000,000	~ $1,260,000,000
	Estimated capital cost per km	~ $92,000,000	~ $92,000,000	~ $92,000,000	~ $92,000,000	~ $94,000,000	~ $94,000,000	~ $94,000,000
What is the estimated annual operating costs per kilometer (km) for the corridor?	Estimated annual O/M cost	~ $7,900,000	~ $7,900,000	~ $7,900,000	~ $7,900,000	~ $8,160,000	~ $8,160,000	~ $8,160,000
Does the corridor require new grade separations?	Number of new grade separations	~ 7 grade separations	~ 7 grade separations	~ 7 grade separations	~ 7 grade separations	~ 5 grade separations	~ 5 grade separations	~ 5 grade separations
To what extent is the corridor likely to impact the cost of supporting bus operations?	Number of bus routes potentially fully removed or partially removed due to LRT service	~ 14 routes	~ 13 routes	~ 13 routes	~ 13 routes	~ 14 routes	~ 13 routes	~ 13 routes
What is the estimated cost per rider for the corridor?	Estimated cost per rider	~ $6	~ $5	~ $5	~ $6	~ $6	~ $6	~ $5
What is the length of the corridor?	Total length (km)	+ 12.7 km	+ 12.4 km	+ 12.7 km	~ 13.0 km	− 13.6 km	~ 13.2 km	− 13.6 km
How complex would it be to expand the system south and east in the future?	Extension south	~ End of line station located for easy extension south.	~ End of line station located for easy extension south.	~ End of line station located for easy extension south.	~ End of line station located for easy extension south.	~ End of line station located for easy extension south.	~ End of line station located for easy extension south.	~ End of line station located for easy extension south.
	Extension east	~ Reasonable extension to connect to Sherwood Park following Sherwood Park Freeway, does not match Capital Region Planning; 98 Ave connection to Base Line Road possible with costly construction.	~ Reasonable extension to connect to Sherwood Park following Sherwood Park Freeway, does not match Capital Region Planning; 9 8Ave connection to Base Line Road possible with costly construction.	~ Reasonable extension to connect to Sherwood Park following Sherwood Park Freeway, does not match Capital Region Planning; 98 Ave connection to Base Line Road possible with costly construction.	~ Reasonable extension to connect to Sherwood Park following Sherwood Park Freeway, does not match Capital Region Planning; 9 8Ave connection to Base Line Road possible with costly construction.	~ Reasonable extension to connect to Sherwood Park along Baseline Road	~ Reasonable extension to connect to Sherwood Park along Baseline Road	~ Reasonable extension to connect to Sherwood Park along Baseline Road
If the corridor directly connects with the existing LRT system, what is the distance to the Clareview Maintenance Facility?	Qualitative assessment	~ Clareview Maintenance Facility is at capacity. New facility required.	~ Clareview Maintenance Facility is at capacity. New facility required.	~ Clareview Maintenance Facility is at capacity. New facility required.	~ Clareview Maintenance Facility is at capacity. New facility required.	~ Clareview Maintenance Facility is at capacity. New facility required.	~ Clareview Maintenance Facility is at capacity. New facility required.	~ Clareview Maintenance Facility is at capacity. New facility required.
How many at grade crossings are located along the corridor?	Total number of track at-grade crossings	~ 29 crossings	~ 30 crossings	~ 32 crossings	~ 32 crossings	~ 30 crossings	~ 31 crossings	~ 32 crossings

TABLE A-4
Natural Environment

		Connors Road Corridor				Dawson Bridge Corridor		
Criteria	Notes	12	12C	12D	12E	25	25C	25D
How many ha of valuable riparian habitat would be acquired for the corridor?	Riparian habitat (ha)	~ 3 ha	~ 3 ha	+ 2 ha	~ 3 ha	− 4 ha	− 4 ha	~ 3 ha
What are the number of stream/river crossings along the corridor?	Crossings	~ 1 crossings	~ 1 crossing	~ 1 crossing	~ 1 crossings	~ 1 crossing	~ 1 crossing	~ 1 crossing
Is the corridor consistent with City plans, bylaws, provincial and federal regulations addressing natural areas?	Qualitative assessment	~ Yes, minimal natural areas impact	~ Yes, minimal natural areas impact	~ Yes, minimal natural areas impact	~ Yes, minimal natural areas impact	~ Yes, minimal natural areas impact	~ Yes, minimal natural areas impact	~ Yes, minimal natural areas impact
What are the total ha of area disturbed during construction?	Hectares (ha)	~ 39 ha	~ 39 ha	~ 39 ha	~ 41 ha	− 42 ha	− 42 ha	+ 37 ha

TABLE A-5
Parks, River Valley, and Ravine System

		Connors Road Corridor				Dawson Bridge Corridor		
Criteria	Notes	12	12C	12D	12E	25	25C	25D
Is the corridor consistent with City plans, bylaws, provincial and federal regulations addressing the river valley?	Qualitative assessment	~ Yes, given proper permitting, assessments and approvals are obtained.	~ Yes, given proper permitting, assessments and approvals are obtained.	~ Yes, given proper permitting, assessments and approvals are obtained.	~ Yes, given proper permitting, assessments and approvals are obtained.	~ Yes, given proper permitting, assessments and approvals are obtained.	~ Yes, given proper permitting, assessments and approvals are obtained.	~ Yes, given proper permitting, assessments and approvals are obtained.
What are the benefits to parks, open space, and river valley accessibility (pedestrian, bike, vehicle, etc.)	Qualitative assessment	+ Benefit. Access to River Valley park and trail system, recreation opportunities around Cloverdale, the velodrome near 73 Avenue.	~ Neither due to increased distance from open space, parks and river valley	~ Neither due to increased distance from open space, parks and river valley	+ Benefit. Access to River Valley park and trail system, recreation opportunities around Cloverdale, the velodrome near 73 Avenue.	+ Benefit. Access to River Valley park and trail system, recreation opportunities around Cloverdale, the velodrome near 73 Avenue.	~ Neither due to increased distance from open space, parks and river valley	~ Neither due to increased distance from open space, parks and river valley
How many ha of public park lands would be acquired for the corridor?	Public park lands (ha)	+ 4 ha	~ 5 ha	~ 5 ha	+ 4 ha	+ 4 ha	− 6 ha	~ 5 ha
To what extent would impact be likely to undisturbed vs. programmed/disturbed river valley areas?	Qualitative assessment	~ New river crossing: traverses possible extensive use parklands.	~ New river crossing: traverses possible extensive use parklands.	~ New river crossing: traverses possible extensive use parklands.	~ New river crossing: traverses possible extensive use parklands.	~ New river crossing: traverses possible extensive use parklands.	~ New river crossing: traverses possible extensive use parklands.	~ New river crossing: traverses possible extensive use parklands.

TABLE A-6
Social Environment

No.	Criteria	Notes	Connors Road Corridor				Dawson Bridge Corridor		
			12	12C	12D	12E	25	25C	25D
38	How many hectares (ha) of private property would be acquired for the corridor?	Total (ha)	~ 2	~ 3	~ 2	~ 2	~ 2	− 3	+ 1
39	How many residences are located within 800 m of station sites that may benefit from increased property values?	Number of residences within 800m	~ 13,200	~ 12,000	− 11,600	~ 13,200	+ 15,000	~ 13,600	~ 13,200
40	What are the potential temporary employment opportunities related to construction?	Temporary construction employment	~ 5,700	~ 5,400	− 5,100	~ 5,400	+ 6,200	~ 5,900	~ 5,600
41	Could neighborhood impacts be avoided, minimized, or mitigated; or are they irresolvable?	Qualitative assessment	− Impacts are reduced, but not resolved	~ Minimized	+ Mitigated based on alignment choice	+ Mitigated based on alignment choice	− Impacts are reduced, but not resolved	~ Minimized	~ Minimized
42	Does the corridor create physical barriers for neighborhood residents?	Qualitative assessment	+ Barriers will be reduced through station design options and Low Floor technology	+ Barriers will be reduced through station design options and Low Floor technology	+ Barriers will be reduced through station design options and Low Floor technology	+ Barriers will be reduced through station design options and Low Floor technology	− Potential barriers in Riverdale neighbourhood due to aerial structure. Barriers will be reduced through station design options and Low Floor technology	− Potential barriers in Riverdale neighbourhood due to aerial structure. Barriers will be reduced through station design options and Low Floor technology	− Potential barriers in Riverdale neighbourhood due to aerial structure. Barriers will be reduced through station design options and Low Floor technology
43	How many sensitive receptors are within 150 m of the corridor alignment that may be impacted by noise or vibration impacts?	Total	~ 1090	~ 970	+ 993	+ 993	− 1183	~ 1087	~ 1105
44	How many known cultural resource/heritage sites are adjacent to the corridor?	Number of known heritage sites adjacent	~ 5	~ 5	~ 5	~ 5	~ 5	~ 5	~ 5
45	What is the post secondary student population within 800 m of proposed station sites?	Post secondary student population within 800 m	~ 2,100	− 1,800	− 1,800	~ 2,100	+ 2,300	~ 2,100	~ 2,000
46	What is the high school student population within 800 m of proposed station sites?	High school student population within 800 m	~ 1,100	~ 1,000	− 900	~ 1,100	+ 1,300	~ 1,100	~ 1,100
47	What is the number of low income, no car, and senior households within 800 m of proposed station sites?	Seniors within 800 m	~ 5,600	~ 5,100	− 5,000	~ 5,600	+ 6,700	~ 6,300	~ 6,200

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