Alternative alignments were evaluated for the following segments: 11<sup>th</sup> Street S.E., 24<sup>th</sup> Street S.E. and Ogden Road S.E. Options were evaluated based on the following categories: the City of Calgary's Triple Bottom Line (social, economic and environmental), transportation, feasibility/constructability, and stakeholder considerations. The evaluations took into account values and knowledge of the public, developers and City of Calgary plans and policies, including the Municipal Development Plan, Calgary Transportation Plan, RouteAhead, and Complete Streets. Underlying to the evaluation process and imbedded within each category were the principles of Transit Oriented Development (TOD).

## **Evaluation Categories**

Social

- Minimize disturbance to neighbourhoods and private property, including existing historical buildings.
- Ensure infrastructure is safe, dependable, and accessible for public, transit vehicles, and emergency vehicles.
- Encourage place making and connect people to destinations where they live, work, play, shop and learn.

## Economic

- Minimize capital cost.
- Minimize cost inefficiencies and impacts to other City Investments.
- Identify areas prime for redevelopment.

Environmental

- Minimize disturbance to parks and green space, while maximizing access.
- Minimize route impact on existing natural areas during and after construction.
- Remediate where necessary, while balancing capital costs.

## Transportation

- Look for opportunities to enhance pedestrian and bike connections to transit stations.
- Provide an efficient and accessible transit service that serves the most transit riders.
- Support revitalization in the community through transit, including opportunities to improve street character or provide a "complete street".
- Consider traffic impacts.

Feasibility

- Ensure there are no irresolvable technical constraints associated with building or operating the system.
- Develop solutions that are realistic with the project timeline and budget.

Stakeholder

• Consider input from the public, industry and City (plans and policies).

## **Alternative Alignments Considered**

## 11<sup>th</sup> Street S.E.

Feasibility screening was conducted on twelve initial options. The two highest ranking options underwent further evaluation:

- Original alignment (elevated track and bridge station)
- 11<sup>th</sup> Street S.E. west side (4 traffic lanes and station centred on 18<sup>th</sup> Avenue S.E.)

## **Multiple Account Evaluation Summary**

The original alignment (elevated track and bridge station) was ranked the highest for the following reasons: the station is adjacent to both Inglewood and Ramsay; the elevated track minimized changes to the current road width and would also provide a northern anchor for development along 11<sup>th</sup> Street S.E. opposite the southern anchor of 26<sup>th</sup> Avenue S.E. station. The recommendation supports TOD by protecting and providing the opportunity to enhance the 11<sup>th</sup> Street S.E. public realm, provides transit reliability and efficiency by minimizing at grade crossings, addresses topography in the area and the alignment minimizes impact on the future CP track alignment.

## 24<sup>th</sup> Street S.E.

Two 24<sup>th</sup> Street S.E. scenarios were considered:

- Ogden Landfill (functional alignment)
- 24<sup>th</sup> Street S.E.

The recommended 24<sup>th</sup> Street S.E. alignment moves the station 200 m west of its functional location. It provides significant improvements to safety, attracts riders, maximizes TOD potential, and mitigates expensive construction and environmental remediation costs. The 24<sup>th</sup> Street S.E. alignment also increases proximity to the growing Quarry Park Community Activity Centre containing employment, residential and recreational uses (Remington YMCA and Glenmore Square Library) and provides frontage to a potential TOD site on the reclaimed dry waste landfill.

## Ogden Road S.E.

Two Ogden alignments scenarios were considered:

- Within CP Right-of-Way from 69<sup>th</sup> Avenue to Glenmore Trail S.E. (functional alignment)
- Along Ogden Road S.E.

The recommended alignment transitions from the Canadian National Railway right-of-way to the west side of Ogden Road and includes a tunnel under Ogden Road to rejoin with the CP rightof-way. The recommended station location at 72<sup>nd</sup> Avenue S.E. moves the station south of its functional placement at 69<sup>th</sup> Avenue S.E. The modified station location is closer to a higher number of existing residents and businesses, is able to act as the centre for a new future TOD development and minimizes traffic impacts to Ogden Road. Though the Ogden Road option was thought to have potential to create a new urban street front along Ogden Road S.E. it was found to be unfavourable based on a detailed assessment of development potential and tax revenue.

A detailed summary of the evaluation can be found in Table 1.

MAE Accounts	Criteria	Expanded Description	Metric	11th Street - at grade	Parallel with CPR - Elevated	Within CPR ROW from 69th Ave to Glenmore Trail	Ogden Road	Ogden Landfill - Functional	24th Street - 200m Closer to Quarry Park and Recreation Center
	Capital Cost	Full costs to construct the options based on the most current estimate.	Dollars (\$)	3/+	1/-	2/+	1/-	2/-	3/+
				3	1	2	1	2	3
Economic/Financial Capacity	Options for project phasing and future transition	Cost efficiency and viability of options for project phasing and conversion to LRT.	Qualitative assessment	2/-	3/+	4/+	2/-	2/-	3/+
	Impact on other City projects/assets	Cost efficiencies and impacts to existing and planned City projects/assets.	Qualitative assessment	2/-	4/+	2/+	1/-	1/-	2/+
	Redevelopment Opportunities	Potential to generate additional (alignment specific) tax revenue through land use, city shaping, and station location. Area (ha) of properties directly adjoining the proposed alignment that would be impacted (lower is better).	hectares (ha)	3/+	2/-	2/-	3/+	2/-	3/+
				2.33	3.00	2.67	2.00	1.67	2.67
Social/Community Well-Being	Community Integration	Overall ability for transit infrastructure to physically integrate and connect the community.	Qualitative assessment	3/=	3/=	3/+	2/-	1/-	3/+
	Urban Design	Overall urban design quality between the transit infrastructure and the neighbouring properties.	Qualitative assessment	4/+	2/-	2/-	3/+	1/-	4/+
	Safety and Security	Safety and security impacts including operational as well as personal (actual and perceived)	Qualitative assessment	3/+	2/-	3/=	3/=	2/-	3/+
	Emergency Services	Emergency services impacts including operational as well as personnel (actual and perceived)	Qualitative assessment	2/-	3/+	3/+	2/-	2/-	3/+
	Private Property Impacts	The number of individual land/property owner impacts and remaining number of parcels.	Number of parcels (ha) impacted vs. Km of exist transportation	1/-	3/+	3/+	1/-	3/+	2/-
	Neighbourhood Impacts	Ability to minimize and/or mitigate disruptions to neighborhoods.	Qualitative assessment	2/-	4/+	4/+	1/-	3/+	2/-
	Historical Resources or Building of Significance	Ability to minimize negative impact on historical resources.	Number of sites	2/-	3/+	3	3	4	4
				2.43	2.86	3.00	2.14	2.29	3.00

# Table 1: Green Line Southeast – Alignment Multiple Accounts Evaluation

Multiple Account Evaluation Summary

MAE Accounts	Criteria	Expanded Description	Metric	11th Street - at grade	Parallel with CPR - Elevated	Within CPR ROW from 69th Ave to Glenmore Trail	Ogden Road	Ogden Landfill - Functional	24th Street - 200m Closer to Quarry Park and Recreation Center
	Transit Service: Ride time and Reliability	Ability to improve reliability and speed of transit service.	Qualitative assessment	1/-	3/+	3/+	2/-	2/-	3/+
	Ridership	Projected ridership one-year after opening day.	Qualitative assessment	3/=	3/=	3/=	3/=	2/-	3/+
	Pedestrian and bike integration	Ability to design for pedestrian and bike movements toand from the route and stations.	Qualitative assessment	4/+	3/-	2/-	3/+	1/-	4/-
Transportation	Improved street character / complete streets	If the alignment presents an opportunity to create a complete street by being within the street.	Qualitative assessment	3/+	2/-	1/-	3/+	1/-	3/+
	Impact on traffic network	Displaced access, parking, traffic operations, and demand along adjacent roadways.	Traffic assessment	3/-	4/+	4/+	1/-	4/+	3/-
	Operations and Maintenance	Overall complexity, costs and other impacts to Calgary Transit and Roads opeartions and maintenance.	Qualitative assessment	3/+	2/-	2/-	3/+	2/-	3/+
				2.83	2.83	2.5	2.5	2	3.17
Custoringhia	Natural and urban areas	Impact on biodiversity and environment and during operation & construction (noise, vibration etc.)	Qualitative assessment	2 / =	2 / =	3/+	2/-	3/=	3/=
Environment	Environmental remediation	Ability to balance value add and liability by remediating environmental contamination.	High/Medium/Low	3/+	2/-	2/-	3/+	1/=	1/=
	Parks/Green space	Benefits and/or negative impacts to existing parks/green spaces.	Qualitative assessment	3/=	3/=	3/=	3/=	2/-	3/+
				2.67	2.33	2.67	2.67	2.00	2.33
Feasibility/Construct ability	Technical constraints	Existence of 'show-stoppers' including geotechnical, archaeological, and physical challenges (gradients, physical constraints, system expandability, etc.) that would make building / operating an option overly difficult. This also includes non- environmental construction impacts	Qualitative assessment	2/=	2/=	4/+	2/-	1/-	2/+
	Construction impacts	Impacts and/or disruption to the surrounding environment and/or detour operating costs during construction (noise, traffic etc.)	Qualitative assessment	1/-	2/+	3/+	1/-	3/+	2/-
				1.5	2	3.5	1.5	2	2

# Table 1: Green Line Southeast – Alignment Multiple Accounts Evaluation

Multiple Account Evaluation Summary

MAE Accounts	Criteria	Expanded Description	Metric		th Street - at grade	llel with CPR - Elevated	hin CPR ROW n 69th Ave to enmore Trail	gden Road	den Landfill - Functional	Street - 200m ser to Quarry Park and eation Center	
					Ħ	Para	Mit fror Gl	0	8 -	24th Clo Recr	
Stakeholders	Public Acceptability	Public response to the option (often gauged through outreach process)	Qualitative assessment		1/-	3/+	4/+	1/-	1/-	3/+	
	Transit Oriented Development and Private Developer Interest	Advisory Group response to the option	Qualitative assessment		2/=	2/=	2/=	2/=	2/-	3/+	
	Alignment with City of Calgary Plans and Policy	Alignment with existing plans and policies. (MDP, CTP, RouteAhead, Complete Streets, Build Calgary etc.)	Qualitative assessment		3/+	2/-	3/=	3/=	2/-	3/+	
					2.00	2.33	3.00	2.00	1.67	3.00	
TOTAL with Capital Cost					16.76	16.36	19.33	13.81	13.62	19.17	
TOTAL without Capital Cost					13.76	15.36	17.33	12.81	11.62	16.17	
Note: Impacts from FCM Railway setbacks are not yet known. Alignment recommendations may change. Risk assessments will be conducted where necessary and mitigation measures applied											
LEGEND				Most desirable to Least Desirable							
Previous Functional Method of											
Evaluation Green				Oran	ge	Yello	W	Red			
Numerical Method of Evaluation Used 4					3 2				1		

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10 =

Comparative evaluation method between alignment alternates

## Table 1: Green Line Southeast – Alignment Multiple Accounts Evaluation

Multiple Account Evaluation Summary