BOW VALLEY REGIONAL TRANSIT SERVICES COMMISSION REGULAR MEETING

111 Hawk Avenue and MS Teams

AGENDA

July 9th, 2025 2:00-4:00pm

1. Call to Order

2. Approval of the Agenda

3. Minutes

- Approval of the May 14th 2025 Regular Meeting Minutes (attached)

4. Old Business (including Standing Items)

a) CEO Report (For Information)
b) Bring Forward List of Pending Items (For Information)
c) Transit Service Monthly Statistics (For Information)

5. New Business

a) CUTRIC Presentation – Alexis Dunphy, Ryan Welfle, Bernard Ross (Receive for Information)
b) Brand Standard Revision (Request for Decision)
c) Tangible Capital Asset Policy (Request for Decision)

6. Next Regular Meeting – Wednesday August 13th, 2025 2- 4pm

To be held at: 111 Hawk Avenue and Microsoft Teams

7. Adjournment

BOW VALLEY REGIONAL TRANSIT SERVICES COMMISSION REGULAR MEETING

111 Hawk Avenue and MS Teams

MINUTES

May 14th, 2025 2:00-4:00pm

BOARD MEMBERS PRESENT
Dave Schebek, ID9 (Chair)
Grant Canning, Town of Banff (Vice Chair)
Tanya Foubert, Town of Canmore
Alex Parkinson, ID9
Barb Pelham, Town of Banff

BOARD MEMBERS ABSENT
Sean Krausert, Town of Canmore

BVRTSC ADMINISTRATION PRESENT
Martin Bean, CEO
Mel Booth, Director of Finance and Administration
Steve Nelson, Director of Service Delivery
Fiona Gagnon, Manager of Communications and Customer Service
Sarah Parsons, Marketing Generalist

ADMINISTRATION PRESENT
Kimberly Fisher, Parks Canada (Virtual)
Colin Debaie, Parks Canada (Virtual)
Patti Youngberg, Parks Canada
Dustin Schinbein, Town of Canmore
Adrian Field, Town of Banff (Virtual)

ADMINISTRATION ABSENT

PUBLIC PRESENT

Greg Colgan - Rocky Mountain Outlook (Virtual)

1. Call to Order

    BVRTSC25-15 Dave Schebek calls the meeting to order at 2:00PM

2. Approval of the Agenda

    BVRTSC25-16 Dave Schebek moves to approve to agenda as presented.

CARRIED UNANIMOUSLY

3. Minutes

- Approval of the April 9th 2025 Regular Meeting Minutes (attached)

BVRTSC25-17 Dave Schebek moves to accept the meeting minutes as presented

CARRIED UNANIMOUSLY

4. Old Business (including Standing Items)

a) CEO Report (For Information)

b) Bring Forward List of Pending Items (For Information)

c) Transit Service Monthly Statistics (For Information)

5. New Business

a) Ratification of email vote for Canada Public Transit Fund (Request for Decision)

BVRTSC25-18 Tanya Foubert moves to direct Administration to submit the capital plan application for the BVRTSC's Baseline Funding allocation as presented.

CARRIED UNANIMOUSLY

b) Presentation of Q1 Financials (For Information Only)

c) Presentation of Brand Standard Revision (Request for Decision)

Request from the Commission to circulate the revision to Commission partners and return with any feedback to be considered.

CARRIED UNANIMOUSLY

6. Next Regular Meeting – Wednesday June 11th, 2025 2- 4pm

To be held at: 111 Hawk Avenue and Microsoft Teams

7. Adjournment

BVRTSC25-19 Dave Schebek moves to adjourn the meeting at 2:48PM.

CARRIED UNANIMOUSLY

CEO and Admin Report

July 2025

Financial:

- 6 new Nova Buses are now in operation, with wraps and all other peripherals installed. Payments have all been completed to Nova Bus.

- After extensive research and diagnosis, it has been determined that two of the Proterra buses need battery replacements. These replacements will be approximately $300,000 for the three batteries that need replacing.

- The new charger for 111 Hawk has been ordered and will be ready to ship in the next couple of weeks. Administration is currently working through the logistics to determine whether the installation will happen in August or if operationally can be delayed until October. The October timeframe would result in a substantial savings on shipping and accommodation for installing crew. The charger will be approximately $310,000, including installation and a required Fortis transformer upgrade. 80% of this cost will be paid by the Rural Transit Solutions Fund.

Transit Service Updates:

- With the increase in volumes, Route 1 is overloading regularly at the Gondola and creating challenges for guests at the Rimrock who have to wait for multiple buses to pass by prior to getting on. This is happening even with the extra shuttles from Pursuit and the Rimrock being in service. Roam has put an Ambassador at the Rimrock during peak times to assist with driver and guest communication and will have Pursuit/Roam working to limit Gondola boardings during weekend peak times. By limiting boardings at the Gondola to seated capacity, space will be available for most Rimrock guests.

- Summer routes are now at full service, with an additional bus on Routes 1 and 6 being added to each on Friday June 27th. Overloads are being dispatched daily and are being moved to the routes as needed.

- Ridership reached peak daily levels that Roam has ever seen on the July long weekend days on a majority of routes. Total ridership for the weekend is in the chart below, with the peak dates and ridership numbers listed subsequently.

	Comparison 25vs24	
	Full Long Weekend	**Canada Day**
Route 1	37.67%	41.16%
Route 2	14.19%	33.97%
Route 3	19.98%	30.84%
Route 4	16.00%	15.56%
Route 5C	-1.88%	2.82%
Route 5T	9.25%	17.00%
Route 6	67.12%	88.68%
Route 8X	9.07%	5.90%
Route 9	22.66%	108.59%
Route 11	44.04%	-3.64%
Route 12	94.14%	439.39%
OnIt	1.54%	-11.33%
Total	24.32%	33.10%

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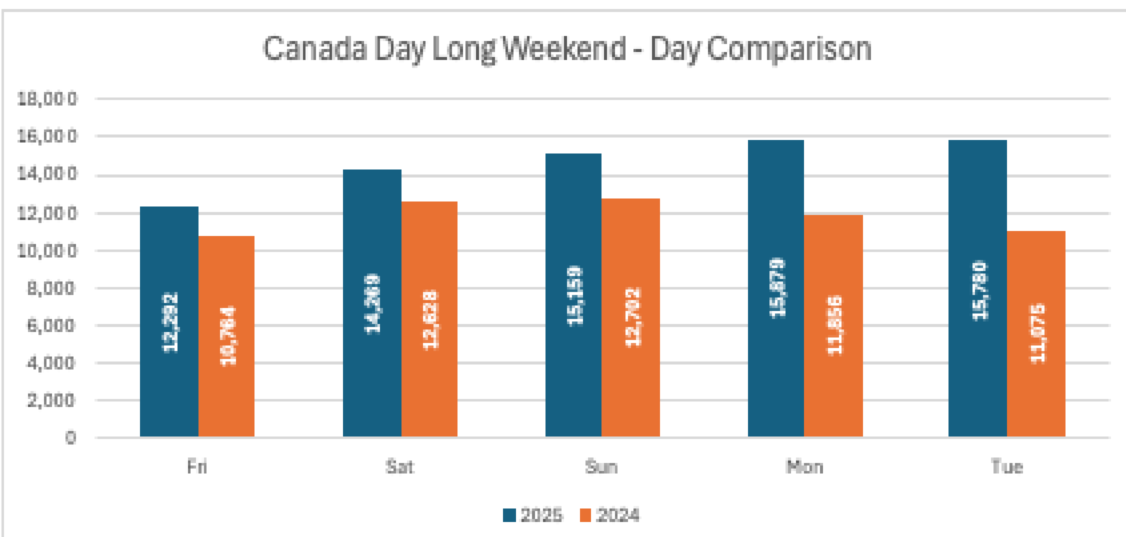
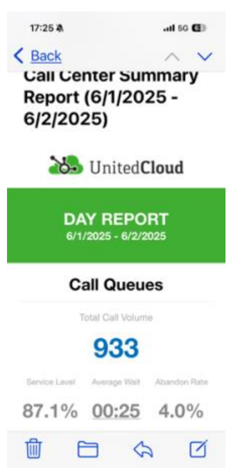


- Route 1 – June 30, 2025 6,028
- Route 2 – July 22, 2024 3,909. (July 1, 2025 = 3,865)

- **Banff Local Total June 30, 2025 – 9,714 July 1, 2025 - 9,315**
- **Route 3 - June 15, 2025 1,896**
- **Route 5 – July 1, 2025 1,383**
- **Route 6 – June 30, 2025 1,124**
- **Route 8X – August 3, 2023 1,848. (June 29, 2025 = 1531)**
- **Route 9 – July 1, 2025 413**

- Calgary Transit provided an articulated 60-foot bus for testing purposes in Banff on June 20th. This was an opportunity to analyze infrastructure to determine the feasibility of using this bus type in the future. Roam Administration was joined by Banff Councillors Barb Pelham and Grant Canning plus representatives from TOB engineering and Parks Canada. The test showed that an articulated bus can successfully navigate the routes that Roam currently operates in Banff and out to Lake Minnewanka, with some potential changes to be recommended for on-street bus bays.

- Reservations opened for Route 8X on Monday June 3rd for the July and August period, with the highest call volumes that have been seen to date. In addition, the reservation system had a glitch where people could not download their tickets, so the Customer Service team had to manually re-send numerous tickets. Call volumes for the day were 933, with a similar number of emails being received and requiring action:



22,500 reservations were made for July and August on June 3rd, selling out the majority of the peak times.

- Flixbus has been operating between Calgary, Canmore, Banff and Lake Louise with multiple trips daily since last year and have now added Moraine Lake to their destinations. According to CTV, Flixbus will be operating 2 trips per day 7 days a week to Moraine Lake throughout the summer. This service started on June 2nd.

  https://www.ctvnews.ca/calgary/article/hop-on-this-bus-to-head-directly-to-moraine-lake-from-calgary/

- Canada Day detours were set up to ensure the service provided was as seamless as possible despite multiple transit routes being impacted. The document attached was developed through many hours of planning and shows the in-depth details that is required for temporary route revisions. In addition to this document that was provided to all drivers working Canada Day, the team also had to do key revisions within our real time tracking software to show the detours to passengers online. On Canada Day, physical detour signs are also distribute throughout Banff and Canmore.

  Canada Day Detour Information Booklet

General/Health and Safety

- **General:**

  - Roam recently completed an external compliance review to analyze our procedural and record keeping compliance on both the driver and maintenance aspects of the operation. This audit was completed by an external organization and was successful, identifying areas in which Roam is doing well and areas for minor procedural changes. The last external review was in 2017; however it will be administration's intent to complete a similar review every two years going forward.

  - Roam team members are able to complimentary two-hour canoe rentals once again this summer as part of the staff wellness program. This corporate pass is available to all full and part time staff from June until September.

  - Administration recently had the opportunity to host the Senior Leadership team of Nova Bus at our facilities in Banff, including President Paul Le Houillier. This was an excellent opportunity for building a collaborative plan as Roam moves forward with growth into the future. Nova's Linked In post of the visit can be accessed here:

    https://www.linkedin.com/feed/update/urn:li:activity:7331337739335806980/

loveistravelling
5 reviews • 2 photos

★★★★★ 4 days ago

Big thanks to your driver Sarabpal! A few days ago, me and my girlfriend were on Route 2 heading to Banff Springs but ended up on the Tunnel Mountain loop,didn't realize it was the last run. He went out of his way to get us back to town and help us to get another route 2 bus. Really appreciate it!

Bow Valley Regional Transit Services Commission - Roam Transit
Owner

Replying publicly

Hi there, thank you so much for taking the time to pass on this compliment for our driver. That's great that he was able to help you get on to the correct bus to the Fairmont. We hope to welcome you back soon!

209/4,000

- **Human Resources:**

  - Roam Training days held recently included a session facilitated by a local company "Scale Naturally" on Neurodiversity. This session was an introduction to Neurodiversity and creating increased knowledge amongst our team for patience and understanding, recognizing that all people are unique.

  - Administration has been involved with the Government of Alberta and their consultants as part of the Passenger Rail Master Plan - Rocky Mountain Regional Group, providing feedback as it relates to passenger rail in this area. It is anticipated that their report will be finalized and presented to Government by the end of summer 2025. The subsequent timeline for disseminating publicly has not been shared at this point.

- **Safety:**

  - The recent safety audit confirmed that our safety program is progressing well, with only minor adjustments needed to improve our procedures. Most of these changes have either already been implemented or are currently underway.

  - With the onboarding of new staff, our Health and Safety Committee has expanded, welcoming new members and perspectives to the team.

- The team is currently in the process of updating Roam's internal Emergency Response Plan. This update will clarify how each department should respond in various emergency scenarios and will be developed in collaboration with our Communications and Customer Experience Manager to ensure we have a clear and consistent communication strategy in place.

- **Training:**

    - In July, we began wrapping up our summer training efforts. Most of our new drivers have now updated their licenses and are in the final stage of training: the ride alongs. With these steps nearly complete, our team is fully staffed and prepared for the busy season ahead.

    - The Field Supervisors will now shift from a training-focused role to increased on-the-road support, conducting ride alongs with drivers, visiting bus stops, and providing assistance during high-demand or challenging situations.

    - Following recommendations from our recent safety audit, administration will be reviewing and updating training documentation and forms to ensure compliance with Alberta Transportation standards. This project will continue throughout the summer and will be informed by feedback gathered from new employees about where they felt most and least supported during onboarding.

    - Research is ongoing into further opportunities to expand upon the Diversity, Equity and Inclusion training that was completed earlier this year. The goal is to ensure all employees are well-equipped to navigate challenging situations, including interactions with neurodivergent individuals.

Marketing and Customer Experience

- Roam's communications team has maintained a strong presence at a variety of community events, including the Seniors Week Ice Cream Social in Canmore, the BLLHA Housekeeping Olympics, and Lake Louise Low Down. Our participation in these events continues to be well received and reinforces positive connections within the community.

- Promotion of all summer services is ongoing, and we are actively encouraging passengers to share their experiences through our customer survey. This feedback remains a valuable tool as we strive to improve service delivery.

- Summer is already proving to be an exceptionally busy time which is no surprise. Our Customer Service team is now fully trained and committed to providing outstanding support to both visitors and locals. While we are continuing to experience high passenger volumes during peak times, our team are working diligently to ensure that customers are informed, supported, and, where necessary, encouraged to consider alternate travel times or wait comfortably for the next available bus.

Mireille Delisle
Local Guide • 49 reviews • 7 photos

★★★★★ 5 hours ago

Wow! Excellent service in the Banff-Lake Louise-Canmore area. You can get to ALL the must-sees efficiently, even from campgrounds and hotels. Pricing is really inexpensive (12$ for 3-Day Pass). Arrival times are accurate and the 👌app 👌 gives you real-time info. THUMBS UP!

Bow Valley Regional Transit Services Commission - Roam Transit
Owner

Bow Valley Regional Transit Services Commission

BRING FORWARD LIST

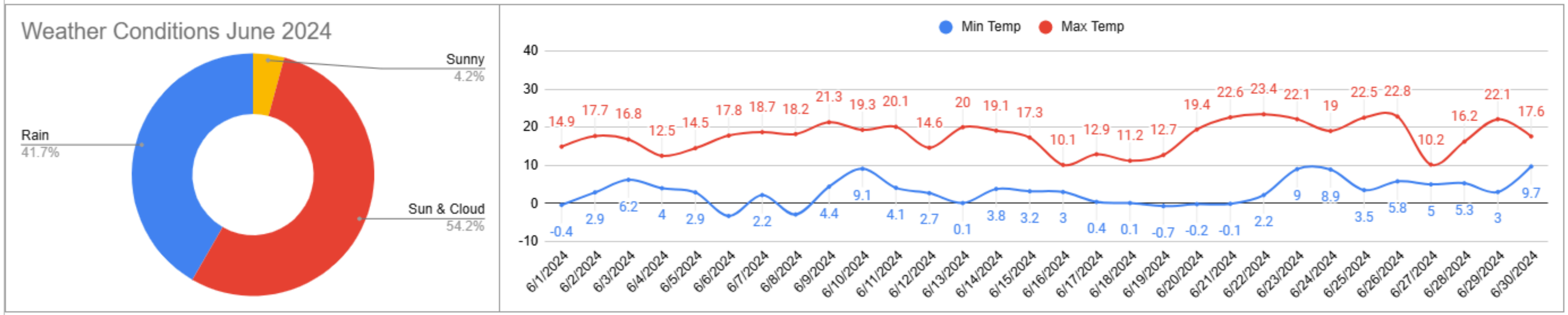
BRING FORWARD LIST OF ITEMS PENDING (as of July 2025)

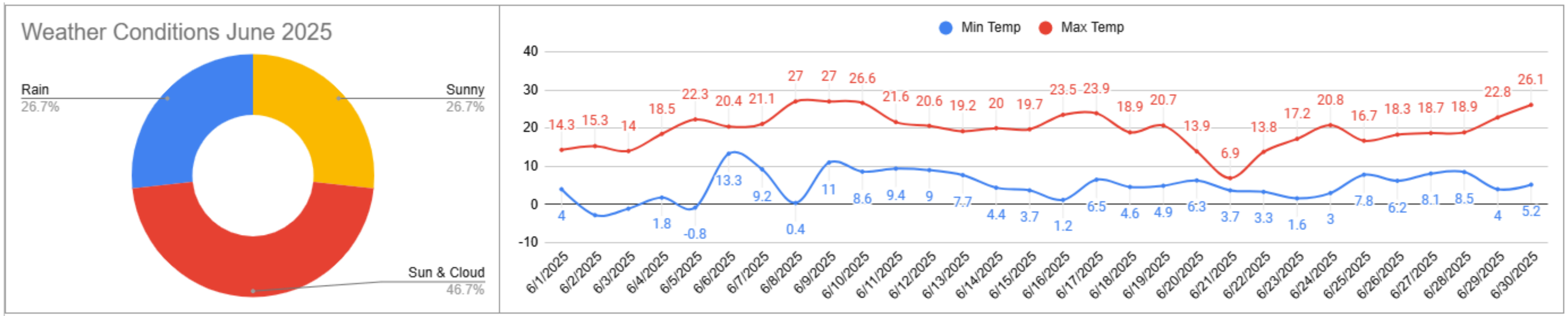
ITEM	Date Initiated	Pending Date	Responsible for Completion	Comments:
BVRTSC25-07 Dave Schebek moves to direct administration to obtain consultant quotations and proceed with phase two of the Capital Plan Study, to be funded by a grant of $50,000 secured from the Rural Transit Solutions Fund. **CARRIED UNANIMOUSLY**	March 12, 2025	Dec 31, 2025	Martin/Steve	Phase Two will expand on infrastructure and further capital requirements supported by funding from the Rural Transit Solutions Fund
BVRTSC24-75 Dave Schebek moves to direct Commission members to perform a Board Self-Assessment in 2025 led by Elevated HR. **CARRIED UNANIMOUSLY**	Nov 13, 2024	2025	Elevated HR	
BVRTSC24-76 Tanya Foubert moves to initiate a BVRTSC Bylaw Review in 2025, with each Board Member providing comments to the CEO and Board Chair on any suggested amendments by the end of Q1, 2025, with the intent of having the review completed by the end of Q2, 2025. **CARRIED UNANIMOUSLY**	Nov 13, 2024	Q2, 2025	Board	

Bow Valley Regional Transit Services Commission Ridership Statistics

Month	Type	Banff Local	Canmore Local	Canmore-Banff Regional	Lake Louise - Banff Regional
June	Ridership	230,840	35,117	37,229	31,954
2025					
	Bikes	788	918	1,428	88
	Winter Sports	0	40	1	0
	Strollers	420	215	81	41
	Mobility Devices	44	19	2	2

Route	Monthly Ridership Change 2024 - 2025	Comment
Route 1	9.66%	Change from June 2024 to June 2025
Route 2	11.58%	Change from June 2024 to June 2025
Route 3	21.26%	Change from June 2024 to June 2025
Route 4	16.18%	Change from June 2024 to June 2025
Route 5	1.34%	Change from June 2024 to June 2025
Route 6	19.39%	Change from June 2024 to June 2025
Route 8X	-4.19%	Change from June 2024 to June 2025
Route 9	10.43%	Change from June 2024 to June 2025


Weather Conditions June 2024
Sunny
4.2%
Rain
41.7%
Sun & Cloud
54.2%
Min Temp
Max Temp


Weather Conditions June 2025
Rain
26.7%
Sunny
26.7%
Sun & Cloud
46.7%
Min Temp
Max Temp

Month	Route 1 (Inns of Banff/ Gondola)						
	R1 2022	R1 2023	R1 2024	R1 2024 YTD	R1 2025 YTD	% Change - 24	% Change - 23
January	16,080	40,636	41,644	41,644	55,849	34.11%	37.44%
February	19,661	40,833	46,080	46,080	54,982	19.32%	34.65%
March	21,722	47,979	52,307	52,307	62,270	19.05%	29.79%
April	20,918	41,098	44,341	44,341	55,941	26.16%	36.12%
May	37,615	67,740	72,973	72,973	85,986	17.83%	26.94%
June	65,375	103,499	107,404	107,404	117,781	9.66%	13.80%
July	100,148	125,827	121,640	3,861	5,450	41.16%	
August	93,303	122,140	120,506	0	0	0.00%	
September	61,567	88,508	91,008	0	0	0.00%	
October	37,893	52,404	54,243	0	0	0.00%	
November	30,751	33,628	42,368	0	0	0.00%	
December	45,460	49,418	60,432	0	0	0.00%	
YTD	550,493	813,710	854,946	368,610	438,259	18.90%	-

Month	Route 2 (Tunnel Mtn / Banff Springs Hotel)						
	R2 2022	R2 2023	R2 2024	R2 2024 YTD	R2 2025 YTD	% Change - 24	% Change - 23
January	16,870	49,989	52,117	52,117	56,298	8.02%	12.62%
February	21,518	47,270	51,430	51,430	53,782	4.57%	13.78%
March	24,785	53,488	60,558	60,558	59,439	-1.85%	11.13%
April	20,192	44,739	45,853	45,853	51,660	12.66%	15.47%
May	27,452	55,890	60,403	60,403	67,765	12.19%	21.25%
June	50,118	76,511	81,019	81,019	90,397	11.58%	18.15%
July	67,979	93,346	92,431	2,885	3,865	33.97%	
August	68,183	91,695	88,241	0	0	0.00%	
September	53,950	75,616	77,274	0	0	0.00%	
October	32,911	46,459	51,530	0	0	0.00%	
November	36,146	43,420	48,789	0	0	0.00%	
December	50,744	54,587	61,275	0	0	0.00%	
YTD	470,848	733,010	770,920	354,265	383,206	8.17%	-

Month	Route 4 Cave & Basin						
	R4 2022	R4 2023	R4 2024	R4 2024 YTD	R4 2025 YTD	% Change - 24	% Change - 23
January							
February							
March							
April							
May	1,153	1,904	1,740	1,740	2,092	20.23%	9.87%
June	4,698	6,689	5,116	5,116	5,944	16.18%	-11.14%
July	7,321	7,647	6,131	270	312	15.56%	
August	6,392	7,191	5,945	0	0	0.00%	
September	4,842	4,842	3,200	0	0	0.00%	
October	396						
November							
December							
YTD	24,802	28,273	22,132	7,126	8,348	17.15%	-

Month	Banff Local (Route 1, 2 & 4)						
	2022	2023	2024	2024 YTD	2025 YTD	% Change - 24	% Change - 23
January	32,950	90,625	93,761	93,761	112,147	19.61%	23.75%
February	41,179	88,103	97,510	97,510	108,764	11.54%	23.45%
March	46,507	101,467	112,865	112,865	121,709	7.84%	19.95%
April	41,110	85,837	90,194	90,194	107,601	19.30%	25.36%
May	66,220	125,534	135,116	135,116	155,843	15.34%	24.14%
June	120,191	186,699	193,539	193,539	214,122	10.64%	14.69%
July	175,448	226,820	220,202	7,016	9,627	37.21%	
August	167,878	221,026	214,692	0	0	0.00%	
September	120,359	168,966	171,482	0	0	0.00%	
October	71,200	98,863	105,773	0	0	0.00%	
November	66,897	77,048	91,157	0	0	0.00%	
December	96,204	104,005	121,707	0	0	0.00%	
YTD	1,046,143	1,574,993	1,647,998	730,001	829,813	13.67%	-

Month	Route 3 (Canmore-Banff Regional)						
	2022	2023	2024	2024 YTD	2025 YTD	% Change - 24	% Change - 23
January	10,642	23,255	25,792	25,792	30,602	18.65%	31.59%
February	10,492	21,303	25,415	25,415	27,714	9.05%	30.09%
March	12,770	23,824	27,059	27,059	30,832	13.94%	29.42%
April	12,028	23,622	26,296	26,296	28,811	9.56%	21.97%
May	15,148	26,946	28,087	28,087	32,990	17.46%	22.43%
June	19,058	30,304	30,702	30,702	37,229	21.26%	22.85%
July	22,015	31,836	32,104	1,135	1,485	30.84%	
August	19,854	32,667	32,717	0	0	0.00%	
September	17,364	28,533	29,297	0	0	0.00%	
October	17,605	28,139	27,917	0	0	0.00%	
November	17,797	27,903	26,674	0	0	0.00%	
December	19,213	31,157	31,841	0	0	0.00%	
YTD	193,986	329,489	343,901	164,486	189,663	15.31%	-

Month	Route 5 Canmore						
	2022	2023	2024	2024 YTD	2025 YTD	% Change - 24	% Change - 23
January	9,224	22,810	30,744	30,744	32,549	5.87%	42.70%
February	9,789	22,119	29,174	29,174	31,393	7.61%	41.93%
March	12,208	25,116	30,530	30,530	33,308	9.10%	32.62%
April	10,924	23,308	28,976	28,976	31,680	9.33%	35.92%
May	13,066	27,143	32,036	32,036	31,162	-2.73%	14.81%
June	16,015	28,039	30,963	30,963	31,377	1.34%	11.90%
July	16,715	28,691	30,700	1,255	1,383	10.20%	
August	17,070	27,658	30,390	0	0	0.00%	
September	17,127	25,056	29,249	0	0	0.00%	
October	16,802	26,233	30,044	0	0	0.00%	
November	19,956	26,722	32,065	0	0	0.00%	
December	21,194	29,271	31,613	0	0	0.00%	
YTD	180,090	312,166	366,484	183,678	192,852	4.99%	-

Month	Route 6 Minnewanka						
	2022	2023	2024	2024 YTD	2025 YTD	% Change - 24	% Change - 23
January							
February							
March							
April							
May	2,783	5,879	4,647	4,647	6,961	49.80%	18.40%
June	12,662	18,255	14,003	14,003	16,718	19.39%	-8.42%
July	20,639	25,806	21,451	521	983	88.68%	
August	19,238	26,074	22,501	0	0	0.00%	
September	10,182	15,400	13,315	0	0	0.00%	
October	530	921					
November							
December							
YTD	66,034	92,335	75,917	19,171	24,662	28.64%	-

Month	Roam Total Ridership						
	2022	2023	2024	2024 YTD	2025 YTD	% Change - 24	% Change - 23
January	56,530	147,062	162,228	162,228	188,695	16.31%	28.31%
February	65,499	141,874	163,675	163,675	179,710	9.80%	26.67%
March	75,790	161,319	182,041	182,041	197,698	8.60%	22.55%
April	68,215	143,794	156,333	156,333	180,505	15.46%	25.53%
May	106,822	206,716	223,906	223,906	256,831	14.70%	24.24%
June	190,769	308,030	316,881	316,881	348,423	9.95%	13.11%
July	271,789	371,077	358,855	11,641	15,412	32.39%	
August	253,615	366,644	354,646	0	0	0.00%	
September	187,534	284,961	288,908	0	0	0.00%	
October	118,488	179,071	190,907	0	0	0.00%	
November	110,983	142,511	160,626	0	0	0.00%	
December	146,145	180,013	201,519	0	0	0.00%	
YTD	1,652,179	2,633,072	2,760,525	1,216,705	1,367,274	12.38%	-

Month	Route 8X (Express Lake Louise - Banff Regional)						
	2022	2023	2024	2024 YTD	2025 YTD	% Change - 24	% Change - 23
January	3,714	9,788	11,227	11,227	12,444	10.84%	27.14%
February	4,039	9,363	10,714	10,714	10,741	0.25%	14.72%
March	4,305	10,205	10,694	10,694	10,522	-1.61%	3.11%
April	4,153	10,013	10,196	10,196	11,353	11.35%	13.38%
May	8,422	17,400	19,167	19,167	21,980	14.68%	26.32%
June	18,115	34,555	33,350	33,350	31,954	-4.19%	-7.53%
July	28,200	41,826	36,750	1,118	1,184	5.90%	
August	22,575	43,140	37,346	0	0	0.00%	
September	16,059	31,100	26,149	0	0	0.00%	
October	8,061	17,351	16,962	0	0	0.00%	
November	6,021	10,248	10,089	0	0	0.00%	
December	9,248	14,463	14,565	0	0	0.00%	
YTD	132,912	249,452	237,209	96,466	100,178	3.85%	-

Month	Route 8S (Scenic Lake Louise - Banff Regional)						
	2022	2023	2024	2024 YTD	2025 YTD	% Change - 24	% Change - 23
January							
February							
March							
April							
May							
June							
July	2,183	2,755					
August	1,640	2,974					
September							
October							
November							
December							
YTD	3,823	5,729	0	0	0	0.00%	-

Month	Route 9 (Johnston Canyon)						
	2022	2023	2024	2024 YTD	2025 YTD	% Change - 24	% Change - 23
January		584	704	704	953	35.37%	63.18%
February		986	862	862	1,098	27.38%	11.36%
March		707	893	893	1,327	48.60%	87.69%
April		1,014	671	671	1,060	57.97%	4.54%
May	1,183	2,602	2,738	2,738	3,701	35.17%	42.24%
June	4,728	6,185	7,265	7,265	8,023	10.43%	29.72%
July	6,589	7,409	8,719	563	413	-26.64%	
August	5,360	6,897	8,413	0	0	0.00%	
September	2,908	5,776	6,468	0	0	0.00%	
October	897	1,884	2,243	0	0	0.00%	
November	312	590	641	0	0	0.00%	
December	286	1,117	1,793	0	0	0.00%	
YTD	22,263	35,751	41,410	13,696	16,575	21.02%	-

Month	Route 10 (Moraine Lake)						
	2022	2023	2024	2024 YTD	2025 YTD	% Change - 24	% Change - 23
January							
February							
March							
April							
May							
June							
July							
August							
September	3,535	6,556	7,178	0	0	0.00%	
October	3,393	4,827	6,751	0	0	0.00%	
November							
December							
YTD	6,928	11,383	13,929	0	0	0.00%	-

Month	On-It (Calgary Regional) - Banff						
	2022	2023	2024	2024 YTD	2025 YTD	% Change - 24	% Change - 23
January			363	363			
February			753	753			
March			830	830			
April							
May	1,759	2,792	2,401	2,401	2,364	-1.54%	-15.33%
June	3,840	6,815	6,410	6,410	4,538	-29.20%	-33.41%
July	7,654	10,031	6,231	0	368	0.00%	
August	6,531	10,389	8,278	0	0	0.00%	
September	5,019	10,329	5,627	0	0	0.00%	
October		2,389	2,224	0	0	0.00%	
November							
December		2,081					
YTD	24,803	44,826	33,117	10,757	7,270	-32.42%	-

Month	On-It (Calgary Regional) - Lake Louise						
	2022	2023	2024	2024 YTD	2025 YTD	% Change - 24	% Change - 23
January							
February							
March							
April							
May							
June			713	0	0	0.00%	
July			1,113	0	0	0.00%	
August			1,290	0	0	0.00%	
September			199	0	0	0.00%	
October							
November							
December							
YTD	0	0	3,315	0	0	0.00%	-

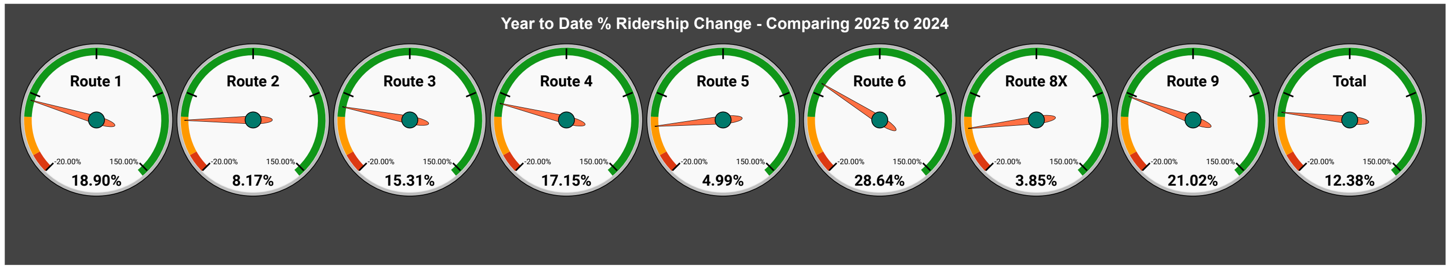
Month	On-It (Calgary Regional) - Moraine Lake						
	2022	2023	2024	2024 YTD	2025 YTD	% Change - 24	% Change - 23
January							
February							
March							
April							
May							
June							
July							
August							
September			1,174	0	0	0.00%	
October			617	0	0	0.00%	
November							
December							
YTD	0	0	1,791	0	0	0.00%	-

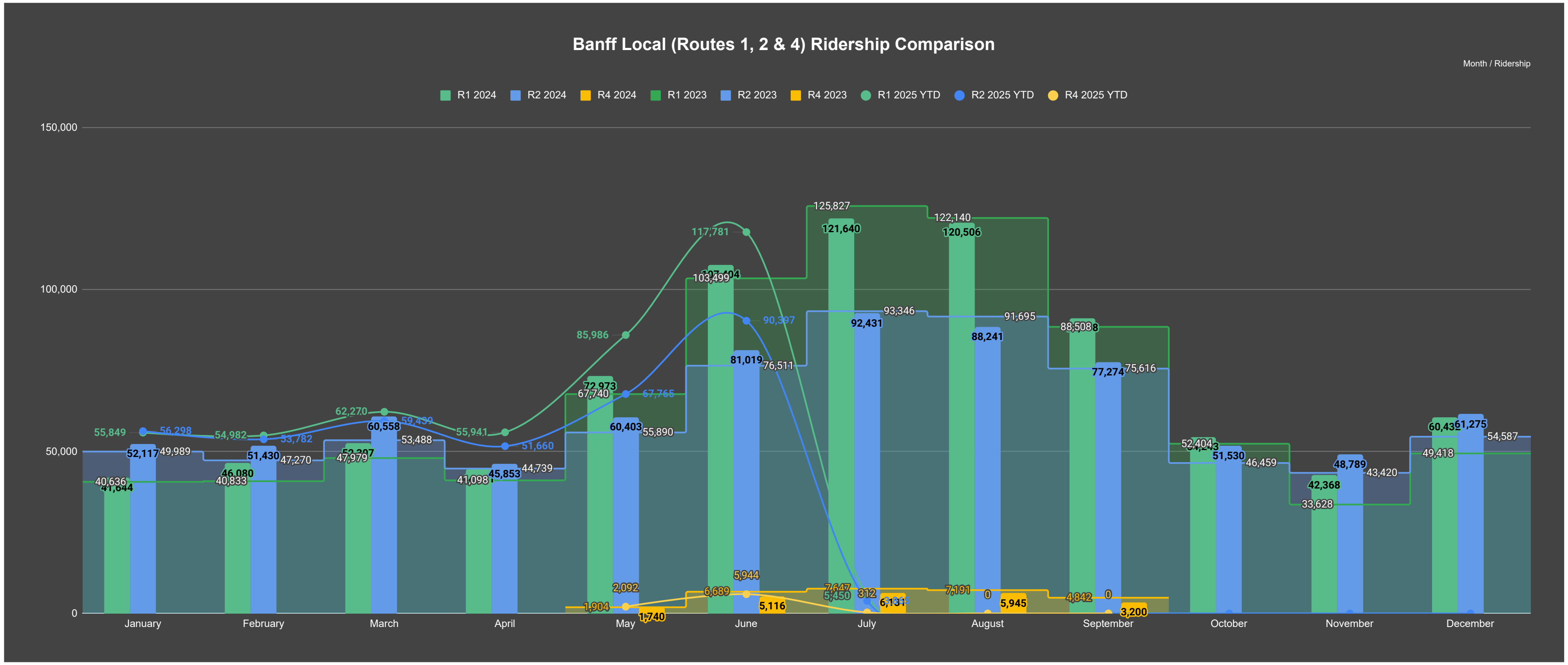
Month	Route 11 (Lake Louise Local)						
	2022	2023	2024	2024 YTD	2025 YTD	% Change - 24	% Change - 23
January							
February							
March							
April							
May		1,212	1,435	1,435	2,085	45.30%	72.03%
June		3,993	5,163	5,163	5,260	1.88%	31.73%
July		5,934	7,206	0	159	0.00%	
August		6,208	5,916	0	0	0.00%	
September		3,574	4,813	0	0	0.00%	
October		853	1,217	0	0	0.00%	
November							
December							
YTD	0	21,774	25,750	6,598	7,504	13.73%	-

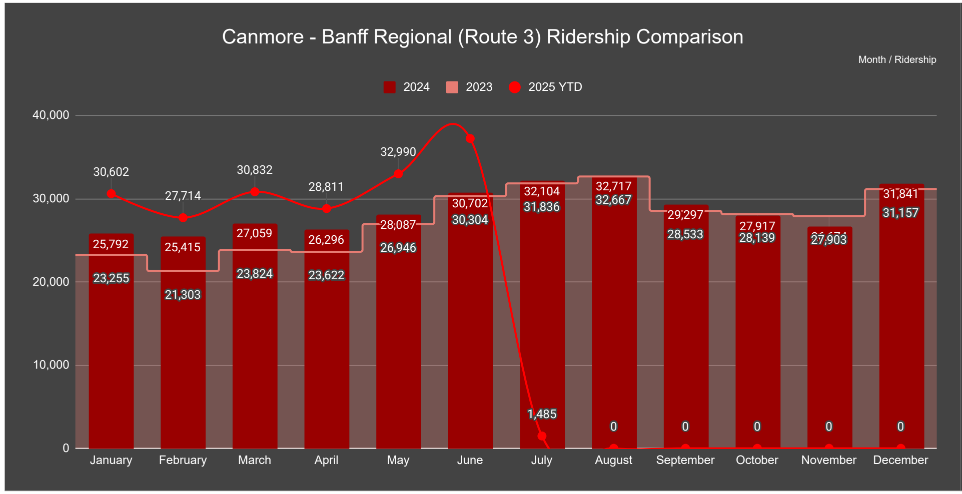
Month	Route 5C (Cougar Creek)						
	2022	2023	2024	2024 YTD	2025 YTD	% Change - 24	% Change - 23
January			19,797	19,797	21,263	7.41%	
February			17,830	17,830	20,299	13.85%	
March			18,442	18,442	20,995	13.84%	
April			17,958	17,958	19,907	10.85%	
May			18,563	18,563	18,653	0.48%	
June			17,076	17,076	18,436	7.96%	
July			17,115	602	619	2.82%	
August		15,005	17,118	0	0	0.00%	
September		14,113	16,643	0	0	0.00%	
October		15,771	18,359	0	0	0.00%	
November		16,468	20,611	0	0	0.00%	
December		18,122	20,228	0	0	0.00%	
YTD	0	79,479	219,740	110,268	120,172	8.98%	-

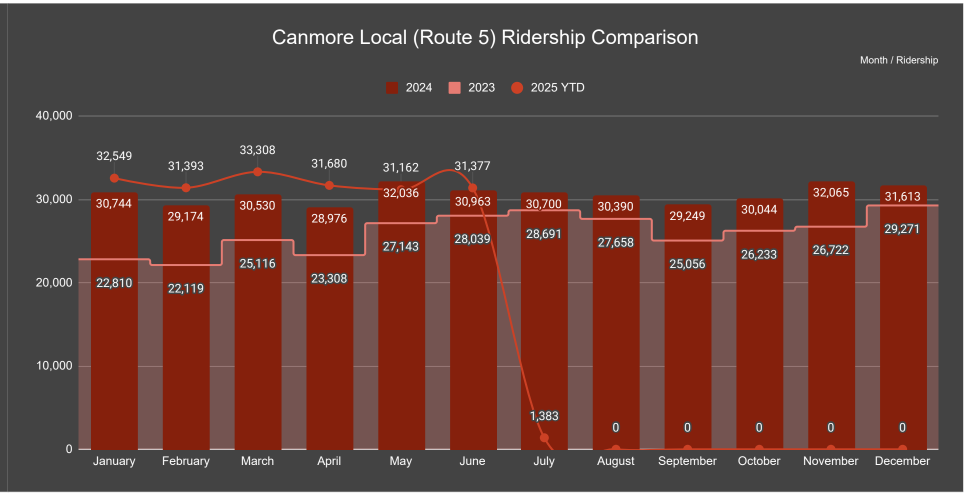
Month	Route 5T (Three Sisters)						
	2022	2023	2024	2024 YTD	2025 UTD	% Change - 24	% Change - 23
January			10,947	10,947	11,286	3.10%	
February			11,344	11,344	11,094	-2.20%	
March			12,088	12,088	12,313	1.86%	
April			11,018	11,018	11,773	6.85%	
May			13,473	13,473	12,509	-7.16%	
June			13,887	13,887	12,941	-6.81%	
July			13,585	653	764	17.00%	
August		12,653	13,272	0	0	0.00%	
September		10,943	12,606	0	0	0.00%	
October		10,462	11,685	0	0	0.00%	
November		11,318	11,454	0	0	0.00%	
December		11,149	11,385	0	0	0.00%	
YTD	0	56,525	146,744	73,410	72,680	-0.99%	-

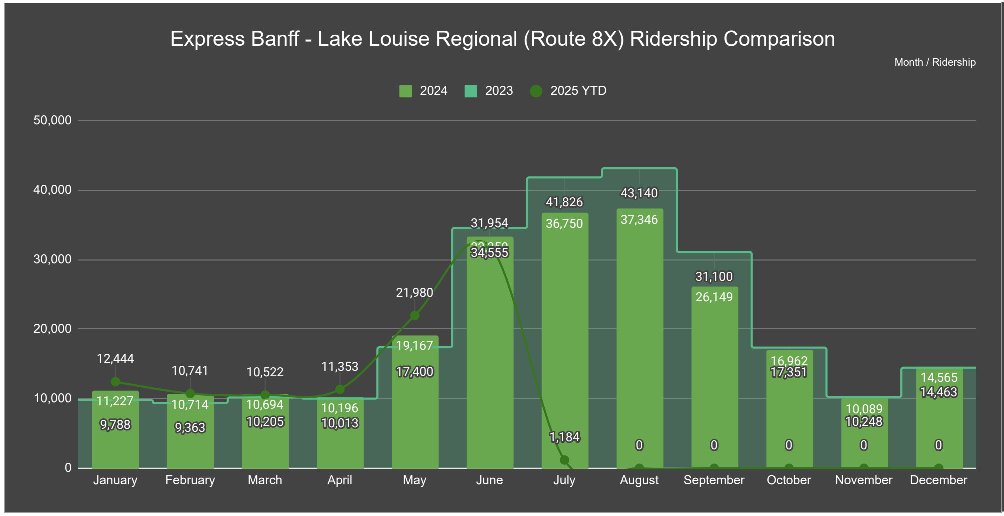
Month	Route 12 (Grassi Lakes)						
	2022	2023	2024	2024 YTD	2025 YTD	% Change - 24	% Change - 23
January							
February							
March							
April							
May			680	680	2,109	210.15%	
June			1,896	1,896	3,740	97.26%	
July			1,723	33	178	439.39%	
August			2,671	0	0	0.00%	
September			957	0	0	0.00%	
October							
November							
December							
YTD	0	0	7,927	2,609	6,027	131.01%	-



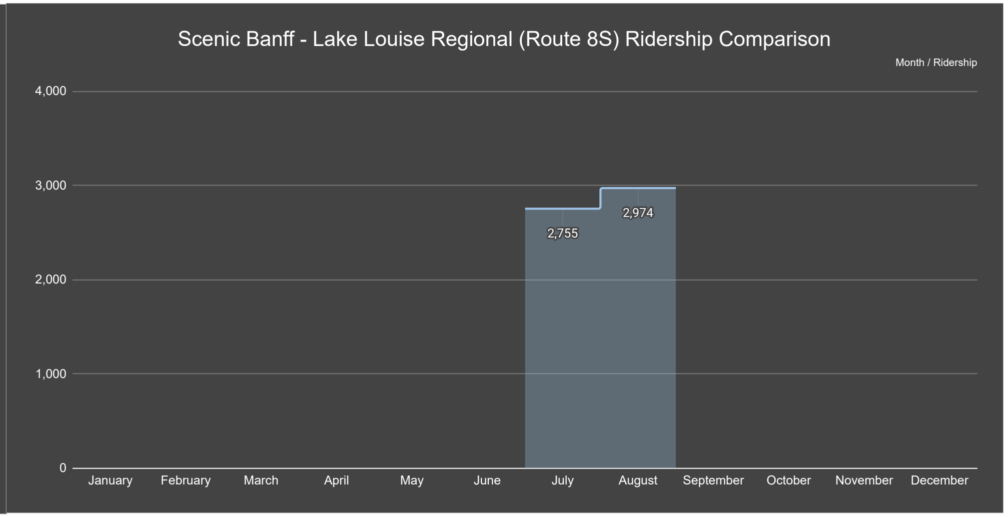

Banff Local (Routes 1, 2 & 4) Ridership Comparison
Month / Ridership
R1 2024
R2 2024
R4 2024
R1 2023
R2 2023
R4 2023
R1 2025 YTD
R2 2025 YTD
R4 2025 YTD
150,000
100,000
50,000
0
January
February
March
April
May
June
July
August
September
October
November
December


Canmore - Banff Regional (Route 3) Ridership Comparison
Month / Ridership
2024
2023
2025 YTD
40,000
30,000
20,000
10,000
0
January
February
March
April
May
June
July
August
September
October
November
December

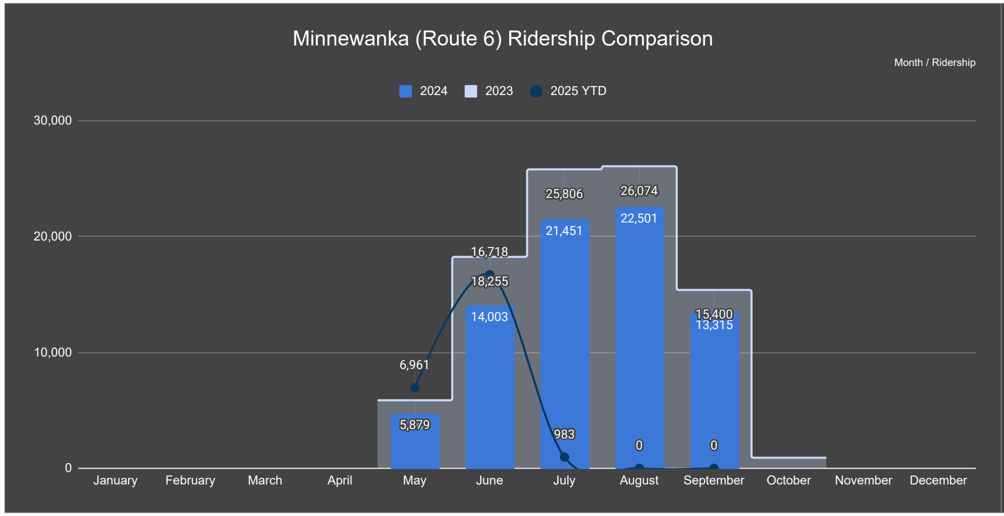

Canmore Local (Route 5) Ridership Comparison
Month / Ridership
2024
2023
2025 YTD
40,000
30,000
20,000
10,000
0
January
February
March
April
May
June
July
August
September
October
November
December



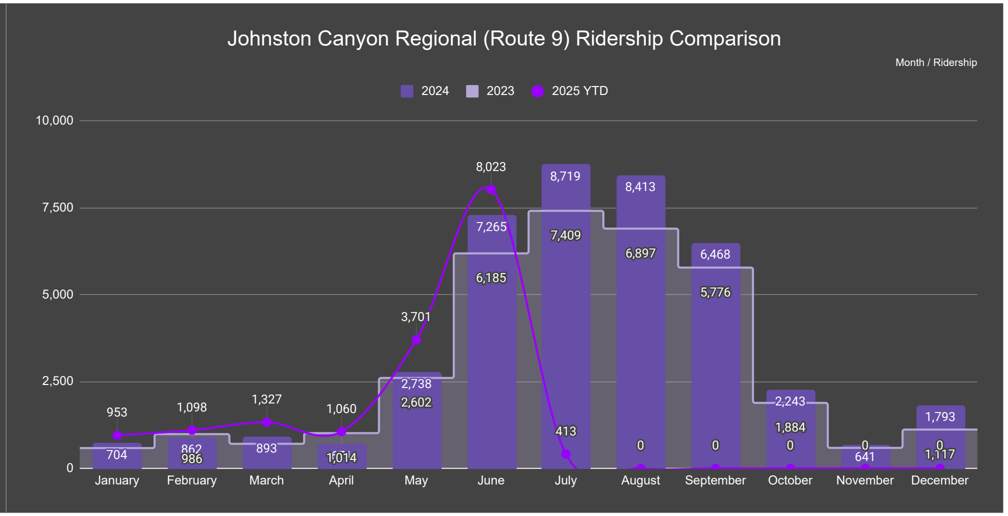
Express Banff - Lake Louise Regional (Route 8X) Ridership Comparison
Month / Ridership
2024
2023
2025 YTD



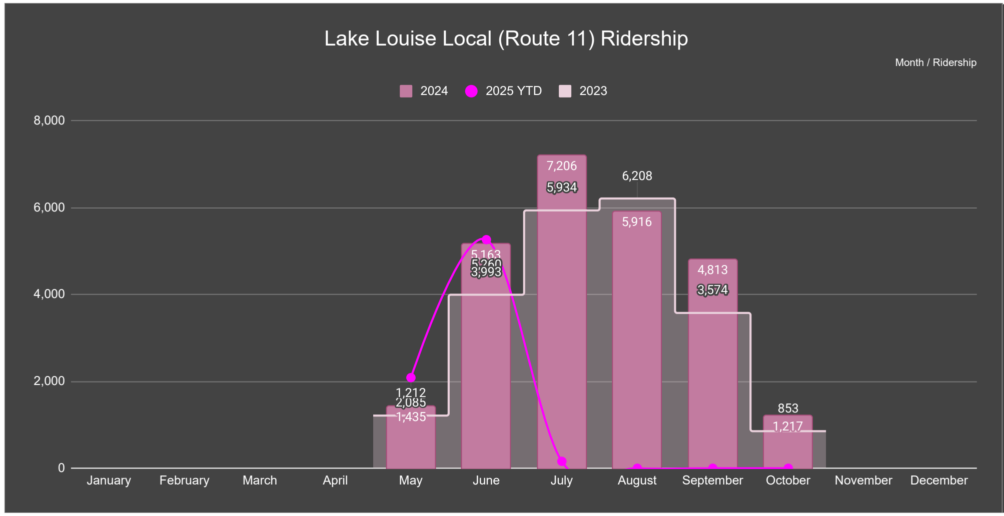
Scenic Banff - Lake Louise Regional (Route 8S) Ridership Comparison
Month / Ridership

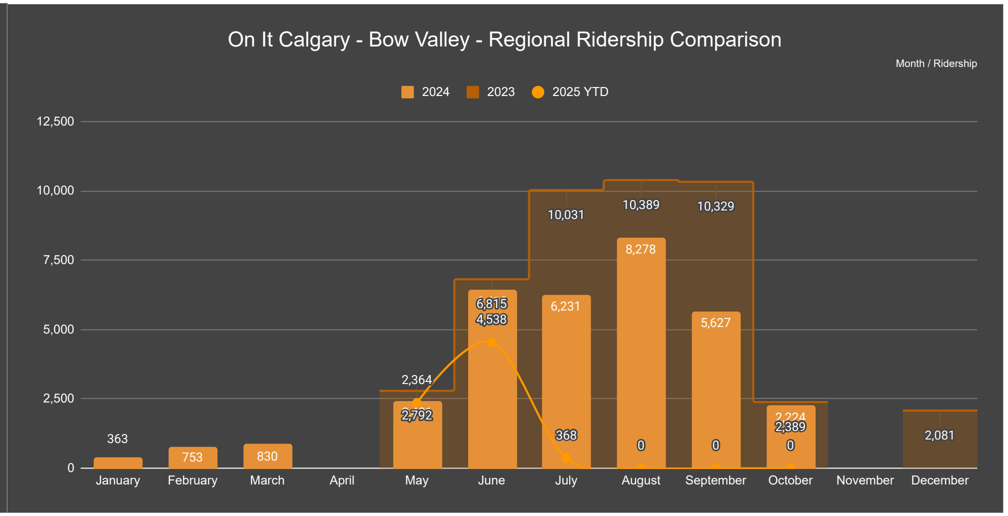


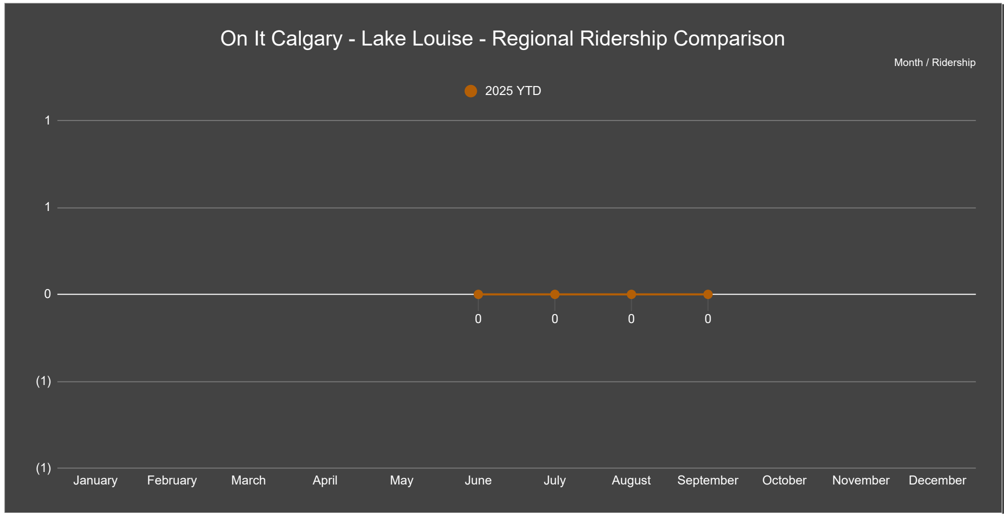
Minnewanka (Route 6) Ridership Comparison
Month / Ridership
2024
2023
2025 YTD

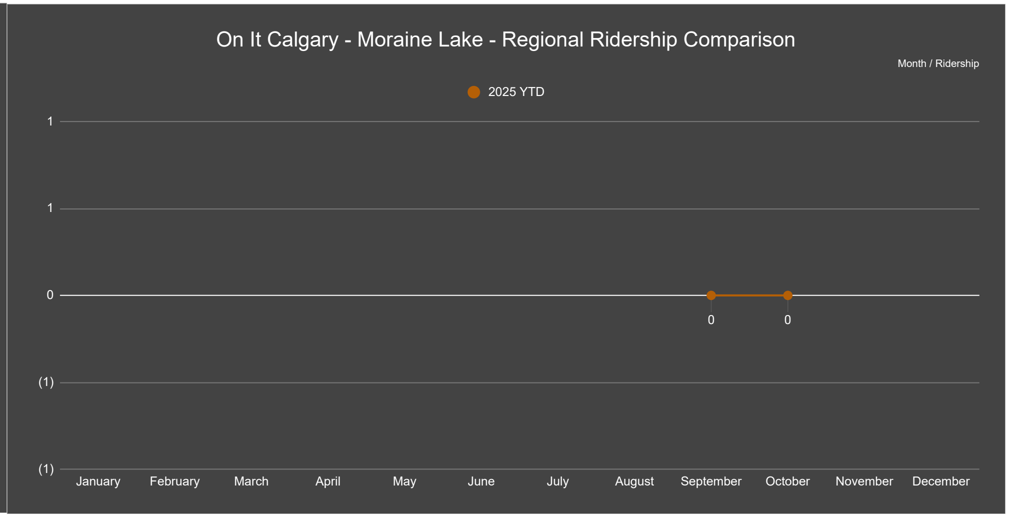


Johnston Canyon Regional (Route 9) Ridership Comparison
Month / Ridership
2024
2023
2025 YTD


Lake Louise Local (Route 11) Ridership
Month / Ridership
2024
2025 YTD
2023
January February March April May June July August September October November December


On It Calgary - Bow Valley - Regional Ridership Comparison
Month / Ridership
2024
2023
2025 YTD
January February March April May June July August September October November December


On It Calgary - Lake Louise - Regional Ridership Comparison
Month / Ridership
2025 YTD
January February March April May June July August September October November December


On It Calgary - Moraine Lake - Regional Ridership Comparison
Month / Ridership
2025 YTD
January February March April May June July August September October November December

Bow Valley Regional Transit Services Commission

NEW BUSINESS

Bow Valley Regional Transit Services Commission

CUTRIC

Canadian Urban Transit Research & Innovation Consortium

Alberta Municipalities Transit Fleet Electrification Planning Project

Attachments:

a) **Infographic**
b) **Executive Summary**
c) **Summary Report (not Roam specific)**

Presentation of Roam Specific Report by CUTRIC:

Ryan Welfle, IP Development Lead
Bernard Ross, ZEB Simulation Modeler
Alexis Dunphy, Project Manager, Sustainable Transit Initiatives

1. ABOUT THE PROJECT

About FortisAlberta

FortisAlberta, a subsidiary of Fortis Inc., is a leading provider of natural gas and electricity services in Alberta, Canada. With a strong commitment to safety, reliability and sustainability, FortisAlberta plays a crucial role in the province's energy infrastructure, serving over 60 per cent of Albera's total electricity distribution network translating to almost 600,000 customers.

About The Ontario Society for Professional Engineers (OSPE)

The Ontario Society for Professional Engineers (OSPE) is a professional regulatory body representing and governing the engineering profession in Ontario, Canada. Established to protect the public interest, OSPE is responsible for licensing engineers, ensuring it meet the highest standards of competence and ethics and promoting the profession's advancement.

About Cutric

The Canadian Urban Transit Research and Innovation Consortium (CUTRIC) is Canada's non-profit leader in technological and financial innovation for transit with expertise in decarbonized and electric transit buses. CUTRIC supports the commercialization of technologies through industry-led collaborative research, development, demonstration and integration (RDD&I) projects.

About the ZETF

Launched in 2020 for capital funding and in 2021 for feasibility programming, the Zero Emission Transit Fund (ZETF) contains $2.4 billion (downgraded from $2.75 billion in the 2024 federal budget) for Canadian transit agencies seeking to decarbonize immediately. The ZETF program is the most viable option for ZEB funding support for public transit agencies in Canada today.

ALBERTA MUNICIPALITIES

In collaboration with **FortisAlberta** and the **Ontario Society of Professional Engineers (OSPE)**, the **Canadian Urban Transit Research and Innovation Consortium (CUTRIC)** led a transit fleet electrification planning study for nine agencies in Alberta.

The following agencies are involved in the feasibility study:

2. FACILITY ANALYSIS

SCENARIO ONE
(full FCEB solution)

Charging peak power demand with Scenario One (full BEB solution) by facility and heater type

Agency	Heater Type One (Electric)	Heater Type Two (Diesel)
Airdrie	550	550
Fort Saskatchewan	120	450
Hinton	180	450
Leduc	450	450
Roam	1,700	1,400
Spruce Grove	550	550
Strathcona County	2,000	1,900
Whitecourt	180	180

SCENARIO TWO
(full FCEB solution)

Scenario Two (full FCEB solution) by facility by duty cycle

Agency	Heater Type One (Electric)	Heater Type Two (Diesel)
Airdrie	550	550
Fort Saskatchewan	120	450
Hinton	180	450
Leduc	450	450
Roam	1,700	1,400
Spruce Grove	550	550
Strathcona County	2,000	1,900
Whitecourt	180	180

SCENARIO THREE
(mixed green fleet solution)

Scenario Three (mixed green fleet solution)

Agency	Heater Type	Peak electrification power demand (kW)	Annual average hydrogen demand (kg)
Strathcona County	One (Electric)	1,090	172,818
	Two (Diesel)	1,090	163,490

3. OUTCOMES

This study conducted a comprehensive analysis of the feasibility of transitioning to a zero emissions bus fleet for eight transit agencies in Alberta, Canada. The study evaluated two primary ZEB technologies: battery electric buses (BEBs) and fuel cell electric buses (FCEBs), across three decarbonization scenarios involving full fleet transitions and mixed fleet deployments. The analysis encompassed multiple dimensions, including global warming potential (GWP), energy consumption, infrastructure requirements and economic considerations.

3.1 Agency summaries

The results for each agency are summarized in this section. For full details, refer to the agency specific appendix. Rocky View County is not included as this county does not have public transit.

Airdrie Transit

	Base Case scenario	Scenario One (Full BEB solution) Heater Type One (electric)	Scenario One (Full BEB solution) Heater Type Two (diesel)	Scenario Two (Full FCEB solution)
Life cycle GHG emission reduction (Grid H2)	0%	47% reduction	49% reduction	16% increase
Fleet size in 2040	17	18	17	17
Infrastructure required	-	9 depot chargers	9 depot chargers	1 hydrogen station
Total fleet cost (Net Present Value, 2024$)	$34.0 million	$47.1 million	$46.7 million	$72.1 million

Roam Transit

	Base Case scenario	Scenario One (Full BEB solution) Heater Type One (electric)	Scenario One (Full BEB solution) Heater Type Two (diesel)	Scenario Two (Full FCEB solution)
Life cycle GHG emission reduction (Grid H2)	0%	47% reduction	45% reduction	16% increase
Fleet size in 2040	16 40-foot diesel 3 30-foot diesel 4 25-foot diesel 12 40-foot BEBs	38 BEB 4 (550+ kWh, 40-foot)	33 BEB 4 (550+ kWh, 40-foot)	33 FCEB 1 (35+ kg, 40-foot)
Infrastructure required	4 depot chargers	19 depot chargers 4 on-route chargers	17 depot chargers 3 on-route chargers	2 hydrogen stations 3 hydrogen pumps
Total fleet cost (Net Present Value, 2024$)	$66.3 million	$96.6 million	$84.8 million	$115.0 million

Fort Sask Transit

	Base Case scenario	Scenario One (Full BEB solution) Heater Type One (electric)	Scenario One (Full BEB solution) Heater Type Two (diesel)	Scenario Two (Full FCEB solution)
Life cycle GHG emission reduction (Grid H2)	0%	21% reduction	23% reduction	9% increase
Fleet size in 2040	3 30-foot diesel	5 BEB 3 (550+ kWh, 40-foot)	3 BEB 3 (550+ kWh, 40-foot)	3 FCEB 1 (35+ kg, 40-foot)
Infrastructure required	-	3 low-powered chargers	2 high-powered chargers	1 hydrogen station
Total fleet cost (Net Present Value, 2024$)	$2.7 million	$10.5 million	$7.4 million	$11.9 million

Spruce Grove Transit

	Base Case scenario	Scenario One (Full BEB solution) Heater Type One (electric)	Scenario One (Full BEB solution) Heater Type Two (diesel)	Scenario Two (Full FCEB solution)
Life cycle GHG emission reduction (Grid H2)	0%	47% reduction	49% reduction	16% increase
Fleet size in 2040	4 on-demand 6 diesel 40-foot	8 BEB 3 (50+ kWh, on-demand) 6 BEB 2 (500+ kWh, 40-foot)	6 BEB 3 (50+kWh, on-demand) 6 BEB 2 (500+ kWh, 40-foot)	6 BEB 3 (50+ kWh, on-demand) 6 FCEB (30+ kg, 40-foot)
Infrastructure required	-	7 depot chargers	6 depot chargers	1 hydrogen station 3 depot chargers
Total fleet cost (Net Present Value, 2024$)	$12.3 million	$20.5 million	$19.2 million	$26.0 million

Hinton Transit

	Base Case scenario	Scenario One (Full BEB solution) Heater Type One (electric)	Scenario One (Full BEB solution) Heater Type Two (diesel)	Scenario Two (Full FCEB solution)
Life cycle GHG emission reduction (Grid H2)	0%	21% reduction	39% reduction	30% increase
Fleet size in 2040	2 gasoline 30-foot 1 on-demand	3 BEB 3 (550+ kWh, 40-foot) 1 BEB 4 (50+ kWh, on-demand)	2 BEB 3 (550+ kWh, 40-foot) 1 BEB 4 (50+ kWh, on-demand)	2 FCEB 1 (30+ kg, 40-foot) 1 BEB 4 (50+ kWh, on-demand)
Infrastructure required	-	2 low-powered chargers	1 low-powered charger 1 high-powered charger	1 low-powered charger 1 hydrogen station
Total fleet cost (Net Present Value, 2024$)	$2.9 million	$6.9 million	$6.5 million	$10.3 million

Strathcona Transit

	Base Case scenario	Scenario One (Full BEB solution) Heater Type Two (diesel)	Scenario Two (Full FCEB solution)	Scenario Three (mixed green fleet solution) Heater Type Two (diesel)
Life cycle GHG emission reduction (Grid H2)	0%	41% reduction	1.4% increase	17% reduction
Fleet size in 2040	86	106	100	100
Infrastructure required	-	53 depot chargers 2 on-route chargers	15 depot chargers 1 hydrogen depot station 1 hydrogen on-route	37 depot chargers 1 hydrogen depot station 1 hydrogen on-route
Total fleet cost (Net Present Value, 2024$)	$135 million	$198 million	$290 million	$212 million

Leduc Transit

	Base Case scenario	Scenario One (Full BEB solution) Heater Type One (electric)	Scenario One (Full BEB solution) Heater Type Two (diesel)	Scenario Two (Full FCEB solution)
Life cycle GHG emission reduction (Grid H2)	0%	21% reduction	25% reduction	9% increase
Fleet size in 2044	10	12	11	10
Infrastructure required	-	6 depot chargers	6 depot chargers	2 depot chargers 1 hydrogen station
Total fleet cost (Net Present Value, 2024$)	$13.7 million	$19.8 million	$19.5 million	$25.2 million

Whitecourt Transit

	Base Case scenario	Scenario One (Full BEB solution) Heater Type One (electric)	Scenario One (Full BEB solution) Heater Type Two (diesel)	Scenario Two (Full FCEB solution)
Life cycle GHG emission reduction (Grid H2)	0%	26% reduction	30% reduction	41% increase
Fleet size in 2040	3 30-foot diesel	4 BEB 4 (400+ kWh, 40-foot)	4 BEB 4 (400+ kWh, 40-foot)	3 FCEB 1 (35+ kg, 40-foot)
Infrastructure required	-	2 depot chargers	2 depot chargers	1 hydrogen station
Total fleet cost (Net Present Value, 2024$)	$2.5 million	$10.3 million	$10.3 million	$13.1 million

ALBERTA MUNICIPALITIES

TRANSIT FLEET ELECTRIFICATION PLANNING PROJECT

2025

EXECUTIVE SUMMARY

TRANSITIONING TO A ZERO EMISSIONS BUS FLEET

CUTRIC · CRITUC

Alberta Municipalities Transit Fleet Electrification Planning Project

Executive Summary Report

April 25, 2025

Prepared for: FortisAlberta Inc., Ontario Society of Professional Engineers

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Dr. Josipa Petrunić, President & CEO

Canadian Urban Transit Research and Innovation Consortium (CUTRIC)

Consortium de recherche et d'innovation en transport urbain au Canada (CRITUC)

Acknowledgment of Contributions

CUTRIC, FortisAlberta, Ontario Society of Professional Engineers (OSPE) and all the participating municipalities extends their sincere gratitude to the Canadian Government and Housing, Infrastructure and Communities Canada (HICC) for their invaluable contributions to *Alberta Municipalities Transit Fleet Electrification Planning Project* through the *Zero Emission Transit Fund*. This partnership demonstrates a shared commitment to advancing sustainable transportation solutions that support municipalities across Canada in achieving their environmental and operational goals.

The financial support provided through the *Zero Emission Transit Fund* has been instrumental in enabling FortisAlberta and participating municipalities to explore and implement innovative technologies that contribute to the reduction of greenhouse gas emissions while fostering cleaner and more efficient transit systems. CUTRIC acknowledges the Canadian Government's leadership in prioritizing climate action and infrastructure development, which serves as a vital foundation for building a net zero future for communities nationwide.

CUTRIC looks forward to continuing collaborations with government agencies and municipalities to advance sustainable initiatives that strengthen Canada's transit systems and contribute to climate goals. Together, we can build a cleaner and greener future for all Canadians.

Housing, Infrastructure and Communities Canada

Logement, Infrastructures et Collectivités Canada

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List of figures

List of acronyms

BEB	Battery electric bus
CAPEX	Capital Expenditure
CCS	Carbon capture and storage
COP	Conference of the Parties
CUTRIC	Canadian Urban Transit Research and Innovation Consortium
FCEB	Fuel cell electric bus
GHG	Greenhouse gas
GreenTRIP	Green Transit Incentives Program
GWP	Global warming potential
HFC	Hydrogen fuel cell
HICC	Housing, Infrastructure and Communities Canada
kV	Kilovolts
kVA	Kilovolt-amperes
kW	Kilowatt
kWh	Kilowatt-hour
LCA	Life cycle analysis
NPV	Net Present Value
OSPE	Ontario Society of Professional Engineers
RDD&I	Research, development, demonstration and integration
SOC	State of Charge
SMR	Steam methane reformation
TCO	Total Cost of Ownership
ZEB	Zero emissions bus
ZETF	Zero Emissions Transit Fund

Glossary

Blocks: A series of trips that are connected and assigned to a single vehicle.

Cash flow: The movement of money into and out of a business' accounts over a specific period. It represents the cash generated or consumed by a company's operations and investments.

Charging strategies: Methods for managing battery electric buses (BEBs).

- **Charging Strategy One (depot-only charging):** The vehicles are expected to pull out of their depots and start their service with a fully charged battery.
- **Charging Strategy Two (depot with on-route charging):** Also known as "opportunity charging." The vehicles are charged in the depot and start their service with fully charged batteries. To sustain an adequate state-of-charge (SOC) while in service on the route, they are charged for five minutes at high power after each trip between two terminal stops when the charging equipment is available.

Depot charging: The act of BEBs replenishing their batteries with electrical energy supplied by the transit facility, i.e., its garage. All BEBs are assumed to use depot charging to some extent.

Depot-only charging: The charging strategy in which BEBs only recharge their batteries when inside their garage.

Environmental Life Cycle Analysis (LCA): Emission Life Cycle Analysis of all assets and fuel and/or energy used in operations GHG^{+PLUS} module. It includes fuel production, operations, infrastructure, maintenance and repair.

Economic analysis: Analysis method used to evaluate the financial implications of an investment. It assesses the costs, benefits, risks and potential returns associated with the electrification project.

Net Present Value (NPV): A metric used to evaluate the profitability of an investment or project. It represents the difference between the present value of cash inflows and outflows over a specific period. The concept behind NPV is that the value of money decreases over time due to factors such as inflation and the opportunity cost of using that money elsewhere. By discounting future cash flows to their present value, NPV considers the time value of money. A positive NPV indicates that the investment is expected to generate more cash inflows than under the Base Case scenario (diesel and gasoline), making it potentially profitable. Conversely, a negative NPV suggests that the investment is expected to generate incremental costs relative to the Base Case scenario. The year the costs discount to will be included in the reference.

On-route charging: The charging strategy in which BEBs charge while on-route. This charging mechanism is also called opportunity charging or fast charging.

Operational GHG emissions: Greenhouse gas (GHG) emissions analysis that captures the spectrum of polluting emissions across the life cycle of fuel and energy used in operations only.

Refuelling strategies: Methods for maintaining state of charge (SOC) and fuel tank level in FCEBs.

- **Refuelling Strategy One (depot-only refuelling):** The vehicles are expected to pull out of their depots and start their service with a fully charged battery and full fuel tank.
- **Refuelling Strategy Two (depot with refuelling):** The vehicles are refuelled in the depot and start their service with full tanks and charged batteries. To sustain an adequate SOC while in service on the route, it is refuelled at either a smaller on-route hydrogen refuelling station or return to the depot mid-service.

Residual value: Residual or salvage value of an asset at the end of the analysis period.

Scenario One (full BEB solution): In this scenario, the study assumes only battery electrified buses are used to achieve decarbonization with two charging strategies analyzed.

Scenario Two (full FCEB solution): In this scenario, the study assumes only hydrogen-fuelled electrified buses (FCEBs) are used to achieve decarbonization.

Scenario Three (mixed green fleet solution): In this scenario, the study aims for an optimized combination of BEBs and FCEBs, reducing as much as possible the number of on-route chargers and charging episodes for BEBs and the total number of buses for full-fleet decarbonization.

Total Cost of Ownership (TCO): The cost of purchasing and operating the vehicle and associated charging and/or refuelling infrastructure over its entire lifespan, excluding labour costs.

Executive Summary

On December 12, 2015, the United Nations Climate Change Conference (COP21) in Paris, France declared the adoption of what is known today as *The Paris Agreement*, a legally binding international treaty on climate change [1]. This *Agreement* was adopted by 196 parties including Canada and entered into force on November 4, 2016.

The overarching goal of *The Paris Agreement* is "to hold the increase in the global average temperature to well below 2°C above pre-industrial levels" and "to limit the temperature increase to 1.5°C above pre-industrial levels" [1]. In recent years, including at the 28th Conference of the Parties (COP28) Conference held in Dubai, United Arab Emirates in December 2023, world leaders underscored the need to limit global warming even more aggressively to 1.5°C by the end of the century. This updated goal is due to the raging consequences of climate change already evidenced worldwide by rising sea levels, increasing ocean acidity and uncontrolled long burning wildfires as exemplified by Canada's own abnormally extensive wildfire seasons from 2020 onwards.

To limit global warming to 1.5°C, greenhouse gas (GHG) emissions must peak by 2025 at the latest and decline by 43 per cent by 2030 [1]. These goals resulted in the Government of Canada's suite of climate action and decarbonization funding initiatives, including the Zero Emission Transit Fund (ZETF). These targets and global efforts have resulted in Canadian cities declaring "climate emergencies" and initiating efforts to radically reduce their own emissions.

To help cities and towns achieve fleet-based emissions reductions, the Government of Canada is investing $2.4 billion[1] (downgraded from $2.75 billion (2024$) in the 2024 federal budget) in funding for upgrades to transition existing public transit systems to zero emissions over the next decade. This includes $10 million (2020$) for topographic data and technical specifications of vehicles and charging infrastructure [2, 3].

Within this funding envelope, Ontario Society of Professional Engineers (OSPE), FortisAlberta and nine Alberta municipalities that partnered with Canadian Urban Transit Research and Innovation Consortium (CUTRIC) to create the *Alberta Municipalities Transit Fleet Electrification Planning Study*. This study leverages the Zero Emission Transit Fund (ZETF) to gain insights into the future of transit electrification in Alberta. The study

[1] All financials are in Canadian funds, unless otherwise noted.

assesses the economic, technological and environmental benefits, risks and constraints associated with facilitating transit fleet decarbonization. The nine municipalities are:

Figure 1. Transit agencies and municipalities involved in the study

While Rocky View County is proactively planning for future transit development, the county does not currently operate a public transit system. Therefore, this study excludes the county from the detailed analysis of existing transit systems.

With today's technology and market options, transit fleet decarbonization can be achieved through three different scenarios:

1. Scenario One represents a transition of the fleet to battery electric buses (BEBs) – full BEB solution.
2. Scenario Two represents a transition of the fleet to hydrogen fuel cell electric buses (FCEB) – full FCEB solution.
3. Scenario Three is a solution with a mixed green fleet of BEBs and FCEBs – mixed green fleet solution.

Since there are no FCEBs available in the Canadian marketplace for smaller bus sizes (20- to 28-feet) used for on-demand service, this study focuses on BEBs to decarbonize any on-demand service fleets, irrespective of the scenario selected.

The study report includes the following sections:

Section One introduces the partners in this study including FortisAlberta and transit agencies. This section also presents an overview of CUTRIC, the non-profit preferred vendor of the Government of Canada's ZETF feasibility and analysis program. The climate action commitments of each transit agency are outlined in this section showing the commitment of towns and cities in Alberta.

Section Two presents climate change policies at a federal, provincial and utility level. This section details the *ZETF* funding program which helps fund this study. This section discusses extensive climate action initiatives implemented by the federal government including the Canada Infrastructure Bank's and *Zero Emission Transit Fund*'s funding and financing programs, alongside other legislative and international commitments, to support public transit agencies in reducing greenhouse gas emissions and achieving net zero goals by 2050. The United States funding programs and regulatory policies, are discussed such as the *Inflation Reduction Act* and *Corporate Average Fuel Economy* (CAFE) standards, have significantly influenced the Canadian ZEB landscape by driving unprecedented demand for zero emissions buses, allied infrastructure and components, but recent program scale-backs, tariffs and supply chain constraints have created uncertainties for both manufacturing capabilities and market stability.

Section Three includes a detailed literature scan of ZEB technologies assessed in this report and their associated charging or refuelling technologies. Municipalities can significantly reduce greenhouse gas emissions by adopting zero emissions buses (ZEBs), which include battery electric buses (BEBs) and hydrogen fuel cell electric buses (FCEBs). While BEBs and their charging technologies are increasingly feasible, challenges such as battery sizing, charging strategies and infrastructure requirements must be addressed to optimize efficiency, reduce costs and ensure reliable service delivery. Fuel cell electric buses (FCEBs) offer operational efficiencies, including shorter refuelling times and a steady state of charge during operations, making them an effective alternative to BEBs and diesel buses in certain applications. Challenges such as hydrogen production methods, infrastructure costs and energy system inefficiencies compared to BEBs and diesel buses must be considered in the context of long-term transit decarbonization goals.

Section Four presents an overview of the methodologies informing *Alberta Municipalities Transit Fleet Electrification Planning Study*. It discusses the methodologies that inform CUTRIC's RoutΣ.i™3.0 simulation tool used throughout this study. This section presents the assumptions used for the geographic information system (GIS) modelling and energy analysis portions of this analysis. The methodology establishes a framework integrating duty-cycles, vehicle configurations, decarbonization scenarios, charging and refuelling strategies to evaluate energy consumption and performance. These findings inform the subsequent energy analysis, which examines efficiency and operational impacts across varying configurations and strategies.

Section Five summarizes the findings of the energy modelling for the transit agencies' service. The energy modelling presents three decarbonization scenarios.

Scenario One (full BEB solution)

This scenario assumes only BEBs are used to achieve decarbonization. This scenario analyzes two charging strategies: "Charging Strategy One: depot only charging solution" and "Charging Strategy Two: depot with on-route charging." In Charging Strategy Two (depot with on-route charging), on-route charging ensures the bus can complete its daily duties while maintaining necessary energy levels.

Scenario Two (full FCEB solution)

This scenario assumes FCEBs are used to achieve decarbonization while allowing BEBs to cover on-demand service portion. It assumes FCEBs can be fuelled with production types of hydrogen, as defined below:

1. Steam Methane Reformation (SMR)
2. Steam Methane Reformation with carbon capture and storage (SMR with CCS)
3. Electrolytic hydrogen using electricity from the grid
4. Electrolytic hydrogen using electricity from renewable sources

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Scenario Three (mixed green fleet solution)

This scenario aims for an optimized combination of BEBs and FCEBs, reducing the number of on-route chargers and charging episodes for BEBs and the total number of buses for full-fleet decarbonization.

Section Six outlines the proposed rollout plans for the Base Case scenario (fossil fuelled buses) and the three decarbonization scenarios.

In the Base Case scenario, the fleet does not significantly grow over time. Buses would be replaced at the end of their life cycle with new buses.

Scenario One (full BEB solution) envisions the replacement of fossil fuelled buses with BEB alternatives. In some applications, there is an increase in fleet size due to the BEB replacement ratio associated with block-splitting. This increase is more pronounced with BEBs equipped with Heater Type One (electric) compared to BEBs equipped with Heater Type Two (diesel).

Scenario Two (full FCEB solution) envisions the replacement of fossil fuelled buses with FCEB alternatives at the end of their life cycle. For the on-demand service, 20-foot BEBs are used, as there are not comparably sized FCEBs available to model on the market. The entire fleet would be fully decarbonized by the retirement of the last fossil fuelled vehicle

Scenario Three (mixed green fleet solution) envisions the replacement of fossil fuelled buses with BEB and FCEB alternatives at the end of their life cycle. Battery electric buses (BEBs) are deployed on on-demand service and fixed service blocks that need neither on-route charging nor block splitting. Fuel cell electric buses (FCEBs) are assumed to handle the remaining blocks, using mid-block refuelling as required. Heater Type Two (diesel) slightly increases the ratio of BEBs to FCEBs compared to Heater Type One. However, the replacement ratio remains 1:1 in both cases as blocks unsuccessful with BEBs are completed by FCEBs.

The fleet timelines and electrification processes in this section help transit agencies align their rollout plans with operational needs and decarbonization goals for a smooth transition to ZEBs. The subsequent life cycle analysis evaluates the environmental impact, offering insights into the long-term benefits of fleet electrification.

Section Seven evaluates the global warming life cycle analysis (LCA) to determine GHG reductions for the three decarbonization scenarios compared to the Base Case (fossil fuelled fleet).

Across small, medium and large cities, the transition from traditional gasoline or diesel buses to BEB and FCEB technologies offers significant potential for reducing global warming potential. Battery electric buses (BEBs) consistently demonstrate substantial emission reductions, making them a viable initial step for all city sizes. Fuel cell electric buses (FCEBs) emissions reductions are highly dependent on the source of hydrogen. Clean hydrogen production, ideally from renewable sources like wind, is crucial for realizing the full potential of FCEBs. Grid-sourced hydrogen may increase emissions compared to traditional fuels. Alberta's electricity grid is predominantly powered by emissions heavy sources resulting in high carbon intensity at 470 grams of CO_2e per kilowatt-hour (g CO_2e/kWh) compared to Manitoba's 1.3 g CO_2e/kWh [4].

Scenario Three (mixed green fleet solution) can provide flexibility, particularly for larger cities, but the overall environmental impact remains tied to clean hydrogen availability.

Section Eight outlines the facility analysis. The facility analysis assessed existing transit facilities to determine if they can support a fleet-wide transition to BEBs and FCEBs. The study concludes with considerations for necessary upgrades to support ZEBs in the three decarbonization scenarios. Current infrastructure, powered by FortisAlberta, is analyzed to understand the capacity and additional demands for bus charging under the three decarbonization scenarios. Each decarbonization scenario outlines the additional power required for charging and the necessary upgrades to ensure adequate power supply and capacity. The findings of this gap analysis identify where further consultation with FortisAlberta to inform potential infrastructure upgrades may be necessary to support the planned decarbonization.

In Scenario One (full BEB solution), total power demand for charging BEBs with Heater Type One (electric) is projected to be 9.33 MW. For BEBs with Heater Type Two (diesel), the total power demand for charging is 8.18 MW.

In Scenario Two (full FCEB solution), annual hydrogen fuel consumption is estimated to be 530.6 tonnes.

In Scenario Three (mixed green fleet solution) – the most suitable for Strathcona given its fleet size and operational needs -- the impact of different heater types on the mixed fleet composition is material. Heater Type Two (diesel) in BEBs can improve their range and reduce the need for on-route charging, potentially increasing the proportion of BEBs in the mix. Scenario Three (applicable to Strathcona) demands 0.85 MW of power and approximately 25 tonnes of hydrogen fuel annually.

These results are summarized in Figure 2.

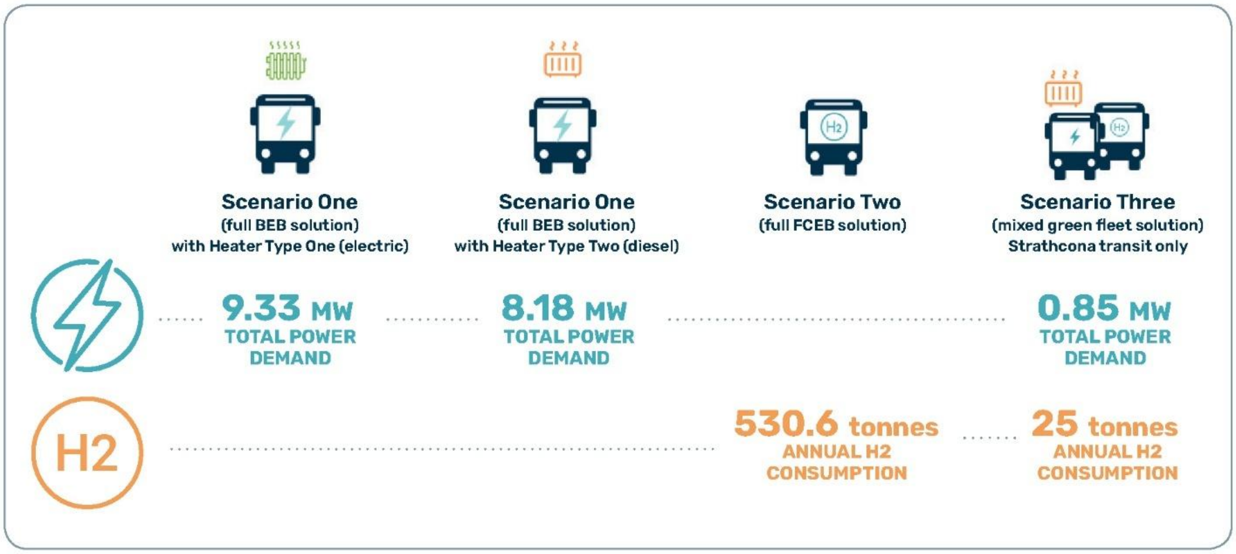

Figure 2. Power demand and hydrogen consumption summary

Section Nine provides an economic analysis of the total costs for full fleet conversion, comparing the Base Case (fossil fuelled fleet) with the three decarbonization scenarios over a 17-year period (2024 to 2041).

Scenario One (full BEB solution) generally has a lower total project cost than Scenario Two but is still 25 per cent to 70 per cent more expensive than the Base Case. Scenario Three (mixed green fleet solution), applicable only to Strathcona in this study, shows a slightly lower total project cost, approximately one per cent less, than Scenario One.

Scenario Two (full FCEB solution) consistently has the highest total project cost with costs ranging from 40 per cent to 120 per cent higher than the Base Case, due to the significant upfront investment in the buses themselves and the hydrogen fuel costs.

The economic analysis outcomes underscore the importance of strategic decision-making in managing bus fleets to optimize costs while considering the specific conditions and requirements of each location. Should an agency pursue a detailed fleet feasibility analysis, CUTRIC provides comprehensive decision-making analysis to guide these strategic decisions, taking into consideration main objectives such as maximizing emission reduction, maximizing cost-effectiveness, maximizing ease of transition and maximizing future readiness.

Summary

The *Alberta Municipalities Transit Fleet Electrification Planning Study* presented in the report results in several key conclusions as a guide to fleet decarbonization for the Ontario Society of Professional Engineers (OSPE), FortisAlberta and nine Alberta municipalities that partnered with CUTRIC.

Energy analysis

The energy analysis examines infrastructure requirements for charging and refuelling, along with energy consumption patterns across three decarbonization scenarios. It stresses the significance of refining charging and refuelling approaches to limit expenses and mitigate grid strain. The study also reveals how factors like heater type and duty cycle can significantly impact energy consumption rates for ZEBs, offering practical guidance for improving fleet operations and strategy.

Global warming life cycle analysis

The analysis of global warming potential identified notable differences among the three decarbonization scenarios. Scenario One (full BEB solution) consistently achieves significant reductions in GHG emissions when compared to the Base Case relying on diesel or gasoline buses. Scenario Two (full FCEB solution) demonstrates the possibility for even greater reductions, although its environmental advantages depend heavily on the hydrogen source. Renewable hydrogen, such as that generated by wind power, provides the most substantial emission reductions, whereas grid-sourced hydrogen posed a risk of producing higher emissions than the Base Case. The findings highlighted the critical role of clean hydrogen production in maximizing the benefits of FCEBs. Scenario Three (mixed green fleet solution) allows for operational flexibility, reaffirming the necessity of prioritizing clean hydrogen sources.

Facilities assessment

The facility evaluation examines current transit infrastructure to assess its ability to accommodate a complete transition to ZEBs. The research pinpoints necessary upgrades and emphasized the importance of collaborating with energy providers to secure sufficient power supply and capacity for ZEB functionality.

References

[1] *The Paris Agreement,* The United Nations Framework Convention on Climate Change, 2015.

[2] (2022). *Zero Emissions Transit Fund*. Available: https://www.infrastructure.gc.ca/zero-emissions-trans-zero-emissions/index-eng.html

[3] Government of Canada. (2022, February 15, 2024). *Clean Fuel Standard: proposed regulatory approach*. Available: https://www.canada.ca/en/environment-climate-change/services/managing-pollution/energy-production/fuel-regulations/clean-fuel-regulations/regulatory-approach.html

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Acknowledgment of Contributions

CUTRIC and Saskatoon Transit extends its sincere gratitude to the Canadian Government and Housing, Infrastructure and Communities Canada for their invaluable contributions to Saskatoon Transit Full-Fleet Zero Emissions Bus Implementation Plan through the Zero Emission Transit Fund. This partnership demonstrates a shared commitment to advancing sustainable transportation solutions that support municipalities across Canada in achieving their environmental and operational goals.

The financial support provided through the Zero Emission Transit Fund has been instrumental in enabling Saskatoon Transit to explore and implement innovative technologies that contribute to the reduction of greenhouse gas emissions while fostering cleaner and more efficient transit systems. CUTRIC acknowledges the Canadian Government's leadership in prioritizing climate action and infrastructure development, which serves as a vital foundation for building a net zero future for communities nationwide.

CUTRIC looks forward to continuing collaborations with government agencies and municipalities to advance sustainable initiatives that strengthen Canada's transit systems and contribute to climate goals. Together, we can build a cleaner and greener future for all Canadians.

Housing, Infrastructure and Communities Canada | Logement, Infrastructures et Collectivités Canada

Government of Canada | Gouvernement du Canada

Canada

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1 INTRODUCTION

1.1 About FortisAlberta

FortisAlberta, a subsidiary of Fortis Inc., is a leading electrical distribution company in Alberta, Canada. With a strong commitment to safety, reliability and sustainability, FortisAlberta plays a crucial role in the province's energy infrastructure, serving over 60 per cent of Albera's total electricity distribution network translating to almost 600,000 customers [1]. It is dedicated to delivering energy solutions that meet the evolving needs of its customers while also contributing to the economic and environmental well-being of Alberta [1].

1.2 About The Ontario Society for Professional Engineers (OSPE)

The Ontario Society for Professional Engineers (OSPE) is a professional regulatory body representing and governing the engineering profession in Ontario, Canada. Established to protect the public interest, OSPE is responsible for licensing engineers, ensuring it meet the highest standards of competence and ethics and promoting the profession's advancement. With a mandate to regulate engineering practice, OSPE sets the standards for engineering education, experience and examination, ensuring that only qualified professionals can practice engineering in Ontario [2].

1.3 About CUTRIC

The Canadian Urban Transit Research and Innovation Consortium (CUTRIC) is Canada's non-profit leader in technological and financial innovation for transit with expertise in decarbonized and electric transit buses. CUTRIC supports the commercialization of technologies through industry-led collaborative research, development, demonstration and integration (RDD&I) projects. CUTRIC brings innovative design to Canada's low-carbon smart mobility ecosystem, including zero and low emissions propulsion technologies, smart vehicles and smart infrastructure, big data for mobility analytics and cybersecurity to advance mobility applications.

As a member-owned, non-profit technology consortium, CUTRIC has supported dozens of Canadian transit agencies in preparing their systems for electrification. CUTRIC is proudly recognized as the Government of Canada's ZETF Fund National Planning Service, supporting public transit agencies in decarbonizing their fleets.

1.4 Alberta municipalities

In collaboration with FortisAlberta and the Ontario Society of Professional Engineers (OSPE), the Canadian Urban Transit Research and Innovation Consortium (CUTRIC) led a transit fleet electrification planning study for nine agencies in Alberta. This study will assess technical, economic and environmental considerations associated with the transition to a zero emissions fleet for the agencies involved.

The following agencies are involved in the feasibility study:

City of Airdrie – Community & Opportunity
City of Fort Saskatchewan
Hinton – Gateway to the Rockies
City of Leduc
Roam
Rocky View County
The City of Spruce Grove
Strathcona County
Whitecourt

1.5 About the ZETF

Launched in 2020 for capital funding and in 2021 for feasibility programming, the Zero Emission Transit Fund (ZETF) contains $2.4 billion (downgraded from $2.75 billion in the 2024 federal budget) for Canadian transit agencies seeking to decarbonize immediately. The ZETF program is the most viable option for ZEB funding support for public transit agencies in Canada today. The program runs to 2026 and offers support for electrifying transit fleets at 50 per cent cost recovery of eligible costs. This funding helps fulfill the Government of Canada's commitment to assist transit agencies in procuring and deploying 5,000 ZEBs over five years from the program launch date (i.e., 2021) and meeting the goals set out in the Emissions Reduction Plan (ERP).

The ZETF has two major funding streams:

Planning Projects ($10 million): Eligible projects include studies, modelling and feasibility analyses that support the development of future larger-scale capital projects. CUTRIC is the preferred non-profit vendor for consultation work in this program, which all public transit agencies in Canada qualify for.

Capital Projects ($2.4 billion): Eligible capital projects include buses, charging and refuelling infrastructure and other ancillary infrastructure needs. All public transit agencies in Canada qualify for this program once they have completed a feasibility and implementation planning study.

2 METHODOLOGY

2.1 Duty cycle

To accurately model bus energy usage and style of usage, three duty cycles (i.e., light, medium and heavy) are simulated in the modelling work.

Figure 1. Light-, medium- and heavy-duty cycles

2.2 Vehicle and operation configuration

This study examines 11 different ZEB vehicle configurations tailored to each transit agency, encompassing 10 BEB configurations and two FCEB configurations.

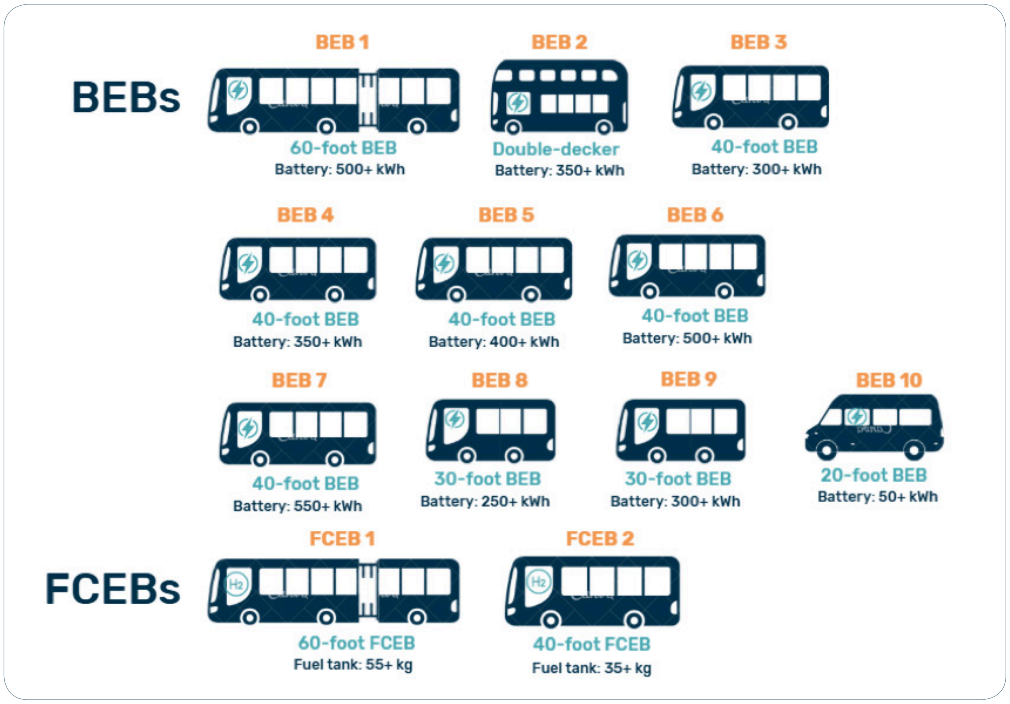

Figure 2. Bus types modelled

Battery Electric Bus Heater Types

Each BEB vehicle model is simulated twice, once using an electric heater referred to as Heater Type One (electric) and once using a diesel heater referred to as Heater Type Two (diesel). For transit agencies operating in colder environments, diesel heaters decrease the power draw on the battery and can increase the BEB's max range and improve success rates. Generally, FCEBs are not offered with diesel heaters because the heat from oxidizing the hydrogen fuel is captured and used in the cabin, reducing the power draw on the battery. Therefore, FCEBs are considered to have electric heating.

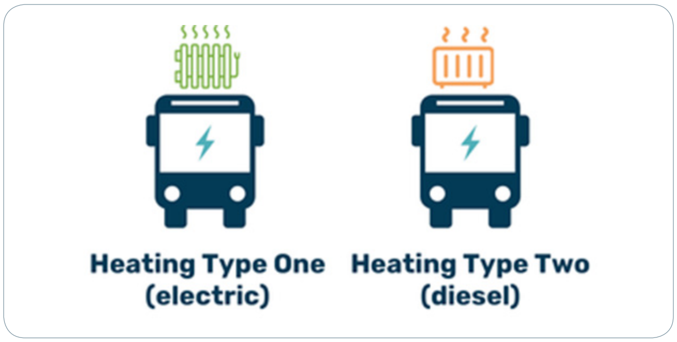

Figure 3. Bus types modelled

2.3 Decarbonization scenarios

With today's technology and market options, transit bus system decarbonization can be achieved through three different scenarios:

1. **Scenario One** presents a solution for transitioning the entire fleet to all battery electric buses (BEBs) – a "full BEB solution."
2. **Scenario Two** presents a solution for transitioning the entire fleet to all hydrogen fuel cell electric buses (FCEBs) – a "full FCEB solution."
3. **Scenario Three** presents a solution for transitioning the entire fleet to a mixed green fleet composed of BEBs and FCEBs – a "mixed green fleet solution."

Figure 4. Decarbonization scenarios

2.4 Charging strategies

Battery electric buses (BEBs) are simulated to operate using two different charging strategies.

Charging Strategy One (depot-only charging)

The vehicles start service with fully charged batteries and are only recharged upon completing their entire service and returning to the depot.

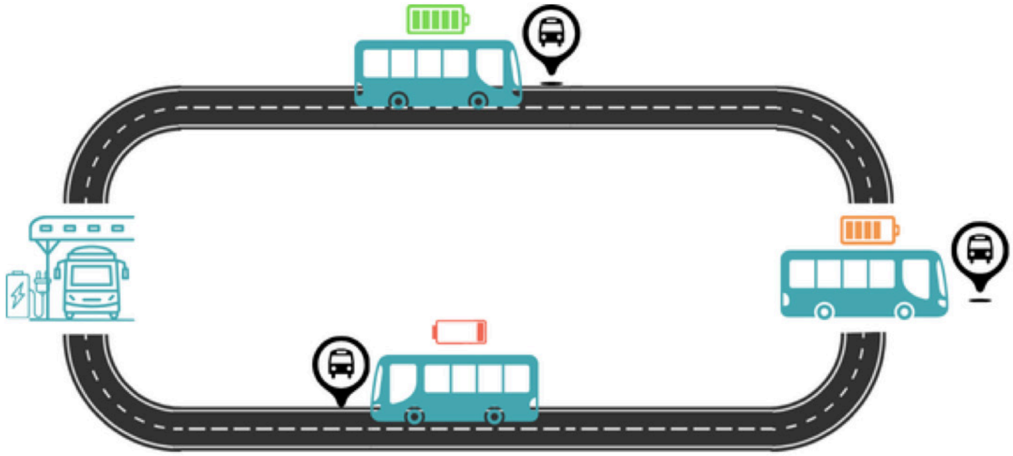

Figure 5. Charging Strategy One (depot-only charging)

Charging Strategy Two (depot with on-route charging)

Vehicles are expected to be charged in the depot and start their service with fully charged batteries and be charged for five minutes or more while completing their blocks.

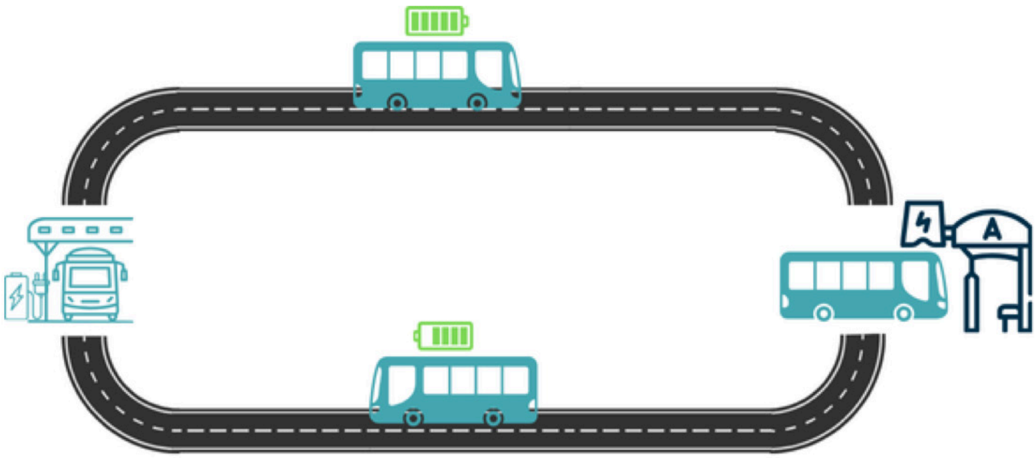

Figure 6. Charging Strategy Two (depot with on-route charging)

2.5 Refuelling strategies

Fuel cell electric buses (FCEBs) are simulated to operate using two different refuelling strategies.

Refuelling Strategy One (depot-only refuelling)

The vehicles start service with fully fuelled hydrogen tanks and are only refuel upon completing their entire service and returning to the depot.

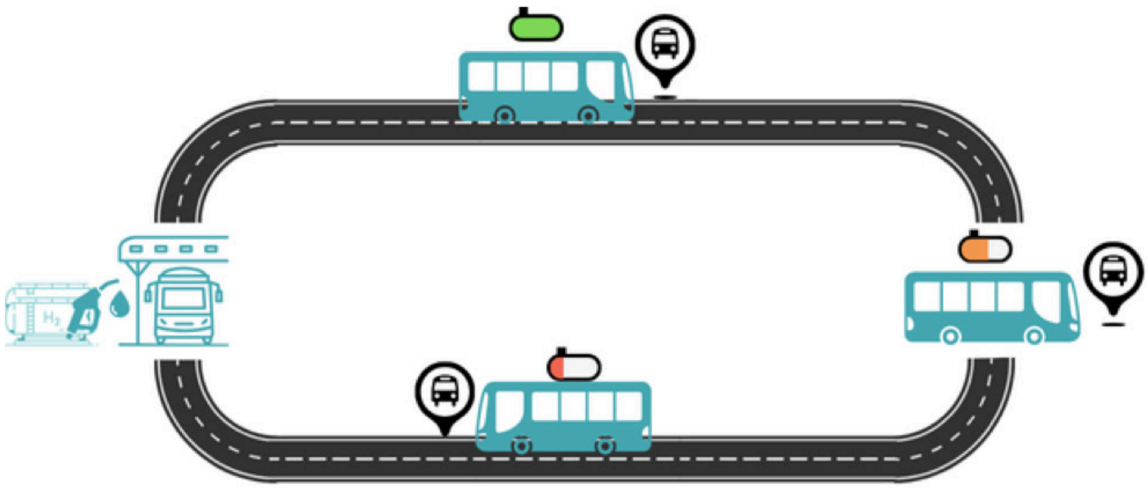

Figure 7. Refuelling Strategy One (depot-only refuelling)

Refuelling Strategy Two (depot with refuelling)

Vehicles are expected to be fuelled in the depot and start their service with fully fuelled tank and be refuelled while completing their blocks.

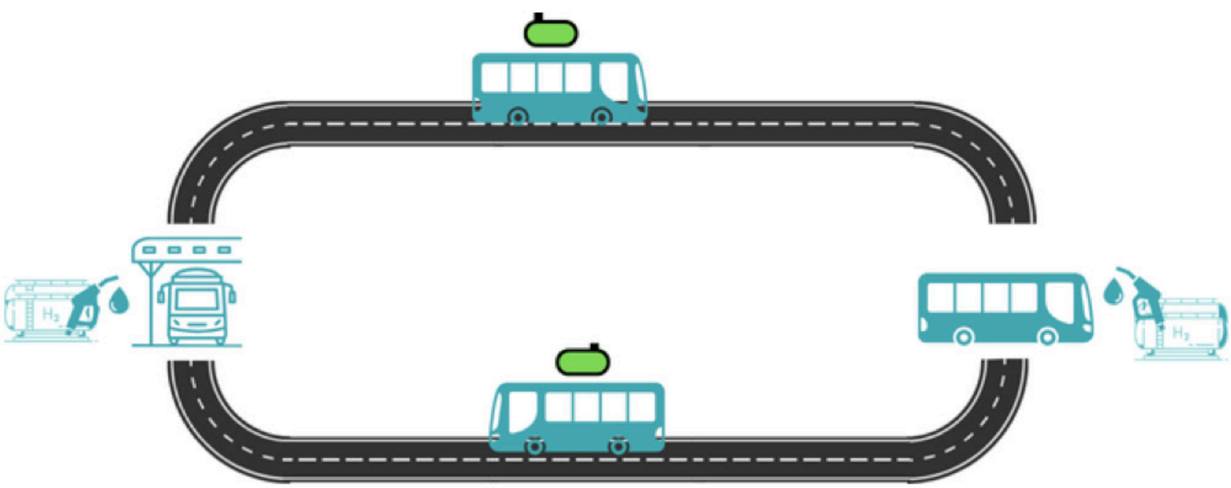

Figure 8. Refuelling Strategy Two (depot with refuelling)

3 ENERGY ANALYSIS

3.1 Energy consumption

The energy required per unit of distance, also known as the energy consumption rate, is a useful metric when determining the efficacy of a BEB on the blocks. When the consumption rate is very high, a vehicle with a larger battery capacity may underperform in range. This scenario occurs when a vehicle with a smaller battery capacity has significantly lower consumption rates.

Table 1. Battery electric bus (BEB) average energy consumption rates

HEAVY-DUTY ENERGY CONSUMPTION	One (Electric)	Two (Diesel)
BEB 1 (500+ kWh 60 foot)	1.75	1.43
BEB 2 (350+ kWh, double-decker)	2.04	1.75
BEB 3 (300+ kWh, 40 foot)	1.75	1.36
BEB 4 (350+ kWh, 40 foot)	2.05	1.65
BEB 5 (400+ kWh, 40 foot)	1.80	1.44
BEB 6 (500+ kWh, 40 foot)	1.85	1.53
BEB 7 (550+ kWh, 40 foot)	1.74	1.42
BEB 8 (250+ kWh, 30 foot)	2.00	1.62
BEB 9 (350+ kWh, 30 foot)	2.07	1.67
BEB 10 (50+ kWh, 20 foot)	0.58	0.36

For the FCEBs, the energy consumption rate is expressed as the amount of hydrogen required per unit of distance.

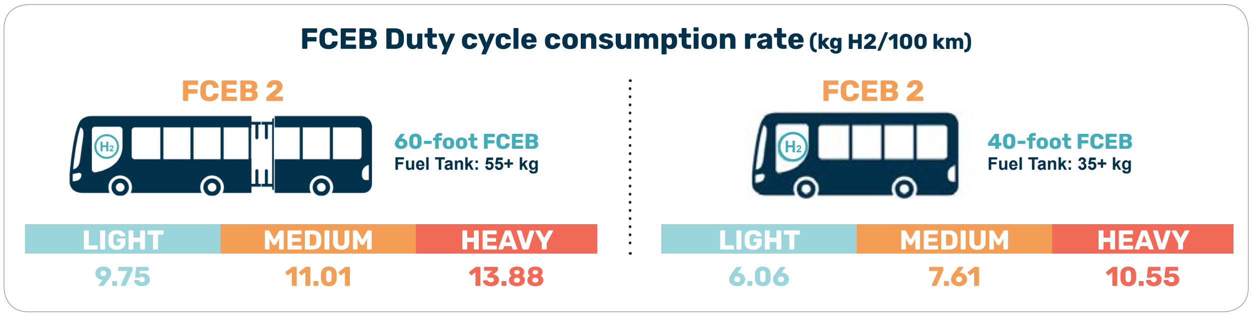

Figure 9. Fuel cell electric bus (FCEB) average hydrogen consumption rates

3.2 Charging/Refuelling Strategy One (depot-only)

3.2.1 Block success rates

The block success rates are defined as the percentage of the modelled blocks that can be successfully electrified on a one-to-one basis with a fossil fuelled bus. The criterion for determining whether a vehicle is unsuccessful is if the battery SOC drops below the 20 per cent mark at any point along the vehicle journey. For Charging Strategy One (depot-only charging), this drop means the battery capacity must be large enough to store all the energy required for a fully operational service day plus an additional 20 per cent buffer. For BEBs, the energy required by the bus to complete full blocks determines whether the bus can be successfully deployed on certain blocks with Charging Strategy One (depot-only charging).

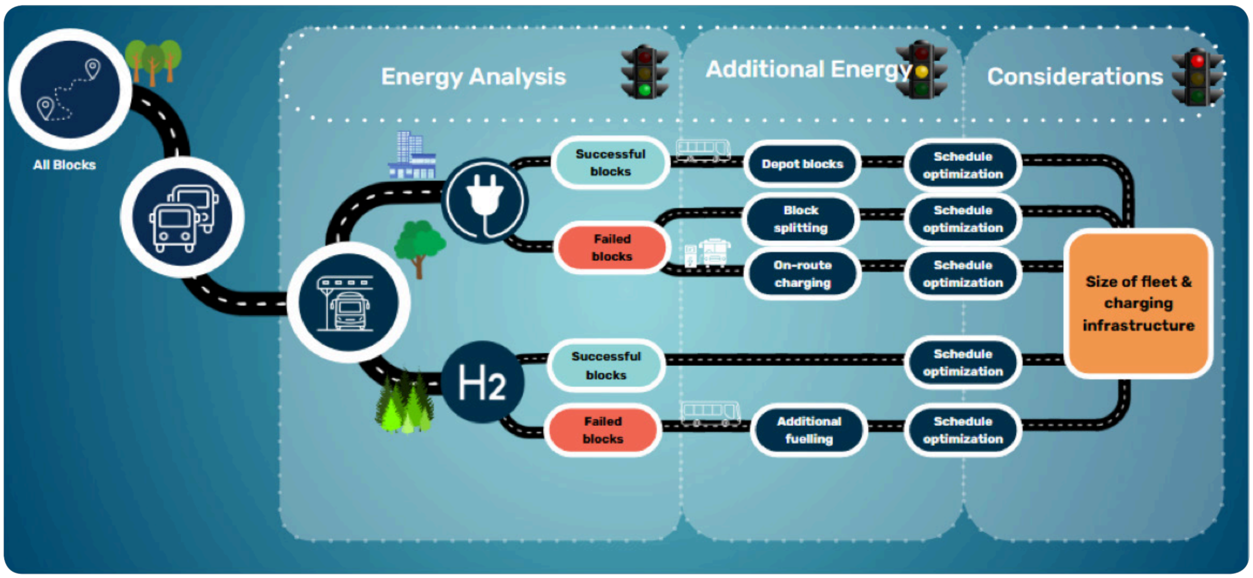

Figure 10. Block success methodology

3.3 Charging Strategy Two (depot with on route charging)

As an alternative to block splitting, Charging Strategy Two (depot with on route charging) uses strategically placed high-powered chargers to replenish the SOC of BEBs during their daily operations. Locations which could improve the success of BEBs on the routes are listed in **Figure 11** which shows the results for Heater Type Two (diesel).

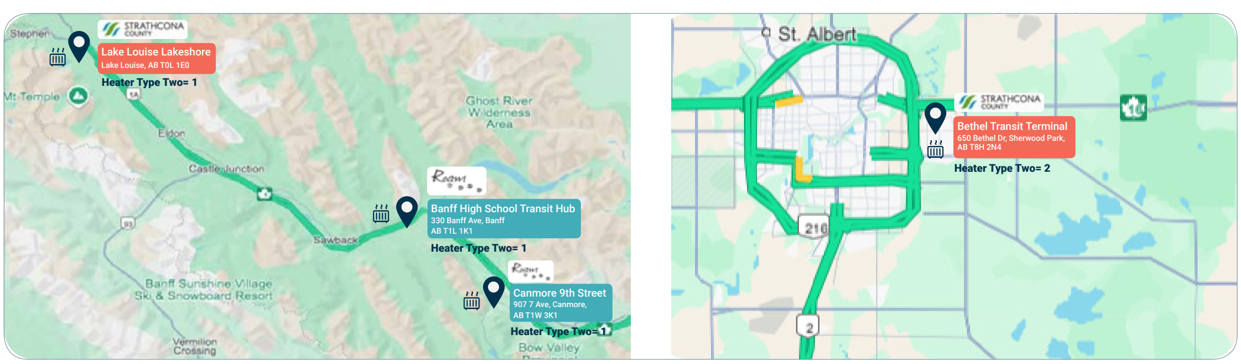

Figure 11. Heavy-duty on route charger locations considering BEB 7 (550+ kWh, 40 foot) and Heater Type

3.4 Monthly energy/fuel consumption

Figure 12 and **Figure 13** depict the projected monthly energy and fuel requirements of Scenario One (full BEB solution) and Scenario Two (full FCEB solution) by agency and heater type for heavy-duty cycle. These results are determined by summing the energy needed to complete all blocks, irrespective of their success, then scaling by the appropriate monthly factor.

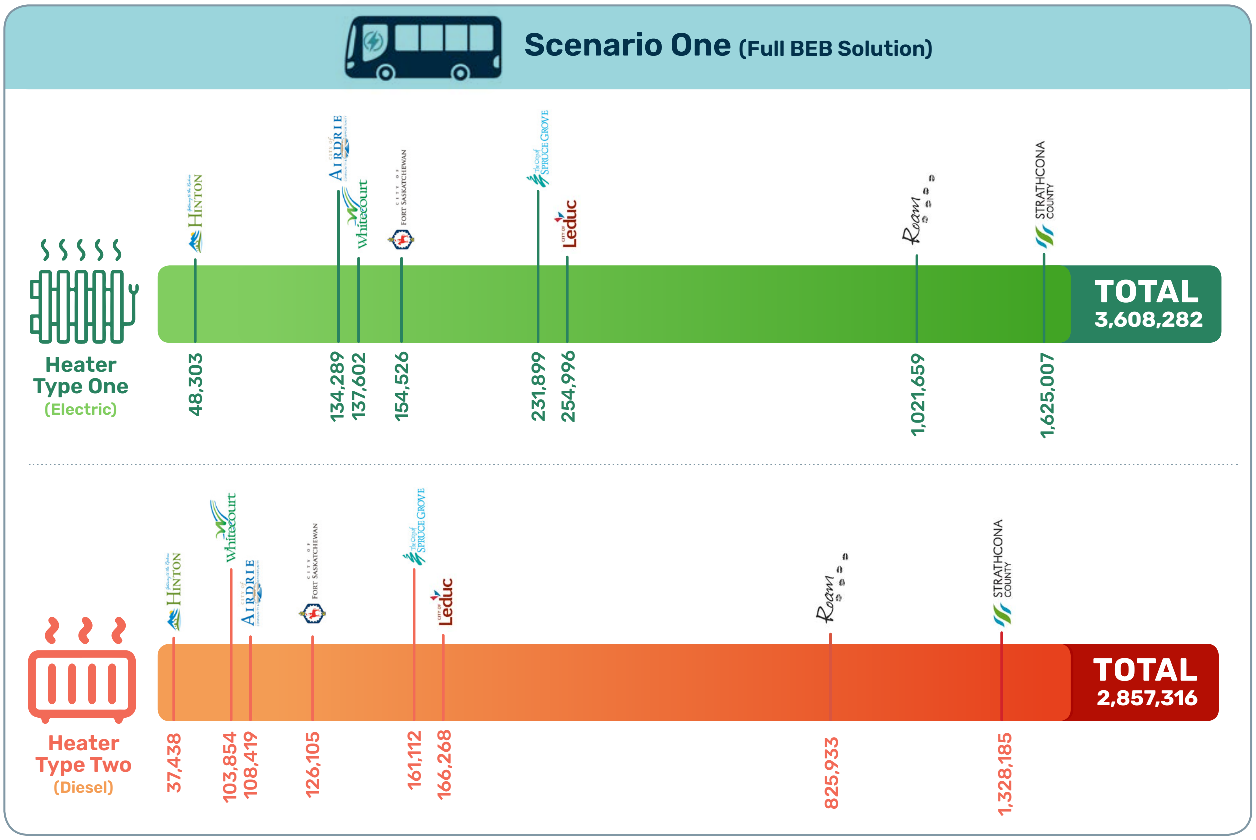

Figure 12. Monthly energy consumption with Scenario One (full BEB solution) with heavy-duty cycle

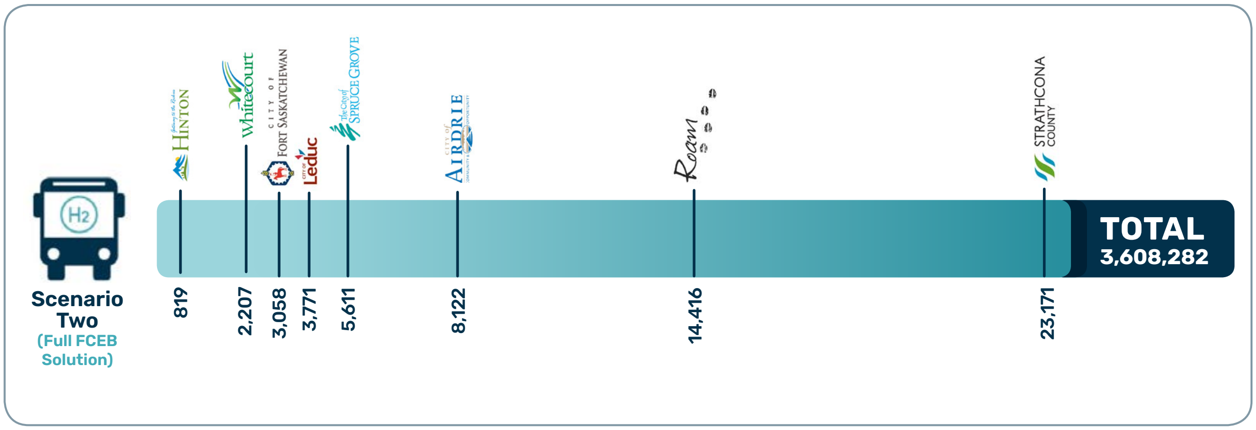

Figure 13. Monthly hydrogen consumption with Scenario Two (full FCEB solution) with heavy-duty cycle

4 FLEET ANALYSIS

The results from the energy analysis serve as the basis for determining scenario fleet sizes in this section. In Scenario One (full BEB solution), Charging Strategy Two (depot with on-route charging) is applied for Roam Transit and Strathcona Transit, whereas Charging Strategy One (depot-only charging) is implemented for the other transit agencies. Scenario Two (full FCEB fleet) uses Refuelling Strategy Two (depot with refuelling). Scenario Three (mixed green fleet solution) employs Charging Strategy One (depot-only charging) for BEBs and Refuelling Strategy Two (depot with refuelling) for FCEBs.

4.1 Fleet implementation timelines

4.1.1 Base Case

In the Base Case timeline, the fleet does not significantly grow over time. Buses would be replaced at the end of their life cycle with new buses.

4.1.2 Scenario One (full BEB solution)

Table 2 details the rollout of BEBs with Heater Type One (electric) to replace fossil fuelled buses at the end of their life. **Table 2** details the procurement schedule for BEBs with Heater Type Two (diesel).

4.1.3 Scenario Two (full FCEB solution)

As shown in **Table 2**, FCEBs in Scenario Two (full FCEB solution) would be procured gradually to replace fossil fuelled buses at the end of their life cycle. For the on-demand service, a BEB similar to BEB 5 (50+ kWh, 20-foot) would be used, as there are not comparably sized FCEBs available on the market. The entire fleet would be fully electrified by the retirement of the last fossil fuelled vehicle.

4.1.4 Scenario Three (mixed green fleet solution)

Scenario Three is applicable only to Strathcona Transit, given its fleet size and the need for long-range blocks. As shown in **Table 2**, Scenario Three (mixed green fleet solution) uses BEBs with Heater Type One (electric) and in **Table 2** shows BEBs with Heater Type Two (diesel). In both cases, BEBs and FCEBs would be procured gradually to replace the fossil fuelled buses at the end of their life.

In Scenario Three, BEBs would be deployed on both the on-demand service and fixed service blocks that do not require on route charging or block splitting. Fuel cell electric buses (FCEBs) are assumed to be able to handle the remaining blocks, using mid-block refuelling as required.

Table 2. Fleet timeline before 2041

Fleet Timeline < 2041	Base Case	Scenario 1, Heater Type 1	Scenario 1, Heater Type 2	Scenario 2	Scenario 3, Heater Type 1	Scenario 3, Heater Type 2
City of Airdrie	17	18	17	FCEBs: 17	NA	NA
City of Fort Saskatchewan	3	5	3	FCEBs: 3	NA	NA
Hinton	3	4	3	FCEBs: 2 On-demand BEBs: 1	NA	NA
City of Leduc	10	12	11	FCEBs: 6 On-demand BEBs: 4	NA	NA
Roam	35	38	33	FCEBs: 33	NA	NA
The City of Spruce Grove	10	14	12	FCEBs: 6 On-demand BEBs: 6	NA	NA
Strathcona County	85	108	106	FCEBs: 70 On-demand BEBs: 30	BEBs: 72 FCEBs: 28	BEBs: 74 FCEBs: 26
Whitecourt	3	4	4	FCEBs: 3	NA	NA

5 GLOBAL WARMING LIFE CYCLE ANALYSIS

The electrification scenarios considered here have scenario-specific global warming potential (GWP) outcomes compared to the conventional fleet Base Case.

- Greenhouse gas (GHG) emissions can be examined from an operational standpoint or through a comprehensive "cradle to grave" perspective, known as environmental Life Cycle Analysis (LCA).
- An LCA evaluates emissions from all assets and fuel/energy usage in operations, production, manufacturing, shipment/supply chain and end-of-life disposal.
- The federal government's GHG+PLUS module encompasses elements, including fuel production, operations, infrastructure, maintenance and repair [3].

Figure 14 depicts a summary of life cycle emissions versus operational GHG emissions.

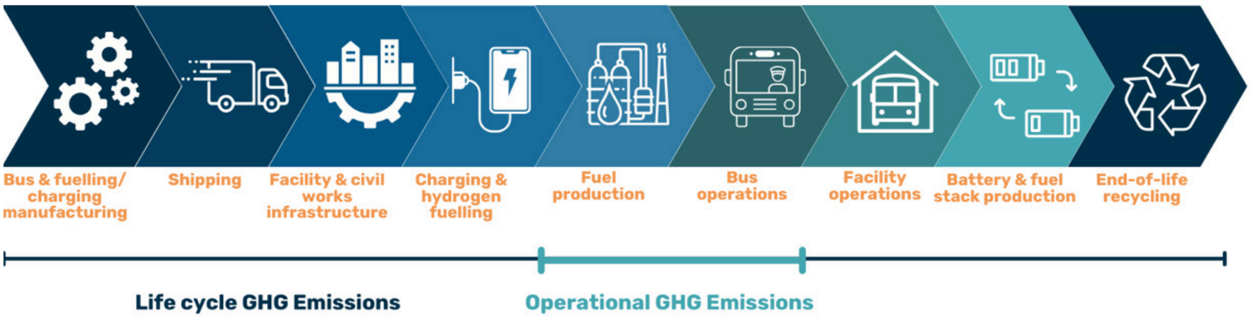

Figure 14. Life cycle GHG emissions summary

In this analysis, individualized LCAs for each transit agency are replaced with amalgamated LCAs. Transit agencies are classified by fleet size into small, medium or large categories and data from these cities are combined to create three general LCAs. This approach allows Alberta municipalities to estimate the environmental impacts of each fleet based on the generalized results of the transit agency LCA.

5.1 Life cycle global warming potential

Emissions and environmental outcomes are aggregated into impact categories to enable an understanding of the overall magnitude and potential impact of each product system.

For FCEBs, the method of hydrogen fuel production further impacts the total GWPs of Scenario Two (full FCEB solution) and Scenario Three (mixed green fleet solution). This analysis identifies four main hydrogen production methods:

1. Steam Methane Reformation (SMR)
2. Steam Methane Reformation with carbon capture and storage (SMR with CCS)
3. Electrolytic hydrogen using electricity from the grid
4. Electrolytic hydrogen using electricity from renewable sources

This section present the Global Warming Potentials (GWPs) of fleet scenarios in the small, medium and large city categories.

- **Small agencies** include Whitecourt, Fort Saskatchewan, Hinton and Leduc. Hinton and Whitecourt have detailed LCA analysis.
- **Medium agencies** include Banff, Airdrie and Spruce Grove.
- **Large agencies** are only Strathcona.

These figures measure the CO2 equivalent emissions per fleet over a 15-year period for diesel buses and a 12-year period for BEBs and FCEBs operating on fixed service blocks.

Figure 15, Figure 16 and **Figure 17** indicate the reductions in emissions by switching from the Base Case fleet to the decarbonization scenarios for small, medium and large cities, respectively.

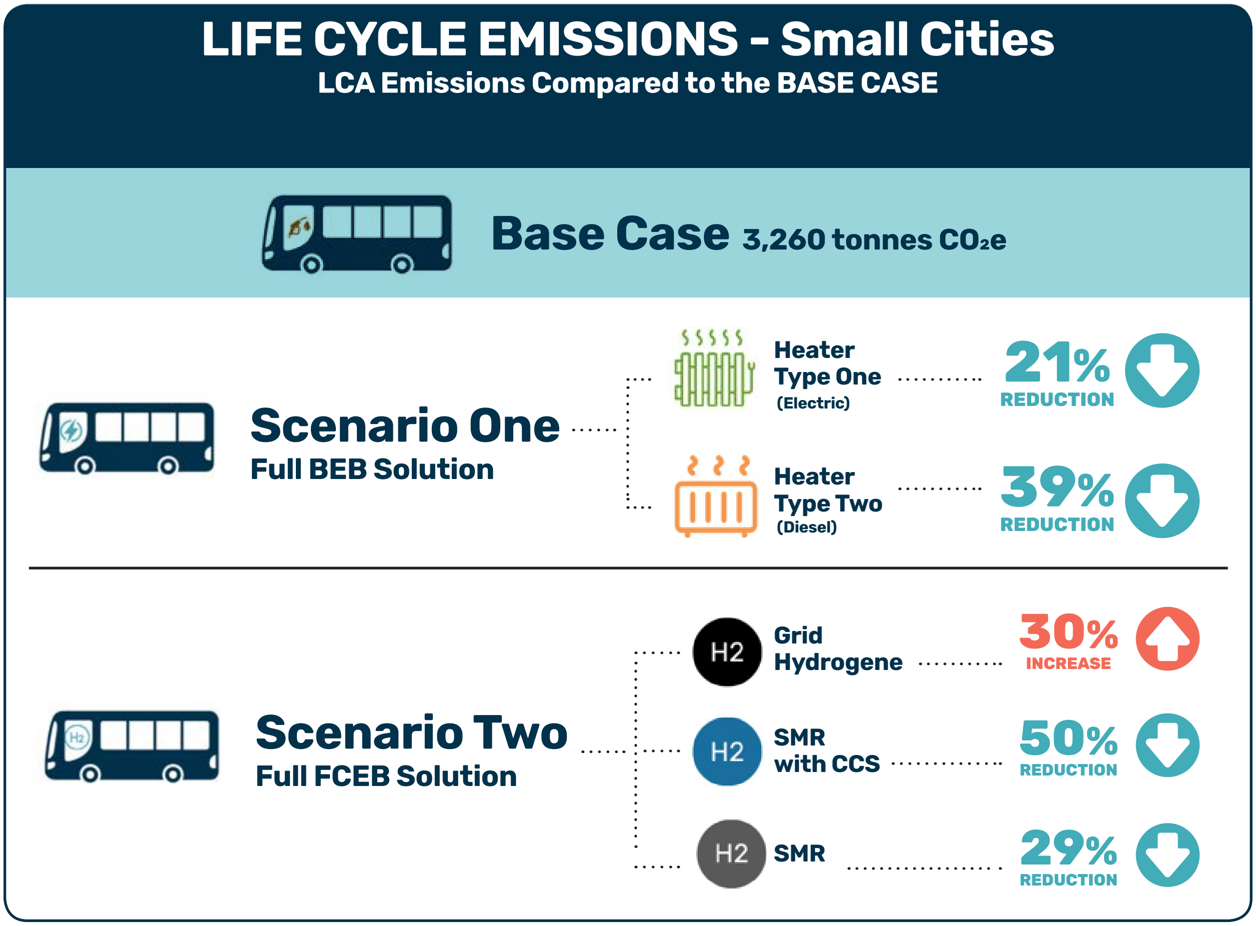

Figure 15. Life cycle analysis summary – small cities

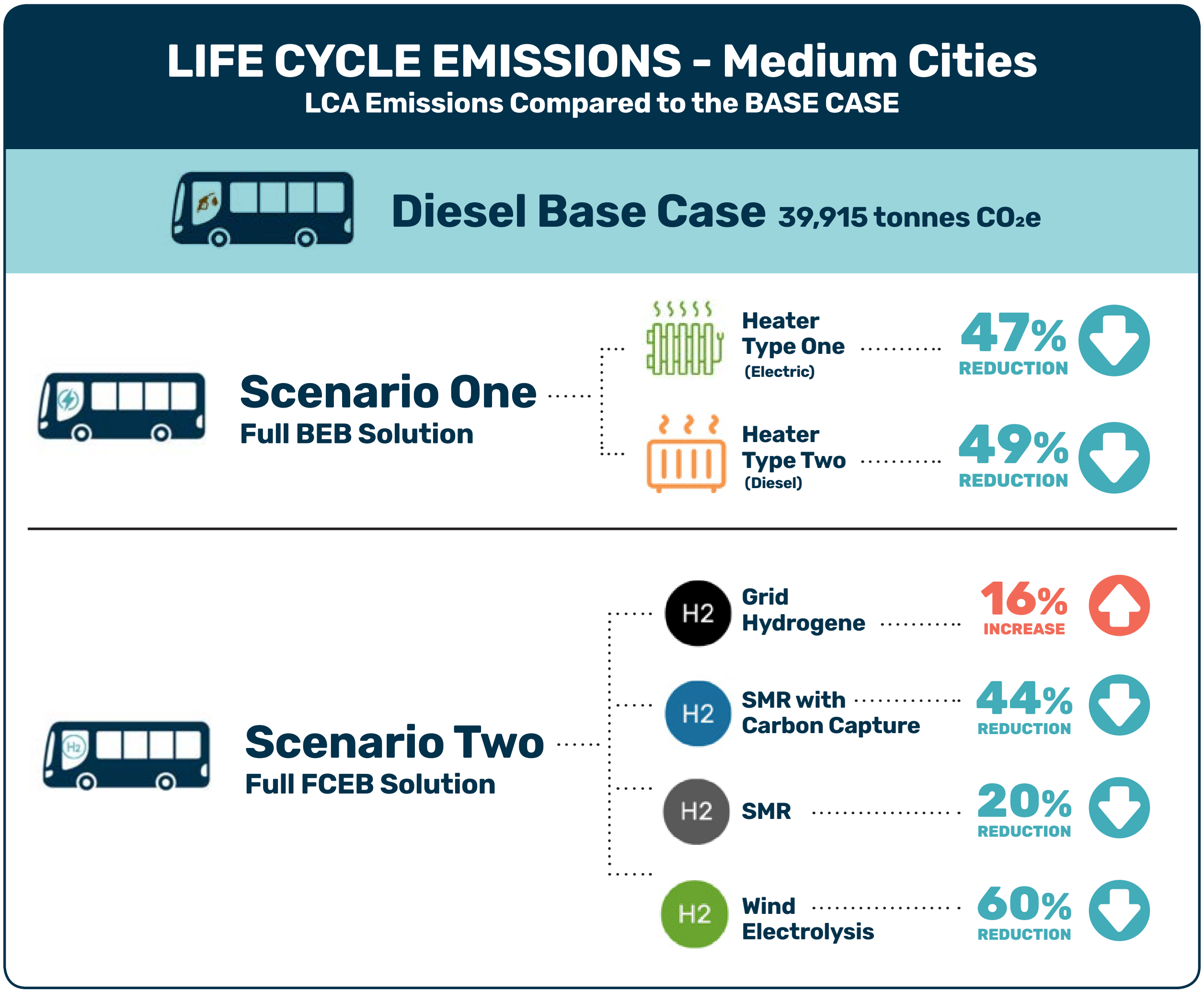

Figure 16. Life cycle analysis summary – medium cities

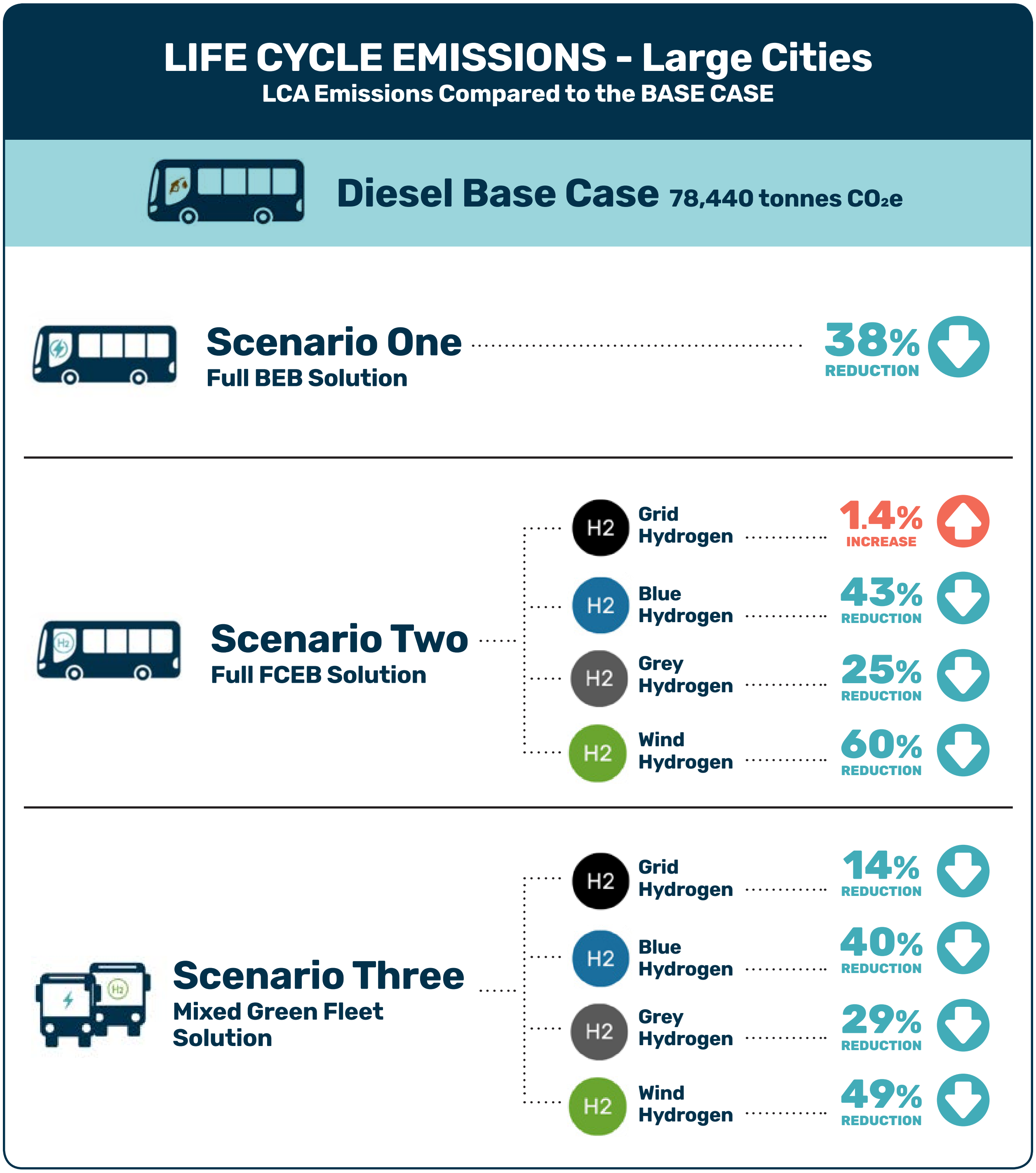

Figure 17. Life cycle analysis summary – large cities

6 FACILITY ANALYSIS

This study assesses the existing transit facilities to determine whether they can support a fleet-wide transition to ZEBs from electrical and technical standpoint. It concludes with recommendations regarding necessary upgrades to support ZEBs in the three decarbonization scenarios.

In Scenario One (full BEB solution), Charging Strategy Two (depot with on-route charging) is applied for Roam and Strathcona, whereas Charging Strategy One (depot-only charging) is implemented for the other transit agencies. Scenario Two (full FCEB fleet) uses Refuelling Strategy Two (depot with refuelling). Scenario Three (mixed green fleet solution) employs Charging Strategy One (depot-only charging) for BEBs and Refuelling Strategy Two (depot with refuelling) for FCEBs.

6.1 Scenario One (full BEB solution)

The worst-case facility loading (presented in **Figure 18**) is calculated based on energy modelling results for the BEB heavy-duty cycle. The use of Heater Type One (electric) or Heater Type Two (diesel) can affect the peak charging demand. This study informs FortisAlberta of the expected peak demand in each facility if the full transition to BEBs is to be completed as planned in Scenario One. The load is expected to increase gradually for those facilities that transition to BEBs over time and ongoing coordination and engagement with FortisAlberta is essential to determine the availability of power on the specified timeline.

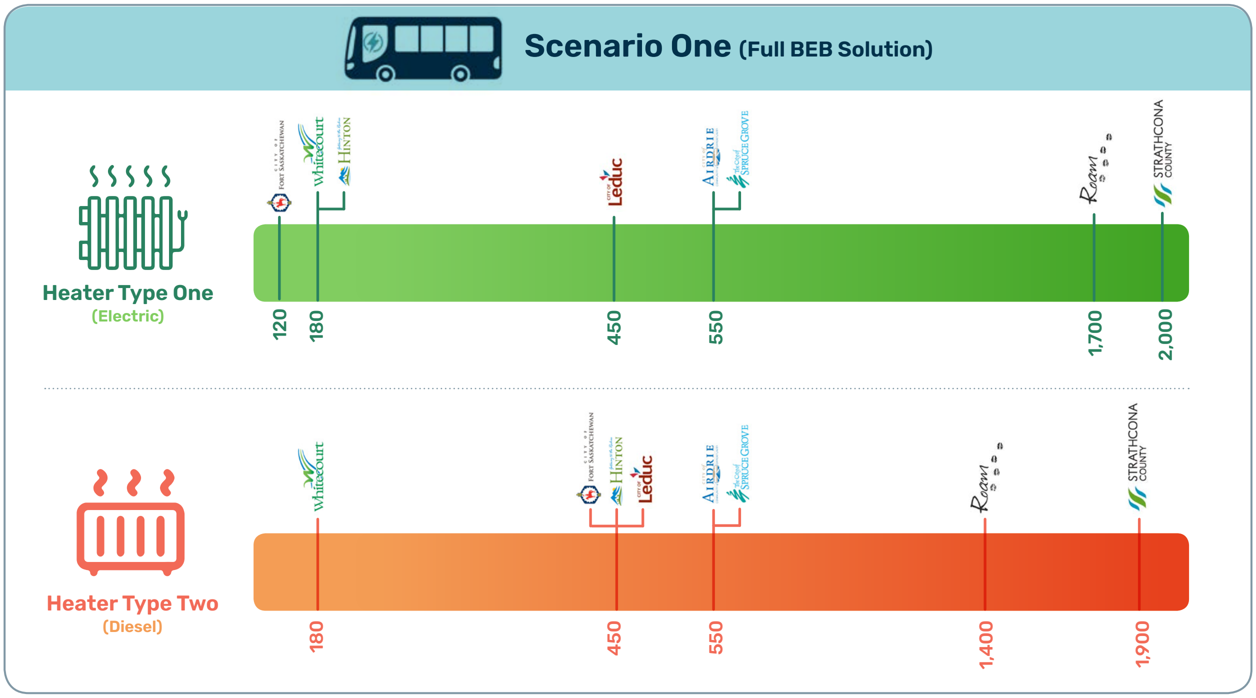

Figure 18. Charging peak power demand with Scenario One (full BEB solution) by facility and heater type (kW)

6.2 Scenario Two (full FCEB solution)

The worst-case facility electricity loading (presented in **Figure 19**) is calculated using energy modelling results for the on-demand BEB heavy-duty cycle and the hydrogen infrastructure demand. The energy results vary depending on the size of the FCEB fleet. This analysis has been used to inform FortisAlberta of the expected peak demand of each facility if Scenario Two (full FCEB solution) is completed as planned. An ongoing coordination with FortisAlberta is essential to determine the availability of power on the specified timeline.

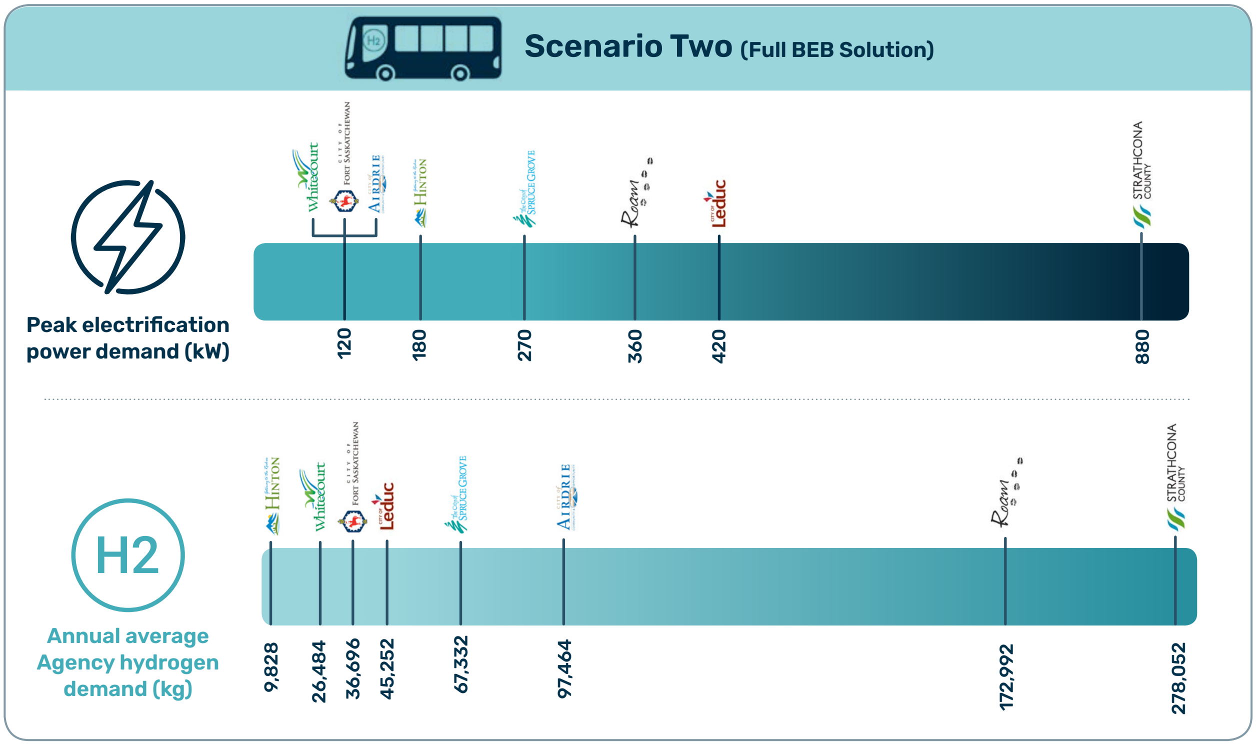

Figure 19. Scenario Two (full FCEB solution) by facility by duty cycle

Part of Fort Saskatchewan transit buses need to be refuelled at the Edmonton transit facility. However, this detail is not covered in this study as it falls outside its scope.

6.3 Scenario Three (mixed green fleet solution)

Scenario Three is applicable exclusively to Strathcona Transit due to its fleet size and the requirement for long-range blocks.

The worst-case facility loading (presented in **Figure 20**) is calculated using energy modelling results for the BEB heavy-duty cycle and the hydrogen infrastructure demand. The result varies depending on the size of the FCEB fleet. This analysis has been used to inform FortisAlberta of the expected peak demand of Strathcona Transit facility if Scenario Three (mixed green fleet solution) is completed as planned. An ongoing coordination with FortisAlberta is essential to determine the availability of power on the specified timeline.

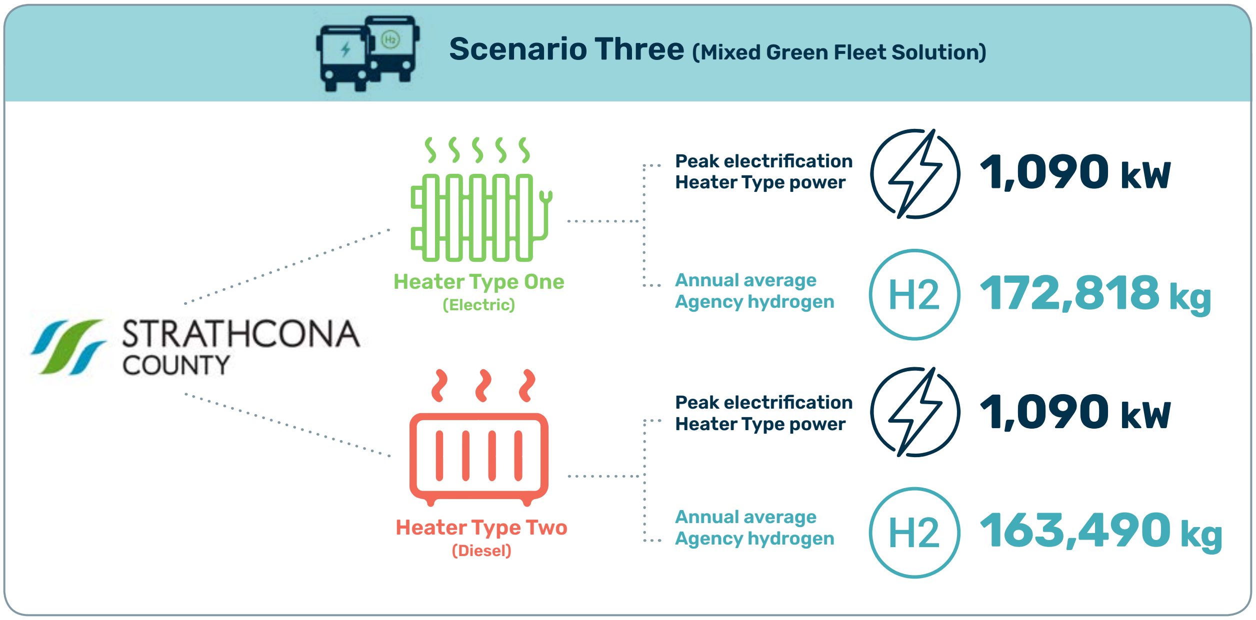

Figure 20. Scenario Three (mixed green fleet solution)

7 ECONOMIC ANALYSIS

This section summarizes the economic analysis results for all agencies.

The fleet scenarios considered in this report each have different costs accumulated over the 2025 to 2041 timelines. These costs include capital (CAPEX) and operational (OPEX) expenditures and residuals.

- **The CAPEX accounts for vehicle and infrastructure acquisitions as well as mid-life battery and fuel cell replacement costs.**
- **The OPEX accounts for fuel, energy, maintenance and infrastructure costs associated with the vehicles. Residuals account for the vehicles' end-of-life salvage values.**

The costs are expressed in Net Present Value (NPV) which is a metric used to evaluate the profitability of an investment or project. It represents the difference between the present value of cash inflows and outflows over a specific period.

The total costs expressed in the present value for the Base Case, Scenario One (full BEB solution), Scenario Two (full FCEB solution) and Scenario Three (mixed green fleet) are presented in **Table 3**.

Table 3. Summary of results for full project costs (in millions of $, present value, 2024$)

	Base Case	Scenario 1, Heater Type 1	Scenario 1, Heater Type 2	Scenario 2	Scenario 3, Heater Type 1	Scenario 3, Heater Type 2
City of Airdrie	$34.03	$47.12	$46.65	$72.12	NA	NA
City of Fort Saskatchewan	$2.74	$10.46	$7.40	$11.91	NA	NA
Hinton	$2.95	$6.88	$6.49	$10.28	NA	NA
City of Leduc	$13.75	$19.79	$19.53	$25.22	NA	NA
Roam	$66.34	$96.64	$84.80	$114.97	NA	NA
The City of Spruce Grove	$12.30	$20.47	$19.15	$26.02	NA	NA
Strathcona County	$122.72	$197.81	$189.52	$254.54	$198.02	$193.82
Whitecourt	$2.39	$10.07	$10.07	$12.97	NA	NA

8 CONCLUSION

This study conducted a comprehensive analysis of the feasibility of transitioning to a zero emissions bus fleet for eight transit agencies in Alberta, Canada. The study evaluated two primary ZEB technologies: battery electric buses (BEBs) and fuel cell electric buses (FCEBs), across three decarbonization scenarios involving full fleet transitions and mixed fleet deployments. The analysis encompassed multiple dimensions, including global warming potential (GWP), energy consumption, infrastructure requirements and economic considerations.

8.1 Agency summaries

The results for each agency are summarized in this section. For full details, refer to the agency specific appendix. Rocky View County is not included as this county does not have public transit.

8.1.1 Airdrie Transit

	Base Case scenario	Scenario One (Full BEB solution) Heater Type One (electric)	Scenario One (Full BEB solution) Heater Type Two (diesel)	Scenario Two (Full FCEB solution)
Life cycle GHG emission reduction Grid H2	0%	47% reduction	49% reduction	16% increase
Fleet size in 2040	17	18	17	17
Infrastructure required	-	9 depot chargers	9 depot chargers	1 hydrogen station
Total fleet cost (Net Present Value, 2024$)	$34.0 million	$47.1 million	$46.7 million	$72.1 million

Figure 21. Airdrie Transit electrification scenarios

8.1.2 Fort Sask Transit

	Base Case scenario	Scenario One (Full BEB solution) Heater Type One (electric)	Scenario One (Full BEB solution) Heater Type Two (diesel)	Scenario Two (Full FCEB solution)
Life cycle GHG emission reduction Grid H2	0%	21% reduction	23% reduction	9% increase
Fleet size in 2040	3 30-foot diesel	5 BEB 3 (550+ kWh, 40-foot)	3 BEB 3 (550+ kWh, 40-foot)	3 FCEB 1 (35+ kg, 40-foot)
Infrastructure required	-	3 low-powered chargers	2 high-powered chargers	1 hydrogen station
Total fleet cost (Net Present Value, 2024$)	$2.7 million	$10.5 million	$7.4 million	$11.9 million

Figure 22. Fort Sask Transit summary

8.1.3 Hinton Transit

	Base Case scenario	Scenario One (Full BEB solution) Heater Type One (electric)	Scenario One (Full BEB solution) Heater Type Two (diesel)	Scenario Two (Full FCEB solution)
Life cycle GHG emission reduction Grid H2	0%	21% reduction	39% reduction	30% increase
Fleet size in 2040	2 gasoline 30-foot 1 on-demand	3 BEB 3 (550+ kWh, 40-foot) 1 BEB 4 (50+ kWh, on-demand)	2 BEB 3 (550+ kWh, 40-foot) 1 BEB 4 (50+ kWh, on-demand)	2 FCEB 1 (30+ kg, 40-foot) 1 BEB 4 (50+ kWh, on-demand)
Infrastructure required	-	2 low-powered chargers	1 low-powered charger 1 high-powered charger	1 low-powered charger 1 hydrogen station
Total fleet cost (Net Present Value, 2024$)	$2.9 million	$6.9 million	$6.5 million	$10.3 million

Figure 23. Hinton Transit electrification scenarios

8.1.4 Leduc Transit

	Base Case scenario	Scenario One (Full BEB solution) Heater Type One (electric)	Scenario One (Full BEB solution) Heater Type Two (diesel)	Scenario Two (Full FCEB solution)
Life cycle GHG emission reduction Grid H2	0%	21% reduction	25% reduction	9% increase
Fleet size in 2044	10	12	11	10
Infrastructure required	-	6 depot chargers	6 depot chargers	2 depot chargers 1 hydrogen station
Total fleet cost (Net Present Value, 2024$)	$13.7 million	$19.8 million	$19.5 million	$25.2 million

Figure 24. Leduc Transit summary

8.1.5 Roam Transit

	Base Case scenario	Scenario One (Full BEB solution) Heater Type One (electric)	Scenario One (Full BEB solution) Heater Type Two (diesel)	Scenario Two (Full FCEB solution)
Life cycle GHG emission reduction Grid H2	0%	47% reduction	45% reduction	16% increase
Fleet size in 2040	16 40-foot diesel 3 30-foot diesel 4 25-foot diesel 12 40-foot BEBs	38 BEB 4 (550+ kWh, 40-foot)	33 BEB 4 (550+ kWh, 40-foot)	33 FCEB 1 (35+ kg, 40-foot)
Infrastructure required	4 depot chargers	19 depot chargers 4 on-route chargers	17 depot chargers 3 on-route chargers	2 hydrogen stations 3 hydrogen pumps
Total fleet cost (Net Present Value, 2024$)	$66.3 million	$96.6 million	$84.8 million	$115.0 million

Figure 25. Roam Transit summary

8.1.6 Spruce Grove Transit

	Base Case scenario	Scenario One (Full BEB solution) Heater Type One (electric)	Scenario One (Full BEB solution) Heater Type Two (diesel)	Scenario Two (Full FCEB solution)
Life cycle GHG emission reduction (Grid H2)	0%	47% reduction	49% reduction	16% increase
Fleet size in 2040	4 on-demand 6 diesel 40-foot	8 BEB 3 (50+ kWh, on-demand) 6 BEB 2 (500+ kWh, 40-foot)	6 BEB 3 (50+kWh, on-demand) 6 BEB 2 (500+ kWh, 40-foot)	6 BEB 3 (50+ kWh, on-demand) 6 FCEB (30+ kg, 40-foot)
Infrastructure required	-	7 depot chargers	6 depot chargers	1 hydrogen station 3 depot chargers
Total fleet cost (Net Present Value, 2024$)	$12.3 million	$20.5 million	$19.2 million	$26.0 million

Figure 26. Spruce Grove Transit electrification scenarios

8.1.7 Strathcona Transit

	Base Case scenario	Scenario One (Full BEB solution) Heater Type Two (diesel)	Scenario Two (Full FCEB solution)	Scenario Three (mixed green fleet solution) Heater Type Two (diesel)
Life cycle GHG emission reduction (Grid H2)	0%	41% reduction	1.4% increase	17% reduction
Fleet size in 2040	86	106	100	100
Infrastructure required	-	53 depot chargers 2 on-route chargers	15 depot chargers 1 hydrogen depot station 1 hydrogen on-route	37 depot chargers 1 hydrogen depot station 1 hydrogen on-route
Total fleet cost (Net Present Value, 2024$)	$135 million	$198 million	$290 million	$212 million

Figure 27. Strathcona Transit summary

8.1.8 Whitecourt Transit

	Base Case scenario	Scenario One (Full BEB solution) Heater Type One (electric)	Scenario One (Full BEB solution) Heater Type Two (diesel)	Scenario Two (Full FCEB solution)
Life cycle GHG emission reduction Grid H2	0%	26% reduction	30% reduction	41% increase
Fleet size in 2040	3 30-foot diesel	4 BEB 4 (400+ kWh, 40-foot)	4 BEB 4 (400+ kWh, 40-foot)	3 FCEB 1 (35+ kg, 40-foot)
Infrastructure required	-	2 depot chargers	2 depot chargers	1 hydrogen station
Total fleet cost (Net Present Value, 2024$)	$2.5 million	$10.3 million	$10.3 million	$13.1 million

Figure 28. Whitecourt Transit electrification scenarios

8.2 Summary

This study is intended to provide insight into electrification in Alberta. The results of this appendix can be used as an introduction to fleet electrification. Further detailed analysis would be required to inform all partners of the path forward.

Going forward, for comprehensive fleet electrification, this analysis should be expanded to include the standard federal requirements of a social analysis to help prioritize routes based on socially disadvantaged communities and housing density to the meet requirements of the Government of Canada's Canada Public Transit Fund (CPTF) as managed by the Ministry of Housing, Infrastructure and Communities Canada (HICC) [4].

All agencies would benefit from exploring workplace development studies to help it plan for the transition to different bus types. The transition to Zero Emissions Buses (ZEBs) will require changes at all levels of the organization.

FortisAlberta, OSPE and the Alberta municipalities that participated should consider a future expanded study leveraging all aspects of CUTRIC's RoutΣ.i™ 3.0 toolkit, developed for the Government of Canada, to fully prepare for its electrification journey ahead. This study can provide recommendations on technologies and electrification scenarios through focused workshops on decision-making matrices, agency specific goals and future plans. The Alberta Municipalities Transit Fleet Electrification Planning Project introduces these themes; however, further studies are needed.

9 REFERENCES

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[4] Housing Infrastructure and Communities Canada. (2021, October 1, 2024). Backgrounder: A Plan to Permanently Fund Public Transit and Support Economic Recovery. Available: https://www.canada.ca/en/office-infrastructure/news/2021/02/a-plan-to-permanently-fund-public-transit-and-support-economic-recovery.html

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Bow Valley Regional Transit Services Commission

Asset Disposal Policy

Suggested motion: "the Board approves the revised Tangible Capital Asset Policy F4 with the updated asset disposal wording included"

POLICY NUMBER F-4

Tangible Capital Assets

Approved: February 12, 2014

Revised: March 13, 2019

Revised: July 2, 2025

1.0 BACKGROUND

The Bow Valley Regional Transit Services Commission (BVRTSC) is required to prepare its annual financial statements in accordance with the Generally Accepted Accounting Principles (GAAP) for para-municipal governments as recommended by the Chartered Professional Accountants of Canada (CPA) and as defined in Section 276 of the Municipal Government Act (MGA). Fulfilling this requirement includes accounting for and reporting Tangible Capital Assets (TCAs) in compliance with CPA Public Sector Standards Section PS 3150.

The purpose of recording TCAs on The BVRTSC's financial statements is to reflect the annualized cost of using these assets to deliver programs and provide services.

2.0 SCOPE

All tangible property owned by BVRTSC, either through construction, purchase or donation and which qualify as capital assets are addressed in this policy. In accordance with PSAB 3150, tangible capital assets (TCA) are non-financial assets having physical substance that:

a) are held for use in the production or supply of goods or services, for rental to others, for administrative purposes or for the development, construction, maintenance or repair of other tangible capital assets:
b) have useful economic lives extending beyond an accounting period;
c) are to be used on a continuing basis; and
d) are not for sale in the ordinary course of operations

Subsequent expenditures on a recorded TCA that:

e) increase output or service capacity
f) increase the service life
g) lower associated operating costs
h) improve the quality of the output

should be classified as betterments and capitalized accordingly. Any other expenditure should be considered a repair or maintenance and should be expenses in the period.

3.0 RESPONSIBILITIES

3.1 All Employees are responsible for:
  a) Keeping accurate records when purchasing, acquiring, selling and maintaining capital assets owned by BVRTSC
  b) Providing valuation detail such as purchase price, fair market value, replacement value, useful life and scheduled maintenance of existing and future TCAs for which they are responsible.

3.2 The Director of Finance and Administration is responsible for:
  a) The development and maintenance of an asset registry to track all tangible capital assets.
  b) Supporting all employees who are involved in the purchasing, acquisition, sale and maintenance of capital assets to ensure the upkeep of accurate records.

3.3 The Chief Executive Officer is responsible for overall enforcement of the policy.

4.0 PROCEDURES

4.1 THRESHOLD

The threshold for each category represents the minimum cost an individual asset must have before it is to be recorded as a capital asset on the statement of financial position. Capital assets not meeting the threshold of $5,000 either individually or as a pooled group are expensed in the year in which they are purchased.

4.2 PURCHASED ASSETS

Cost is the gross amount of consideration paid to acquire the asset. It includes all non-refundable taxes and duties, freight and delivery charges, installation and site preparation costs, etc. It is net of any trade discounts or rebates.

Cost of land includes purchase price plus legal fees, land registration fees, transfer taxes, migration and survey costs. Costs would include costs to make the land suitable for intended use, such as pollution mitigation, demolition and site improvements that become part of the land.

When two or more assets are acquired for a single purchase price, it is necessary to allocate the purchase price to the various assets acquired. Allocation shall be based on the fair value of each asset at the time of acquisition or some other reasonable basis if fair value is not readily determinable.

4.3 ACQUIRED, CONSTRUCTED OR DEVELOPED ASSSETS

Cost includes all costs directly attributable (e.g. construction, architectural and other Professional fees) to the acquisition, construction or development of the asset. Capitalization of general administrative overhead is not permitted.

Capitalization of carrying costs ceases when no construction or development is taking place or when the tangible capital asset is completed or ready for use.

4.4 DONATED OR CONTRIBUTED ASSETS

The cost of donated or contributed assets that meet the criteria for recognition shall be valued equal to their fair market value at the date of construction or contribution. Fair market value for land will be based on land assessment value or appraised value; all other items shall be based on fair market value.

4.5 AMORTIZATION

The cost, less any residual value, of a tangible capital asset with a limited life will be amortized over its useful life in a rational and systematic manner appropriate to its nature and use. The amortization method and estimate of useful life of the remaining unamortized portion shall be reviewed on a regular basis and revised when the appropriateness of a change can be clearly demonstrated. Useful life is normally the shortest of the asset's physical, technological, commercial or legal life.

For all TCAs, the BVRTSC will use the straight-line method of amortization. The straight-line method assumes the asset's usefulness is the same each year. The amortization amount is determined by dividing the asset's original cost by its estimated life in years. In the year an asset is acquired or put into service and the year of disposal, amortization expense will be calculated using the half-year rule. No amortization shall be recorded on a capital asset in progress or one that has been removed from service but not yet disposed of.

The BVRTSC shall maintain an up-to-date table of ANTICIPATED useful life with respect to the tangible capital assets owned by the BVRTSC.

4.6 DISPOSAL

Tangible capital assets are to be taken out of service when they can no longer be used by BVRTSC due to obsolescence, scrapping, dismantling or when major repair costs exceed value of the asset. The department manager is responsible for determining and making recommendations as to when assets are to be disposed of. Final decision of disposal will be made by the CEO or the Director of Finance and Administration.

When TCA are taken out of service, destroyed or replaced the department manager or designate shall notify the Director of Finance and Administration of the asset description, serial number and effective date. The Director of Finance and Administration shall be responsible for adjusting the asset ledgers.

Any TCA that is determined to have a resale value shall be offered for sale at fair market value in a manner where it is accessible by the general public. An asset with a resale value may also be donated to a local not for profit organization at the discretion of the CEO. The sale of an asset to a BVRTSC employee is permitted provided that the employee pays the determined fair market value.

If an item has no resale value or is irreparably damaged it can be disposed of in a recycling facility, example Town of Banff recycling, vehicle scrap organizations or vehicle scrap not for profit organizations.

Prior to selling or disposing of fleet assets Roam wraps are to be removed, and any useable items within the vehicle such as fareboxes etc. shall be removed and designated as spares. Prior to selling or disposal of any computer equipment the hard disk must be erased.

For any assets purchased through partial grant funding, the CEO or Director of Finance and Administration will be required to consult the grant contract for specific grant funding disposal periods to ensure that the disposal criteria are met.

The disposal of a TCA shall result in its removal from service as a result of sale, destruction or loss. When a TCA is disposed of, the cost and the accumulated amortization shall be removed from the accounting records and any gain or loss recorded. Costs of disposal paid by the BVRTSC shall be expensed. A gain or loss on disposal is the difference between the net proceeds received and the net book value of the asset and shall be accounted for as a revenue or expense in the period the disposal occurs. The gain or loss will be credited to the municipality or municipalities responsible for the purchase. Gain or loss on sale or disposal of BVRTSC funded assets will be credited to all members.

4.7 CAPITAL

The department head or designate shall notify the Financial Controller of any capital lease that will acquire an asset with a value of $5,000 or more. If equipment is acquired through a capital lease, then the Director of Finance and Administration shall account for the capital asset and incur a liability in accordance with Public Sector Guideline-2 Leased TCA.

4.8 ASSETS EXCLUDED FROM AMORTIZATION

Land shall be capitalized and not amortized. Works of art, historical treasures and intangible assets such as patents, copyrights and trademarks shall not be capitalized nor amortized.

Bow Valley Regional Transit Services Commission

Roam Brand Standard Revision

Link to current Brand Standard for reference:

https://acrobat.adobe.com/id/urn:aaid:sc:VA6C2:7c3186f8-d726-41d0-ae5f-2543a52976e8

The new Brand Standard document presented is draft to visually view layout, and will be finalized with additional pictures/page insertions once approved:

https://bvrtsc.sharepoint.com/:b:/s/BVRTSCDocuments/EbCwaK3KtQdJknkKjDqfhhoBrCnJT2umNyoOEDYrHQXmHQ?e=7OTns2

Report to the Bow Valley Regional Transit Services Commission

Revised Report 2025–05.02 – Brand Standard Revision

July 03, 2025

SUMMARY/ ISSUE

The Roam Brand Standard, originally developed in 2012 and updated in 2017 and 2020, has undergone a comprehensive review. This refresh was driven by Roam's continued growth and the launch of our redesigned website in 2024, ensuring it reflects current needs and future goals. The updated standard incorporates modern design practices, supports digital advancements, and allows for future expansion. While core branding and messaging remain unchanged, several sections have been revised to reflect updated design, and communication, ensuring consistency across our expanding fleet and digital platforms.

PREVIOUS COMMISSION DIRECTION/POLICY

The original Brand Standard was provided to the Commission by the Town of Banff in 2012, with updates incorporated in 2017 and 2020. These documents have guided Roam's visual identity and communications strategy across vehicles, print materials, and promotional assets. No previous direction has been issued regarding a comprehensive redesign.

As directed at the May 14 meeting, Administration shared the revised Brand Standard document with our stakeholders and partners: Parks Canada, the Town of Banff, the Town of Canmore, and Improvement District No. 9 for their review and feedback to ensure alignment and consistency.

The Town of Canmore, Improvement District No. 9, and Parks Canada did not propose any changes to the revised document. The Town of Banff provided several suggestions related to accessibility, authenticity, and infrastructure. These were reviewed by Administration, and where appropriate, corresponding amendments have been incorporated into the final version of the Brand Standard. Amendments highlighted in yellow.

Administration Recommendation:

That the Commission Board directs Administration to implement the updated Roam Brand Standard as presented, incorporating the revised design elements, updated communication guidelines, and structural changes, in alignment with Roam's future growth objectives.

INVESTIGATION

A section-by-section review of the Brand Standard was conducted by administration, with particular attention to alignment with our new website design, evolving transit operations, and digital communication practices.

Notable updates include:

- **Sections 1–4**: Revised for clarity and consistency; no significant changes to content or messaging.

- **Sections 5–5.5**:
  - **Brand Elements**:
    - No changes to the logo.
    - Updated typography to align with the website and modern design trends.
    - New standardized icons added to support clear communication across print and digital materials, aligned with Roam's updated visual identity.
  - Refined colour palette, establishing primary and secondary colours, including details outlining options to support future route branding.
  - **Photography**:
    - Emphasis on showcasing buses in natural environments ("Where We Take You").
    - Wildlife imagery continues as a secondary design element.
    - New policy explicitly prohibits the use of AI-generated imagery to preserve authenticity.
- **Sections 6–6.8**:
  - Transition from focus on printed materials to digital formats.
  - Inclusion of special occasion/event-based bus wraps.
  - Renaming of "Bus Drivers" section to "Uniform and Training Standards" to reflect all team members.
  - Removal of the Bus Shelters section, which will be developed as a separate infrastructure standards document tailored to each municipality.

IMPLICATIONS:

BRAND IMPACT

The updated Brand Standard enhances Roam's visual and communication consistency across all platforms, aligns with modern design expectations, and reinforces our commitment to sustainability and professionalism. The removal of outdated styles and inclusion of new tools ensures Roam remains a recognizable and respected brand in the Bow Valley.

BUSINESS PLAN / BUDGET IMPLICATIONS

There are no immediate budget implications, as the majority of changes relate to design standards and internal documentation. Future materials will adopt the updated standards as part of regular replacement and development cycles, allowing for phased, cost-neutral implementation.

OPTION

A) Direct administration to implement the changes as recommended.
B) Request further revisions or clarification on specific sections before implementation.
C) Defer the update pending further consultation or external review.

RISKS

- Minimal risk, as changes are designed to support operational consistency and brand clarity.
- No service impacts or cost increases are anticipated as a result of these changes.
- Excluding AI-generated imagery supports brand integrity and avoids reputational risk related to authenticity.

ATTACHMENTS

1. 2012 Brand Standard with appendix: A, B & C
2. Roam Brand Standards Revision Copy (Draft 3)
3. Draft 3 version: 2025 Revised Brand Standard

Roam Transit Brand Revisions

1. What is a Brand

A brand embodies the essence of a product or service, defining its identity, positioning, and character — key pillars of success.

It's the blend of elements that brings this personality of the brand to life, from visual design and imagery to tone of voice, packaging, promises, and customer experience.

A truly successful brand goes beyond building recognition—it creates an emotional connection, aligns with people's values, and meets their needs and priorities. It transforms a product into an experience and an interaction into a meaningful, lasting impression.

2. The Roam Brand

In Banff National Park and the Bow Valley, wildlife roam freely, capturing the spirit of exploration and adventure. The word "roam" invites discovery, movement, and freedom. – Residents and visitors alike should be able to experience that same sense of wonder, eager to explore every corner. Roam enables this to happen by making travel easy — sustainable and congestion-free.

Roam isn't just a bus ride; it's an experience. From the moment passengers' step onto our eco-friendly buses, they know they're part of something special. Wrapped in breathtaking imagery of Banff National Park and the Bow Valley's iconic wildlife, our buses make it clear: this isn't just transportation — it's an adventure.

Roam is cheerful, welcoming and reliable. Our drivers and customer service team greet riders with a smile and share insights about the valley. Inside, our buses are comfortable, clean, and accessible, creating a relaxed atmosphere.

Whether planning your trip, talking to our drivers and customer service members, or visiting our website, every interaction with Roam feels unified.

3. Roam Responsibly

When Roam Transit launched in 2008 in Banff, it became the first municipality in Canada to operate an all-hybrid fleet. These low-emission, fuel-efficient vehicles were designed to encourage public transportation use and promote sustainability. Roam's fleet reflects the environmental values of Banff National Park and its surrounding communities, including Banff, Canmore, and Improvement District 9 (ID9).

The Roam brand is exclusive to environmentally friendly buses. New buses must meet strict environmental standards, providing at least 10 percent greater fuel efficiency than the class average for that vehicle. Whether it's a 40-foot or 20-foot bus, Roam maintains its commitment to sustainability as a performance benchmark.

In 2021, Roam furthered its green initiatives by introducing fully electric buses. These zero-emission e-buses enhance Roam's environmentally friendly mission, reducing its carbon footprint while offering passengers a cleaner, quieter ride.

To highlight our commitment to sustainability, environmental decals and messaging are prominently displayed on Roam buses, reinforcing our dedication to protecting the environment. We're also working to reducing waste and promoting sustainability by improving the accessibility of our website and schedule information. Offering digital schedules and contactless payment options helps us reduce our reliance on printed materials, minimize paper waste, and provide a more convenient and efficient experience for our riders. Every Roam bus is not just for transportation; it symbolizes our promise to preserve the beauty of Banff National Park and the Bow Valley for future generations.

4 Only Roam

Roam knows no boundaries. While it runs through the national park and to different in communities in the Bow Valley, there is only one Roam.

Do refer to Roam as:

• Roam Public Transit

• Roam Public Transit in Banff National Park

• Roam Public Transit in Canmore

• Roam – Banff to Canmore or Canmore to Banff Regional Service

• Roam Public Transit in Banff

• Roam Route 1, Roam Route 5, Roam Route 8X

Do not refer to Roam as:

• ROAM

• Canmore Roam

• Banff Roam

• Park Roam

• Lake Louise Roam

• Regional Roam

5. Brand Elements

The Roam brand is composed of several core elements that come together to create a distinctive look and feel, making it instantly recognizable.

The following elements will guide and assist in reproducing the Roam brand.

5.1

Primary Photography

Roam takes you places. Showcase the beauty of Roam's destinations with captivating photography that complements the Roam brand. Feature our buses with stunning natural backdrops that embody the spirit of Banff National Park, the Bow Valley and the iconic Canadian Rockies. Photography featuring people should feel authentic and candid, avoiding staged or posed appearances. This imagery should be the primary photography used in advertisements, marketing, website, social media and printed materials.

Secondary Photography

Roam's photography can also showcase the untamed beauty of the wildlife in Banff National Park and the Bow Valley, carefully selected from our approved wildlife list. This imagery can be used as a secondary element in materials for marketing, print and bus wraps. Please refer to section 6.4 for more details on bus wrap guidelines. These images should:

- Capture the authentic majesty of the wildlife roaming freely through the National Park or Bow Valley, showcasing the changing seasons.

Photography Use Guidelines

All photography must:

- Maintain the integrity of wildlife by pairing the correct logo prints with the appropriate animals — ie. no bear prints with elk photos.
- Only feature animals that appear on Roam's bus wraps — if there's no moose bus, do not use moose photos in our materials.
- Ensure the text flows harmoniously with the image, without clashing or overshadowing it.
- Avoid clutter — don't layer photos on top of each other.
- Keep it clean — don't mix different animal images in the same material.
- Product shots (e.g., fares) and equipment photos (e.g., buses) can be creatively combined.
- Photography credit must be visible as required based on the photographer's contract.

AI Generated Visuals

Use of AI generated visuals should follow style consistency with our primary and secondary photography guideline. They should align with your brand's tone, colours, visual style and should seamlessly integrate into content. Any AI generated visuals should be approved by marketing or management to ensure the feel of authentic imagery.

5.5 Partner Recognition

Roam partners are recognized for their contribution to roaming responsibly. Partners' logos may be included on printed materials no bigger than:

• one-half of an inch high x 1 inch wide in ratio to an 8.5 x 11 media size

No partner or other business may display their logo on the bus interior or exterior, except for third-party interior transit advertisements.

6.1 Print Material

Roam material must:

- Be designed using primary or secondary photography and use the corresponding Roam logo to the bus in the image
- Must always use consistent bus stop names, route names and direction of travel descriptions system wide
- Promote online tools for information
- Use "Public Transit" to describe the services offered
- Use the 12-hour clock
- Be created with accessibility in mind (e.g., high contrast, legible fonts, appropriate font sizes, and clear layout for ease of reading)

6.2

Roam's digital platforms should offer a seamless and intuitive user experience. All digital content must:

- Be relevant, up-to-date, and 100% accurate.
- Feature simple, user-friendly navigation for quick access to essential information.
- Enable users to effortlessly find bus routes and schedules.
- Utilize responsive design to ensure smooth access across all devices — desktop, tablet, and mobile.
- Provide enhanced cross-navigation for easy access to all service information (e.g., regional fares, schedules, and routes).
- Adhere strictly to Roam's brand guidelines across all applications and platforms.

- Offer real-time GPS tracking for up-to-the-minute bus schedules.

- Use the 12-hour clock.

- Must always use consistent bus stop names, route names and direction of travel descriptions system wide.

- Ensure website content is accessible in multiple languages and designed to be user-friendly for individuals with disabilities.

6.3 Fares

Roam prioritizes rider convenience with flexible fare options and fare technology by offering the following:

- **Variety of Payment Options**: Riders can choose from multiple payment methods, ensuring flexibility to suit individual needs.
- **Visual Fare Guides:** Fare options are clearly communicated with visuals, including images of Canadian currency and Roam's fare products, helping multilingual and first-time riders navigate the system easily.
- **Distinctive Non-Cash Fare Products**: Non-cash fare options feature consistent wildlife photography and the Roam logo, creating a recognizable and intuitive experience.
- **Online Payment**: Riders can purchase fares online through partnered applications, as well as through Roam's online reservation system.

Roam is committed to regularly reviewing and enhancing fare technology to ensure ongoing convenience and accessibility for all riders.

6.4

All Roam buses must display brand compliant wraps prior to entering service, except in cases of CEO approved extenuating circumstances.

Wildlife Imagery

Approved Banff National Park and Bow Valley wildlife for use on Roam buses are listed in Appendix A. Each species may be depicted in any of the four seasons, with balanced seasonal representation essential when selecting photos.

Special Occasion Imagery

In addition to wildlife imagery, Roam buses may occasionally feature special occasion wraps. These wraps must align with Roam's brand values, celebrating relevant events or themes while maintaining a cohesive look across the fleet. Special occasion bus wrap imagery must be approved by the Commission's Board of Directors.

Roam may incorporate special occasion unique visuals such as, Indigenous art or holidays and celebrations such as Pride. These visuals should:

- For Indigenous artwork the imagery should reflect the cultural significance and beauty of Indigenous art by local artists.
- Be thoughtfully integrated with the Roam brand, creating a respectful and vibrant visual experience.
- Ensure the use of cultural imagery is respectable and enhances the sense of place and honors the stories of the land.

Bus Wrap Specifications
Each bus wrap must include the Roam logo and designated animal prints. The wrap layout should closely follow existing designs, ensuring a unified look on both sides of the bus. Photos should be minimally retouched to preserve authenticity, with animals blending naturally into backgrounds that are proportional in size, sharp, and in focus. The same animal should not appear multiple times along one side of the bus wrap.

Roam buses must remain clean and well-maintained while in service.

Interior Design
Roam bus interiors are intentionally understated to keep focus on the surrounding scenery.

Seating and Storage
The seating layout accommodates passengers with skis, poles, or snowboards and provides additional space for strollers and bike racks for convenience. Accessible priority seating is available on all buses.

Environmental Messaging
Consistent-sized decals may be placed on the bus exterior to highlight Roam's commitment to environmental sustainability.

6.5

Uniform and Training Standards

Transit Operators

Drivers' uniforms must prominently feature the Roam logo embroidered on the arm for clear identification by riders. Before operating Roam buses, all drivers are required to complete the following training:

- **Environmental Driving Training:** Focuses on eco-friendly driving practices.
- **Local Cultural Awareness Training:** Enhances knowledge of the area and promotes engagement with riders.

- **Customer Service Training:** Emphasizes effective communication and rider support.

Customer Experience Team
Members of the Customer Experience Team must wear uniforms displaying the Roam logo and complete training to provide high-quality rider support that aligns with Roam's service standards. Required training includes:

- **Local Cultural Awareness Training:** Equips team members to offer knowledgeable assistance to visitors.
- **Customer Service Training:** Ensures consistent, positive experiences for all riders.

6.6 Bus Stops

All Roam bus stops should be designed with a consistent look and feature clear, easy-to-read signage, providing essential information for first-time transit users.

Each Roam bus stop must:

- Follow a consistent map design.
- Must always use consistent bus stop names, route names and direction of travel descriptions system wide
- Display route, schedule and bus stop details.
- Use the 12-hour clock.
- Indicate your current location on the map.
- Highlight nearby landmarks.
- Provide contact information for further assistance.
- Show fare details.
- Display real-time schedule information at high traffic bus stops where possible.
- Signage should be designed with accessibility needs in mind. (e.g., high contrast, large fonts, and clear icons)

Roam bus shelters should adhere to the Roam brand standards and maintain consistent infrastructure in their respective community.

6.7 Service Standards

BVRTSC will regularly monitor the bus service to ensure high quality across key areas, including:

- On-time performance.
- Courtesy and local knowledge of staff.
- Cleanliness, care, and comfort.
- Ease of use for all riders.

- Safety and risk management.
- Consistent design across signage, stops, shelters, pamphlets, advertisements, and fare cards.

Maintaining high standards in each of these areas is essential to elevating the level of transit service that Bow Valley residents and visitors have come to expect.

6.8

Roam Bus Shelters
Roam bus shelters are an integral part of the Roam transit experience. Designed to be simple, clean, and attractive, they're clearly identified as Roam stops.

Exclusivity for Roam Public Transit
Roam Public Transit shelters and stops in each community served, including Banff National Park are dedicated solely to Roam Transit. Any mutual use is at the discretion of the BVRTSC and should ensure no service disruption to Roam Public Transit. They do not display:

- Third-party advertising
- Community posters or unrelated information

For more specific requirements for Roam Bus shelters, please refer to the Roam Public Transit Infrastructure Design Guide.