

TOWN OF CANMORE

AGENDA

Committee of the Whole

Council Chamber at the Canmore Civic Centre, 902 – 7 Avenue

Tuesday, May 16, 2023 at 1:00 p.m.

- 1:00 – 1:05
- A. CALL TO ORDER AND APPROVAL OF AGENDA**
- 1. Land Acknowledgement**
 - 2. Agenda for the May 16, 2023 Committee of the Whole Meeting**
- 1:05 – 2:05
- D. STAFF REPORTS**
- 1. Railway Avenue Central Concept Design Community Feedback**
Purpose: To provide Committee of the Whole with a summary of community feedback on the Railway Avenue Central Concept Design and to provide an overview of current project status.
- 2:05 – 2:20
- B. DELEGATIONS**
- 1. EPCOR 2022 Performance Report**
- 2:20 – 2:25
- C. MINUTES**
- 1. Minutes of the April 18, 2023 Committee of the Whole Meeting**
- 2:25 – 2:55
- D. STAFF REPORTS**
- 2. 2023 Utility Master Plan Update**
Purpose: To provide the Committee of the Whole with a summary of the updated Utility Master Plan.
- Meeting Break 2:55 – 3:10**
- 3:10 – 3:25
- 3. Electric Vehicle Infrastructure: Best Practice Review and Recommendations**
Purpose: To provide the Committee of the Whole with a summary of the findings and recommendations from the Electric Vehicle Infrastructure: Best Practice Review and Recommendations report.
- 3:25 – 3:45
- 4. Renewable Feasibility Study Results and Next Steps**
Purpose: To provide the Committee of the Whole with a summary of the Renewable Energy Feasibility Study and the proposed next steps.
- 3:45 – 4:00
- 5. Regional Emergency Management Bylaw**
Purpose: To collect feedback on a draft regional emergency management bylaw before a final draft is presented to Council for approval.
- 4:00 – 4:15
- 6. 2022 Year-End Report**
Purpose: To provide the Committee of the Whole with a 2022 year-end review of Canmore Fire-Rescue.

- 4:15 – 4:30 **E. COUNCILLOR UPDATES**
 1. **May 2023 Councillor Updates**
- 4:30 – 4:45 **F. ADMINISTRATIVE UPDATE**
 1. **May 2023 Administrative Update**
- 4:45 – 4:50 **G. COUNCIL RESOLUTION ACTION LIST**
 1. **Council Resolution Action List as of May 8, 2023**
- 4:50 – 4:55 **H. CORRESPONDENCE**
 1. **Letter from Minister Dreeshen**
 2. **Letter from Alberta Municipal Affairs**
 3. **Marigold Library System Annual Documents**
 4. **Letter from RCMP**
- I. IN CAMERA – None**
- 4:55 **J. ADJOURNMENT**



**TOWN OF CANMORE
MINUTES**

Committee of the Whole
Council Chamber at the Canmore Civic Centre, 902 – 7 Avenue
Tuesday, April 18, 2023 at 1:00 p.m.

COUNCIL MEMBERS PRESENT

Tanya Foubert	Deputy Mayor
Wade Graham	Councillor
Jeff Hilstad	Councillor
Jeff Mah	Councillor
Karen Marra	Councillor
Joanna McCallum	Councillor

COUNCIL MEMBERS ABSENT

Sean Krausert	Mayor
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ADMINISTRATION PRESENT

Sally Caudill	Chief Administrative Officer
Therese Rogers	General Manager of Corporate Services
Whitney Smithers	General Manager of Municipal Infrastructure
Robyn Dinnadge	Manager of Communications
Allyssa Rygersberg	Deputy Municipal Clerk (recorder)
Palki Biswas	Manager of Finance

Deputy Mayor Foubert called the April 18, 2023 Committee of the Whole meeting to order at 1:00 p.m.

A. CALL TO ORDER AND APPROVAL OF AGENDA

1. **Land Acknowledgement**
2. **Agenda for the April 18, 2023 Committee of the Whole Meeting**

10-2023COW

Moved by Deputy Mayor Foubert that the Committee of the Whole approve the agenda for the April 18, 2023 meeting as presented.

CARRIED UNANIMOUSLY

B. DELEGATIONS

1. **Tourism Canmore Kananaskis Regular Update**
Rachel Ludwig, Chief Executive Officer with Tourism Canmore Kananaskis, provided a regular update on TCK and answered questions from the Committee.

Minutes approved by: _____

11-2023COW

C. MINUTES

1. Minutes of the March 21, 2023 Committee of the Whole Meeting

Moved by Deputy Mayor Foubert that the Committee of the Whole approve the minutes of the March 21, 2023 meeting as presented.

CARRIED UNANIMOUSLY

D. STAFF REPORTS

1. 2023 Citizen Perspectives Draft Survey (verbal report)

Catherine Knaus, Director of Ipsos Public Affairs, provided the Committee of the Whole with a report on the 2023 Citizen Perspectives Survey to assess citizens' attitudes and opinions toward the Town, to understand the day-to-day experiences of local citizens, and to inform the Town's direction and future priorities.

Meeting Break 2:08 – 2:18

2. Preliminary Tax Rates for 2023

Administration provided the Committee of the Whole with preliminary 2023 property tax rates for discussion, prior to Council approving the Property Tax Bylaw at the upcoming May 2, 2023 regular meeting.

E. COUNCILLOR UPDATES

1. April 2023 Councillor Updates

Written report, received as information.

F. ADMINISTRATIVE UPDATE

1. April 2023 Administrative Update

Written report, received as information.

G. COUNCIL RESOLUTION ACTION LIST

1. Council Resolution Action List as of April 12, 2023

Written report, received as information.

H. CORRESPONDENCE

1. Letter from Minister of Municipal Affairs Re: Ministerial Order

Received as information.

2. Gov't of Canada Letter - Retroactive Costs for RCMP

Received as information.

3. Municipal Affairs Letter Re: Alberta Building Codes

Received as information.

I. IN CAMERA - None

Minutes approved by: _____

J. ADJOURNMENT

12-2023COW

Moved by Deputy Mayor Foubert that the Committee of the Whole adjourn the April 18, 2023 committee of the whole meeting at 3:03 p.m.

CARRIED UNANIMOUSLY

Sean Krausert, Mayor

Allyssa Rygersberg, Deputy Municipal Clerk



Briefing

DATE OF MEETING: May 16, 2023 **Agenda #:** D-1

To: Committee of the Whole

SUBJECT: Railway Avenue Central Community Feedback

SUBMITTED BY: Trevor Reeder, Engineering Project Manager
Adam Robertson, Communications Advisor

PURPOSE: To provide Committee of the Whole with a summary of community feedback on the Railway Avenue Central Concept Design and to provide an overview of current project status.

EXECUTIVE SUMMARY

Public engagement for the Railway Avenue Central Concept Design took place in January and February. There was strong interest in the project, with a wide variety of opinions and feedback received. Administration has been collating the feedback, assigning it into themes and has revised and updated the concept design based on the feedback received.

BACKGROUND/HISTORY

The Railway Avenue Concept Design Brief was approved for planning purposes by Council on July 2, 2019 (169-2019). This motion included approval to proceed with detailed design and construction of Phase 1 (Railway Avenue South) which was included in the TIP20 project. Direction was given to administration to return to Council for approval of Phases 2 (Railway Avenue Central) and Phase 3 (Railway Avenue North) prior to commencing detailed design of those phases (170-2019).

Engagement for the overall Railway Avenue Concept Design Brief took place in 2018. During this phase, residents and stakeholders were asked to identify their experiences along the corridor so that they could be considered and addressed through the design process. Input was provided through stakeholder meetings, an open house and online mapping tools. Additional engagement took place in 2019-2021 for Phase 1 design and construction, and has started in early 2023 for Phase 2.

Phase 1 (Railway Avenue South / TIP20) is operating and the project team has incorporated several lessons learned from that project into the design and planning of subsequent phases. Signal design was completed based on updates to the concept design, and long lead signals hardware is on order. Transportation modelling informed the concept design for the Main Street and 10th Street intersection geometry and lane configurations. Snow and ice control, especially snow clearing and storage were considered early and throughout the concept design update. Delivery and other large vehicle access and traffic patterns have been considered and turning movements have been analyzed and incorporated.

DISCUSSION

Railway Avenue Central (Phase 2) is focused around the Main Street and 10 Street intersections and connects through new pedestrian and cycle facilities to the north and south sections of Railway. Intersections are to be protected, with physical separation between vehicle traffic and walking and cycling.

When undertaking design for any new transportation initiative, the Integrated Transportation Plan (ITP) guides that work. The ITP outlines a long-term plan for Canmore's transportation network and was developed with input from citizens. At a high-level, the ITP aims to:

1. Apply a functional and recognizable street design that accommodates all modes of travel: driving, walking, cycling and public transit;
2. Design safe spaces that accommodate people of all ages and all abilities; and
3. Accommodate a mode shift that allows for efficient travel by visitors and residents, with attractive options for walking, cycling and transit.

Engaging at the Right Step

Administration recognizes how challenging this conversation is in the community, given the diversity of views on the future of transportation. Much of the conversation during this engagement focused on the overall direction of transportation planning – this level of conversation and engagement is better suited to the Integrated Transportation Plan, which offered the opportunity for public input prior to its latest update in 2018. When looking for feedback on specific projects that are based on the guiding principles from the ITP, the goal is to improve the specific elements of the project to ensure they are meeting community needs.

The Project Team has sought public feedback in a number of ways including an online component, a community open house, and direct engagement with locally impacted businesses and residents.

Key Themes and Impacts on Design

General Disagreement with Direction

A common theme heard throughout the engagement was general disagreement with the direction of transportation planning. There were numerous reasons why disagreement was noted, including:

- Congestion, as a result of:
 - o fewer lanes
 - o intersection changes / signals
 - o transit operations
 - o turning movements;
- Left turn access (into and out of driveways and Elevation Place);
- Solid continuous median; and
- Snow removal and storage.

The project team has incorporated changes into the concept design which address these project-specific concerns. Lane configurations and intersection geometry has been modelled along with signal phasing design to ensure current and future volumes can be accommodated. Turn bays were added and lengthened at the Main Street and 10 Street intersections. Bus pullouts or bays were added at transit stops. Left turns at all current driveway locations are accommodated and queuing space for left turning vehicles is provided at most driveway accesses. A solid continuous central median has been removed. The design has been reviewed multiple times with the Streets & Roads business unit, including the front line crew, in an effort to address snow clearing concerns and to provide ample room for snow storage.

General Agreement with Direction

Another common theme heard throughout engagement was general agreement with the direction of transportation planning. There were numerous reasons why agreement was noted, including:

- Consideration for all modes of travel;
- Active transportation network connectivity; and
- Concern regarding conflict points between different modes of travel.

The project team has incorporated changes into the concept design which incorporate feedback received. Higher level network connectivity has been reviewed and bi-directional cycle facilities were extended. Connections to existing active facilities at TIP20, Spring Creek, Main Street and the multi-use path along the CP Rail Tracks have been reviewed. The Elevation Place mid-block crossing was realigned to reduce the crossing distance and improve user safety. The intersections at Main and 10 Street are near fully protected.

FINANCIAL IMPACTS

The design phase of Railway Avenue Central is funded from CAP 7239 which was approved in the 2022 budget. Scope includes an updated concept design, engagement support, and preliminary design work in 2022-23 followed by detailed design (pending Council approval) in late 2023.

Construction scope is currently funded from CAP 7359 which was approved as a placeholder in the 2024 budget. Construction staging and budgets are under development and will be presented to Council for context ahead of future design approvals. As identified in a briefing report at the May 16, 2023 Special Council meeting, with revised scope and available resourcing, completing the full central portion of Railway Avenue in 2024 is not feasible. A split scope and revised phasing of the Railway corridor will be proposed to allow for completion of priority work in 2024 and will be outlined in the future request for decision report.

STAKEHOLDER ENGAGEMENT

Public engagement was conducted from January 23 – February 10, 2023, with both an online component and a community open house. The purpose of the engagement was to gather feedback from the public on how the proposed concept designs for Railway Avenue Central would impact travel experiences when driving, walking, cycling and using transit. See Attachment 2 for a full What We Heard report from the engagement process.

Online Component:

- 2160 participants were “aware” (visited at least one page) of the project.
- 1080 participants were “informed” (interacted with the project site).
- 378 submissions to the online survey were received. See Attachment 4 for full details.

Community Open House:

- Approximately 90 people attended the Community Open House on January 25, 2023. Staff solicited input on designs and answered questions on the project. See Attachment 3 for full list of questions and comments from the Open House.

Locally Impacted Stakeholders:

Engagement with residents, businesses, and property owners in the project area began in January, this engagement is ongoing and will continue through detailed design.

NEXT STEPS

The project team is progressing into early preliminary design work and continuing to make design changes based on stakeholder feedback and through design development and application of lessons learned.

A final draft of the concept design has been received and is attached for reference (Attachment 1). Minor updates may still occur based on final signal phasing and modelling, expected to be complete by the end of April. The project team will discuss the changes made to date and welcomes additional and continued discussion of the concept update with Council.

Inflationary pressures and a competitive market for construction materials, equipment and labour have manifested in pricing for recent tenders. As a result, construction staging and overall project budget for Railway Avenue Central is currently under review. It is expected that the project will include utilities and

surfaceworks improvements between Bow Valley Trail / TIP20 and Mainstreet, this scope would include the intersection at Main Street and Railway Avenue but not extend to 10 Street. Administration will return to council in the coming weeks and months to present proposed scope and budget modifications for approval.

Administration intends to return to Council in July for final approvals prior to Detailed Design as per motion 170-2019.

ATTACHMENTS


- 1) Railway Avenue Central Concept Design V3 – Attachment 1
- 2) Railway Avenue Central What We Heard Report – Attachment 2
- 3) Railway Avenue Central Open House Feedback – Attachment 3
- 4) Railway Avenue Central Online Survey Responses – Attachment 4



AUTHORIZATION

Type your date of approval next to your name.

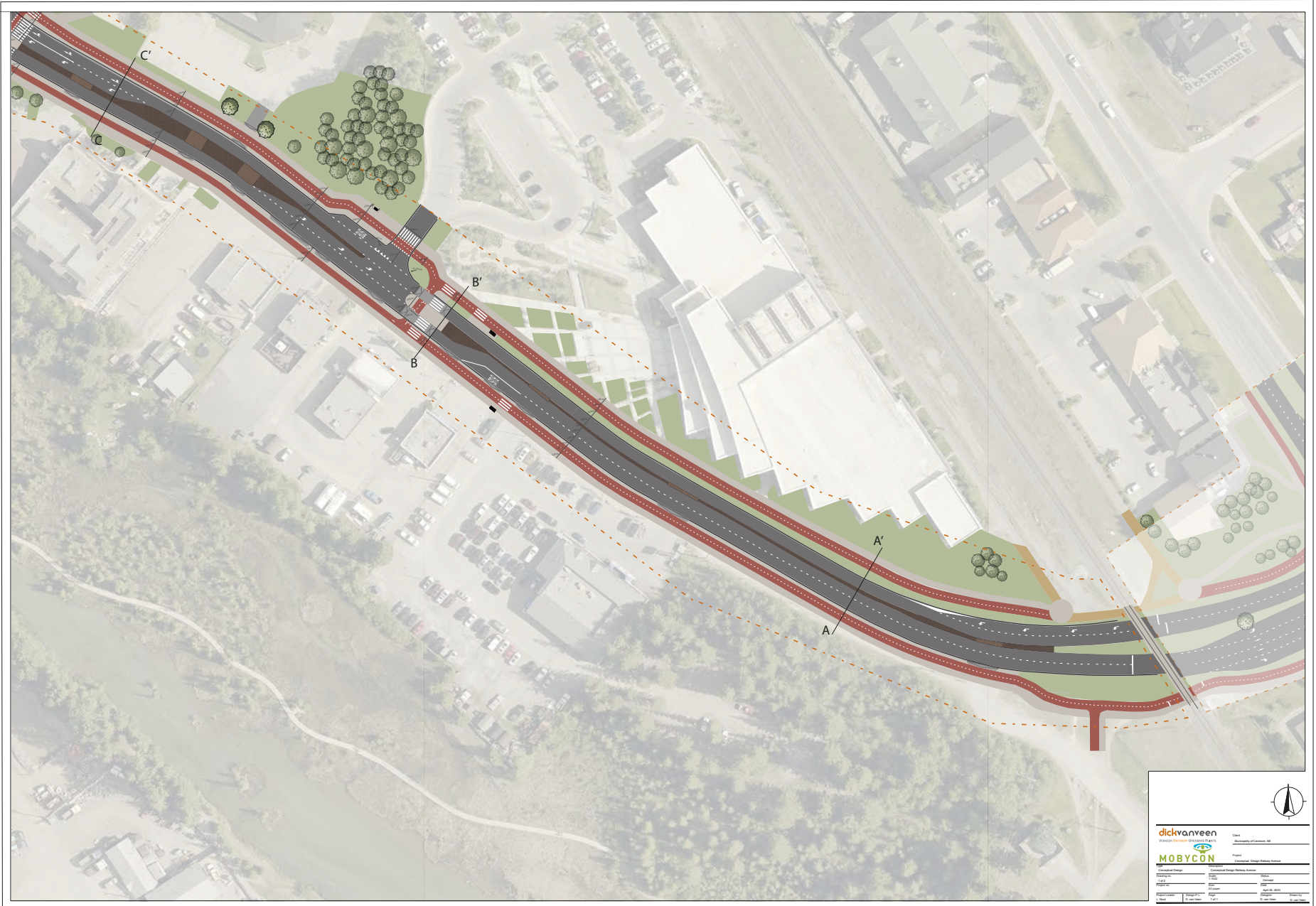
Submitted by:	Trevor Reeder Project Manager	Date:	<u>April 24, 2023</u>
Submitted by:	Adam Robertson Communications Advisor	Date:	<u>April 24, 2023</u>
Approved by:	Andy Esarte Manager of Engineering	Date:	<u>April 24, 2023</u>
Approved by:	Whitney Smithers GM of Municipal Infrastructure	Date:	<u>April 27, 2023</u>
Approved by:	Sally Caudill Chief Administrative Officer	Date:	<u>May 9, 2023</u>






		Client: Municipality of Guelph, ON
		Project: Guelph Transit Station
Consultant/Design: Mobycon	Consultant/Design Review: Dick van Veen	Date: 2023
Project No.: 23-01	Drawing No.: 100	Scale: 1:100
Project Location: Guelph, ON	Date: March 15, 2023	Status: Final
Author: [Name]	Check: [Name]	Date: [Date]







dickvanveen <small>A Division of Dick Corporation</small>		<small>Client</small> Municipality of Cambridge, MA	
MOBYCON <small>MOBILITY CONSULTANTS</small>		<small>Project</small> Cambridge Outer Rail Station	
<small>Conceptual Design</small>	<small>Conceptual Design Review</small>	<small>Station</small>	<small>Station</small>
<small>MOBYCON</small>	<small>MOBYCON</small>	<small>MOBYCON</small>	<small>MOBYCON</small>
<small>Project Location</small>	<small>Design</small>	<small>Scale</small>	<small>County</small>
<small>Maple Street</small>	<small>Cambridge</small>	<small>1:1000</small>	<small>Essex</small>
<small>MOBYCON</small>	<small>MOBYCON</small>	<small>MOBYCON</small>	<small>MOBYCON</small>



What We Heard: Railway Avenue

Attachment 2

April 2023

Background

Railway Avenue is a key transportation corridor, which is due for underground utility upgrades. Anytime we are doing major underground work, it makes sense to combine updates to surface work at the same time.

When doing updates to our transportation network, our planning process is based on the Integrated Transportation Plan (ITP). The ITP outlines a long-term plan for Canmore's transportation network and was developed with input from citizens.

The ITP aims to:

- Apply a functional and recognizable street design that accommodates all modes of travel: driving, walking, cycling and public transit.
- Design spaces that accommodate people.

Approach

We conducted public engagement from January 23 – February 10, 2023. The purpose of the engagement was to gather feedback from the public on how the proposed concept designs for Railway Avenue Central would impact travel experiences when driving, walking, cycling and using transit.

Tactics:

- Online Survey
 - *✓ Result: We received a total of 378 submissions to this survey. See Attachment 2 for full results.*
- Community Open House.
 - *✓ Result: Solicited input on designs and answered questions on specifics. Community Open House had roughly 90 people in attendance. See Attachment 3 for full list of questions discussed at the Open House.*

Key Themes and Impact on Design

General Disagreement with Direction

A common theme heard throughout engagement was general disagreement with the direction of transportation planning. There were numerous reasons why disagreement was noted, including:

- Congestion, as a result of
 - fewer lanes
 - intersection changes / signals
 - transit operations
 - turning movements;
- Left turn access (into and out of driveways and Elevation Place);
- Solid continuous median;
- Snow removal and storage.

The project team has incorporated changes into the concept design which address concerns raised. Lane configurations and intersection geometry is being modelled along with signal phasing design to ensure

current and future volumes can be accommodated. Turn bays were added and lengthened at the Main Street and 10 Street intersections. Bus pullouts or bays were added at Transit stops. Left turns at all current driveway locations are accommodated and queuing space for left turning vehicles is provided at most driveway accesses. A solid continuous central median has been removed. The design has been reviewed multiple times with the Streets & Roads business unit, including the front line crew, in an effort to address snow clearing concerns and to provide ample storage.

General Agreement with Direction

Another common theme heard throughout engagement was general agreement with the direction of transportation planning. There were numerous reasons why agreement was noted, including:

- Consideration for all modes of travel;
- Active transportation network connectivity;
- Concern regarding modal user conflict points.

The project team has incorporated changes into the concept design which incorporate feedback received. Higher level network connectivity has been reviewed and bi-directional cycle facilities were extended. Connections to existing active facilities at TIP20, Spring Creek, Main Street and the multi-use path along the CP Rail Tracks have been reviewed. The Elevation Place mid-block Crossing was realigned to reduce the crossing distance. The intersections at Main and 10 Street are intended to be near fully protected once signal phasing design is finalized

All Themes

The full listing of the key themes of engagement feedback with comments on design impact is included:

Theme	Design impact / Action
Accommodation of other modes	Review overall active network connectivity Safety at intersections (protected priority) Safety at crossings (all users) User separation / buffer space
Seasonality of active modes	Snow and ice control Adequate snow storage Review design with Streets & Roads (including crew / frontline) Peak volumes are summer, mode shift needs are largely seasonal
Alternate routes for active modes	Review overall active network connectivity Alternate routes are constrained, railway is a strong desire line (especially for visitors)
Existing active infrastructure is fine	Connectivity is poor User conflicts are many Safety priority
Congestion in general	Modelling on current and future volumes
Congestion with fewer lanes	Modelling on current and future volumes Peak vs average volume TIP20 volumes and signalling
Congestion network impacts (spring creek, BVT, Fairholme/17th)	Refer to ITP Spring Creek monitoring

Congestion - environmental impacts	Mode shift
Congestion - turn movements	Signal phasing and modelling Extended turn bays Bus bays / pullouts Left turn space / median CAD turning movements
Congestion - parking / intercept parking	Expansion of parking at EP is under consideration Work with BVT and other accommodation providers to encourage alternative modes
Congestion - emergency impacts	Concept to be reviewed with emergency services / Fire during early preliminary design Design follows standard Fire access requirements Past feedback is included
Confusing design	Similar to TIP20, lessons learned
CP rail crossing merge	Merge length and lane configuration is under review
Grading issues / ponding	Excessive crowning along portions of Railway to be addressed at preliminary design Stormwater design
Landscaping generally and in medians	Landscaping to be considered at detailed design, maintenance is a key factor Minimal landscaping in medians
Mountable medians	Majority of medians are mountable Mostly no central median except for safety (intersections, crossings, etc.)
Signals near or far side	Signal placement will be confirmed at detailed design, current intent is for near side similar to TIP20 (with lessons learned)
Snow removal	Detailed reviews with Streets & Roads including front line crew Snow storage is priority in design Adequate positive drainage (ice) Operational lessons learned incorporated in design to ensure effective and efficient clearing
Transit operations congestion	Bus bays / pullouts are provided Consideration for future planned routes Modelling on current and future volumes
Transit operations user conflicts	Placement of active facilities with respect to bus stops
Truck access	Turning movements have been modelled Large vehicle delivery and pickup routing and paths considered

Conclusions

We gathered a lot of valuable feedback throughout this process, which enabled the project team to consider many different issues and update the design accordingly to ensure it is serving the concerns identified.

We recognize the polarizing views on transportation that the first phase of Railway Avenue created in the community. Those views, both negative and positive are reflected in what we have heard in this phase of engagement. We want to ensure you that we heard everything and whether you agree with the direction or not, our ultimate-goal is to ensure feedback received improves this and future transportation projects.

The project team recognizes the feedback and is appreciative how challenging the conversation around what change in the future of transportation in Canmore looks like. This level of conversation is best reserved for an earlier stage in the planning process, the creation and any future updates to the Integrated Transportation Plan – which guides the direction of what transportation planning looks like.

Attachment 2: Online Survey Results

The online survey was open from January 23 – February 10, 2023. The purpose of the survey was to gather feedback from the public on how the proposed concept designs for Railway Avenue Central would impact travel experiences when driving, walking, cycling and using transit. We received a total of 378 submissions to this survey. *Full list of comments from the online survey is available in attachment 2.*

Attachment 2: Community Open House Questions/Feedback

The Community Open House was held January 25, 2023 at the Canmore Recreation Centre, with approximately 90 people in attendance. The project team presented the designs, gathered feedback on how it will impact travel experiences and answered questions on the project. *Full list of questions and topics discussed is available in attachment 3.*

Community Open House – Railway Avenue Central Questions/Feedback

The following is a summary of questions and comments that were received at the Community Open House on January 25, 2023.

- What about people who have to drive for work, trades people, delivery people, etc. If you constrict traffic won't you have a disproportionate impact on them? How are you accommodating them?
- I live in south Canmore, won't this make it harder for me to get in and out?
- You are destroying this Town, didn't you learn from 'the intersection', why would you do that again?
- Is this going to be like the intersection? That's great, I love it.
- The merge after the train tracks looks too short, won't this cause accidents?
- The turn lanes / bays look too short at main and 10th.
- There needs to be an extra lane coming out of main street.
- Will there be an extra lane on southbound Railway at main?
- There needs to be an extra lane exiting Save-on at 10th
- The two-way, right-in / right-out needs to be kept at Save-on just north of Main street
- What are you putting in the green medians? How is it going to be maintained, will it impede sightlines?
- Have turning movements been done for the delivery vehicles at all the business accesses?
- Will the intersections all be fully protected like TIP20?
- Will the signals be near side like TIP20? (~50/50 that's dumb / that's great)
- Won't this make everything more confusing for tourists?
- Is additional parking being provided around EP / another intercept location?
- How are you going to convince all the visitors not to drive into downtown?
- The bike lanes should be bi-directional, people won't follow this.
- The red concrete doesn't really work, pedestrians especially tourists don't know that it's a bike lane, how can this be made more clear?
- How will emergency vehicles get past traffic in this design?
- Where are you going to put all the snow?
- Has the cost to clear all the sidewalks and bike lanes been considered?
- Are driveways and crosswalks going to be cleared by the Town after the road is plowed and puts windrows across them?
- Will the northern section be done also? When?
- What is the plan for 17th street? Can this intersection be done soon? What about 17th and Fairholm? It's difficult to get out of Larch with the traffic now, these intersections need to be considered sooner than later.
- Will 17th be signalized (even temporarily) during construction? Lot's more traffic will go that way to avoid construction and that intersection won't be able to handle it as is.
- Appreciate the bike lanes and closing the existing gaps in connectivity
- Can the path behind EP along the railway be widened?
- Will there be a crossing at the tracks from Spring Creek to EP? If not what will be done to discourage this desire line?
- Why did you move the crossing in front of EP to the north?
- Will left turns out of EP be allowed and will this design make them easier?
- Why do the busses stop in the lane? Won't that cause congestion? Esp in front of Shoppers.

- Will the excessive amount of driveway crossings along the east side be reduced? Why do the Drake, Shoppers, Gas station and GM dealer get two driveways?
- Won't it cause congestion when cars try to turn left across traffic when there is only 1 lane?
- Why add medians when you could just leave it as is and have the extra lane? (main to 10th)
- Why do you need bike lanes on both sides?
- What will happen to the sidewalk and bike lanes connecting to main and 10th street? Do these just dump onto the road?
- When will 10th street be improved? Will the bridge at 10th be widened?
- What is happening with the old firehall site? Will that impact this design / frontage?
- Will the intersection at main be realigned to make the north through and left clearer?
- Will the intersection at main be realigned to eliminate the confusion / conflict between cars E bound out of main and W bound out of nutters?
- Will the weird grades at the 10th and railway intersection be fixed? Railway has a huge crown here and it makes that intersection weird to cross.
- What's the purpose of this (and TIP20, still asking...)? What is the Town's goal? Why?
- What does the actual traffic data look like? What is the future impact / how does this play out over time?
- How can this design possibly work? How can it move enough vehicles?
- It's cold and snowy here for 6 months of the year, no one will bike or walk, this will just cause more congestion.
- What is the vehicles per hour now vs after?
- Mode shift, what and why, what are the targets based on? What happens if we don't achieve them? Would this be reversed? Why not make it temporary to test it out before committing?

Railway Avenue Central - Concept Design Feedback

SURVEY RESPONSE REPORT

14 January 2023 - 12 February 2023

PROJECT NAME:

Railway Avenue Central



Please note:

- 1. Screen names have been removed to protect privacy and increase civility in the Public Engagement process.**
- 2. No comments have been edited or removed.**



SURVEY QUESTIONS

Q1 The diagram below shows Railway Avenue from Elevation Place to Main Street. *Note - cross sections A and B from the Railway Ave cross sections document apply to the section of the design. Legend: dark grey - road, red - bicycle lane, light grey - sidewalk. Please provide your feedback on how the concept design will impact your travel experience when: 1. Driving 2. Walking 3. Cycling 4. Using Transit

Screen Name Redacted

1/23/2023 02:07 PM

1. this will most likely lead to more congestion as you are reducing traffic lanes. Will the combining of two lanes into one so close to the rail line create issues? 2. Missing a connection to the trail that runs to Spring Creek and behind EP - there is no safe way to cross at this location. 3. this will make cycling more accessible and safer along railway 2. no impact

Screen Name Redacted

1/23/2023 04:36 PM

1. I don't think it will significantly impact my driving experience. 2. This design will make me feel much safer when walking along the corridor. 3. This design will make me feel much safer when driving along the corridor and will provide a much-needed bike connection to other areas of town. However, I would suggest that the bike path be two-way on the north side of the road between the Elevation Place entrance and the railway. I'd expect that if it's one way there will be a lot of people who ride in the wrong direction on this side of the road. 4. I don't take transit but don't think this will affect transit much from the current road design. General: I hope that in the future, the town will try and consolidate access to the businesses on the south side of the road (car dealership, gas station, etc) so there are not as many driveways that cross the sidewalk and bike path. That's where the danger is - vehicles crossing the path of vulnerable users. I like the raised crossing with median near Elevation Place. I think the three-lane cross section with one vehicle lane in each direction and a centre turning lane is the right roadway design to maintain similar capacity to what's there now while being able to provide space for active modes. It probably won't keep people from complaining about losing car space, but it won't change much. I think the biggest issue is the Town doesn't do a good job explaining how this change still allows significant vehicle traffic while making it much safer for people walking and cycling. Looking at the webpage for this project, there's very little description, explanation, or justification for the changes. Some people will understand, but most won't. And then you get the anti-bike brigade out and you can't control the narrative. To be fair, I really like many of the changes that have been implemented in the past few years to increase cycling and walking safety, the Town has just not done a very good job with communications to the public!

Screen Name Redacted

1/23/2023 06:21 PM

Should not remove 2 vehicle lanes in place of bicycle lanes that only benefit a small percentage of residents for 4 months of the year. Leave 4 lanes. Already bicycle path on ep side that is enough. Regular sidewalk on other side is sufficient. Most experienced cyclists will ride on road because pathway is too slow and pedestrians are also walking on bike path. Spring creek drive is a perfect example of What NOT TO DO!

Screen Name Redacted

1/24/2023 06:26 PM

I generally drive from 3 sisters to downtown 5 days a week. I don't have time to take transit, walk or ride my bike. Just like 99% of the visitors to our tourist town. Town needs to be welcoming to all not just uber athletes and cyclists.

Screen Name Redacted

1/24/2023 08:35 AM

When driving, two lanes are required to keep traffic flowing when turning into elevation place and with back up from the train tracks. I am a cyclist and when you reduce the width of each traffic lane on the road with ridiculous and unnecessary concrete and median structures, you make it very dangerous to be on the road which is a bicycle's right as cars cannot overtake. As a cyclist on the 'bike' paths, they are not mixed use as they are full of pedestrians taking up the whole path and being rude and swearing at me constantly for being where they think I should not be. Absolutely no need for bike paths either side, please add a car lane instead. For walking, there is nothing wrong with the path already in place and crosswalks.

Screen Name Redacted

1/24/2023 08:53 AM

The bike lane is great

Screen Name Redacted

1/24/2023 08:58 AM

I often bike from Kananaskis way to my work on main street. And I'm forced to take a detour through spring creek. This bike path on the opposite side of the road from elevation place would make my bike trip safer and faster.

Screen Name Redacted

1/24/2023 09:28 AM

1- driving is already a bottleneck because of the railroad. I strongly oppose reducing the flow in this area as most of the groceries and big boxes stores are and biking and walking are not an option often. Most of the tourism parking is also on this side of the tracks and I don't believe traffic will reduce because of it. I am a contractor having to carry many heavy tools around in 2 to 3 locations per week. The access to the downtown area is already frustrating at best in the summer and I am not looking forward to more difficulty moving around to service the downtown area. Access to EP is definitely a problem. Mostly when coming out turning left. 2/3- Walking and cycling are not an issue in my view. There is plenty of paths to get downtown and

around. Also, there is plenty of land on each side that the city would have access to do the planned walking and cycling path. 3- I don't use transit. And don't plan too.

Screen Name Redacted

1/24/2023 09:31 AM

1. Driving into downtown, having 1 lane should be perfectly fine. The way the main intersection operates now, you won't have a right turn and a straight through at once, so once lane is adequate. However, I think that leaving downtown needs to be two lanes all the way through railway. The amount of summer traffic backed up trying to turn right onto Bow Valley Trail for the condo's and when a train stoppage occurs.... one lane will completely backup and start to congest roads other than Railway. Not to mention making the left turn into EP or leaving EP will be miserable - for everyone. It's already difficult to left turn from EP now, even in the off season. 2. Walking now I generally choose the side closest to EP because it is wider. The sidewalk on the other side could be wider for sure, and this can be accomplished by removing the one driving lane. 3. Cycling similar, I usually take the side of EP for going into town. For leaving town I avoid the area and go through Spring Creek. I don't think this is a bad alternative. Not many folks are going to the ESSO or car dealerships on their bikes. 4. N/A

Screen Name Redacted

1/24/2023 09:51 AM

1. Think will cause issues in winter with snow. 2 & 3 - I know you have gone for red & white for what path but really it should be shared & this would make cyclists slow down a bit as noticed cyclists ignore most things & think they can run you over, so if mixed, then it's a bit like traffic calming for cyclists! However you have started this colour coding but you know you can't see this when covered with snow? 4. No opinion on transit

Screen Name Redacted

1/24/2023 09:52 AM

1. This will greatly impacted driving particularly when the lanes shrink to 1 just after the tracks. This will create bottlenecks and confusion as to why a lane suddenly ends for no apparent reason. And for that reduction to occur so close to the tracks creates a huge safety concern with vehicles not being able to clear the tracks thereby introducing potential collisions with the train. As a person with a background in traffic safety, this a huge flaw. 2. Walking n/a 3. Cycling....I typically used alternate paths around that area and would avoid Railway Ave. I don't feel that I would use these new paths as the current ones are sufficient. 4. Transit - n/a

Screen Name Redacted

1/24/2023 10:12 AM

This will greatly improve my bike commute to work. I commute roughly 5 days a week for 6 months of the year and avoid this section currently as it is not bike friendly.

Screen Name Redacted

1/24/2023 10:14 AM

This will greatly improve my bike commute to work. I commute 5 days a week over the 6 months of summer on a bike. I currently avoid this section as it is not bike friendly

Screen Name Redacted

1/24/2023 10:33 AM

I like the cycling lanes. It all looks quite usable.

Screen Name Redacted

1/24/2023 10:41 AM

This will impact my travel very negatively. We live in south canmore, and bottlenecking the incoming lane to one lane is absurd. It's already busy here, why are you making things more difficult for drivers? At all times I've never ever seen the bike and sidewalks too busy, but the road is ALWAYS too busy, so, so what's the logic here? Please don't do this to the canmore locals living in South Canmore just trying to get home after work.

Screen Name Redacted

1/24/2023 11:20 AM

This looks great and I think additional bike lanes are a great way to decrease traffic and parking volume. I would be more likely to bike if there were bike lanes. Victoria BC has some amazing bike lanes that are separated from the main road with a curb. I dont think this will effect my experience with driving, walking, or transit but will have a positive impact on cycling.

Screen Name Redacted

1/24/2023 11:43 AM

1. Negatively impacted heavily. As someone with a business that relies on my staff driving along Railway Ave multiple times a day the changes proposed will have a significant effect. The changes to the Bow Valley Trail intersection have already caused delays because there is not enough space for turning vehicles. Fundamentally, the weather in Canmore and needs of its residents results in automotive transport being necessary. During the summer, the BVT intersection is backed up and can take 20 minutes to get through the lights. Without significant changes to parking outside of the downtown core, including the EP lot, the same rate of car use to this area will continue. 2. Unchanged. There were sidewalks available before including a very spacious one on the Elevation Place side. 3. There is already a bike lane on the Elevation place side of the road. It would be useful to continue the bike lane through to main street at the intersection with 8th. 4. Not impacted. Current transport stops are easily accessible.

Screen Name Redacted

1/24/2023 11:57 AM

This is ridiculous! Eliminating vehicle lanes is a catastrophic waste of taxpayer money. This vision you have is myopic and does not consider that CARS are not going away. The bike lanes in every

major centre across canada are being removed because the are not being used. We live in snow snow and cold for 6-8 months a year. This will create significant congestion at an already ruined intersection.

Screen Name Redacted

1/24/2023 12:26 PM

1. Driving will be very negatively impacted by the proposed design. The change to largely one-lane will greatly exacerbate the long lines of congestion that occur during busy periods and following train crossings - particularly east-bound in the afternoons and west-bound in the mornings. Commercial vehicles but more importantly emergency vehicles will be impeded significantly more than they are now. There are already huge financial and safety costs to people in Canmore because of the incredibly small area that falls within the Municipal Government Act's requirements for response times and I see this worsening the situation. Things overall are challenging with two-lanes in each direction - with only one, and modal choices not likely to massively shift, this will only get worse with one. 2. Waling will be far better on the south side, but could that not be achieved by widening the existing sidewalks there? 3. Cycling improves the most with the proposal. Do we have the luxury of building this infrastructure on both sides of the road however? Please know I am an avid cycling commuter. 4. Using Transit. Will be impacted the same as car use. Finally, at some-point the rail-crossing has to be addressed and likely a separation will be required. Does this plan and the previous changes to 'The Intersection' on Bow Valley Trail acknowledge or explore that? Are we further painting ourselves into a corner?

Screen Name Redacted

1/24/2023 12:46 PM

I don't drive Great for me as I walk everywhere with 2 kids and at the moment the paths are shocking and not pedestrian/bike friendly!

Screen Name Redacted

1/24/2023 01:51 PM

I am very much in support of extending the bike path on *both* sides of Railway Ave. through this section, and also keeping the pedestrian-activated crossing lights near EP.

Screen Name Redacted

1/24/2023 01:51 PM

1. Terribly. This will bottleneck an already busy and bottlenecked area of town, especially during the busy tourist season when millions of visitors rent vehicles and travel to the mountains for recreation. 2. Not change much. I typically use the multi-use path behind Elevation Place to walk through this area. 3. Not change much. I typically use the multi-use path behind Elevation Place to bike through this area. 4. I would imagine the busses will struggle with the constricted traffic flow.

Screen Name Redacted

1/24/2023 02:11 PM

1. I do not see this having any material impact on my driving experience. I think the two outbound lanes is a good idea for train clearing. 2. This will vastly improve the walking experience on the dealership side of the road. The narrow sidewalk is not welcoming or comfortable for travel. I like the new placement of the crosswalk closer to Elevation Place, makes sense given the improved crossings at the A&W intersection. 3. This is the biggest improvement for me and my family. Current cycling conditions on Railway Avenue are not inviting, especially not when riding with my 6 year old. The improved cycling lanes on the dealership side are welcome, will allow for a nice connection through Spring Creek all the way to Elevation Place or Main Street . 4. Not an avid transit user, but I imagine this will allow for more space for comfortable bus stops and better amenities at them. I appreciate these improvements. We are a one car family and these continued improvements toward other modes of travel continues to make that easier, also making life more affordable for us with the choice to be a one car family. My young daughter continues to ask when she can get winter spikes for her bike!

Screen Name Redacted

1/24/2023 02:21 PM

I don't know how to imagine my use during either shoulder or peak seasons.

Screen Name Redacted

1/24/2023 03:04 PM

This will affect my daily driving experience from our restaurant to our storage daily. From downtown to Bow meadows crescent. I do not approve reducing the lanes of traffic on Railway ave, This will add up to more congestion. Already bad when a train passes by. I am not sure what is to final goal for this project. I see more challenges than benefits for this.

Screen Name Redacted

1/24/2023 05:57 PM

Looks nice, but it will create a dangerous bottleneck. This design depends on NO problems and everything being clear and working perfectly. Unfortunately that isn't always the case and the traffic flow will be chaotic when: there's a traffic incident - stalled vehicle or accident; an obstacle on the road such as lost cargo or debris; a sinkhole or pothole requiring repair; a delivery truck offloading new vehicles to the car dealership that currently takes up one lane; emergency vehicles requiring traffic to pull over to let them pass - to where?; The RR crossing arms are notorious for breaking down. What happens then if your design is in place? Now drivers make u-turns to avoid the blockage. In your design, the medium will prohibit cars from doing this - or will it? I predict, tire rut repairs in the living mediums will be a routine activity and another obstacle. With only one lane, backups will affect roads right into town causing frustration, noise and air pollution; visitors and tourists (and perhaps locals too) who aren't sure where they're going will get into trouble. We already

see cars driving on cycle paths on Palliser Trail and on the BVT. This design provides more opportunity for errant cars to jeopardize more people on the cycle paths (especially on the south side); add in winter conditions with snow and removal operations to the above and we have compounded traffic chaos. I mentioned emergency vehicles earlier, but what happens in a broader emergency if evacuation orders are issued? One lane traffic corridors will not work. The goal of morphing Canmore into a friendlier and safer place for pedestrians and cyclists is noble and worthwhile, but it won't be successful if the measures to accomplish this adversely impact on the flow of traffic. Cars, trucks and vans are a reality that will be a constant in this town for the foreseeable future. We need a design plan to enable all vehicles, cyclists and pedestrians to navigate our town safely, and easily without constrictions and confusing details.

Screen Name Redacted

1/24/2023 06:04 PM

Driving - This will create further traffic congestion going from 2 lanes to 1 lane.

Screen Name Redacted

1/24/2023 07:09 PM

I find the bus stop crossing the bike path very confusing and potentially unsafe. Will there be enough space to wait for the bus with a stroller? Are the bike lanes 2 way or will each bike lane be single direction like a road? If it is 2 way crossing with a stroller or small child to access a bus could be dangerous if there are a lot of bikes or bikes are not paying attention to what is ahead of them. Turning left from the elevation place junction is already quite difficult. Will the pedestrian crossing impact sightlines for this at all? Similarly will the bike lane across the entrance impact this? Is the bike lane 2 way, who has right of way, bikes or cars? Again as a banff resident with small children we like to use the pool at Elevation place and I already find turning left from this exit quite difficult. This plan does not look to be improving this situation.

Screen Name Redacted

1/24/2023 07:19 PM

I do feel that if the town of canmore feels there is enough future or projected bike traffic to warrant bike lanes on both sides of the road and from the plan it appears these bike lanes would support 2 way traffic then this is very unsafe to have to cross to access a bus. Have these planners tried travelling with small children, a stroller, bags, and potentially a child's bike or scooter and then boarding a bus, this is very complicated and stressful already, adding having to be aware of 2 way bike traffic while trying to quickly board the bus would be one too many things and would completely discourage me from using public transport to visit canmore. Much more than the increased travel time by car because of the road narrowing for bike lanes will discourage me from driving,

Screen Name Redacted
1/24/2023 08:33 PM

This design will continue to make downtown less accessible to locals, with backlogs on a regular day being amplified on high traffic days

Screen Name Redacted
1/24/2023 11:33 PM

1. Longer back ups with reduced lanes 2. Existing sidewalks are fine
3. Can cycle on the paths the LIMITED time I cycle 4. No change

Screen Name Redacted
1/25/2023 06:39 AM

I frequently walk or cycle either alone or with my kids along this stretch. The south side of the road is currently very uncomfortable to walk on as it is narrow and feels very close to the road. Others feel no choice but to cycle on that sidewalk because of the speeds on railway ave. I think this conceptual design will improve perceptions of safety for myself and when I'm walking with my kids (might prevent me from feeling the need to cross to the north side and detour a little!)

Screen Name Redacted
1/25/2023 06:50 AM

1. Recess the bus stops into the driveway. So that traffic keeps flowing when bus stops. even better, have the bus stop at the EP pull trough parking lot. Imagine being EP a transport hub in 5-10 years. inner medians or grass is a waste of public funds 2.good 3. good 4. congested intersection at EP parking lot exit. Consider moving public transport parking to ep parking lot ..?

Screen Name Redacted
1/25/2023 09:33 AM

It would be nice to see a larger close-up of the area. What are the long blobs on the road, crossing the RR tracks??

Screen Name Redacted
1/25/2023 10:12 AM

Most important is moving pedestrians away from fast/huge cars. People will complain about lane reductions for cars which could increase congestion.

Screen Name Redacted
1/25/2023 10:14 AM

most important is move pedestrians away from cars. People will complain about any lane reductions for cars.

Screen Name Redacted
1/25/2023 10:52 AM

It would appear that access from/to the provincial building would be routed to the EP entrance. This will cause more delays and unnecessary idling of vehicles while waiting to exit the area. Taking away business access is not in the best interest of the community. Walking and riding does not seem to be affected with this design.

Screen Name Redacted
1/25/2023 11:27 AM

It looks like the West bound lane merges form 2 to 1 lane very quickly after crossing the tracks. This will cause issues and back up traffic. It's difficult to tell from the plan, but if busses stop by Elev Place, that

may cause traffic to back up as well. When I reviewed these plans, it looks to me to be very similar in design to the intersection where Railway & BVT meet. While clearly designed for ped & cycle safety and convenience, this intersection has caused confusion and difficulty for drivers, who represent the majority of those entering the town (visitors) and those navigating through the town. This has caused an increase in traffic through SCMV as people try to avoid this one-off intersection, that is completely different from all other intersections drivers encounter in Canmore and beyond. In terms of cycling or walking, I'm sure this plan improves those methods of travel, but at the expense of vehicle travel. I realize that is the goal of administration, but I don't believe it's shared by the majority of residents. Canmore is a winter resort town, and as we've seen in other AB cities, creating and maintaining bike lanes in the winter is a great expense for relatively few year-round users. I would be far more supportive if cyclists were required to contribute through licensing, which would also allow enforcement as it's common to see cyclists run through intersections and ignore posted traffic signs - without any fear of a fine or enforcement. These changes are a big shift in what people are used to, primarily in the favor of cyclists, and it's not unreasonable to expect a similar shift in how cyclists are managed.

Screen Name Redacted

1/25/2023 11:36 AM

1. Please don't reduce the number of vehicular lanes going onto main street. I do not agree with this plan. 2. Walking and cycling - i do not agree with putting a cross walk at the EP entrance. I feel it is more dangerous to cross there instead of at the intersection and/or by the path to spring creek. I would rather cross near spring creek and walk on the path on the east side of the road then stay on the west side and cross later. 4. Will make vehicular congestion so affects transit as well causing longer commutes

Screen Name Redacted

1/25/2023 12:05 PM

Shutting Railway Avenue will have an adverse affect on me and my business in all modes of transportation proposed. Biking is a 2 month seasonal activity and does not take precedence over the 4 lanes we currently have.

Screen Name Redacted

1/25/2023 03:31 PM

Driving: I think this will create a very confusing and frustrating travel route for drivers. It seems needlessly complicated and ever- changing lane allocations will be a stressor that can and should be avoided. Bikes and Walking: I see no reason pedestrians and cyclists cannot share ONE pathway. Easy enough to stipulate bikes on the left for example and walking on the right. It is excessive and unnecessary to create dedicated lanes for walking and biking. If the issue is etiquette (as we see in other situations in town) then re-education is needed not expensive and excessive paved lanes. Transit: It seems that

buses will have more issues in my mind as they dodge the various lane changes, no right turn on red and other such traffic flow impediments we already see in town.

Screen Name Redacted

1/25/2023 03:42 PM

Driving: Most traffic congestion is caused in summer by visitors and part timers coming into town and very few if any come on bicycles. Therefore, Railway avenue being one of the main thoroughfares, we cant afford to lose the 2nd lane for vehicles for some hypothetical cause - to accommodate bikers and walkers. Walking : The sidewalk between Bow Valley Trail to Safeway is perfectly adequate for pedestrians at this time. We do not need a separate one way (each way) walkway for pedestrians? Cycling: The existing pathway from Bow Valley Trail to 17th Avenue (behind EP and Save On along the railway) is designed to accommodate both bicycles and pedestrians and to date is perfectly adequate to accommodate both. Many times in the summer this pathway is NOT heavily utilized and it can be accessed from numerous points along the way.

Screen Name Redacted

1/25/2023 05:09 PM

As traffic in our town continues to increase (hopefully in tourist visitation and likely in population), if I'm understanding the proposal correctly all I'm seeing is a decrease in travel lanes for motorized vehicles - cars, vans, suvs, commercial delivery trucks, buses (including town transit), etc. rather than the much needed increase. It also appears that various sections of the road are being completely wasted. Huge negative impact on driving and transit, positive impact on cycling with additional cycling lanes and no impact on walking as it really doesn't matter what side of the street one walks on. Given that our cycling season (the main group to benefit) is only half of the year I can't support such a major change affecting motorized vehicles for all 12 months of the year. Two lanes of vehicle traffic in each direction is needed, could do one bike lane with flow in both directions and one walking lane with flow in both directions.

Screen Name Redacted

1/25/2023 07:27 PM

There is no reason to change Railway Ave in any drastic manner. The town solving a problem that does not exist. Restricting a very busy downtown road is outrageous, short sighted and disconnected with the current needs of the community (as was paid parking). These continuous municipal missteps are a huge detriment to the downtown core. Taking lanes away is dangerous as it will cause significant and sustained congestion along with countless other negative impacts. This proposal will undoubtedly delay emergency response vehicles to a large number of Canmore residents. This group of citizens includes the particularly venerable community members in the Seniors Lodge. It is also a waste of money in an already bloated budget. Please fix/widen the sidewalk on the east flowing direction, define a bike and

walking lane on the Elevation Place side, limit left turns where needed and remove the snow regularly and properly. Then the town should focus on more important/relevant issues that positively affect the residents of the community such as fixing the dangerous cliff side sidewalk that exists between the Rose and Crown and Springcreek bridge on Main Street. Did I mention removing the snow. Lets get back to the basics!

Screen Name Redacted

1/25/2023 10:03 PM

Love that you are considering a cycle lane on this section as there is currently a larger drop off on the side of the street by Esso and its hard to ride and feels dangerous in the traffic. As someone who bikes a lot the biggest issue with the mixed use paths where the red bike lanes are right next to the pale grey walking paths is it is not at all obvious to tourists that they are wandering around 4 people spread out taking pictures right on the bike lanes. The bike lane marking should be way more obvious that it is a bike lane. They are currently just dangerous round town. I have biked in many cities and it seemed to work better when the bike lane was part of the road but had a small curb so it kept cars out of the bike lanes. This would also teach bikers how to actually ride according to road rules like they are supposed as opposed to in this town teaching bikers that they can act like pedestrians and do what ever they want. Bikes should follow road rules - keep them on the roads and make it safe for them to do so. The red bike path near the Malcolm hotel is an example of how ridiculous they work in this town. You go on the red path towards the Malcolm on the right side of the road- it takes you across the road in front of the Malcom Hotel and then spits you out facing traffic on the wrong side of the road.

Screen Name Redacted

1/26/2023 08:25 AM

Regarding the pubic consultation process: (i) the supporting documents are unclear and make it extremally difficult to gain a good understanding of the projects key variables (ie revised traffic capacity) and how this will affect me as a resident of Canmore. (ii) the scope of questions asked by the town in this consultation process (ie travel experience) seem limited in scope and do not seem to address the full project impact (iii) considering the scope & impact of the proposed project I am surprised to have initially heard of this on CBC and not in our local paper - I am also somewhat surprised by the limited consultation timeframe Feedback on specific questions: 1. Driving: I believe this will significantly increase congestion and I have concerns on (i) increased CO2 emissions due to idling time (ii) livability of Canmore as a full time resident. My questions to the town are: - What are the anticipated increased CO2 emissions from additional idling due to congestion (CO2 tonnes eq/yr)? - What are the projects excepted constructions emissions (would prefer to see full life cycle emissions in CO2 eq) - Have traffic studies been

performed to estimate increased transit time? - RE: Already completed Benchlands Tr lane reduction: (i) Have studies been conducted to measure the actual increased transit time & increased CO2 emissions due to idling time (ii) increased pedestrian use pre / post lane reduction? (iii) decreased vehicular use pre / post lane reduction? (iv) how did (ii) and (iii) compare to project objectives? 2. Walking - I walk along this route daily and have no concerns with the current infrastructure; I would prefer to see the monies spent on ice removal in winter to make it safer 3. Cycling - I cycle along this route routinely in the summer (never in the winter) and have no concerns with the current infrastructure. 4. Transit - I rarely take transit and have no opinion From a project / capital allocation perspective I would be interested in improving my understanding with: - What is the cost of the project and has a cost benefit analysis been performed? - Has there been any public engagements where residents expressed a wish to spend taxpayer money on this project or is this a town initiative? - If so (to above) what are the drivers for the project? - I had heard a comment from the town that removing a lane of traffic will not decrease vehicular capacity - as this is counter intuitive I would be interested to see study that confirms this. I hope my feedback is well received and I look forward to receiving information back from the town
jdbezanson@gmail.com.

Screen Name Redacted

1/26/2023 08:54 AM

Will the railway tracks be leveled so it isn't so hard on equipment (vehicles) crossing? Moving the crosswalk, how will that make it easier for traffic to access EP and exit or make it more challenging? I like that less chance of vehicles getting rear ended making a left turn into EP. What has been thought out when a very long train goes by and how will this new plan deal with the backlog of traffic? While the traffic is backlogged, how do emergency vehicles get through quickly? Will this improve the transit keeping to their schedules? I look forward to esthetically a pleasing look and easier to walk and ride a bike in this section.

Screen Name Redacted

1/26/2023 09:04 AM

Non-resident resident - when visiting Canmore I prefer to park at edge of town and travel by bike. Expanded bicycle lanes, separated from traffic and more room between bikes and pedestrians will make for improved cycling walking modes on Railway Ave.

Screen Name Redacted

1/26/2023 09:36 AM

This will be a tremendous improvement for cycling and walking. Yes please to these changes! I'm wondering about the access driveways to the businesses on the south side though - how will those conflict zones be handled with regard to the new wheeling lane? Hopefully green paint, elephant feet marks, bicycle symbols and new signage

indicating where bikes have the right of way? I cycle and also drive and I know the street design impacts the speed people feel they should be driving at. I believe these changes will naturally make people feel like driving slower, which is a good thing as it means less deadly collisions. If there is any change to vehicle travel times, I expect it will be minimal and is acceptable to me!

Screen Name Redacted

1/26/2023 10:12 AM

To whom it may concern. After speaking to your representative at the open house I like to just put this in writing and use this opportunity to raise my concerns about the Railway Avenue Street update. Too short of designated left turn lanes or some right turn lanes is a concern due to high volume entering and therefore blocking lanes going straight. We already seen that many times with the A&W intersection were the right turn lane is insufficient turning from Railway into bow valley trail. This scenario has become quite annoying and frustrating to drivers. When the room is there we should use it for those intersections otherwise a backup is created and frustrating other drivers going straight. Merging lanes from 2 into 1 should be longer to give drivers more time to merge. Otherwise I like the bike lanes who are useful for 3-4 month a year. My biggest concern are more places or trails to maintain and clean for a safer biking experience is already nearly impossible and very bad in the winter. I like green spaces in between lanes and bike paths but no maintenance and lots of gravel make these places dirty and unsightly when not well maintained and cleaned regularly. Therefore I discourage these places since they will be costly and hard to clean. We see this already partially on the trial version off the bow valley trail, where the grass is not visible anymore, due to gravel, covering it entirely. This I can see all over town and it's unfortunately, and it seems to be a major problem in this town. We should not forget that this is a mountain town and there are hundreds of thousands of people coming in with cars every year and with growing numbers like Calgary for example It will be a challenge. We have no trains or busses to bring those people here so they will come with cars. Roads are always going to be an issue and if these roads are not well planned, we gonna see a lot of chaos in our little beautiful mountain town. We also should not forget that north American people are not like Europeans, and changing a mentality that everybody comes with bikes and trains is nearly impossible, unless we have trains or buses to bring those people here. I sometimes think that the town seems to forget that we are a tourist town and when I come into town I can't see that. The winters are too long. The summers are too short. The season is not enough to enjoy what you design. Thanks for listening.

Screen Name Redacted

1/26/2023 11:02 AM

Cycling - slight improvement for cyclists coming to/from Spring Creek area by the tracks. Is the crosswalk at the entrance to EP going to be

a rideable/multi-use crossing? Is there a possibility of a crossing closer to the tracks to access the pathway behind EP from Spring Creek? That would be great for walking, too. This design will improve the driving experience, for sure.

Screen Name Redacted

1/26/2023 11:41 AM

The idea that this is somehow going to help vehicle traffic move is absurd. The roadway going towards cougar creek is constantly plugged and backed up from vehicle traffic, and this is going to make that worse. Prioritizing foot and bike traffic is irrelevant for half of every year due to weather. Think about all the people sitting in their cars crammed into those smaller/inaccessible lanes, what will they be thinking about waiting to get through that intersection? They'll be thinking, "boy I hate the people who plan this town" and that will directly affect your positions going forward.

Screen Name Redacted

1/26/2023 12:38 PM

Driving - Not in favour - I understand the 2 current lanes will be reduced to 1 lane. This is certainly going to impact traffic especially during the high seasons.

Screen Name Redacted

1/26/2023 12:40 PM

Enough bike lanes. Should be two road lanes each way plus turn lanes. Wider sidewalks

Screen Name Redacted

1/26/2023 01:14 PM

1. I feel like this will have a negative affect on driving, this area backs up considerably already and will be even more challenging to navigate with a car in this area. During construction this will be even worse. 2. I think this will have a positive impact on walking as the trail system just comes to a dead end here, and it's very challenging and unsafe to navigate. 3. I think this will have a positive impact on b as the trail system just comes to a dead end here, and it's very challenging and unsafe to navigate. 4. I do not currently use transit.

Screen Name Redacted

1/26/2023 01:38 PM

Driving: I am glad to see two lanes heading toward the BVT as this can get quite backlogged, especially during peak season and trains. I avoid driving this road in peak season, so will continue to use BVT or the two exits as I live on Railway north and work in Elk Run industrial. Walking: With this new proposal, I would be more likely to walk this route. I rarely walk along the side opposite to EP since the traffic moves quickly and it is quite narrow. Cycling: Since I live on Railway Ave. and often bike to work in the warmer months, I currently avoid travel on this stretch of road and use the Spring Creek route or cross to BVT to avoid it due to traffic and narrow road. I may use it more with proper bike lanes, but not sure it is needed on both sides. I adjust my route on BVT to be on the bike path and would be ok to do so on

this stretch as well. A concrete divider to separate the bike lane from the sidewalk would be a good addition, in my opinion. Many people do not adhere to the red/grey markings and just walk on both. Transit: I use Roam a few times a week for work, particularly in winter, so this new layout wouldn't adjust my plans for this.

Screen Name Redacted

1/26/2023 02:03 PM

The median in the road seems like wasted space, reducing the west bound "in to town" lanes to 1 lane just seems like traffic will back up heavily. Perhaps bike lanes could remain on just one side like current status?

Screen Name Redacted

1/26/2023 02:23 PM

The sidewalk from A&W past the dealership and into town is not great, but there's already an excellent paved pathway that goes along the other side of the road (right beside EP, and also the one beside the grocery store), so there are already a number of decent walking & cycling options. From a driving perspective, I am totally opposed to turning this into effectively a 2 lane road. That will be awful. Please do not do that.

Screen Name Redacted

1/26/2023 02:42 PM

Walking and riding a bike are great, but I think its important to remember that Railway ave is the main route to access EP and grocery stores. Two places that many require a vehicle to do so. Especially with the town expanding further to the East in Three Sisters, more and more people need to drive into this area for their jobs, groceries, recreational activities. Not all of us live in South Canmore and can walk and regularly avoid these points of increased congestion. Canmore is getting more busy, not less so pinching off traffic into one lane, denying the ability to turn on a red, and building intersections that take a much larger footprint than needed (and subsequently shrink the lanes that access them) is making it harder and harder to get oneself and one's kids to places they need to be. Canmore is a quite a spread out town for the size of its population. Bike accessibility is hugely important but can it not be done along routes/roads that don't make the regular coming and going in and out of the railway ave area more challenging and time consuming? I haven't heard much if any positive feedback about the new intersection at A&W so would suggest that pursuing that model on future projects may not be the direction the citizens or visitors of this town will want.

Screen Name Redacted

1/26/2023 03:42 PM

Pedestrian road crossings should be raised to curb height to slow traffic and improve visibility of pedestrians using the crossing. I like how tight driveways are at the bike lane curb. The driveway to the rec center could have its turning radius tightened. Maybe an island in the

middle of the driveway?

Screen Name Redacted

1/26/2023 04:54 PM

The plan still results in a bike infrastructure that dead ends before getting downtown and does not segregate pedestrians from bikes. Most people do not adhere to lane designations for cyclists or pedestrians. The inconsistent approach to bike and pedestrian traffic across the town causes confusion and results in people not understanding or obeying the rules. Significant vehicle congestion is inevitable, and emergency vehicles will be impeded. Idling cars will increase vehicle emissions. Requiring drivers to change lanes several times in the space of only a few blocks increases the risk of collisions. Transit will suffer from even greater delays than normal delays as busses will be stuck in the same vehicle traffic as cars.

Screen Name Redacted

1/26/2023 05:36 PM

Absolutely love this. Research shows that improving safety and design for pedestrians and cyclists reduces injuries and collisions for ALL road users, including vehicular. Connecting this infrastructure throughout the town will be a huge win, for safety, environment, visitor experience.

Screen Name Redacted

1/26/2023 06:02 PM

This is a massive improvement. It appropriately prioritises walking and cycling, while recognising that induced demand means it's impossible to build your way out of congestion. Of which, let's be honest, Canmore has very little congestion. My only criticism is the existing overhead pedestrian light is located at a relatively intuitive location. It's removal may increase travel times for pedestrians, but they are being directed to higher quality crossings, which is good.

Screen Name Redacted

1/26/2023 06:03 PM

Generally a good design from most users perspectives. My only concern/question is over a left or east turn when exiting Elevation Place. At present it is difficult at busy times and the line of sight is obstructed due to the poor placement of the "Elevation Place" monument ! This needs to be addressed. The plan as presented does not appear to have a 3rd lane on R/W ave. to allow an east-bound merge. Such a lane was I believe was incorporated in the preliminary design. Also have discussions been held with the car dealership where presently car transporters unload when parked on R?W ave ?

Screen Name Redacted

1/26/2023 06:11 PM

It will be great to connect cycling infrastructure to the existing paths near Bow Valley Trail. I hope this will encourage more people to use active modes through this area of Canmore

Screen Name Redacted

1/26/2023 06:53 PM

Not excited about the back up traffic this create. its hard enough to get from A to B, and over the bow river in this town as it is. Not convinced that your ideology to make it harder for vehicles will detour people from driving downtown.

Screen Name Redacted

1/26/2023 06:56 PM

Where is the intercept parking lot going to go? How can we plan anything to do with our future infrastructure without seeing the big picture? Where are the vehicles from Calgary, or tourists from all over the world (who have little choice but to arrive via car), going to park in order to switch to walking/biking? Virtually everyone arrives here via car and that will not change even with a far fetched train service that won't provide a robust park access. While there has been some growth in other modes of transport locally, vehicular traffic has seen the largest growth. Why are we not planning how to deal with this? Elevation Place is full to the point where we can't find parking on a weekday to use our own recreation centre/library and it cannot be used as the sole intercept parking lot and should only be focused on EP user parking. What is the plan for vehicles, and why are we limiting vehicle capacity on our major arterial roads when we don't know where they will be parking in the future? Is the goal to have gridlock backed up to the exit ramp so people don't stop and just pass by Canmore? Or do we have a plan for parking in close enough proximity to the downtown core to allow for walking/biking to restaurants/shops/events. If so, where is the future parking planned and are we focusing solely on vehicular travel to the parking lot with pedestrian/cycle traffic elsewhere. If not, why not? Without knowing the big picture, there is very little valuable input that one can provide in regards to this specific plan. Why is Walking/Cycling being encouraged and incorporated into driving infrastructure when every other resort town attempts separates the two? The walking/cycling trail should be moved to the opposite side of the commercial buildings, with access to any of the commercial lots from the back, away from vehicles, roads and vehicular entrances. Why are we encouraging modes of transportation that are inherently dangerous to each other, to be incorporated together? Would you rather ride/walk next to and across roadways, or would you rather ride/walk on a completely separated access, that doesn't slow vehicular traffic, is far safer, faster and still allows access without competition? Why not build a trail nearby the one depicted south of the commercial parking lots with access to the businesses from behind? Same thing on the north side? Why have hundreds of people walking/biking across the EP Access road instead of moving the walking and biking path behind EP and the courthouse? It would provide a faster, safer commute for those walking/biking without the danger of crossing active roadways, and wouldn't inhibit vehicular traffic. If you look at whistler, you'll see vehicle centred roads accessing parking lots from the highway and then walking and cycling paths providing access to rest of the town,

with very limited vehicular access. These walking/biking trails are along completely separated routes, with little to no vehicle access. Why not focus on a separated approach instead of this dangerous, inefficient one?

Screen Name Redacted

1/26/2023 07:10 PM

1 Driving going down to a single lane on main road way will cause more congestion and traffic flow won't move smoothly. Cause more accidents and more road rage because individuals will become impatient and possibly more pedestrians getting hit as well. 4. Using transit- there will be a delayed around town because of any congestion that is going to happen and so it going to in packed individual schedules for work and or any other plans; especially in the summer with the heavy amount of traffic from tourists. It's already a struggle with bus running behind due to traffic

Screen Name Redacted

1/26/2023 07:21 PM

My primary mode of transit is cycling. This plan will greatly improve my transportation experience around town and make it infinitely safer. Ensuring that there are wider sidewalks on each side of the road is a fantastic design feature that will make walking a better and safer experience as well. When using public transit, the only hiccup I can think of would be that bus times would have to be adjust as on driving lane is being reduced. If there is an accident in one lane, I can see it being tricky for busses to circumvent such a situation and keep their schedule. I rarely drive in town anymore, so I would just alter my expectations of transit time (allowing more travel time) knowing that one lane is reduced. Making this road single-lane for car traffic is a great design feature that will slow traffic down, making all forms of transit automatically safer. I think that this is a wonderful design.

Screen Name Redacted

1/26/2023 07:48 PM

It will make it so much easier for me to get around by bike. This section is one of the trickier ones to navigate as there is so much traffic and I'm not comfortable riding on what is clearly a sidewalk. I don't drive unless i have to and i don't think this will have any impact on my walking. I just hope the bike lane /pedestrian signals are improved from BVT/RT avenue. Can they simply be timed to the lights so that I can continue riding instead of having to wait for the next set of signals to come around? I also often see pedestrians standing there waiting for the light to turn, but only the bike light goes on, and then they get stuck in the center of the road because they think they can go, but the bike light is super short, and they don't know what to do and are confused. Also, i would love it if the signal buttons were placed as close to the pavement as possible, rather than a yard away from the path as it can be hard to reach from a bike.

Screen Name Redacted

1/26/2023 08:00 PM

It would be great if the bike symbol was somehow made permanent in the red pavement, and a walking one in the grey rather than those stickers that came off. I hate dinging at people when they don't know what the rules are, but I also want to use my designated lane for it's intended purpose, biking. Also, maybe some signs saying "entering high traffic/mixed use zone. SLOW DOWN" might be nice, but i don't know if anyone would read them. Certainly not if they're already going too fast. :)

Screen Name Redacted

1/26/2023 09:06 PM

Sophisticated European design. Visitors from the continent will feel right at home. People who live here will love it too.

Screen Name Redacted

1/26/2023 09:16 PM

1. Driving will be slowed slightly, but smoothed significantly. This design addresses two major causes of traffic flow disruption: eastbound left turns into EP and westbound lane switching approaching/at the Main St intersection. This design will also be easier on drivers by combining the EP turn and crosswalk; by making the left onto Main a choice (rather than forced by previous lane choice); and by making turning intentions clearer with turn bays. This will be particularly helpful in reducing impacts of visiting/tourist traffic. Eastbound queuing for train crossings should be largely unchanged. Westbound traffic at the rail crossing may be confused by the merge. It may be worth marking the road as 1-lane all the way from the BVT intersection. Traffic exiting EP and turning left will have an easier time due to reduced vehicular travel lanes and (potentially) being able to use the turn bay to cross the westbound lane then merging into the eastbound lane. 2. Walking will be vastly improved on the south side. The sidewalk gains separation from the vehicle lanes, which will improve perceived safety and reduce splashing. Frequent sidewalk grade/slope changes due to vehicular accesses could cause issues for accessibility and snow/ice clearing if the sidewalk is not kept at the same grade across all these accesses (raised crossing). Walking will be slightly improved on the north side. The additional width and use/mode separation from a dedicated bike lane will reduce bike/pedestrian conflicts. The crosswalk relocation will improve crossing safety. The addition of a protected median refuge improves perceived safety. The reduction in vehicular travel lanes will prevent inside-lane vehicles from blocking the view of the crosswalk/users from outside-lane vehicles. The new crosswalk location is also located along a straight (rather than curved) section of road, which will improve visibility of users. 3. Cycling will be vastly improved. Even as an avid and seasoned cyclist, the current state of Railway is unusably unsafe for cyclists. The addition of dedicated cycling lanes makes this an excellent route to access locations along Railway and into downtown. The connection to the Spring Creek paths completes this cycling connection not only for Spring Creek, but also for South

Canmore and across-River neighbourhoods when connection via Main St is unsafe/unpleasant (which is often when Main St is opened to car traffic). Cycling paths along Railway provide an alternative access for east-side Railway locations (groceries, etc) in addition to the path along the tracks. This is especially helpful if riding to locations on the north end of Railway (JK, new Eclipse, etc) because it avoids the need to cross the Safeway parking lot. More notably, the paths along Railway provide the first proper cycling access to west-side Railway locations (Shoppers in particular). Dedicated cycling paths can substantially improve winter cycling connectivity. Especially in winter, the separation from vehicular traffic is key for safety and user comfort. Dedicated, paved paths can also be maintained in winter (snow clearing.) 4. Using transit will be slightly improved by not getting splashed as much while waiting at the eastbound stop.

Screen Name Redacted

1/26/2023 09:37 PM

I foresee travelling on Railway Ave by car becoming more challenging and frustrating to a critical area of town that houses necessary services. I foresee walking and cycling to be no different currently offered levels. I foresee transit travel to be mildly improved under the proposed framework. While I understand the attempt to manage future levels of traffic to these areas and not forever catering to vehicles that an attempt to restrict or reduce from current levels is shortsighted and problematic.

Screen Name Redacted

1/26/2023 09:54 PM

I am so excited to see bike lanes on both sides of the road and a way to cross right by EP. It is very difficult to turn right onto railway av when leaving EP by car. Is there a way to improve that?

Screen Name Redacted

1/26/2023 10:17 PM

1 Why would we reduce to three lanes and create more congestion - this will be horrible on weekends and whenever trains cross. 2 Maintenance is more important than creating a different path. 3 I am not going to cycle regularly via this route from Rundlevue or Peaks. This will impact everyone in those neighborhoods negatively. It is not reasonable to expect people to choose to do their groceries, etc. by bike from those neighborhoods, especially with the complete absence of maintenance. 4 Will not impact my transit experience.

Screen Name Redacted

1/27/2023 12:48 AM

1. Bottlenecks = slow travel. 3. Fabolous biking.

Screen Name Redacted

1/27/2023 07:05 AM

This will bottle neck emergency services. I live on 3rd St and am an on call emergency worker. I will have to drive back to three sisters in order to get through town in summer. It's already extremely difficult to avoid the a&w lights which are an unmitigated disaster. People

will get delayed vital treatment because of poor planning and insight and the consequences of that poor planning and follow through will land squarely on the planners head.

Screen Name Redacted

1/27/2023 08:08 AM

Driving: less worry about pedestrians slipping off of sidewalk into traffic, better visibility of crosswalk Walking: I will use the route more often, whereas previously avoided it Cycling: it is now a viable route, not safe for man or beast previously Transit: unsure

Screen Name Redacted

1/27/2023 08:38 AM

1, 2, 3, 4: Negative. The turn in and out of Elevation Place is already a serious problem for pedestrians and vehicles. This plan does not appear to address this. In fact, it looks like it will choke traffic down to a single lane, and make it far worse. Railway Avenue is a major cross-town traffic artery. Reducing lanes and tightening flow is NOT going to help improve the flow of traffic, or make it safer for pedestrians. I support the general idea of better pedestrian and bike access totally, but this is NOT the way to do it. It's incredibly frustrating to see this honestly, no learning at all from the Shops disaster.

Screen Name Redacted

1/27/2023 08:59 AM

Living in the three sisters I mostly drive to town and this looks like it will make my driving experience much worse in similar ways to the new intersection.

Screen Name Redacted

1/27/2023 09:04 AM

This will impact me negatively. The design is not well thought out.

Screen Name Redacted

1/27/2023 09:13 AM

When will the town listen to peoples comments regarding the infrastructure that is being put in place. Ever since the introduction of the intersection at the Shops of Canmore that makes no since I have seen traffic backed up to the Spring Creek Traffic Circle. This will further congest traffic trying to enter town. Why would you even attempt to reduce the lanes, to accommodate more walking and bike traffic. I got an idea, take a count of how many people drive down railway ave vs the amount that bike and walk. I am sure walking and biking are around a 100 while vehicle usage is over 1000 daily. We have a perfectly decent path on the North side. With no other resources to Park where are people and their vehicles supposed to go.

Screen Name Redacted

1/27/2023 09:17 AM

You need to rethink the intersection at elevation place. The facility's large sign out front blocks the view of the driver when looking left, while the forest blocks the view of the driver looking right. It is very

hard leaving this facility as it is due to traffic congestion combined with pedestrian and bike traffic. Turning the traffic into one lane each direction will only compound the problems with using this intersection. As a regular user of this facility, I am certain the new design will not make it safer but actually more dangerous not only for pedestrians and bikers, but also motorists. This is not a well thought out plan.

Screen Name Redacted

Fucked

1/27/2023 09:25 AM

Screen Name Redacted

What the town has done to the intersections especially by A&W is criminal. Stop making the town difficult to move around in.

1/27/2023 09:25 AM

Screen Name Redacted

That intersection really sucked. Plz don't do anything similar.

1/27/2023 09:27 AM

Screen Name Redacted

Coming from Cougar creek, going down to 1 lane will make my driving even worse than it has already been made by the A&W intersection. It will increase my travel time and idling. The design will not improve my walking or cycling since there is already sidewalks and bike paths along this road as well as behind EP which is the one I always use. What would make walking and biking better is a nicer connection from the path behind EP onto and across/ around the 3 grocery stores parking lots (these currently poorly place curbs) Walking and biking does not all have to be along Railway avenue - use what's already in place, do not remove any car lanes.

1/27/2023 09:54 AM

Screen Name Redacted

This is insanity, we already have a traffic issue in town, this will just move the traffic lineups elsewhere, out onto bow valley trail. We want to move to a greener world but by switching to biking infrastructure will not make it so! The council has been led down the garden path here. This is the entry to town we need to have a better plan, that allows for the traffic to enter peacefully, for the proposed plan to work you need intercept parking built on the outskirts of town with an RTD system that runs every six to ten minutes to shuttle people down into town, and we have neither of these, we are putting the cart before the horse! We can do better, do not exacerbate the mistake of the railway bow valley trail intersection but doing this, . Think again

1/27/2023 09:55 AM

Screen Name Redacted

I don't use transit. Biking will not be impacted I have no issues with biking here as the road is wide enough and I am comfortable in traffic. The winter is challenging regardless as the town's snow removal on both pathways and streets is sub par. This will significantly impact

1/27/2023 10:41 AM

driving. I would in some cases be forced to use the three sisters parkway to get out of town. This section of road is consistently backed up in both summer and winter due to volume and train. This will create a grid lock situation. Traffic flow through this area needs to be facilitated not restricted!

Screen Name Redacted

1/27/2023 10:42 AM

Driving. Too much construction. Nobody happy except construction workers.

Screen Name Redacted

1/27/2023 10:50 AM

Fewer lanes mean more traffic backed up. I live too far to cycle (from three sisters) every day for things like groceries etc so the biking and walking lanes so not really apply to me. I see people using the sidewalk though i never see it overcrowded with pedestrians. I do not see good reason to expand walking/cycling and reduce vehicle lanes. Perhaps planners can look into subdividing the existing walking lane to make cyclist only lanes?!

Screen Name Redacted

1/27/2023 11:14 AM

Please do not proceed with this, I have some serious concerns

Screen Name Redacted

1/27/2023 11:19 AM

Driving

Screen Name Redacted

1/27/2023 11:27 AM

If I'm reading this concept right, it looks as though there is a reduction of the road lanes to 3 in total? Any reductions to vehicular traffic in this area will diminish the overall experience of being in Canmore. I'm a cyclist, and love commuting by bike, but we are not the right place to think that taking a lane away will enhance the Canmore experience as a resident or visitor. Leave primary arteries like Railway Ave as is and create bike/pedestrian friendly nodes adjacent like in Vancouver. We need to move vehicles through our town as we do not have mass transit from Calgary or BC (as a tourism destination this is critical to consider as our visitor make us uses passenger vehicles at this time), intercept parking or other critical solutions in place for a practical transportation system... so these concepts very much putting the cart before the horse. It is not good planning to limit roadway space for cars until other tools are in place - the sequence is wrong. Of note, this concept design is poorly labeled and hard to read. It makes providing useful/productive feedback challenging. There is no cross sections A & B identified as noted in the preamble and the detail is too small to view (my eyes are younger and good). For example, what does the red dotted line mean? Where is the light grey sidewalk? Is that the teeny tiny sliver nearly impossible to see alongside the red line? Please start again and expand the concept,

identify eastbound & westbound road lanes, etc.

Screen Name Redacted

1/27/2023 11:32 AM

Great to increase the safety of cycling and pedestrian and increase the focus on environmentally friendly transportation.

Screen Name Redacted

1/27/2023 12:01 PM

Appreciate the connection with the cycling lanes from the Bow Valley Trail intersection - currently this is challenging to navigate. I personally found the changes to the Benchlands Trail intersection changed my behaviour in that I started to use my bike more from Cougar Creek to downtown, and I expect that the improved cycling facilities will encourage me to use my bike even further in these areas.

Screen Name Redacted

1/27/2023 12:08 PM

Walking: With this plan, I see no difference from the existing arrangement. I walk this section several times a day and have never had any problems with it. I would say there needs to be better lighting though. Driving: I foresee significant traffic back ups. I work at the Provincial Building as a first responder and we often travel this route for emergency access to the Alpine Hangar (we have and use emergency lights/sirens). Our response times were significantly increased and made more dangerous to ourselves and the public(we are required to weave through traffic if there is any progress to be made) with the intersection upgrade at BVT/Railway. I see this next phase as limiting this even more and causing even more risk to us and the Public. Cycling: I also cycle this route and find the existing trails (either behind EP or into Spring Creek) more pleasant and safer. I have no need to cycle Railway Ave proper. That won't change with the new design. Transit: I can't comment, I don't use transit.

Screen Name Redacted

1/27/2023 12:09 PM

Anything that removes existing car lanes will only increase traffic. Much of the traffic through this corridor is through town or coming into town traffic. Congestion leads to angry impatient drivers which leads to incidents. Bike and walkways are great, but they do not work for people driving through the intersection to their destination, there needs to be room for drivers or there will be major backups.

Screen Name Redacted

1/27/2023 12:24 PM

Thus will be a screw up. If it's even remotely close to the other intersection it will be a fussyter

Screen Name Redacted

1/27/2023 12:24 PM

More traffic More taxes Not needed

Screen Name Redacted

1/27/2023 12:28 PM

Much more comfortable and feeling safer when walking and cycling!
More pleasant when driving - less car dominated streetscape.

Screen Name Redacted

1/27/2023 12:32 PM

1. Driving: It will be an exercise in frustration. Given when there is now a train the traffic in two lanes is backed up past the Drake intersection, I can't even begin to imagine how it will be when this is reduced to one lane. 2. Walking: there are pathways already on both sides. I see no issues as it stands now. 3. Cycling: On the EP side there is a good path for cycling already. Harder on the S side of Railway as the road is not in good condition with build up of gravel and tight for cars. The new design will provide better bike paths which won't be used in the winter months or by tourists who have arrived in their vehicles with no intention of cycling. No body, especially tourists understand the color coded walkways and that's a disaster waiting to happen as presently everyone walks and cycles in both lanes. 4. Using transit, I can envision being stuck in traffic on the bus as the line up goes all the way back to 10th intersection. Additional Comments: Merging into one lane west bound from Bow Valley Trail intersection onto railway will be an absolute cluster and I can envision vehicles blocking the railway tracks and further blocking the lights as there is no room for flow. They already do that now on the Eastbound side. Countless times I have seen vehicles stopped across the tracks. New traffic lights on Bow Valley trail are the talk of the town and all for the wrong reasons. I constantly see people turning on the red arrows. People also are looking up at the lights and not out across the intersection. Looking out allows for better scanning of pedestrians and cyclists. Looking up only focuses on what is over head and not what is to the sides. I have seen cyclists and pedestrians racing the lights and almost getting hit by drivers who aren't focusing in the right direction. I have been told by EMS paramedics that they hate the intersection as it can be blocked most of the time and makes it harder to get through in an emergency. The proposed changes to Railway will make this even worse. I can't believe that anyone who actually drives a car in this town and pays attention to what is going on could actually think that these proposed changes are a good idea. Traffic Calming is a joke and it makes people so angry that they do stupid things (my observation). I have seen accidents, at least 3, and so many near missed at this intersection. Please don't exacerbate the problem in Canmore with more intersections like this. Our issues aren't the locals who may bike more, use more transit or get used to the oddball intersections and "traffic calming" devices, the issues are with the thousands of people who come into this town as tourists and are quickly confused.

Screen Name Redacted

1/27/2023 12:59 PM

Driving will be negatively impacted for those who choose to and need to drive down here for groceries, post office, shopping, etc. As traffic

is already horrific at the new intersection (BVT/RW) it will be even more backed up with Railway down to 2 lanes. This also negatively effects businesses in all areas as many do not want to even pull in to a business because it is too hard to get out. 2 +3 Obviously this makes it more pleasant to walk and cycle down here. However, I don't walk or ride down to get groceries. I personally prefer to walk and ride on trails, not going downtown. It feels like those who are designing this, all live downtown and don't ever need to use their vehicle unless leaving town. As much as I would love to walk and ride everywhere, we don't live in a flat city. I don't want to haul heavy groceries up to Eagle Terrace. I don't trust locking my bike up outside of anywhere in this town and I don't want to spend money on a town bike or ebike (nor do many have room for more bikes) because you are making it more difficult to drive into town for amenities. I personally believe this forces people to spend money outside of our town by ordering from companies that deliver to town (amazon, costco, spud, etc) This saves them time and money from going downtown since it will be even more congested driving down.

Screen Name Redacted

1/27/2023 01:12 PM

Expect total gridlock weekends and all summer. Insane ideas.....

Screen Name Redacted

1/27/2023 01:12 PM

I feel that reducing to single lane traffic just past the tracks will create a nightmare for driving access into Town. Trying to access any business on the South side will cause terrible traffic back up at times. I feel the Town has already made up there minds as to what they want this to look like. Discouraging people from driving is the bottom line, but it isn't realistic for travelers entering the community. You have basically discouraged some of us residents even going down into the Town core at certain times of the day or year. I sure hope Administration & Engineering learned something from the absolute mismanagement & money wasted at the Benchlands Intersection. We as residents have & will adapt. Yes it functions for walkers & bikers, but is generally a joke for driving. Turning lanes are too short & not accessible, traffic backup's ongoing during certain times of the day & summer months with visiting tourists is a comedy show. How much money was spent constantly changing the lights & defending your design at all cost. Please, please spend our money wisely. Yes improve accessibility for all but don't throw money away. It has become very hard to affordably survive here in Canmore for so many people.

Screen Name Redacted

1/27/2023 01:27 PM

Impact driving as the intersection at 1A and railway is already the most frustrating intersection in the town to move through for those driving. Why does a driving lane need to be removed if there is already public lands on the north side of the roadway that the road

right of way could be expanded into? The City of Calgary doesn't require dual bike lanes on any road so why would Canmore? Is there a "Bike Impact Assessment" to justify that amount of space designated? What problem is this addressing? It would be the same walking experience as before as the bike/walking lane is against the active roadway on the south side. There's no improvement to the user experience other than making driving more difficult. No additional trees, no new walking/biking area and users are still next to the road. Looks like an expensive engineering study to produce the same if not worse results than the current layout. Yes improve the sidewalk on the south side but that shouldn't require the removal of a driving lane.

Screen Name Redacted

1/27/2023 01:31 PM

How about instead of moving forward with more really bad project ideas you focus on fixing that brutal new intersection at the shops of canmore. So many examples of bad engineering on that project.

Screen Name Redacted

1/27/2023 01:44 PM

There is already quite the challenge to turn left out of EP onto railway ave. This design does not make any improvements with this and in fact would likely make it more challenging.

Screen Name Redacted

1/27/2023 01:58 PM

1. Increased congestion , greater traffic backup when there is a train (which happens frequently throughout the day) , delay in driving, poorer snow removable (more accidents) 2.walking, nothing will change. All that needs to be fixed is the bumpy sidewalks. It is extremely accessible to walk 3.cycling more rooms and better smoothness because the current sidewalk is in dire need of repair. 4.transit will be delayed even more, especially during summer months.

Screen Name Redacted

1/27/2023 02:14 PM

If it is anything like the Bow Valley Trail "improvements" this concept design when implemented will only add to my frustration when travelling in Canmore. As a bike rider and pedestrian the BVT improvements only made things worse. I spend more time with my car at idle which is probably not good for the environment. After living over 30 years in Canmore I find my self extremely frustrated when having to travel through the BVT/Railway intersection. To continue the same design is causing great anxiety and concern especially when we are experiencing excessive property tax increases. **DO NOT REMOVE TRAFFIC LANES FOR CARS!** Fail Fast and scrap the project and save the Canmore a pile of money and frustration. I am not aware of anyone who supports this.

Screen Name Redacted

Traffic back up due to the trains will be hellish. We don't do much

1/27/2023 02:34 PM

walking or cycling in this town anymore (been here since 1998) due to my partner who has MS and and the fact we live in the Peaks. It wipes us out to ride home. Don't have enough money to buy ebikes.

Screen Name Redacted

1/27/2023 02:45 PM

My concern is that when a pedestrian wants to cross the road they have to cross the bicycle lane: these need to have the same controls as for cars since cyclists come a higher speeds than pedestrians and tend to treat traffic lights as optional.

Screen Name Redacted

1/27/2023 02:58 PM

This section looks better to accommodate all modes. I am hoping that the crosswalk is consolidated at the two main intersections and not between where it is currently located.

Screen Name Redacted

1/27/2023 02:58 PM

This section looks better to accommodate all modes. I am hoping that the crosswalk is consolidated at the two main intersections and not between where it is currently located.

Screen Name Redacted

1/27/2023 03:16 PM

These changes, along with the previously completed changes at the shops intersection will negatively impact my driving experience. They will do little to improve my walking experience, nothing to improve my cycling experience, and I do not use transit but I doubt it would improve that experience if I used it. Canmore's efforts to reengineer the shops intersection and railway avenue are perhaps noble in their vision. I presume it is to improve pedestrian and cyclist access and reduce vehicle congestion in the downtown. However, the implementation is majorly flawed. I suggest you consider the following. 1. Reducing driving access will not reduce traffic in the downtown, it merely increases congestion in other places. The shops intersection is a nightmare and has significant breakdowns at peak traffic flow periods. For example, there is not enough length for the separate lanes and they end up blocking one another (e.g. right turn is green but no one in the lane as they are trapped behind everyone waiting to go straight or left). To boot, I still have not heard a reasonable answer for why the traffic lights are on the wrong side of the intersection... 2. Providing alternative routes/access and improving traffic flow will alleviate traffic issues. Not everyone can/will walk/drive into/through town. Provide an appealing option for visitors to town to park on the outside of town and walk in. Build increased parking capacity downtown (parkcade?). Redesign the railway ave and bow valley trail to maximize flow by having two lanes and no unnecessary pedestrian/cyclist routes. Have a long term vision for moving traffic through/past downtown and onto three sisters parkway. 3. Recognize that major roads don't need, often should not be, and are often not used for pedestrians and cyclists. I for one choose to

walk along quieter routes and often they are more direct. E.G. going through spring creek paths, through the backside of save-on/canadian tire, behind EP. Improve these routes by connecting them where they are incomplete, improving them where they are in disrepair, adding them where they are warranted, and shelter paths as much as possible from vehicle traffic where necessary using distance or barricades. All this can be done without stealing space from vehicle traffic. 4. Cycling and walking in Canmore will never replace driving in Canmore. Some will walk and bike but the majority will still drive. We can support that reality rather than going overboard and giving up an unnecessary amount of driving space. 5. Consider using pedestrian/cyclist overpasses in high traffic locations such as bow valley trail.

Screen Name Redacted

1/27/2023 03:44 PM

Any safety improvements for walking and biking will enable my children, wife and I to live car-free, happy and healthy in Canmore, which has already done so much to promote active transportation.

Screen Name Redacted

1/27/2023 05:05 PM

not a good plan to read. If there is two way traffic and current turning points, this will not change driving, walking or cycling

Screen Name Redacted

1/27/2023 05:20 PM

Will make my drive longer, traffic's tie ups, hate the lights, stupid idea

Screen Name Redacted

1/27/2023 06:21 PM

As a pedestrian travelling on the sidewalk this always felt like the least safe part of town. I am constantly sharing the sidewalk with bikes and feel far too close to vehicles for comfort. This initiative is a much welcomed change to the area.

Screen Name Redacted

1/27/2023 06:47 PM

1. Lots of congestion turning right into evation place. Please do not remove the second lane. It's already a busy intersection. Your reducing traffic but not providing any satellite lots for people to park and travel from. We are 100km from Calgary! Everyone drives here.

Screen Name Redacted

1/27/2023 06:59 PM

I think this redesign will hinder the use of roadways. The average modern person does not walk or use a bike to get around in this town. The central road arteries of this town are railway AVE and bow valley trail. I think a traffic study over the span of 1yr needs to be done to determine how many vehicles use this area, and if it's responsible city design to add congestion through one roadway either way compared to the two.

Screen Name Redacted

1/27/2023 08:19 PM

1.???????? Two lanes to one lane to two lanes ?????? How did this even get to a proposal status? 2. Extra crosswalk is nice 3. I don't think a bike lane on both sides of the road is needed. 4. Driving and transit are effectively the same thing

Screen Name Redacted

1/27/2023 08:48 PM

I feel All will be compromised and made dangerous for many users
No

Screen Name Redacted

1/27/2023 08:57 PM

This seems like a terrible idea for people who live out of the town of Canmore like myself. It's not feasible for me to walk, cycle or use transit in Canmore. I have to drive. I imagine the same can be said of many visitors to Canmore and many tourists. So why reduce a main road from 2 driving lanes each way to 1? Seems to me like this will only make the already awful traffic in Canmore even worse.

Screen Name Redacted

1/27/2023 11:14 PM

The more bike trails you have offered the more I use them. This continued to make it easier to do so! Also, love the pedestrian light crossing by Elevation Place. Coming from Cougar Creek is almost seamless in flow to get to classes or take kids safely to pool there.

Screen Name Redacted

1/28/2023 12:55 AM

The dividers would be helpful in the winter. However it adds more congestion with less lanes. The new lights, trains and increase of tourists is frustrating and longer times to travel for permanent residences. Cycling and walking no change

Screen Name Redacted

1/28/2023 01:22 AM

Won't change walking. Improvement for cycling. Serious problems for driving. Town planning must accept that vehicles are a necessity and need to accommodate volume efficiently. Stop hostile planning towards the inevitability of vehicles. No change to transit.

Screen Name Redacted

1/28/2023 07:23 AM

It appears to me that you have engaged the same people who did the intersection at Railway/Benchlands/Bow Valley. I would have thought that the town was smart enough to fire anybody associated with that project. Based upon the plan above this appears to be another extension of the same bad design. I get the impression that just because the previous project reduced accidents you appear to have mistakenly called it a success.... It is the worst piece of engineering that I have seen.... the frustration and amount of time that it takes to get through the intersection is mind boggling. The placement of the lights is idiotic and certainly NOT best practice. I thought that you had saved money by having some high school students do as I could not fathom that any reputable engineer would have ever put their beaver

stamp on it...

Screen Name Redacted

1/28/2023 07:56 AM

Already submitted

Screen Name Redacted

1/28/2023 11:13 AM

Add a bicycle lane if you want but for the love of God do not allow whoever created the last intersection anywhere near the planning team. Seriously, if they can't figure out how to place traffic lights so you can actually see them or make it possible to leave beamers within 30 minutes, I don't have a lot of faith in their next project.

Screen Name Redacted

1/28/2023 01:19 PM

Seriously!!! This has to be a joke. Why on earth would you go from an already 2 lane road down to a one lane..... Everyone involved with this plan needs to be fired immediately. Have you not learned anything from the absolute failure of a intersection at the shops of Canmore???? Give your heads a shake! STOP WASTING TAXPAYERS MONEY ON THESE HORRIBLE PROJECTS! JUST STOP!

Screen Name Redacted

1/28/2023 03:30 PM

So the Town of Canmore figures eliminating 2 fully function lanes on this road (A main artery, i might mention) , to have 1 lane each way with a center turning lane. To increase sidewalk and pedestrian/bike paths is the correct path forward? When there is a perfectly functioning pedestrian/bike path that parallels the railway tracks?

Screen Name Redacted

1/28/2023 03:43 PM

1. Driving to and from downtown will be a nightmare further fulling my desire to avoid buisnesses in downtown and not "support local". When a train passes through town the current traffic backup is horrendous and this will only add to the issues. Currently exiting from either elevation place or the provincial building is challenging and this will only add to this especially for emergency vehicles in the area. The encourage biking idea is a grand plan but this is a tourist town that people access with a vehicle, there is no train station or public bikes scooters etc. Seniors that I know of already avoid this area. If the previous intersection set the bar this is a concern as driving into downtown from the 1A ia challenging due to a lack of lanes. This will be another reason to avoid going into downtown and my economic activities as a local will go elsewhere. People are "Crushed" in this town already due to rising costs and a 12% tax rate hike increase. Is this truly the appropriate time for this? 2. I found the content in the paper biased as the sidewalk was described as dark and hostile. Ive walked this area numerous times and never foudn this a concern. There are two sidewalks on either side one much larger than the other but to state that a sidewalk is hostile is a misrepresentation of

the events based on someone's drive to move a project forward. 3. We use the path next to EP and have never had any concern with this. Its not overrun and it fine for travel. 4. While its great to use transit for planned events, often last minute things happen such as runs to the bank or family coming out for dinner and its simply not an experience they want to wait in the cold to have dinner at a restaurant downtown. Again this would lead me more to why bother going downtown. My resounding vote in No. Dont raise taxes for a project such as this that will create more problems and drive more people out of downtown that it will encourage to go there due to frustrations with travel. Tourists drive here... we are a tourist town... they come in cars.

Screen Name Redacted

1/28/2023 03:56 PM

It will make driving, the only practical mode of transportation for many seniors, more difficult.

Screen Name Redacted

1/28/2023 04:35 PM

The left turn lane from Railway Ave onto Main Street will become backed up with vehicles, blocking other vehicles that want to proceed straight to 10th Street. This will greatly reduce the capacity of the intersection. The left turn lane should be made as long as possible to prevent this from happening.

Screen Name Redacted

1/28/2023 05:12 PM

I'm a driver who has to work two jobs to be able to afford to live in Canmore (I can't get to work in reasonable time in multiple different locations without driving). For this reason, I have little time to walk to get groceries and run errands, etc. That would be great, but there simply isn't enough time. Have you thought of us? It doesn't seem like you have. It seems like whomever is planning this lives some idyllic lifestyle and wants to drag the rest of us along. I bet he/she/they lives downtown, right? It wouldn't surprise me. What about the rest of us who live on the other side of the highway or in Three Sisters? What sort of walkable score do these areas have? Why are we forcing this issue? So, as a driver this will be yet another unreasonable, expensive change in Canmore. If you truly want less traffic downtown, why have you created a central hub around the only grocery stores and almost all other services? Confining traffic before services are more spread out seems a little pre-emptive and poorly timed.

Screen Name Redacted

1/28/2023 06:07 PM

I am a bit saddened by this decision as I personally believe that this will have negative consequences on the environment. This is arguably one of the busiest roads in Canmore that sees the heaviest traffic and the most "traffic jams" already. I know that the town is trying persuade people to leave their cars at home and walk/bike, but

especially now that international tourism is ramping back up, what about all the tourist who rent their cars and have no bikes? Visitors travelling to town for the first time will no doubt not know that they should be parking elsewhere and walking into town. They will still follow google maps and largely use this road with their vehicles. What about people who live further from downtown and prefer not to bike with all their groceries? With the large amount of vehicles on the road, the railway and the new intersection, I think that removing a lane on this east bound section of road will cause way more back ups and traffic. Idling cars are way worst for the environment than cars that can travel with a good flow of traffic and get to their destination quickly. As someone who is born and raised in Canmore and has a Bachelor in Tourism Management I am a bit in disagreement with some of the changes made to Canmore's roads in the past few years. I think that until Canada has great train systems like Europe we need to be realistic and remember that the majority of residents and tourists rely on cars as their main mode of transportation. I understand and agree that making things safer for bikers and pedestrians is great, but we still need to ensure that traffic can flow efficiently and easily so that cars get be put in park and turned off at their destination quickly. This ensures easy to understand roads and intersections and enough lanes to limit the amount of times traffic is being backed up.

Screen Name Redacted

1/28/2023 06:29 PM

Walking on the west/south side of Railway Avenue is currently extremely unpleasant (Section A). Cars are often going over the limit and don't stop at the pedestrian crosswalk to EP even with the lights blinking. Walking and cycling will be greatly improved by calmed car traffic and greater setback between sidewalk and street. Thank you for proposing these improvements! Cycling and walking around BVT feels so much more civilized these days. The pathway from Spring Creek ends very abruptly at Railway Ave. It would be nice to have better connectivity from here to the pathway along the rail tracks, but maybe a new pedestrian/bike corridor along Railway Ave will replace that need. Not part of this plan but the bridge over Policeman's Creek at Spring Creek is a bottleneck, people taking photos on a narrow bridge conflicts with bike traffic.

Screen Name Redacted

1/28/2023 06:36 PM

Will be difficult to access the shops and elevation place. It is a major road to get through town and decreasing to 3 lanes will cause major headaches especially when the trains pass through I don't live within walking distance to get groceries or go to elevation place, this initiative is ridiculous for those of us that have to drive to get there. Transit is not sufficient to allow easy access. The town should really examine the demographics of who live here. I believe there is a large population of seniors who although are active probably do it want to

always bike or walk or take transit especially in Alberta winter weather. The town should also look at who pays the taxes and I suggest the majority are not athletes of any age. I do not support this initiative.

Screen Name Redacted

1/29/2023 07:39 AM

This is a complete disaster for emergency response for egress and access to the downtown core - And yes, I know what I'm talking about (Scott Wing - I have been living here since 1976)

Screen Name Redacted

1/29/2023 07:59 AM

Firstly, what happens when there is an emergency? Where will vehicles pull off to let emergency vehicle go by???? How has this not been thought out. Also, snow removal...we already struggle with where the snow goes when roads need to be cleared in the winter. Now there will be NO where to put snow, what's the plan here?? Do you really think the thousands of city visitors coming to downtown canmore are going to plan to park and bike into town? No. They won't. There is just going to be worse traffic jams. People will still need to go through town to get to the quarry. I don't understand how this stuff isn't considered. Particularly the emergency response vehicles. This is dangerous and harmful for canmore residents.

Screen Name Redacted

1/29/2023 12:16 PM

It will create more traffic as Railway Ave is busiest route in town. Even two lanes are not enough when rail comes. Worst idea to reduce lane and creating more traffic on Railway avenue. More traffic means more pollution as vehicles will not move fast.

Screen Name Redacted

1/29/2023 02:51 PM

1. This will impact the amount of time to get through town. As a commercial business, we have trucks that have to travel this route twice a day, and it will delay our travel. Also makes it harder to navigate in the winter, due to restricted area for plowing. Delivery trucks and trades that need to work down town are larger vehicles, and this is a difficult area to maneuver. Back log will happen when the train is stopping traffic - it already back logs up benchlands overpass. This also creates no lane to turn off when emergency vehicles have to pass -FIRE TRUCKS! 2. No impact 3. I do not bike, I have two dogs that come with me. 4. I do not use transit, cannot take my dogs with me.

Screen Name Redacted

1/29/2023 03:22 PM

That intersection between Railway Avenue, Bow Valley Trail and Benchlands Trail has to be the worst designed intersection I have ever seen, and I have been to a lot of different countries and seen a lot of bad intersections. My wife drives miles out of her way just to avoid it. You should just send in the bulldozers, tear it all down, and

start over with a new set of designers with a more rational and more importantly, much simpler plan. Also your web site sucks too, and I am speaking as someone who used to develop web sites.

Screen Name Redacted

1/29/2023 05:29 PM

Travel experience negatively impacted due to increasing risk of vehicle collisions and longer drive times. Can't think of a positive, not for residents or visitors, so here are the concerns: how will one lane design work for snow plowing, a vehicle break-down, emergency vehicles (no option to move to the right), bus stop, left turns into businesses, left turn lane onto Main Street will at times flow into the one lane and cause deadlock (as it does at A&W intersection' right turn) - all will negatively impede traffic flow and/or cause complete blockages. And the Roam bus will likely never be on time given traffic congestion and this will deter usage. Just because you can design something to encourage walking/cycling doesn't mean you should via disrupting tax-payers getting to work, shopping for groceries, and other essential services. My current 7 minute drive, which is essential, will take significantly longer with this design and thereby not help the environment as I navigate delays or a different/longer driving route. Additionally, left turn out of EP is already challenging and this will become more hazardous if you move the pedestrian crossing to this part of the road. At least consider moving it to the right of the turn-out otherwise pedestrian/vehicle collision is more likely at this very dynamic turn-out. Time for leadership to acknowledge this redesign misses the mark on helping residents and visitors safely navigate our downtown area, particularly when our weather for most months does not make walking/cycling a reasonable daily option for residents and most visitors get here in a personal vehicle. And ideologically, lets face it, before spending taxpayer dollars, this is not going to help climate change.

Screen Name Redacted

1/29/2023 05:55 PM

1. Driving - right turning traffic into businesses will slow down overall traffic flow. 2. walking - no change 3. cycling - no change. Canmore is winter the majority of the time and bike lanes will likely be under utilized. We should not be basing major traffic flow decisions on biking a few months of the year.

Screen Name Redacted

1/29/2023 07:06 PM

The intersection at the shops of Canmore has had a negative impact on travel for cyclists, pedestrians and cars. Often cars are backed up into the roundabout as the lanes pinch cars without providing any additional space for cyclists or pedestrians. I am at a loss to see the benefit of this design. If the goal was to encourage cycling and walking, why would you limit the space with cement islands rather than create bike/pedestrian paths? Given the expense and exclusively negative impact of this design I do not have confidence in

future designs ostensibly for the purpose of improving travel experiences through town. Please do not create another difficult to navigate, expensive and potentially dangerous intersection.

Screen Name Redacted

1/29/2023 08:59 PM

Biking: I am in agreement of making Canmore more bike friendly. My preference would be to put the bike path behind Elevation Place, Save-On-Foods, C. Tire and Safeway. There's lots of space to make that current paved path between the train tracks and the businesses wider and would keep bikes and cars far apart. It also provides easy access to EP, Save-On, C Tire and Safeway. An access point on the west side of Safeway could funnel bikes south across Railway Ave. by Vertical Addiction to the path leading to the Engine Bridge. Cyclists could head east into downtown on the side streets off that path, depending on their destination. Concerns with proposed design - 1. cars turning right into Elevation Place from Railway Ave. and cutting off bikes. 2. Where do all the bikes go at the Drake corner? Are we going to eliminate parking on the street downtown so cyclists have more space? 3. Have serious concerns with pushing people to bike - not everyone is comfortable biking, not everyone can afford a bike, it's a hassle and dangerous trying to bike home with groceries, Canmore is very hilly, I have a very hard time riding my bike up to Cougar Creek and I'm fit. Transit: I will happily use Roam if it is offered more frequently eg. every 15 minutes instead of every 30 minutes. Driving: I am not going to ride my bike in the winter, which is 7 months of the year. If the goal is to reduce cars coming into downtown, then make it easy for me to park relatively close. We need more parking especially in the summer. I suggest adding parking in the field (pave it) by Palliser - for free- provide shuttles to downtown, or build a pedestrian overpass over the TCH. Trains: With only one lane for cars, the line up of cars heading NE towards the A&W on Railway Ave. waiting for a train, will be backed up around the Drake corner and on Railway Ave back to 10th St. Walking: My walking experience is very positive. I like the new intersection - it's much safer.

Screen Name Redacted

1/29/2023 09:33 PM

While I do not like the way that the lights are set up as this is very confusing for people. I acknowledge that my driving experience may be worse however my walking and biking experience will be substantially improved.

Screen Name Redacted

1/30/2023 09:32 AM

Driving It will impact the way of travel greatly, horrible idea, traffic will get so backed up, we already have idiot tourists that use the bike lanes as actual road ways we don't need this to happen

Screen Name Redacted

1/30/2023 10:11 AM

This will make my driving a major pain in the[redacted]. I have to drive to work, stop at the boardwalk building and carry on to Banff. That intersection is already a nightmare over long weekends and weekends in the summer, often times so long and past the round about, and sometimes a traffic line all the way to the courthouse.

Screen Name Redacted

1/30/2023 10:14 AM

I have to drive this road twice a day during the school year and 4 times in the summer when my daughter is at summer camp. I live in south Canmore and work downtown. This new design will only add to the confusion and congestion of the whole downtown core!! Walking, biking and transit are all not an option for me without adding an additional 2-3 hours to my already 9 hour day. Working less is not an option either because I need the money to be able to afford to live here. Could this road use a face lift, yes. But this design is a disaster waiting to happen.

Screen Name Redacted

1/30/2023 11:33 AM

This piece of road works fine as it is. Room for cycling, walking & driving. Leave it as is!

Screen Name Redacted

1/30/2023 12:03 PM

Hello, I have question about Crosswalk from Esso to Elevation place, Will have left turn to go Esso gas station for Benchland Trail traffic? There should be left turn to go Esso gas station. As we receive fuel delivery with two trailers will have hard time to take left turn to Esso gas station. Customers who comes from Benchland Trail will block traffic as they come shop in Esso gas station. There should be wider road and left turn to access Esso gas station as there will crosswalk. Please reply to me on esso13208@gmail.com or call # (306)715-4657. Thank you, Sunil Patel

Screen Name Redacted

1/30/2023 01:35 PM

No impact at all, we have hundreds of trails around and I will be still drive or walking in the area.

Screen Name Redacted

1/30/2023 02:02 PM

Carrying on the bike trails along this road makes is easier to access Safeway/Sobey/Cdn tire area from Spring Creek. Since the intersection at Bow Valley trail and Railway only allows for one lane at a time to enter Railway from the north, I can see taking the one lane away. Heading north bound your taking away a lane, my guess is your plan is to install an intersection and light pattern similar to that of Bow Trail/Railway at the Railway/8th Street intersection. Which would then allow only one lane of traffic down this section of Bow Trail. If that's the case, I'm definitely not in favour.

Screen Name Redacted
1/30/2023 05:09 PM

1 I don't drive often, but will appreciate a more picturesque route. 2 Walking vastly improved as there will be some separation from driving lanes. 3 See 2 4 I don't use transit enough to comment

Screen Name Redacted
1/30/2023 09:51 PM

Improve the walking and cycling experience. Make it safer and more convenient to not take a car. It may make driving less practical but this is what we need for change and then we can take transit if we don't want to walk or take a bike.

Screen Name Redacted
1/30/2023 10:03 PM

Cycling will be easier and safer. No need to drive.

Screen Name Redacted
1/31/2023 12:21 PM

1) driving experience will be increased here overall. consider leaving enough space for a left and right turn lane coming out of Elevation place. I expect entering and exiting out of the southwest commercial space to be more difficult 2/3) walking and cycling experience will drastically improve. I expect usage to exceed expectations listed in 2019 concept brief. 4) happy to see dedicated space for bus stop

Screen Name Redacted
2/01/2023 09:39 AM

Reducing lanes in this area is unreasonable given that this is a main artery into our large box stores and access to downtown. There are two existing pathway systems - one by the railway tracks and one behind the condos along the creek that could be improved substantially to enable cyclists and pedestrians in that area and keep the roads 2 lanes each direction for our high volume of cars that come into our town and use that street. Please do not do this!!! There are improvements that could be made to the area but this redesign is not the way to do it.

Screen Name Redacted
2/01/2023 10:17 AM

This is a main route from the east side of town to the nordic centre and vice versa. There is no bypass to offer alternatives outside of 3 sisters parkway. This concept seems very narrow minded and focused on bikes/pedestrians. Bikes/pedestrians are the minority in a mountain town that experiences 6 months of winter (or more). Canmore is not Amsterdam. This plan looks great for people that live downtown however for many that live in Eagle Terrace/Peaks/Rundle, biking and walking is not a great option. What is the plan to get vehicles from the eastside to the nordic centre or the west side of downtown?? Build the bypass before clogging up the downtown corridor even further. Heading away from downtown towards the sunnyside is already backed up significantly during peak periods. I can see backups to elevation place entrance on a regular basis. The queue length if going to double and cause issues, especially with the new signal system which is also adding to

community frustrations. I would like to see a targeted survey to taxpayers that live on the eastside of the trans canada. I am imagining that there would be very little support for this concept and they would share many of the same concerns I have outlined.

Screen Name Redacted

2/01/2023 02:12 PM

1. I don't think it will impact my experience much when driving. 2. More direct routes and wider paths will be great! I am worried that without separation such as pylons or bollard between the cycling and walking areas these may have user conflict. 3 - hugely improved, having connected, protected, direct cycling lanes will be a massive improvement, I'll feel safer and be more likely to ride more often. 4. No change

Screen Name Redacted

2/01/2023 05:14 PM

The current mix of having cyclists and walkers on the same pathway is very frustrating and very inefficient. Bikes are moving way to fast to have people on the same pathway. And no one will ever understand the unique colourways for the paved pathway. I think the town has failed to understand that this is a tourist town and these unique intersection patterns and pathways take extra attention to understand. People that are visiting are driving based off habits all the while looking at their GPS trying to navigate town.

Screen Name Redacted

2/01/2023 07:16 PM

17-242 Benchlands Terrace

Screen Name Redacted

2/01/2023 07:23 PM

Driving: I can only imagine the long lineups, exacerbated each and every time there is a wait for a train. As much as council thinks we can all cycle, walk or take the bus for groceries, this is NOT going to happen. I don't live in Europe where a grocery store is a 10 minute walk. I live in Eagle Terrace where the store is a 35 minute walk there and a 45 minute walk home. Imagine me laden with bags of groceries. Not going to happen. I will be stuck in the queue to get to Safeway like the rest of town. I have a grown daughter who is physically unable to walk that distance. I have elderly neighbours who are also unable to walk that distance. Being stuck in traffic every time we all need to head to town is simply unacceptable. Cycling: I can already get right downtown on my bike and ride on zero roads. This for me, is not worth commenting on. What is worth mentioning is that I am a seasonal cyclist. I do not ride in the winter. Bus: I have taken the roam bus ONE time from Banff to Canmore in the snow and rain. The closest bus stop to me is across from the Iron Goat. Not exactly convenient for me to haul my groceries UP Benchlands Trail to my home.

Screen Name Redacted

2/01/2023 07:33 PM

We need an ability by car to turn left out of Elevation Place, to get back over the highway to Cougar creek side or any of the dwellings accessed by turning left, this includes residents of Three Sisters who use Highway 1 to access town. We need to be able to turn left or to exit we will have to go to Supermarket parking lot and wind thru to come out at the traffic lights or drive all through town to come back along Bow Valley Trail As a car driver it is difficult to turn left out of Elevation place because of the large solid sign saying Elevation Place that is right in the middle of the driver's view. Could this be moved while all this is being done.? One has to pull into bike/walk lane already to see if there are people coming across which is dangerous.

Screen Name Redacted

2/01/2023 07:35 PM

So excited to have a bike path on the other side of the street! Doubt it will impact transit, driving or walking at all.

Screen Name Redacted

2/01/2023 08:35 PM

1. Driving: No significant impact expected. 2. Walking: Proposal will greatly improve walking on the south side of the street by increasing the safety buffer space from fast moving cars. Currently often cross railway avenue twice just to walk down the other side of the street since it seems safer. 3. Cycling: When heading south cycling I usually just ride in the car lanes with traffic. Proposal with separate bike lane seems much safer. When heading north, proposal would improve cycling speed by separating lane from pedestrians. 4. Using Transit: Proposal would enable me to walk on south side of street while heading south and then could catch the roam bus if it happens to go by. Currently I would walk on north side of street to be away from cars and then wouldn't have opportunity to catch bus so would walk the entire way.

Screen Name Redacted

2/01/2023 08:56 PM

Concerns regarding increased congestion when driving to An already very congested Area. Sitting through multiple lights after train. Difficulty crossing from one side to the other via car, bike and in foot through congestion. Increased Difficulty exiting EP, gas station etc.

Screen Name Redacted

2/01/2023 09:14 PM

Driving- traffic is bad in winter jet alone summer when it's tourist season with 4 lanes. I don't think it needs any changes. Other than on the far left side. The sidewalk is very skinny. But the right side is wide. Visitors don't walk in correct lanes bike/walk lanes. I have 2 e-bikes. I carry my children with disabilities on the back as they can't ride a bike themselves. I can bike downtown no problem as it is. I think we need 4 lanes. Look at the backup we have when there is a train. It will be gridlock with 2 lanes. Trying to get down to my children's school is super busy as it is. It takes you so long to get

through downtown. Especially when you close the Main Street access. What needs to happen at this intersection is traffic lights. So when you are coming out of Elevation Place you can actually get out. And, a normal Canadian set of traffic lights. Not the disaster that has been installed in town.

Screen Name Redacted

2/02/2023 08:26 AM

In this area I'm mostly a pedestrian or cyclist, so I like to see what looks like separated vehicle lanes.

Screen Name Redacted

2/02/2023 09:52 AM

1. I will drive less 2. It will be a more direct way for me to bike into town 3. It will be a nicer experience walking into town 4. Walking to and from bus stops will be easier

Screen Name Redacted

2/02/2023 09:58 AM

The new bike path & walking path will be a fantastic improvement, thank you. Please plant lots of trees.

Screen Name Redacted

2/02/2023 10:10 AM

Hello, I am against this plan to make Railway Ave single lane. You can have shared lane with cyclist. Having single lane for vehicles is bad idea. There will be traffic issue. Business will suffer big time as there will be less customers. Thank you, Sunil Patel

Screen Name Redacted

2/02/2023 10:12 AM

The redesign will impact my commute to work negatively, as I must drive. Walking/biking/transit are not an option. This new concept will likely have huge negative impacts on vehicle traffic. Existing infrastructure for walking and biking are more than adequate. I drive this area multiple times a day and it is already terribly busy at times. I also walk/bike this area frequently, and it is never too busy, nor is it unsafe. This re-design is totally not needed.

Screen Name Redacted

2/02/2023 10:27 AM

Driving - this looks worse than the current design. I find the biggest current problem is with lanes starting and ending randomly. Its not clear if this signage will be better in the new design. Cycling and walking - good to have a bike lane but do we have the capability to plow this in winter? Currently we do a terrible job on the existing lanes.

Screen Name Redacted

2/02/2023 10:59 AM

Looks good for either transport

Screen Name Redacted

2/02/2023 12:05 PM

I think widening the south side / creek side of the paths is a great idea. We bike through this area to get to EP and it is very disjointed

currently.

Screen Name Redacted

2/02/2023 12:30 PM

Driving

Screen Name Redacted

2/02/2023 02:21 PM

To much traffic already for 2 lanes, new "turn lanes" not big enough locals don't bike everywhere! I live in three sisters and don't look forward to this at all.

Screen Name Redacted

2/02/2023 02:34 PM

Having more side walk space would be positive as railway avenue is a busy road and currently has narrow side walks. That being said, we should not decrease the number of lanes available for vehicular traffic on this road as that would create more backlogged traffic.

Screen Name Redacted

2/02/2023 02:35 PM

1. I think it's a real miss to not put a traffic light in front of EP. It was one of few hopes I had from this redesign to make it safer to get in and out of EP for all users. I believe a controlled intersection would be safer for pedestrians in the area as well instead of the proposed crossing even with lights, etc. 2. I rarely walk in that area so I have no comment. 3. I appreciate that we might start to see some consistency on how bike paths are positioned around town however my experiences with the paths through Spring Creek have generally meant that pedestrians simply spread out more (despite signage). I generally avoid cycling on Railway and use the path behind EP. This might make it better or I may continue with my current avoidance techniques depending on pedestrian compliance with the path divisions. 4. I don't use transit.

Screen Name Redacted

2/02/2023 02:37 PM

No need for Bike lane, I have rode my bike down both the road and side walk with no issue whatsoever. There is much more vehicle traffic here, than both pedestrian or bike traffic, to warrant such a change. This is another bad example of town planning, very similar to the clogged intersection at the A&W/shops of Canmore.

Screen Name Redacted

2/02/2023 03:03 PM

I live on the north side of the valley and appreciate the existing protected lanes and crossing for cyclists and pedestrians. I will only use the cycling lanes, due to the weather constraints, from about April to October each year. Separate lanes for cyclists and pedestrians in front of Elevation Place is a great idea, though I think a new bike lane on the south side of Railway Ave is excessive and I likely won't use it. As a motorist, I dread the proposed lane reduction for cars. As the Town grows in size and visitation increases, driver experience is only going to get worse. With current and future volumes of traffic, and

proposed lane reductions, how far back is the line up of cars expected to be during a train crossing?

Screen Name Redacted

2/02/2023 04:56 PM

Driving - stop getting rid of lanes of traffic! This is really getting insane how the town planners keep designing out lanes. Traffic is only getting worse here.

Screen Name Redacted

2/02/2023 05:49 PM

1. Less people trying to double park for nothing before the other light at main st. Traffic will be slower and safer because of the one line. 2. Walking will be better because now it's not fun to have cars at 50km/h at less a feet from you. Specialy when you have water on you at spring because of a car and a water spot.On the road side of the ford dealership. 3. Cycling will be better because of the dedicated line. I'ESS dangerous for bikers and pedestrian. 4. No big difference

Screen Name Redacted

2/02/2023 05:56 PM

We all appreciate it mostly to walk, we all are aware of the negligence of people driving there but as well some cyclists are not respecting the pedestrian which makes it dangerous, there is a way almost parallel to it just next to the train rail which can be repurposed for it.

Screen Name Redacted

2/02/2023 06:05 PM

1: Driving will slow me down, 2: I don't walk there. 3: There is already a bike path. 4: I don't use transit.

Screen Name Redacted

2/02/2023 06:13 PM

I think if we didn't live in a tourist town with many visitors every day who aren't aware of how the road works, really puts pedestrians and cyclists at risk for increased injury. There is also a potential for vehicle backups all the way out to the highway which creates additional risk outside of our town. I walk everywhere because driving is already a [redacted] experience. I don't see how removing lanes is going to improve traffic congestion.

Screen Name Redacted

2/02/2023 07:05 PM

DRIVERS. We drive downtown, for grocery's. Reducing traffic lanes for the fringe minority that cycle all year round in the snow is unsound. It will cause further congestion traffic. Did you forget there is congestion with trains? This happens regularly when entering the intersection for Bow Trail. Further, Bikes on the side walks for pedestrians is a safety hazard. NO to the plan.

Screen Name Redacted

2/02/2023 07:13 PM

If it's anything like the first intersection ... forget it ..it's a mess

Screen Name Redacted

2/02/2023 07:16 PM

1. For the whole project I would consider the width of all roads to stay wide enough in regards to winter and snow accumulation, with the intersection at Railway Avenue and Bow Valley Trail showing that the Town of Canmore did not consider the snow banks in the winter. That intersection width works in the summer, but in the winter, it gets a bit icy and is even narrower due to the snow banks, a have noticed this happening in Banff as well. I would also like to remind the Town of Canmore that this road is the thoroughfare to get into Canmore and restricting the movement of vehicles will have a detriment to those having to drive, mainly people delivering, getting groceries and working in the construction industry. (Its a bit hard to bring all your tools and material on the bus.) Together with all the restrictions on cars there will be more idling of vehicles trying to get places which contradicts with Canmore trying to reduce emissions. As regards to this plan I would wonder why having two lanes initially after the railroad crossing? The main intersection at Bow Valley Trail restricts it down to one lane already, I would have it one lane right from the Bow Valley intersection instead of having a small part with two lanes until after the railroad tracks. As for the paths I think having duel cycling lanes on both sides of the road are a bit overkill. there are many other ways to get into town that should get the attention rather than having another path. with would separate cars and bikes entirely. kike the article in the Outlook I think the path behind elevation place should get upgraded and widened instead of it following Railway avenue.

Screen Name Redacted

2/02/2023 07:33 PM

2. It depends on whether the bike lane is on the sidewalk level or the road level. If road level, it won't impact me as a pedestrian, but if it is a bike lane beside a sidewalk at sidewalk level... just don't. On main street bybthe nwmp barracks the rarely used bike lane is way too wide compared to the heavily used pedestrian sidewalk. Please don't make that mistake again.

Screen Name Redacted

2/02/2023 07:46 PM

1. More congestion going into town. Don't use other forms of travel as I avoid going into town besides for some groceries

Screen Name Redacted

2/02/2023 10:12 PM

If the plan is to convert a current driving lane into a bicycle lane, I think the impact to traffic will be abysmal. It is already a very highly congested road with long wait times at traffic lights, possibly the most crucial traffic flow artery for locals. I would not take any steps that diminish traffic flow lanes in any capacity here. If anything, priority should be to increase vehicle capacity. I say this as a local who rides bikes all of the time. Diminishing vehicle lanes will impede locals ability to travel significantly. It's truthfully a terrible idea. This is already one of the most congested roads; why make that worse? Voluntarily?

Screen Name Redacted

2/02/2023 10:56 PM

The islands for crosswalks make it more difficult for snow plows to clean the snow and ice and more dangerous for people and drivers - instead of reducing lines railway ave and bow Valle trail should be one-way roads without traffic lights (connected in a big circle)

Screen Name Redacted

2/03/2023 07:39 AM

We need to keep the 4 lane

Screen Name Redacted

2/03/2023 07:58 AM

I don't bike in winter. In the summer when I do occasionally bike I use the bike path along the rail tracks. The main reason I use railway ave is for grocery shopping which is not practical to do on my bike. I am concerned that loss of driving lanes will cause even more congestion in this area.

Screen Name Redacted

2/03/2023 09:03 AM

Any time you reduce the to one lane you will have double the traffic problem you have now. We have 7 months of winter, most people live on the steep slopes on the mountainsides, not everyone can afford an E bike, to use 4 months of the year. Not everyone is capable of cycling up the steep hills.

Screen Name Redacted

2/03/2023 10:04 AM

It's create more traffic for vehicle.

Screen Name Redacted

2/03/2023 10:11 AM

Driving: the congestion to get to the grocery stores, pharmacies, and after school lessons, which is when I primarily drive downtown, will be dramatically impacted by this redesign. After the new intersection was installed, the backup of traffic at peak driving times, or when there is a train, can at times be all the way up Benchlands Trail. This redesign does not make the town more livable for residents. I can not buy my weekly groceries on a bike, and this design makes an already frustrating situation, even more frustrating. In fact the congestion that already exists has discouraged me from shopping downtown at all. In three years, I have shopped in our downtown core maybe 6 times--it's just become too inconvenient to shop local. Also, if you've ever tried turning left out of the Elevation Parking lot, you would know that it's both an exercise in patience and aggressive driving to try to time it. This would only become worse. Not everyone has the leisure time built into their days to get their children to lessons by biking or walking.

Screen Name Redacted

2/03/2023 10:20 AM

I dont think single lane on railway ave is good idea. Its gonna make business in trouble

Screen Name Redacted

2/03/2023 10:41 AM

The driving will be impacted negatively

Screen Name Redacted

2/03/2023 10:58 AM

Sorry I couldn't find a general comment area. I believe the vision is flawed and will fail the local and downtown business. But even after the fallout of the infamous intersection you guys didn't learn or listen and keep pushing a flawed project without any consideration of public opinion. There is so much need for basic improvement in this town like an expanded water treatment. Why don't you pave the north side of the tracks for bike pedestrians alike

Screen Name Redacted

2/03/2023 11:01 AM

This plan will not work, it's heavy traffic on this road during summer so a single lane is not going to work as well as for business prospective owners lose a good amount of business due to a single lane.

Screen Name Redacted

2/03/2023 11:48 AM

I live on 4th St & 5th Ave junction area in downtown, and frequent this crossing on bike or on foot. I am 100% in support of this project to improve the safety of pedestrian and cyclist, as well as smooth flow of both. Currently this area is in favour of car traffic only, with narrow pass being shared with pedestrian and cyclist. 50% of time, car ignores crossing signal and keeps driving through. When rain falls or snow melts, huge puddles accumulate against the pass and we get big splash from the car. In order to promote more alternative ways of traveling through the town rather than car, this will benefit the community and therefore I'm in favour. Thank you for the planning and I hope this will be agreed by the majority. It's time for change!

Screen Name Redacted

2/03/2023 12:21 PM

Driving will be congested and frustrating, walking would be fine if the snow and ice is properly managed, which it isn't at this time. Same for cycling, and I don't use transit. I don't understand the decision to make driving in Canmore even more difficult than it already is. There are no intercept parking lots available for tourists, tourism will continue to decline and if all the developments on the table go forward congestion will be a huge issue. This proposal does not seem to address how the town intends to manage the vehicle traffic that already exists and the inevitable increase in congestion. Further because Canmore deals with winter road conditions 6-7 months of the year, and the TOC does little to manage the ice and snow, biking/walking is not very appealing. Limiting vehicle traffic and ease of use to the main services residents depend on will only cause frustration and negatively impact the quality of life for residents. This proposal will not encourage biking or walking much more than what is currently available. The town's affordability issues mean that it is an

aging population, young people/families cannot afford to live here, many who do may unlikely be able to retire here. Older people will choose to drive rather than risk a fall on snowy/icy roads/trails to get groceries or go to the bank. This proposal will do nothing but waste our tax dollars and further alienate the tax payers who live here in Canmore.

Screen Name Redacted

2/03/2023 12:22 PM

This section of the plan makes sense. Wider boulevards for Cycling and walking are present. Two lanes for traffic heading towards the railway tracks makes sense as traffic can back up considerable at the Railway and BVT particularly when trains pass through. Thinking ahead, this will only get worse if passenger trains begin from Calgary. The absence of a left turn lane when heading from BVT to Main will make it difficult to get into businesses and will cause back ups

Screen Name Redacted

2/03/2023 12:28 PM

adding a bike lane is a good idea but not at the expense of the crosswalk. That is vital because people from out of town always cross the tracks then start going really fast. I think the better solution is to widen the left side sidewalk towards the bushes and the car dealership and include a bike lane

Screen Name Redacted

2/03/2023 01:05 PM

Will make an already congested roadway worse. Look at the trails and walkways that already exist along the railway track and along Policeman's Creek and improve Rove them. Remember this is a tourist town who come here via automobiles

Screen Name Redacted

2/03/2023 03:04 PM

This looks great. I love the focus on active modes of transportation.

Screen Name Redacted

2/03/2023 03:10 PM

I almost never use this stretch of road. It's okay for walking on the Elevation Place side, but pretty scary on the opposite side of the street. When driving, I curse the new intersection, mainly when vehicles are stopped in all directions and there are no pedestrians/bicycles in sight. There must be better technology to improve the flow of traffic. I see the concept design making the back-ups by the A&W even worse than they already are. But it will be a more pleasant experience for biking/walking than it is right now.

Screen Name Redacted

2/03/2023 03:11 PM

1-Driving: Negatively: Sounds like a terrible idea, slowing down traffic at a time where more people come into town and traffic increases. why to go from 2 lanes to one lane when two are required? between people turning to Esso and to EP, having one lane seems like it would be hell to to through, plus the backup traffic it would create.... Lanes

are much narrower and beside not being handy, it feels scary and dangerous when a big truck drives beside or if someone happens to even slightly move sideways. I bike everywhere, all the time, all year round, but sometimes I need the car, and that project sounds depressing. I get the idea of pushing for biking, but that's just not right. 2-Walking: Negatively: with the backed up traffic it'd create, it could make a constant line of cars running and standing almost still on the road, creating fumes around the sidewalk. that's not to mention people who smoke in their car and that goes towards walkers too. it is very unpleasant when walking to be exposed to those. If they just pass by and its quick is one thing, but now they would drive slowly beside if not stopped and walking just doesn't allow to get out of that environment fast enough. 3- Cycling: Negatively: while those pink lanes are very cute, they are also right beside the sidewalk, and yes, people just go and walk on it. It's much of a hazard when you're trying to bike at a minimum flow pace and there is a constant danger of hitting a pedestrian who carelessly jumps on the biking lane, or doesn't move out of the way when called on it. Pointless to have a biking lane if we have to step off of it to go around pedestrians. Its honestly much easier and safer to ride on the street, providing lanes aren't shrank down to the size of a smart car and there's actual room to share the road. Then we can ride and follow the flow of traffic. Much more efficient. 4-Using Transit: Negatively: Well, the bus keeps you warm in winter while you're stuck in that one lane traffic jam until it's the bus's time to jam traffic of the ONE LANE road by dropping people at EP.... It would be faster to walk, but not everyone can walk from cougar creek to downtown. They don't need to be held hostages in a bus cause someone had the idea that decreasing amounts and size of lanes help the flow of the increasing traffic. 5-Impact on mental health.... Negatively: Come on guys, who thought it's actually a good idea to jam all streets in town with micro lanes for car traffic and bike lane used more by pedestrians!? Please stop wrecking the town and enraging everyone. it makes for a bad vibe in the community which affects moral of the day for everyone. We already hear enough about the flop it was at the light, can we really take more? It's depressing that the idea even made it to a considered project. people are tired that the tax payers money go to throw concrete in the middle of the streets when it's fine as is. Just stop

Screen Name Redacted

2/03/2023 04:05 PM

It seems as though there will be a major pinch point coming from BVT onto Railway at EP where the road moves to one lane. That combined with slower traffic due to the volume of vehicles turning in seems as though this area will get backed up. The same could be said for coming from main street; very slow as people prepare to turn into the businesses. Seems like a lot of room for bikes and pedestrians, so likely improved experience for those modalities. However, with such a reliance on tourism with most visitors in

vehicles, will this be feasible on busy summer days?

Screen Name Redacted

2/03/2023 04:59 PM

Walking: this is fine
 Cycling: what's the need to have bike lanes on both sides? What's wrong with the pathway along the railroad tracks?
 Buses: with one lane each direction and the amount of times busses stop, that will back up traffic LIKE CRAZY
 Driving: same thing, one lane each way? Holy cow traffic!!!! I own the longest running business in Canmore (established in February 1974) the paid parking has already put a huge damper on my business, this will put an even bigger damper on it, what about all the other business on maintreet let alone downtown in general?! You say all this is to fix water and sewer lines? GREAT fix them, that's fantastic, but to make it one lane each way and have a median in the middle? DONT DO IT!!!! What's wrong with the way the roadway is now? What happens when there's an emergency and a fire truck/ambulance or police officer needs to get through? Their screwed (for lack of a better term)

Screen Name Redacted

2/03/2023 05:03 PM

With a minor impact to vehicles, this strengthens the cycling corridor, moves the x-walk to an appropriate place in from of elevation place and I love the bus stop location move as well. The only issue I see is the flow through from Benchlands Trail to Railway in having the flow through shift right. It would be better for the right-turning traffic from BV Trail to merge into the flow-through lane.

Screen Name Redacted

2/03/2023 07:00 PM

Why do you think you need to fix something that's not broken? We don't need this stuff and the millions it's going to cost. This will only make the perceived problems worse! Taking two lanes and making one and then telling us it will work better is the most ridiculous form of logic I've ever seen!!!! Save the money and give our taxes back!

Screen Name Redacted

2/03/2023 11:23 PM

Don't make any changes, it works just fine right now for walking, cycling, transit and driving. You are going to have a mess, just like you created at the very expensive and totally unnecessary Bow Valley Trail intersection. Spend the money on other more important initiatives.

Screen Name Redacted

2/04/2023 02:56 AM

Until the tourist economy no longer fuels Canmore, these changes will only frustrate residents and create more traffic congestion
 Tourists will continue to use their cars which is how they arrive in Canmore initially I see no benefit for residents

Screen Name Redacted

this is unnecessary use of town finances.

2/04/2023 04:06 AM

Screen Name Redacted

2/04/2023 05:35 AM

One lane traffic? It gets backed up with two lanes of traffic. How is this going to solve the issues with traffic in the town. Flooding was a major issue with the previous upgrade. Please ensure that the necessary surveys and work are completed to ensure that these problems do not happen again. Do not put in the lights that were installed on the new intersection in here. They do not work and cause more confusion than help. It would be great to learn about the main goals of this project and if the solution actually solves the problem or compounds the issues. These plans seem like they compound the problem instead of solve them.

Screen Name Redacted

2/04/2023 05:41 AM

Your designs all show small cars with one large semi trailer. A majority of this town tribe large SUVs or trucks. The small cars shown in the photo also suggest that only summer conditions have been considered. Have you considered what the driving and separation will look like when covered in snow??People also have trailers. has tracking survey for trucks been competed or just small cars?

Screen Name Redacted

2/04/2023 09:06 AM

3. Cycling on south side of Railway will be significantly improved. Currently it is dangerous to cycle on south side (no separation from vehicles). 1. Driving may experience bottlenecking driving towards Main St from Rail tracks. Having to change lanes from left to right while crossing tracks may be problematic. 4. Transit. I hope there are laybys for transit stops to allow traffic to keep flowing when bus stops.

Screen Name Redacted

2/04/2023 09:48 AM

From a walking perspective: all sidewalks for pedestrians should be a minimum of 2.5 meters. Otherwise it is complicated for those with strollers, dogs, families walking together and meeting those walking towards them. Cycling and driving is suitable for the location. I look forward to the results

Screen Name Redacted

2/04/2023 09:56 AM

110 Settler Way

Screen Name Redacted

2/04/2023 10:00 AM

THATS GREAT.

Screen Name Redacted

2/04/2023 10:01 AM

110 Settler Way

Screen Name Redacted
2/04/2023 10:01 AM

110 Settler Way

Screen Name Redacted
2/04/2023 12:03 PM

I only drive downtown for groceries. My hope is for easy driving access.

Screen Name Redacted
2/04/2023 01:11 PM

It will slow things down just like the Shops of Canmore intersection does. Driving is slow, biking is not easy in the winter since all of the pathways are very icy anyways.

Screen Name Redacted
2/04/2023 01:45 PM

Walking and cycling look like there will be improvement, but I didn't really think there was an issue with either of those things in this area. Driving and using transit seem like it will remain the same.

Screen Name Redacted
2/05/2023 09:03 AM

710-3rd Street

Screen Name Redacted
2/05/2023 11:55 AM

The only positive I see here is the turning lane into EP. Just leave the road as is, and add more bike paths. Please stop burning money.

Screen Name Redacted
2/06/2023 10:44 AM

1. Driving will become frustrating. There needs to be options for 4 lanes, AND the expanded bike and walk lanes. Based on the drawings, the green space could be significantly shortened to allow for the road to still exist as 4 lanes, and still get the extran walk and bike lanes. Alternatively, 2 lanes with dedicated turn lanes to keep people waiting to turn out of the way for those going through. Additionally, the bus stop will only cause backups and become a nuisance. It would be beneficial if there is a dedicated space for transit busses to pull over. 2. Walking will become easier. However, as proposed it will be at the expense of an effective and functional vehicle traffic plan. 3. Biking will become easier. However, as currently proposed it will be at the expense of an effective and functional vehicle traffic plan. 4. It will make no difference to transit s proposed. Transit, as proposed will only become problematic for vehicle traffic.

Screen Name Redacted
2/06/2023 11:20 AM

I'm sure that it will improve walking and cycling, but I'm concerned about Transit. As I don't normally drive to my office, driving is not a concern for me; however, it will be for our clients. We own a business on 10th & Railway.

Screen Name Redacted

2/06/2023 02:52 PM

1. Driving - this is ridiculous! It will have a major impact on my driving and the time it takes to get to work. The bus does not go to where I work therefore I have no choice but to drive. Bike you say!? - It takes me 40 minutes on a nice weather day in summer. From November to April you are saying that I should be encouraged to bike!??? So then, to get to work.... I would really need a fat bike since you expect us all to get on our bikes in winter. Or get studded tires for my old mountain bike. C'mon Town!! You want locals to get on bikes or walk, yet on weekends and in the summer when we have a ton of tourists, you think they will be coming by bike?? I don't know what is happening at the Town of Canmore these days. You say YES to all this development, but then you take away driving lanes on main roads!?? This is insane planning.

2. Walking - I live on the north side. The likelihood of me walking to get anywhere is very slim due to how long it takes. We are a spread out community - we are not Banff! I'm completely indifferent to the intersections if I'm walking, as it likely takes the same amount of time. Both sides of Railway Ave (the sidewalks) should be extended wider, but not into the roadways. The other way works way better. The businesses on the south side hamper this, but people in vehicles shouldn't suffer because there is a lack of a good solution on one side of the road.

3. Cycling - November to March or April, I guarantee you I am NOT biking because it's winter! Snow and ice make it treacherous for me to try and bike and I think it's crazy you expect us on our bikes all year. In summer, on my bike - the intersections won't make any difference with how I get anywhere. And just so you know - I love biking! I like to encourage biking - but this is not the way to do it. (also same comments as #2 for widening)

4. Using Transit - I don't use transit because it doesn't go to where I work. If it did, I would definitely consider it. But then of course, the poor bus is going to get stuck on all these roads trying to get anywhere! Especially in the summer! A lot of people in town work weekends due to the amount of visitors - and then you want people to use the bus on weekends to get to work, but build these roads and intersections which will slow down all the buses. The 30km/h speed limit is good, but only in certain areas. Canmore is NOT Banff. It has more residents and housing that stretches farther. You will have to really, really increase the bus service if you want less traffic because you are approving so much high density development. The residents will suffer because you can't say NO. Visitors are coming in their cars, no matter what. Are you planning a shuttle service from Calgary or the airport? The Town needs an awesome parkade with free parking to encourage visitors to park and walk (or bike). Thanks for taking my feedback, although I know it won't change a thing.

Screen Name Redacted

2/06/2023 02:59 PM

Driving

Screen Name Redacted

2/06/2023 04:02 PM

Driving

Screen Name Redacted

2/06/2023 05:00 PM

This wouldn't have as significant impact as second concept (Main Street to 10 Street. *Note - cross sections C - G from the Railway Ave cross sections). not much of adaption will be required as there is already a crosswalk on that same spot except this time, it is a traffic light.

Screen Name Redacted

2/06/2023 06:33 PM

207 cougar point road

Screen Name Redacted

2/06/2023 09:36 PM

1-Any lane reductions/narrowing will slow traffic flow and increase idling especially due to train and new traffic light. 2 and 3- Unsure if will change much since I already use road or the already EXISTING DEDICATED bike/walk lanes along train tracks OR Bow Valley Trail. I use these 2 modes of transport the most and do not feel that more options are needed. Definitely do not like to see more idling of cars and frustrated drivers. 4-Probably more delays due to traffic congestion. Will there be more bus stops along the core, to encourage more rider ship? For example, now that there is no longer 1 big loop but instead 5C and 5T, it takes long time to get across one side of town to other. Also, I mainly take 5T bus and there is only stop by Starbucks and then only main bus stop??? Instead of taking away road lanes, what about having dedicated bus/bike lane or a multi-passenger lane? Also, green spaces in the middle sounds like unnecessary and may attract animals.

Screen Name Redacted

2/07/2023 10:11 AM

Experience from the A&W intersection is that the length of the turning lanes are too short leading to delays as vehicles are stuck in the single lane section behind vehicles who are waiting to travel in a different direction. These concept designs have the same flaw and will lead to drivers waiting longer than necessary (multiple traffic signal cycles) as traffic backs up in single lane sections - this happens on bow valley trail north bound in front of the shops of Canmore regularly and results in queues back to the spring creek roundabout and beyond. I'm also concerned about no longer being able to turn left out of businesses on the south west side of railway ave with the central median in the way. The ped crossing at EP will be great, love it, but why take away the existing crossing location, roughly where the section A-A is located, why not keep it too? Generally I like the extra and separate space for active modes. I assume the different bike lanes widths on either side of the corridor are because of space limits? I feel a, 2m bi-direction bike lane on the

south west side is a bit narrow, even with the adjacent pedestrian sidewalk, it would be better if space allows to get to 3m to match the other side.

Screen Name Redacted

2/07/2023 10:56 AM

I think driving will become more difficult with the plan to narrow the driving lanes with a centre boulevard. I would definitely keep the four lanes, two each way, through this section to allow for people turning since this is a major arterial road. Walking and Cycling should improve even if narrower than in the plan.

Screen Name Redacted

2/07/2023 11:36 AM

1. Driving, reducing the lanes will increase traffic into the core in the morning and out of the core at the end of the day. With a train the congestion will continue further. Bus stops will also further congest the roads, cause drivers to become impatient= accidents. Reducing the driving lanes will not reduce congestion, instead it will cause frustration and accidents from people rushing. A town with 8 months of winter cannot run as a European city with most people using other options, bike, walk, transit. Also with a town close to surrounding hamlets that all use the town as their main work, grocery, rec area, expecting people to not drive is not feasible other options should be considered. Suggestion- 2 lanes into the core in the morning, 2 lanes out of the core in the evening.

Screen Name Redacted

2/07/2023 01:13 PM

I think the design will greatly improve walking and cycling. As a cyclist, I generally avoid the area since it's not tied in (on the one side) or a bike lane is non-existent on the Esso side. I am wondering if the bus lane is an exclusive lane? I assume it is open for all drivers, since the lanes are needed when traffic stacks up due to a train coming through. The added crosswalk is certainly welcome and needed - however, there's no direct crossing into the Spring Creek trails for biking and walking. Is there no need to tie that in?

Screen Name Redacted

2/07/2023 02:46 PM

1. Driving - Cutting down the traffic heading in and out of town will be severely backed up by reducing the number of lanes to just one. This is a main artery accessing the town and reducing the number of lanes will make it more difficult to enter and exit the town. Also accessing the businesses across from Elevation Place will be limited. Looks like left turns will be eliminated. Not great! 2. Walking - No change as there are already sidewalks on both side of the road. 3. Cycling - No change as there is already a cycling lane on the Elevation Place side of the road. Seems unnecessary to add in another bike lane and reduce the number of lanes for automobiles. 4. Transit - I don't use transit

Screen Name Redacted

2/07/2023 03:00 PM

Hello Dear, I would like to raise concern about traffic issue at the Railway Ave as its busiest route in town. Having single lane is not good for town people as they have to commute every day. It will limit people access to downtown and will create more pollution as slow moving vehicles. Please keep two lanes for vehicles and modify your plan. Thank you

Screen Name Redacted

2/07/2023 03:07 PM

Hello, I am against on this plan to create one lane on railway Ave. Having one lane will create more traffic and it is hard to access businesses in downtown as most business rely on tourists and local people. It will create more traffic when the train will come and that's not good for environment. I would like to request you to keep two lanes for vehicles on railway Ave and modify your plan with some other solutions for cyclists and pedestrians. Thanks Twinkle Rani

Screen Name Redacted

2/07/2023 03:29 PM

I travel every day from this road for work, grocery shopping. And for so many other things. Currently we have two lane road for the vehicles but still in pick season road is always busy if we make this one lane it's gone be more traffic specially when trains pass. As per new concept we are hoping people will use bicycles if there is bicycles lane. I am not convinced for that as if I want to go for grocery or shopping with my family I don't want to carry all bags and other stuff by feet. Let's say I use transit to do that but still traffic will be the problem. So I am giving Negative vote for the new project for the Railway Avenue.

Screen Name Redacted

2/07/2023 03:42 PM

Hi, I would like to raise concern about the single lane plan for Railway Avenue as its main route for local people and tourist. Having less vehicle in town will impact negative to local businesses and kill business eventually. It will create more traffic and pollution on Railway avenue and when train will stop traffic will be disaster for traffic. I see that there is limited access to business. Please review your plan keep two lane for Railway Avenue. Thank you, Seema

Screen Name Redacted

2/07/2023 06:12 PM

New project will make more traffic on railway avenue and as railway avenue is main road for locals to travel for daily needs. New project look like only focusing on tourist. Also it's will effect local business on railway avenue. I have negative vote for this project

Screen Name Redacted

2/07/2023 06:56 PM

I don't agree this.

Screen Name Redacted

Please tell me how reducing from 2 lanes to 1 lane is going to make

2/08/2023 06:41 AM

traffic flow better? Have you forgotten the experiment they did in Banff last summer with the Bow River Bridge? Wait times went from 3 hours to more during high season in the summer. As for Canmore, do you not see traffic backed up to the HIGHWAY in the middle of summer with what they did on BVT?

Screen Name Redacted

2/08/2023 06:44 AM

It will impact me greatly as Railway Ave is one of my main routes to and from work. Besides that I use the highway to AVOID the congestion caused at the intersection by A&W. These changes will cause significant congestion when trains go through town. As a TOURIST town, TOURISTS bring cars to get to where they want to go

Screen Name Redacted

2/08/2023 06:51 AM

With a single lane heading into downtown, Driving will be more restricted and less efficient. This is a main artery and should not ever have a single lane on any part of it.

Screen Name Redacted

2/08/2023 06:55 AM

1. This looks similar to the other intersection and it is awful. Long line ups of traffics, people not seein how two lanes go to four and being in the wrong lane, large empty spaces have been created that could have been used for traffic that aren't, massive sidewalks that look like roads that even I, as a local, have turned onto. Waste of money and I don't see how it helped alleviate the traffic, it's made it worse.

Screen Name Redacted

2/08/2023 06:59 AM

Using transit or driving.

Screen Name Redacted

2/08/2023 07:14 AM

I do walk and bike in the area somewhat frequently, and don't find it to be a problem. I DO NOT AGREE with removing a lane of traffic through this section. I understand that the concept is designed to encourage alternative transportation, and I'm for that, but this section of town is just too traffic dense. Between people who live here trying to get to their homes or across the river and those needing to shop for essentials in the core, like groceries, this will always be a high volume area. When you factor in the hundreds and thousand of visitor vehicles that the town depends on, it will be chaos. I don't think you can expect weekenders or holiday visitors to drive to our town, and then use or bring bikes to get around. I don't believe we have sufficient infrastructure for this (intercept parking, transit from Calgary, local transit, etc). When I have taken transit through the area, the bus fell behind schedule every morning as it waited in traffic lines. How much more will this plan negatively affect wait times and schedules? I suspect it will be a lot.

Screen Name Redacted

2/08/2023 07:28 AM

Will make driving worse. No impact on walking or transit. No impact on biking since I use the path next to the tracks.

Screen Name Redacted

2/08/2023 07:39 AM

Great idea if we didn't have 15 trains a day and traffic didn't build up. Oh did you all even mention that we are tourist town and have you thought about the traffic jams we will have. How are business going to operate.

Screen Name Redacted

2/08/2023 07:43 AM

1 2 3 4 all positive, forward thinking, people oriented

Screen Name Redacted

2/08/2023 08:07 AM

Very concerned that limiting road traffic will jam up street, Bike traffic can safely bypass this by routing through Spring Creek or behind EP no need for a bike lane. I say this as a cyclist

Screen Name Redacted

2/08/2023 08:19 AM

Reducing driving lanes and access to other side of tracks is a problem. This design is not the right design for a mountain town that has winter driving 7-8 months. Please do not proceed.

Screen Name Redacted

2/08/2023 08:56 AM

I am not a cyclist, however, I regularly walk downtown, sometimes using this route. I also drive or take transit depending upon what I exactly need to do and what my time constraints might be. I like the flow for cyclists & pedestrians and see this concept as helpful for safety and overall experience. It also reduces bikes slowing down traffic. The pedestrian crossing at the entrance to elevation place makes sense. My concern lies simply in the potential for worse congestion than we see today at peak periods and when the train is travelling through town. How about an underpass at both train crossings coming from the 1A into downtown?

Screen Name Redacted

2/08/2023 09:33 AM

Do not build this mess.

Screen Name Redacted

2/08/2023 09:44 AM

1. Driving is will be a nightmare. Even more backed up than it already is! Worst idea ever. 2. Walking. Maybe slightly faster to get around people but not really a significant improvement vs cost and effect on driving. Also dangerous walking when cars drive on the walking and biking path. Yes, this happens more than you think. I've seen it plenty! 3. Biking. More trusting because most people still walk I. Them and don't move over in a safe or timely manor. Is faster and safer to bike in the road. 4. N/A there is no transit stop close to my house so I

do not use it

Screen Name Redacted

2/08/2023 10:14 AM

Cutting down lanes will make a nightmare for both transit and vehicle passage. In winter, even worse with the snow that builds up. There is already so much traffic build up when a train passes. Even without a train, but with after school hours traffic, trying to pick up my daughter from preschool from cougar creek by ERS can take 20+ minutes sometimes with ALL lanes available. This design is a nightmare for passage by car. This design will not "encourage more traffic by foot or by bike." People who NEED to drive for certain things will have to drive either way and will make a huge inconvenience. We have a cleaning business and need to be able to drive around town from unit to unit quickly WITH all our cleaning supplies and laundry so NOT by bike or walking. This plan and inefficiency will affect our work in the summertime.

Screen Name Redacted

2/08/2023 10:40 AM

Please don't make the driving lanes 1 lane each direction. Walking and Biking plan seems great

Screen Name Redacted

2/08/2023 11:33 AM

Driving

Screen Name Redacted

2/08/2023 11:34 AM

1. Slowed permanently. Increased potential for conflict/accidents as users navigate lane reductions. 2. I've found the current red path next to walking paved paths have increased conflict with cyclists and confused drivers. Diminished safety and use. 3. May cycle more on the south side of the road. Would continue to use trainside path on the north side to go behind EP, Can Tire, Save On etc, then join into downtown depending on which direction desired. 4. No impact. Expect delays.

Screen Name Redacted

2/08/2023 12:07 PM

This will negatively affect my ability go get downtown for shopping. It is a design good for people, like Calgarians, who drive out here for 2 hours to take pictures of mountains with buildings and peoples heads in foreground.

Screen Name Redacted

2/08/2023 12:24 PM

I prefer the idea of upgrading the walking/cycling path BEHIND the rec centre. Leave the road for transit/transport trucks/ snow removal/ cars ETC. I'm a very concerned tax payer!!!

Screen Name Redacted

2/08/2023 12:28 PM

Design will definitely improve experience for walkers and cyclists travelling on the south (old CanBow) side of the street. I don't believe

there'll be any change to the experience for walkers/cyclists on the north or EP side of street. The experience is already very pleasant on this side. I used my bike all summer to travel to the market and would come down along the railway path from Crazy Weed to EP. I believe money would be better spent improving travel along that corridor - it is a very busy pathway, walkers, cyclists, joggers all use it as the most direct route from 17th Ave to Benchlands Trail.

Screen Name Redacted

2/08/2023 12:31 PM

1. Driving - NEGATIVE impact. The idea of bottle necking the main artery of which to access the services in the area serves no advantage to anybody, but especially not to drivers. People don't come to visit this town on bicycle - they come here in vehicles. The vast majority of people that live here don't bike/walk (especially in winter) to get groceries etc. - they drive there. People that don't have office jobs and have to get to point A to B to C in their day to day don't bike/walk - they drive. First responders have found it very difficult to navigate the new infrastructure and congestion created by famous new intersection and these plans will make all of those issues that much worse. 2/3. Walking/Bicycling - There is currently plenty of right away to widen the path system to achieve a more functional volume of traffic without shrinking the roadways with unnecessary meridians. 4. Transit - No positive impact. Intersections - Not sure what the plan is with the intersections. If the plan is to adopt the concept of the new intersection on Railway Ave. and Bow Valley Trail, then it will have a huge negative impact on all categories for many reasons, but most importantly safety. For starters, this will just add to the congestion that will be created by shrinking the roadways, but when traffic control and safety is concerned, consistency is paramount. If you have one set of rules to follow for one intersection, and then an entirely different set of rules to follow one block over, this creates confusion for not only people visiting who have never been here before, but also for people who live here. When pedestrians or drivers don't know which rules apply to which, people will get seriously injured and we've seen it happen already at the new intersection.

Screen Name Redacted

2/08/2023 12:53 PM

I am required to drive to work and this is going to make traffic a major issue. I am unable to walk or bike due to location and the amount of equipment I need to take to my work. Great for tourists walking or biking but not great for local population that need to move kids around or have a vehicle for work.

Screen Name Redacted

2/08/2023 01:07 PM

1/2/3/4 Stop this project!

Screen Name Redacted

2/08/2023 01:20 PM

I live in Kananaskis Way and primarily commute/travel via cycling and walking. I often avoid taking Railway Ave to downtown due to the small and dangerous sidewalks. That are often splashed with water and mud. My preferred route is through Spring Creek, despite the additional time. This is because traffic has been calm, multimodal transport has been prioritized and the route feels safer. I currently do not feel safe using the Railway Ave pedestrian crossing to EP because of the speed and volume of traffic. Motorist are travelling at a high rate of speed around the corner and it feels dangerous crossing 4 lanes of traffic unprotected. The proposed design with pedestrian islands would allow me to comfortably cross to EP from the south sidewalk. In addition during my job as a police officer I see high volumes of pedestrian traffic along Railway Ave to and from downtown/Kananaskis Way. I have seen people walking on the street due to the volume of traffic and size of pathways. When I have stopped people doing this they state the sidewalk is not larger enough or clear of snow/ice. The proposed design would allow for efficient snow removal, and high volumes of multimodal traffic through this vital corridor. I often see large personal vehicles in this corridor with 1 or two passengers. If multimodal travel is prioritized I would predict a significant drop in personal vehicle volume. Allowing for more efficient travel for those who cannot/will not travel via walking/cycling. My only change would be to attempt to prioritize transit over personal vehicles. I'm not sure if there is space or if special signals with transmitters in the buses could be employed.

Screen Name Redacted

2/08/2023 01:22 PM

1. Turning left when leaving EP will be more difficult - needing to monitor for faster moving bikes AND pedestrian traffic both across the side lane and across railway ave at the same time, and in the opposite direction for oncoming traffic. Through traffic going NW will also suffer as heavy pedestrian traffic forces those turning into EP to wait - and in this configuration, it can back up traffic through to the lights/train/etc. 2. Pretty much the same, walking around this area seems entirely fine. 3. Expanding the sidewalks on the south side in front of the business is a nice add for cyclists heading to Shops of Canmore I suppose. 4. More likely to be slowed by traffic caught up at the EP intersection, but otherwise unaffected.

Screen Name Redacted

2/08/2023 01:24 PM

OK

Screen Name Redacted

2/08/2023 01:41 PM

1/ Driving My concern is the time that will be added on for my employees (construction workers) to get from one project to another or to pick up supplies. We have to use our vehicles frequently throughout the day. A slow moving train will cause massive traffic backups. I am concerned about the businesses downtown and how

visitors who drive here (mostly all of them) will get downtown during construction. Some of these young businesses are still recovering from Covid interruptions, staff shortages, the decrease in traffic from paid parking and then WHAM road construction that will, without a doubt, take more time than anticipated. I think this will hurt many local downtown businesses. 2 & 3 Walking & Cycling There are already walking and bike paths that get me downtown very easily from cougar creek. The trail behind shoppers is gorgeous and gets me to the other end very easily as well. Why don't we just enhance what we already have? 4 Transit I only use it to go to Banff

Screen Name Redacted

2/08/2023 02:05 PM

1. This should make it easier to get in and out of EP. 2. Good to have dedicated cycling lane. 3. Having the walking and cycling paths side by side means there will be pedestrians on the bike path. The red sidewalk seems to have no meaning to most people.

Screen Name Redacted

2/08/2023 03:02 PM

if the design is anything like crash zone at the a&w intersection. it will be dangerous. i have been cut off, i have had bikes with riders act as cars then humans and then a car , swerving in and out as they please weving through pedestians and traffic. Not only that but the amount of ideling cars infront of me most days causes my breathing issues to act up. the back up past the traffic circle is a waste of fuel, and a massive smog problem. sitting there for 45 min a day in unacceptable. Also a problem for snow removal leaving ice. this year i almost hit a pedestrian i was below speed limit and i cold not stop. massive traffic congestion and the problems it causes. Signs like high crash area will need to be installed like they have in old strathcona in Edmonton the massive never ending snake of traffic one lane will make will create hazards polution and a never ending line of traffic. this design is made for bikes that most people use 6 months a year. i do not approve i recomend a traffic circle at the rose and crown, and a pedestrain crossing at pinewood.

Screen Name Redacted

2/08/2023 03:33 PM

My day to day commuting patterns will be impacted by these changes, and not positively. When I am a pedestrian I am not using these areas, but, I use them to drive my vehicle and my family across town. I foresee these changes increasing my commuting times in mornings and afternoons.

Screen Name Redacted

2/08/2023 03:41 PM

This is ridiculous. The reduction in lanes will make this a traffic nightmare. We are a weekender and tourist town. We have no rapid transit from Calgary. Even if everyone buys an electric car they will still drive. The parking problems we have should tell you we will have more traffic in the future not less. You should be widening the road

and not restricting it. I've lived here for over 30 years and can tell you the Bow Valley Tr. and Railway Ave. intersection is a disaster, even you try to tell residents it is working. It is not. This project is just another example of unrealistic expectations and a waste of taxpayers money.

Screen Name Redacted

2/08/2023 04:16 PM

I see several issues with the design as provided. Where the turn-off notch to the utility building south of Railway avenue at the east end is located, with single lane Railway traffic westbound there is a strong possibility of a bottle neck being created, with traffic backing up back of the train tracks. You have the two lanes coming to one right before this, which is already creating a bottle neck. That pinch point seems to be too close to the crossing. If vehicles are stuck in the left lane waiting to pull over, if a train comes along there could be chaos. At this time there is already a long wait to turn left out of the EP parking lot to go east on Railway avenue at many times of the day. With the bus stop across the street and the crosswalk, it will become even more difficult to make this turn. You will have eastbound traffic having to pull over to the left to get past the bus stop, after the left-turn lane INTO EP. People using that crosswalk will also prevent people from turning out of EP. A great portion of the population live on the north side and need to turn left. Instead of the crosswalk it would make more sense to install traffic lights here. The location of the bus stop also impacts people accessing Wolfe Motors entrance, and also exiting the gas station. The zigzag traffic pattern will be confusing, especially for tourists. I live in Eagle Terrace, and leaving EP to come home is already a problem much of the time, trying to turn left out of the parking lot. If you plan to make the exit one lane in and one out, it will be a major bottle neck. The plan makes no difference to walking this route. Using transit, having the stop located closer to the EP entrance makes a bit of a shorter walk to EP, but not that much. There would not be much difference for cycling, either. The major impact will be to vehicle movement, in a negative way.

Screen Name Redacted

2/08/2023 04:57 PM

For all 4, this project looks great in the 2 months of summer. But for inclement weather, especially winter, this design will become a nightmare. There is poor road clearing services at this point, and I can a solution guarantee that there will be no commitment to clearing these bike paths during winter months. As much as you would like people to ride their bikes year round, it just doesn't happen. We are not Holland, here. We are not tge UK. We are not Germany. Those areas are where biking year round is feasible. Canmore, a winter mountain town, does not see bike traffic i9 months of the year. Expecting a mom with 3 kids to bike down from 3 Sisters in winter, on unmaintained paths, to get groceries in -31C weather is ludicrous. Seriously, stop with this project.

Screen Name Redacted

2/08/2023 05:39 PM

I like the new intersection design as it is much safer as a pedestrian and cyclist - though need more education and enforcement related to no right turn on red. On the flip side, the lack of 2 lanes/left turn lane to access businesses along Railway Ave (Shoppers, Esso, etc) will bring traffic to a halt as soon as someone is turning left there. It will not take long for traffic to back-up especially with volumes related to trains, etc. The relocation of the crosswalk to the main entrance of EP makes sense from a pedestrian perspective, but may hinder an already difficult left turn out of EP. This location makes more sense from a transit perspective on the north side of the street (the north EP bus stop is not shown on the map, so I am wondering if it is planned for the same location?) I see the transit stop on the south side will be moved, but have concerns for folks getting on/off the bus will have issues with cyclists (there is a crosswalk, but how is the town going to mitigate this hazard to both user groups?)

Screen Name Redacted

2/08/2023 05:46 PM

I think it will delay every transport type listed above. The new intersection can barely handle weekday volume, my multiplying this form of intersection I can only foresee greater congestion

Screen Name Redacted

2/08/2023 05:47 PM

Lane reductions will impact traffic flow in an extreme way. I believe money would be best spent on mitigating the railway crossing, if at all possible. I agree that a continued bike lane will benefit the downtown core, however as a pedestrian, cyclist and driver it is nearly impossible to commute to work through this area by vehicle as it is, and for those of us that have to drive to the downtown core this creates yet another barrier.

Screen Name Redacted

2/08/2023 05:53 PM

1. Driving. Loss of driving lanes will increase traffic congestion causing longer commutes, more idling thus increased air pollution and noise.
2. Walking. It seems the walking paths are in most cases sufficiently separated from bike and driving lanes.
3. I think that this plan will improve movement for cyclists. However, if the goal is to make driving so distasteful as to get more people to use bicycles, I think you have missed the mark. Cycling is not for everyone especially during our long winters. Studded bike tires are not a safe option, especially for seniors. Also, a car is often necessary for errands to businesses along Railway Avenue. For example, weekly grocery shopping and many purchases at Canadian Tire or Home Hardware cannot be transported by bicycle or public transit.
4. Public transit. I believe the increased traffic congestion due to lane reductions will impede the timely flow of both local and regional busses.

Screen Name Redacted
2/08/2023 05:59 PM

Emergency services- EMS/RCMP/Fire are unable to get through if it's single lane with any sort of median

Screen Name Redacted
2/08/2023 06:10 PM

Driving and walking Get rid of some of the traffic lights in town and put in traffic circles - roundabouts

Screen Name Redacted
2/08/2023 06:18 PM

The random islands in the middle of roadways only add to congestion and make snow clearing and road cleaning much more difficult. Pedestrians will notice no difference whatsoever. Cycling is improved however there's a very real chance that the widened sidewalk and cycle track will be used as a roadway as we've seen in the past!

Screen Name Redacted
2/08/2023 06:42 PM

Unless you are planning a bridge over the railway tracks any reduction in lanes on Railway Ave is an increadably dumb idea. I'm all for reducing dependence on cars however this design doesn't have a bus lane meaning any traffic jam caused by trains will cause busses to be stuck as well

Screen Name Redacted
2/08/2023 06:44 PM

This will make driving any service vehicle an nightmare! How is anyone doing work in supposed to gain access to downtown with all the congestion of summer traffic. Parking is already a nightmare once you enter down town fairholm is not an option. Once snow falls your are down to one lane with the way this town clears snow and let's it freeze. Absolutely against any more changes to roads in town unless it's to add better driving lanes not more bike lanes that are barley used!! Most bikers still stick to the road.

Screen Name Redacted
2/08/2023 07:04 PM

1. Would cause more congestion 2. Would be the same as it currently is 3. I don't cycle 4. More congestion

Screen Name Redacted
2/08/2023 07:34 PM

1. i'm worried there will be large back ups when driving into town with only one lane - if someone wants to turn left (ex: into esso), there's no way to drive around 2. I appreciate more space between vehicles and myself when walking; Im not sure a crosswalk by the EP entrance is necessary if there's one down the road closer to the train tracks? or is that one being removed? 3. I am happy to have a dedicated bike lane but I don't personally need one. I think efforts could also be made to encourage folks to walk/bike on the existing paths along the train tracks. perhaps pave both paths, not just the one on the south side? 4. Based on my understanding the only spot in this section where there is a bus stop, there are 2 lanes, so cars can get around, and traffic can be managed

Screen Name Redacted

2/08/2023 07:54 PM

Don't want any changes

Screen Name Redacted

2/08/2023 08:42 PM

1. Driving- negatively 2. Walking - the same. I don't find walking a problem now. Do it all the time. 3. Cycling- same. Don't have a problem with it now as is. 4. Transit - the same No point changing. Just paint lines down the middle of the lanes for Pete's sake! Tourists don't know how wide a lane is.

Screen Name Redacted

2/08/2023 08:54 PM

What an insane waste of tax dollars! Traffic and snow removal is already a huge problem here. What will happen when emergency vehicles need to get through? The terrible lights at the bow valley trail and railway Avenue intersection have traffic SO backed up now, and it's complete chaos when emergency vehicles need through. There are zero bikes on the roads here in the winter because of the cold. STOP trying to make everyone ride a bicycle everywhere! Stop wasting tax dollars!

Screen Name Redacted

2/08/2023 08:57 PM

Will slow driving by car, but is safer walking or by bike. Also much more visitor friendly.

Screen Name Redacted

2/08/2023 09:22 PM

It'll make it more enjoyable to walk or bike on that road

Screen Name Redacted

2/08/2023 09:33 PM

I thought the town might have learned something from the huge mess they made with the Shops of Canmore and Bow Valley Trail redesign. Traffic backs up through this area and intersection all day long and sometimes past the Spring Creek intersection. So now vehicles just sit and idle verses moving. There are too few entrances and exists into downtown to continue to remove driving lanes. If you want to add cycling lanes and sidewalks go ahead, just don't do it at the expense of vehicle traffic flow. The reality is there continue to be more visitors to Canmore and they come by car. We live in the Canadian Rockies and get more winter than summer so using a bike to get around town in the winter, rain, etc. is not happening, just look around and count the bikes in the winter and even summer verses the cars.

Screen Name Redacted

2/08/2023 09:45 PM

Negative impact for driving; increased congestion, increased pollution from idling cars; snow removal? We need to keep space for vehicles while making it safe for pedestrians and cyclists but not at the expense of vehicle traffic; pretending vehicles will stop being used is not helpful for the ease of living and visiting in our community.

Attention needs to be paid to emergency evacuation; hardly any snow pack this year; implications for forest fires - meridians prevent easy egress.

Screen Name Redacted

2/08/2023 10:02 PM

This is a terrible design all around. Seriously !!

Screen Name Redacted

2/08/2023 10:07 PM

1. Driving - I like the idea of having a dedicated turning lane into Elevation place when travelling away from downtown. Otherwise no concerns. 2. Walking - I support the extra space for walking. 3. Cycling - This will be a huge improvement i.e. safety travelling away from downtown, and ability to safely cross Railway Av to get to EP. 4. Transit - Shouldn't be a problem.

Screen Name Redacted

2/08/2023 10:34 PM

Help me get around town on my bike

Screen Name Redacted

2/08/2023 11:56 PM

I do not cycle or use transit because both are very inconvenient and I am 65 yrs old. Transit does not come within miles of my house and a bicycle is prohibitive many days of the year, particularly when having to carry groceries home. Also my electric bike is very expensive. I would want safe bike boxes like at the hospital so that baskets and heavy batteries do not get removed (stolen) and I don't have to lug these things around when I shop. Please also put a barrier between the bike lanes and the road. Bikers have a tendency to go from being a vehicle to a pedestrian in a blink and many of them don't share the road well with cars. Force cyclists to only cross the road where there are crosswalks.

Screen Name Redacted

2/09/2023 05:52 AM

Will just cause more traffic build up when the train crossing is activated. Traffic will be backed up all through the town due to less traffic lanes.

Screen Name Redacted

2/09/2023 06:43 AM

1. Getting through town is a nightmare. I have to drive cause I can't walk my tools and material to different jobs. The first intersection is really pointless and just made it unbearable to live here while it was being built and now the town wants to do two more only a block away from each other. I hate it.

Screen Name Redacted

2/09/2023 06:59 AM

Increased commuting time in winter. Bike on forest trails and paths not next to roads.

Screen Name Redacted

2/09/2023 07:06 AM

Driving - looks like it will be almost impossible to turn left out of elevation place? And everyone will get stuck at the merge after the train tracks. Are you sure you don't want to keep it double lane for leaving town? It's good to keep the flow of cars exiting downtown strong to leave room for the slower trickle of cars coming in. Do we need a double bike lane on one side AND a single on the other? Walking & cycling looks good. Will there be strong snow clearing and salting of the bike paths throughout the winter, because when it's cold and icy I don't think walking/cycling is really an option for most people, especially with the way sidewalks are currently maintained. That's going to create a big accessibility issue in the winter. Transit- the bus will be stuck in traffic too so will be a similar experience to driving. Isn't there a bus stop on the side of elevation place? I'm not seeing that one, it's an important stop and will need a pull out of the street is only one lane.

Screen Name Redacted

2/09/2023 08:38 AM

It will make cycling WAY better:walking will be improved: driving or transit into town unaffected: driving out if town may get backed up towards the rose and crown when trains go through

Screen Name Redacted

2/09/2023 08:57 AM

The Bow Valley Trail and Benchlands intersection is already congested during peak time and summer and it's very dangerous as you have to switch lane in a short time. By further reducing the traffic flow to one line you will increase the hazards especially when crossing the tracks. As it is bicycles and pedestrians have plenty of room and don't need to impede on car traffic.

Screen Name Redacted

2/09/2023 10:02 AM

I bike and walk along this section of Railway Avenue frequently and I welcome having a dedicated bike lane so I don't have to use the sidewalk as I do now.

Screen Name Redacted

2/09/2023 10:15 AM

Not needed. Why is wrong with the bike lanes behind Save On along the train track? Bike lanes already exists. No need for more on Railway Ave.

Screen Name Redacted

2/09/2023 10:28 AM

Driving. To and from work. Getting groceries, picking up my wife. Even though we use the bus at times, it's not a perfect schedule (lots of holes) where driving is needed. After running around the restaurant for 8 hours serving guests I'm not getting on my bike to pedal the 40minutes home. Biking is a leisure activity. Weather/fatigue ect all play a role in my travel. When people come to town by the thousands their cars don't disappear. What used to take 15 minutes now takes 30. Through the summer traffic is already backed up past the round

about with people honking at one another due to lane choking and confusion. We have a longer winter than summer...I don't see many people pedalling through the snow. I know I won't be. Thanks.

Screen Name Redacted

2/09/2023 10:55 AM

I am driving, biking, walking and using transit in that area often. Overall I think this as an absolutely bad idea. Lets start with the "improved" intersection of Bow Valley and Railway Av: - all the extra side lanes are really short, meaning that less cars fit into them and that makes the car lines really long. Prior to it's "improvement" I've never seen the lines so long. There are times when the line on Bow Valley Trail (from Solara) reaches Napa, Alpine helicopters and one time even Valbela - The intersection is super confusing for tourist, many times I've seen them run a red light because of that. I come from Europe and I am familiar with their traffic patters but that intersection has no place being here in North America - right hand turn on red light: getting rid of this on many places across town is the biggest mistake I've seen. You hugely underestimate the positive affect of right had turn on red light: trickling the traffic instead of big waves of it. This has noting to do with safely. I urge you to send my safety issues (traffic incidents over last 10 years from that intersection to my email: iaacek@gmail.com) That whole design around EP is terrible for multiple reasons: - bottlenecking the road right after the intersection. This is a huge potential for more accidents, not a prevention - any car doing a left turn to any of the businesses will block the whole road, no way to get around it, it will have to yield to oncoming traffic, pedestrians and bikes. In busy summer it will block the road for minutes. - Left had turn lane at the Rose n Crown intersection is too short, most of the cars go to downtown or drive up to Nordic centre. These cars will block the other lane as well and traffic that goes straight will not be able to pass. - There is a perfect bike path through Spring creek, why not utilize that more instead of having bikers near cars - bike path on the side of EP would probably be enough - totally unnecessary islands of concrete and green in the middle of the road, waste of usable space. Same as on the overpass to Benchlands. In general: - you are catering to bikers while hindering the car traffic - while I use bike the current infrastructure is more than enough, having more paths won't make me using the bike more. The usage is hindered by lots of other factors, namely whether, nowhere to park the bike and also a lot of bike crime. - the town has a lot of plans for expansion but no real plan for updating the infrastructure to match it. All the town proposals are essentially making the infrastructure worse. Tradesmen need to use cars to service the city. People need to get to work on time. - town makes it hard for people who can't afford living in Canmore (and live in Exshaw, Dead Man's, etc) to even come and work here with: making the infrastructure worse, paid parking that offer them nothing since they don't live here. - using Netherland model in Mountain town that has 5 months of very

cold winter makes no sense. - tourists will never fly in here, rent a car, rent a 4 bikes to use them cause you limit their options to get in here. Eventually they will just avoid the town at all. This will have a negative impact on businesses down town. In fact, they are already reporting this and I have a feeling many will move out of there. Your policies will make the downtown die out. - did nobody thought of building a parkade in downtown similar to what Banff has? With free parking for extended period of time. There is certainly room for it - if this design goes through the summer traffic will be at standstill and people will start using other routes and eventually block them as well. - if the design can't at least accommodate the same amount of cars passing through then it needs to be redesigned, don't you think? - the town don't need bike lanes on every single road. - the more "can't turn on red light" signs you put up the worse the problem - and for no reason, people are used to them and I haven't seen a single accident when used. - spend money on affordable housing, that will serve many, not just 50 bikers for 2 months a year costing millions in construction, costing businesses loosing customers and frustrating everyone that comes to visit our town - and will drive here, be sure of that.

Screen Name Redacted

2/09/2023 11:03 AM

test

Screen Name Redacted

2/09/2023 11:06 AM

Test

Screen Name Redacted

2/09/2023 11:24 AM

This configuration does not recognize that the flow of vehicular traffic is currently overwhelmed at key points during the day - the resulting overflow and backing up of traffic onto Bow Valley Trail and other roads should not overwhelm these routes of travel. Furthermore, the issue which exists is that drivers not familiar with where they are actually traveling will create further and more substantial snarls or blockages which will further create accident potential and restrict emergency access. Other methods of transportation such as walking and biking are already supplied with a network of trails that connect the full length of Railway Avenue.

Screen Name Redacted

2/09/2023 11:43 AM

I feel that the town should encourage pedestrians and cyclists to use the existing pathway along the railway. It is a far less congested and enjoyable way to move along railway ave . As a cyclist, I would not use these proposed bike paths in preference to the existing path along the railway - no cars and trucks, no stop lights.

Screen Name Redacted

2/09/2023 11:48 AM

BAD IDEA REDUCING TO 2 LANES! THIS WILL LEAD TO INCREASED CONGESTION! DONT BE STUPID & PULL YOUR HEADS OUT OF YOUR ASSES!! BAD IDEA!!

Screen Name Redacted

2/09/2023 12:21 PM

Driving - It is hard to imagine a plan that could be more anti-vehicle than this one. It appears that vehicle capacity is being reduced by at least 50% with no stated plan as to where the vehicles that currently use the road will go (perhaps there is some advocate type thinking that people will walk to the grocery or hardware store when it is -25 and carry their purchases home in their arms). Reducing road width from 4 lanes to 2 will result in intense congestion for most of the day and of course traffic will come to a standstill if Roam stops to pick up or drop off passengers. It is also notes that there with as much width given to bikes as cars in cross sections A and B. A design proposal that does not appear to have any defensible basis and does not align with the 2018 ITP which suggests that 60% of trips will be by vehicle. the diagram also fails to include the windrows from snowplows that will further reduce road capacity much of the year. Hopefully this is not being given any serious consideration but is being used as a stalking horse and when the real plan comes out people will say at least it is better than the original proposal. Biking / Walking - obviously a good news story for when walking or biking. Probably be well used during the summer. even though not sure why people would bother walking up and down Railway Ave for recreation given the multitude of more interesting alternatives. However, even in Canmore, there are very few people who use walking or bikes as their basic transportation during the winter so will be mostly empty for 6 - 7 months of the year. Probably the usual "build it and they will come" type of thinking is going on here which is relied on by advocates when trying to defend the indefensible and when there is no logic to fall back on.

Screen Name Redacted

2/09/2023 12:33 PM

Railway Ave is a major avenue that leads to the most important shopping district in Canmore. This is an area people drive to as they frequently purchase larger quantities or larger items that require a vehicle. For this reason reducing s avenue to one lane each either direction with a turning lane does seem to be feasible. It is very difficult to understand how this would work without having information regarding how the traffic lights would operate. It was difficult to comprehend how the intersection at Bow Valley Trail and Benchlands Trail would work without having prior knowledge of the traffic light structure. This is a faux pas on the part of communicating this concept. During the summer I ride my bike all over. I never ride on Railway Ave. I go the the trail behind the businesses. This is where the bike path should be. It is not that much out of the way. I prefer to see Railway Avenue remain a vehicular roadway.

Screen Name Redacted

2/09/2023 12:43 PM

Driving into town, where it goes from 2 lanes to one lane (passed the railway tracks), this distance seems too short. Drivers often get confused in this spot already and to add that the left lane in now ending I'm sure will add further confusion. This I feel may then back up cars onto the railway tracks. I also am concerned about the traffic backups that may occur when drivers are trying (turn left) to enter the Esso fuel station and other businesses on the south side of the road. Driving (leaving town), the left turn lane into EP is a great idea as is where the second lane starts. Walking on the south side of Railway looks better. You're currently quite close to the vehicles. Cycling, I don't normally bike in this area. No opinion. Transit, I can't tell if there is a pull in bus stop going into town at EP. This would be advisable to do otherwise you'll have traffic backups (on a major transit route) from the bus stop.

Screen Name Redacted

2/09/2023 12:45 PM

I'm not sure if my previous comment got submitted so here it is again (revised likely) Railway Avenue is a main avenue which leads to the most important and busiest shopping district in Canmore. People drive to get groceries, to shop at Canadian Tire, the hardware store, to exit the townsite and to enter the townsite. For this reason I do not comprehend how reducing this roadway to one lane in each direction, with a turning lane to add bicycle lanes is feasible. Traffic would get even more congested than it already is. I ride my bicycle all summer. I will not ride on Railway Ave because there is a perfectly good bike lane behind the businesses. I would much rather see that lane at the back, along the fence by the railway track, widened and properly developed for bicycles and pedestrians. The side walks along Railway Ave. could be widened slightly for pedestrians.

Screen Name Redacted

2/09/2023 12:46 PM

Eliminating lanes for driving will create unnecessary bottlenecks and slow down traffic. When I am riding my bike I use the path behind Elevation place. When I am walking I use the path behind Elevation place. I don't use the public transportation.

Screen Name Redacted

2/09/2023 01:03 PM

Shops of Canmore intersection is a complete disaster. Please do NOT do this, will make a bad situation worse.

Screen Name Redacted

2/09/2023 01:14 PM

It is a great idea to make walking and riding a bike along this section of busy roadway safer and more pleasant, but the solution is not to dumb down car and truck traffic (or traffic calming as you like to call it). My opinion is that separating vehicle traffic from pedestrian and cycle traffic entirely is the best way to achieve this. Most of the local bikers already use the path behind Elevation Place, and there are

always plenty of pedestrians using this route. Fixing this pathway to encourage everyone to use it would be a very worthwhile project. On the south side of the street building a better boardwalk along Policeman's Creek would create a more direct, and certainly a more pleasant way to reach the main street from the railway crossing. We already have lots of pathways around town that are totally separated from the streets, let's continue with this and continue building the charming character of our town.

Screen Name Redacted

2/09/2023 01:15 PM

My use of downtown is typically limited to work or grocery shopping I rarely come downtown for other reasons as the town has become overrun, from a driving standpoint I expect the proposed work will add significant delays, even with 2 lanes wide the traffic backs up now and dropping down to 1 lane will only make things work. I feel while the goal is to give each segment of travel style there own space the foot and bicycle traffic are being given way to much space at the expense of day to day traffic (Canmore Workers) and goes unused a large portion of the year due to weather. The crosswalk proposed at EP I suspect is going to cause a significant bottle neck

Screen Name Redacted

2/09/2023 01:16 PM

My use of downtown is typically limited to work or grocery shopping I rarely come downtown for other reasons as the town has become overrun, from a driving standpoint I expect the proposed work will add significant delays, even with 2 lanes wide the traffic backs up now and dropping down to 1 lane will only make things work. I feel while the goal is to give each segment of travel style there own space the foot and bicycle traffic are being given way to much space at the expense of day to day traffic (Canmore Workers) and goes unused a large portion of the year due to weather. The crosswalk proposed at EP I suspect is going to cause a significant bottle neck

Screen Name Redacted

2/09/2023 01:18 PM

Do not see any problem now. Costs are prohibitive

Screen Name Redacted

2/09/2023 01:41 PM

I remain concerned about driving and transit as the intersection at Main Street and Railway Ave appears to be similar in design to the one at Railway Ave and Bow Valley Trail (new intersection) - traffic here ties up b/c peeps are waiting to get into the left hand turn lane and block all the other lanes of traffic. As well, walking will definitely be affected if lights are similar to the new intersection.

Screen Name Redacted

2/09/2023 01:46 PM

The one lane setup looks similar to the new intersection at Railway Ave & Bow Valley Trail where traffic trying to turn left blocks all three lanes ... this looks to me like in busy periods that there will be

backups trying to turn onto Main Street. As well, like the new intersection, the only mode of transportation that this appears to be designed for is bicycles. Little thought appears to have been given as to how this will really work for pedestrians. I would suggest that the designers/engineers go stand at the new intersection and watch real people going through the intersection in all forms of transportation.

Screen Name Redacted

2/09/2023 03:55 PM

This will slow down and bottle neck motorists going into this area. Especially, as EP parking lot is now used for Downtown overflow there will be significant turning into the EP parking lot, backing up the flow of traffic. It appears that the bike lane and pedestrian lane are juxtaposed. That will promote bike riding on the pedestrian path, even if it is just to pass another bike on the red lane. Also, what will happen to the paved path behind EP if there is a new cyclist path near the road way? Could we not use the existing infrastructure of the bike path to lead cyclists away from Railway Ave and then they can reconnect at 10th (already a main access point from Bow Valley Trail)? or next to EP (the existing path extends the length of the proposed area & provides access to all areas along Railway.)? Clear signage would enable this and then we would not require the loss of a vehicle lane?

Screen Name Redacted

2/09/2023 04:36 PM

1. As a driver in the affected area, creating more congestion will likely make left hand turns into Elevation Place even more of a problem, thereby backing up traffic to Main Street. 2. I rarely walk that stretch. 3. I try to avoid cycling that stretch because of traffic. The congestion being created by this design will likely make cycling to Elevation Place even less desirable. A dedicated bike lane may help, but turning left will still back up traffic. 4. Transit is not readily available to me from my home.

Screen Name Redacted

2/09/2023 04:50 PM

I am a senior and DO walk to town five times a week. I am unable to cycle due to a medical condition. I live on Benchlands Terrace. As I cannot carry all my groceries home, I must use the car for this. The reduction of traffic lanes on Railway will certainly affect me. Railway Avenue is the only access to essential services - grocery stores, pharmacies, banks and many medical offices! The reduction of traffic lanes will cause long lineups and it will take more time to access essential services. Can you imagine what it will be like on Railway Avenue during holiday weekends and tourist season? Is this what you want for Railway Avenue? Will my life revolve around what is a good time to access town services? Please do not reduce vehicular traffic lanes on Railway Avenue.

Screen Name Redacted

2/09/2023 05:03 PM

living in the MD of bighorn requires me to drive into canmore daily. I cannot bike to town and I have no secondary destinations to go to even if they were walkable. this seems like it would make my commute much less pleasurable.

Screen Name Redacted

2/09/2023 05:03 PM

I have compared the design tot he existing design and I see no apparent significant advantage of this design to the existing design walking, cycling or using transit. However, by restricting the driving lanes it will increase transit times through the area as has the new intersection at Bow Valley Trail. I cannot see how this expenditure can be justified.

Screen Name Redacted

2/09/2023 05:39 PM

I am a senior who has lived in Canmore for over 40 years. By reducing traffic on Railway Avenue you are creating more congestion. There are bike paths behind Elevation Place. Beautify them and leave Railway Avenue alone. The Town already has major backups with slow trains (example Wednesday Feb 1) and by narrowing the street it will take longer to clear. Also have you thought of emergency vehicles accessing the downtown core with the fire hall being across the highway. I honestly can't see any logic in this plan when Canmore is growing and you want to narrow a major roadway.

Screen Name Redacted

2/09/2023 05:55 PM

1. Driving from Railway to downtown: I'm concerned about having to merge so quickly after the railway tracks when going towards downtown. It seems traffic would back up quite dreadfully if someone had to stop to turn left into the Esso station or other businesses along the south side of Railway. The left turn lane into Main Street seems quite short, which risks backing up traffic along Railway, particularly when downtown is busy. And given the volume of traffic heading into downtown in the summertime, it seems strange to reduce traffic flow to one lane. Essentially, I don't see how reducing the road surface for driving will reduce the number of vehicles; rather, it seems like it will simply back up traffic. I know there is a push to encourage walking and biking, but no one coming off the TransCanada Highway is arriving on foot or bicycle. This whole plan would make more sense if there was large intercept parking or a parkade nearby, as there is in Banff. A multi-story parkade next to Elevation Place would solve a lot of traffic problems. Finally, if the intersection at Main Street and Railway is slow moving like the one at Railway and Benchlands, I can only imagine how snarled traffic will become. Leaving downtown towards the highway, assuming the lane marked bus is a driving lane, it seems like there will be two lanes for cars to wait for a train to go by, which hopefully will be enough and not back traffic up along the single lane coming from Main Street. 2. Walking/Biking: The concept plan makes it seem like walking and biking will be more pleasant, but I

have little reason to walk or bike in this area, and when I do, I prefer to walk or ride along the path by the railway tracks, which is open and pleasant enough. Or I take the boardwalk along Policeman's Creek. Would it not be possible (and likely cheaper) to improve the path along the railway tracks instead? 4. I don't use transit, so I have no comment.

Screen Name Redacted

2/09/2023 06:21 PM

When I moved here 20 plus years ago, I knew that this little mountain town would grow into something much larger. The problem is there will be no travel to the downtown core when we are at the height of our visitors season, which is and will continue to hinder our local economy. One other problem is if there is a fire in any part of town we will have vehicles backed up to the highway to where the new location of the fire hall will be as no one can make a right hand turn. My suggestion is to leave a fire station downtown and scrap this So called improvement!!

Screen Name Redacted

2/09/2023 06:51 PM

This is an evacuation route. It is also a route that semis that service the grocery stores/Can Tire use. It is also a main route for the trades to connect to the shops on the other side of Safeway. I must use my car to access the stores. It would not work for me to walk or to use a bicycle. Stop putting obstructions in the roads used for evacuations. I hate this plan. Never-mind the terrible stoplights that will slow traffic. The town is not just a pedestrian zone. It must work also for seniors who use their vehicles, workers, access for our food. This plan addresses none of what I have talked about. Please Stop! I am a senior with asthma and covid is not finished for us. I am not getting on a cramped bus with a bunch of people not wearing masks! Science demonstrates that it is not enough for you to wear your own mask when in a cramped situation where no one else is. You entirely ignore seniors with your plans. Stop!

Screen Name Redacted

2/09/2023 07:30 PM

I recommend instead a bicycle and pedestrian path elsewhere (behind elevation place as others have suggested?) and keeping the lanes for traffic as is. Otherwise traffic will be even further congested than it already is—the opposite effect of what is needed. While it is nice to think that everyone can get around by walking and cycling to do their errands, get groceries, etc, this is not feasible nor practical in our winter climate, and not everyone can afford an ebike.

Screen Name Redacted

2/09/2023 07:31 PM

This will cause gridlock in the downtown core when summer traffic returns. This will impede emergency response vehicles by not having sufficient room to move vehicles over. This will increase little used infrastructure for a town that is spreading east - as in needing

vehicles to shop. This will kill the downtown core. 1. I will drive slowly to impede traffic. 2. I live in 3 Sisters so will never walk here. 3. I will never bike here during 8 months of inclement weather per year. 4. I will never use transit as it is unreliable and my time is worth money that I need to live in this town.

Screen Name Redacted

2/09/2023 07:42 PM

Those big swaths of pavement, whether they are grey, black or red are actually not nice to walk. I am a huge walker; if I am not in a time crunch, I will walk rather than drive. But, covering every width of transportation space with pavement or concrete is not a nice user experience. Where are the tree lined boulevards? Where is the quaintness of walking? Or the cushioning surface for walkers? As a cyclist, I like having a bike lane, but there are better places to bike because this just isn't a place I will bike unless for transport reasons. As a driver, it's much of the same - no change. However, even in front of Spring Creek, the maze and criss crossing from red to white, to green to black is so confusing. Making extra wide streets, even if there is a dedicated lane for each user is unsightly, impersonal and very industrial without soft touches of some grass, trees and middle boulevards.

Screen Name Redacted

2/09/2023 07:49 PM

1) driving , it will make it the same as bv trail. Slow and frustrating. 2) Great 3) Great 4) refer to 1

Screen Name Redacted

2/09/2023 09:02 PM

I believe the most impact would be for driving. Reducing the already congested 2 lanes to 1 would have negative impact. I believe we can be safe with bike lane on only side of the street as oppose to bike lanes on both side of the streets

Screen Name Redacted

2/09/2023 09:20 PM

It may cause some delays for me when I drive through, but you've tried to preserve two southbound lanes, which will help. I'd really appreciate the wider sidewalks as a pedestrian, especially on the south side (opposite Elevation place). I think the addition of and design of the separated bike lanes are great, especially the raised mid -block crossing. Missing is a direct crossing near the CPR tracks. Also, the town really needs to up your snow clearing for active travel to maximize success, especially around holidays.

Screen Name Redacted

2/09/2023 09:59 PM

I do agree that a central turning lane to get into elevation place is a good idea, however, the towns obsession with these red bicycle paths leads me to believe that not a single member of the council, engineering team or design team has ever biked in this town, especially during peak foot and vehicle traffic. There is no amount of

signage that will be make it clear to tourists that the red lane is for cyclists and the town seems to have forgotten to order signs. Trying to navigate limited red paths already in place is nearly impossible, pedestrians clog the bike baths and render them practically unusable. In my experience it pushes me and other cyclists onto the roads which are now perilously narrow. It makes no sense whatsoever.

Screen Name Redacted

2/09/2023 10:31 PM

Driving 1 car only and we rarely take our bikes downtown. Occasionally we take the bus if we aren't in a rush and if the bus is heading to where we are going.

Screen Name Redacted

2/09/2023 10:33 PM

Stop the insanity now, listed for once to your taxpayers (the people who pay your wage). Let's see, make the road single lane throughout most of this area, what happens when emergency vehicles need to get through, especially through our busy summer? How about snow removal, where do you plan on putting the snow? The sidewalks on both sides of Railway are already oversized plus we have the trail along the rail line. If the whole plan here is to make it easier to bike and walk, you have the space. The overwhelming town opposition to the Benchlands - Bow Valley overpriced intersection should be all the evidence you need (Town Council). End this proposal now or face the wrath of the voter.

Screen Name Redacted

2/09/2023 10:50 PM

This plan will negatively impact my driving travel. The loss of lanes and having to squeeze right to merge when coming westbound at the train tracks will make driving more problematic. This seems to cause a safety hazard at the railway. No effect on walking and adding the eastbound cycling path improves cycling. Hard to know how transit will be affected. From looking at the plan view and cross sections, that there is ample space on the north side that could be used better. This could allow the addition of the eastbound cycle path and maintain the same driving lanes that currently exist. I think this plan should be revised to add the cycle path and not lose so much lane space for vehicles and busses.

Screen Name Redacted

2/09/2023 11:03 PM

I struggle with biking along this section of railway Ave and do ride on the sidewalk. It's challenging to walk on the spring creek side with the very narrow sidewalk. This concept design helps with that! However, traffic does back up significantly when there is a train, I might be missing it, but one lane going to the railway tracks will be challenging. I also turn left out of EP onto railway Ave daily. Not sure if there's still that ability in this design.

Screen Name Redacted

2/10/2023 12:19 AM

I cannot stress enough how poorly planned these diagrams are. Granted, I know a lot has changed in Canmore since I was young (we moved to Canmore in 1987), but dropping a vehicle lane, while adding additional biking and pedestrian infrastructure won't make things any easier in Canmore. I'm a real estate agent. I drive to do my job. With the past changes to Benchlands Trail and Bow Valley Trail, it's become increasingly challenging to get around town. These changes as proposed will only make matters significantly worse. If the Town wants to add capacity, they've got sidewalks on the Esso side and a paved path on the Elevation Place side, utilize this. Please do not add more congestion to an already challenging transportation corridor. If you want to add a dedicated turn lane, pull from the Elevation Place side of Railway Ave, but please, do not remove the roadway lanes, traffic is already bad enough, that I try and avoid downtown Canmore at all costs (and my office is at Re/Max). Respectfully this looks and sounds like an opportunity to spend precious tax dollars on a project that isn't needed. The A&W corner was and is a disaster. That's caused massive gridlock and traffic jams; this will only add fuel to the fire.

Screen Name Redacted

2/10/2023 09:52 AM

Clearly there will be more issues with vehicle traffic with these changes. This is the main artery into our town. We have many out of town visitors who are driving to come here. For locals, our climate is not often "cycling-friendly". I believe most of us who live here are happy to ride bicycles or walk as much as possible. However, being in a car is more more comfortable at -20C. Please don't do this.

Screen Name Redacted

2/10/2023 10:42 AM

Driving: More congestion, back up of traffic. Does this area address intercept parking traffic? Walking: An upgraded sidewalk on the creek side will improve safety. Cycling: I navigate the current system by using the trail along the railway tracks. I only bike from late spring to early fall. Transit: I do not use. Comment: Suggestion; Barriers could be placed this summer to ensure the design will work to move traffic, including emergency vehicles.

Screen Name Redacted

2/10/2023 10:42 AM

This new design will greatly improve our ability as a family to move through this part of town safely and effectively. The majority of the time, we try to ride our bikes (often towing our young children with a chariot trailer). We have observed a number of 'near misses' (where pedestrians were almost struck by people driving vehicles) at various portions of the road shown, under the current circumstances -- situations which will for the most part be addressed by this improved design. We are very excited about the improved facilities for people walking and biking on the Policeman's Creek side of Railway Avenue (south of Elevation Place). This is currently a very narrow sidewalk

which cannot be used safely by both a bicycle and person walking - especially in winter when snow is (understandably) piled next to the sidewalk on the informal dirt path where people ride their bicycles to avoid being on the sidewalk in the summer. We're looking forward to the improved safety of the crossings. We don't anticipate there will be a major change to time / efficiency of moving through this area when we use our car. We have a friend who timed their travel times moving in a car through town, from Larch neighbourhood to Cougar Creek, before and after the construction of the upgrades at Railway Avenue & Benchlands Trail, and there has been no change in timing (it takes no longer than previously).

Screen Name Redacted

2/10/2023 11:20 AM

This is a very flawed project and should be immediately shelved and better designs sought. The Town completely ruined the Bow Valley Trail, Railway Ave intersection and this new project will bring that disaster all the way through the main access into the town. Look at the traffic chaos that the Bow Valley Trail, Railway Ave intersection has brought. People sitting idling for 25 minutes plus to try to get through that disaster of an intersection. How does hundreds of cars a day idling for extended periods of time help the environment or is good for walkers or cyclists? Whether the town administration likes it or not, people own, drive, and park cars. That includes people who live in the town or are visiting the town. Having them stuck in unending traffic jams due to a terribly designed road is not going to solve any problems, it will just create frustration for anyone using the town's infrastructure. Town Administration and Council, please admit that this redesign is a mistake and rethink this proposal, thanks. Granted, it will be beneficial to bikers and walkers. I both bike and walk Railway Ave with no issues to date. But I, like most people, only bike in the area for at most six months a year. Canmore is a mountain town with lots of snow and cold weather. Not too many people bike during those six months. Why ruin a perfectly good road for almost no benefit, only drawbacks?

Screen Name Redacted

2/10/2023 12:02 PM

This hasn't changed much with respect to driving when heading West. However, when heading East, having it go to one lane at 10th St, will cause a backup at the intersection, just like what has happened at Bow Valley Trail westbound at intersection at the Coast Hotel. It gets backed up past the roundabout every day at 5:00pm and on weekends!

Screen Name Redacted

2/10/2023 12:05 PM

Driving will become less reliable as the potential for significant delays due to congestion will increase. Train crossings will occur frequently and there is less space for the volume of traffic to accumulate. Left turn lanes could be blocked creating gridlock along the street. The

same issues apply to transit use. Walking and cycling will be significantly improved.

Optional question (364 response(s), 14 skipped)

Question type: Essay Question

Q2 The diagram below shows Railway Avenue from Main Street to 10 Street. *Note - cross sections C - G from the Railway Ave cross sections document apply to the section of the design. Legend: dark grey - road, red - bicycle lane, light grey - sidewalk. Please provide your feedback on how the concept design will impact your travel experience when: 1. Driving 2. Walking 3. Cycling 4. Using Transit

Screen Name Redacted

1/23/2023 02:07 PM

1. More congestion as down to one lane. Concerns about only one lane exiting the Save On Food parking lot - this area gets very back up and with no ability to go right or straight while people wait to turn left, will create issues. This is one of the only areas in town where people are more likely to need to drive as walking or biking home with large grocery orders can be difficult. Can most likely remove bike lanes in this area as it is a private business entrance, therefore people will be driving slower. 2. no impact 3. more accessible 4. no impact

Screen Name Redacted

1/23/2023 04:36 PM

1. Why do the Drake Inn and the Shoppers need two accesses each? They should both have just one access so that it reduces the number of conflicts between vehicles and pedestrians/cyclists. I hope that the weird grades at the 10th Street intersection are fixed with this construction. The combination of raised crossing plus huge crown on Railway Ave make the driving experience poor when driving from the Save-On, across Railway Ave, and onto 10 St. 2. This design will make me feel much safer when walking along the corridor. I like the fully protected intersection at both Main and 10th Street. I like the physical separation between the roadway and the sidewalk and bike path on the north side of the road. However, on the south side the bike path and sidewalk are squished together, that's not great. Why can't you move the driving lanes a bit further north and try to provide a bit of green space and landscaping on both sides of the road? 3. This design will make me feel much safer when driving along the corridor and will provide a much-needed bike connection to other areas of town. I really like the protected intersections at Main and 10 Street. If possible, it would be great to provide a bit more queuing space for people cycling so that those waiting to cross the road don't block others in the bike lanes. 4. I don't take transit but don't think this will affect transit much from the current road design. General: I hope that in the future, the town will try and consolidate access to the

businesses on the south side of the road so there are not as many driveways that cross the sidewalk and bike path. That's where the danger is - vehicles crossing the path of vulnerable users. I think the three-lane cross section with one vehicle lane in each direction and a centre turning lane is the right roadway design to maintain similar capacity to what's there now while being able to provide space for active modes. It probably won't keep people from complaining about losing car space, but it won't change much. I think the biggest issue is the Town doesn't do a good job explaining how this change still allows significant vehicle traffic while making it much safer for people walking and cycling. Looking at the webpage for this project, there's very little description, explanation, or justification for the changes. Some people will understand, but most won't. And then you get the anti-bike bridge out and you can't control the narrative. To be fair, I really like many of the changes that have been implemented in the past few years to increase cycling and walking safety, the Town has just not done a very good job with communications to the public!

Screen Name Redacted

1/23/2023 06:21 PM

Added medians add cost to our taxes for landscaping and causes issues with snow removal. The medians by the shops impede traffic flow and are unnecessary. Same here. Do not impede traffic flow in favor of cycling. Idling traffic is bad for the environment no? Scrap the median and leave 4 lanes for traffic.

Screen Name Redacted

1/23/2023 06:26 PM

Bad bad bad. Just like the intersection at bow valley trail and railway. it would be better if left alone. This is not an improvement.

Screen Name Redacted

1/24/2023 08:35 AM

More car lanes, more car lanes, more car lanes! This is a busy section of road for accessing multiple areas of Canmore and reducing to one lane with tiny turn lanes will mean no traffic will flow properly. You cannot make cars go away and when you do these projects you forget that EVERY visitor to Canmore comes in a car, and town keeps getting busier, so you are simply making the experience worse for EVERYONE to travel through town. As a cyclist, I can say that I avoid completely the junction at A&W as it is more dangerous after your 'fixes' than it was before and this plan fills me with dread as you again are narrowing the roads so cars cannot safely overtake bikes on the road and again, cycling on your mixed use paths is awful due to constant angry pedestrians. As for walking, a person takes up a small space and the existing paths are more than sufficient and you do not need paths on either side of the road, give this space back to car.

Screen Name Redacted

The curves in the bike lanes at intersections will make it more

1/24/2023 08:53 AM

dangerous to cycle as cars won't see the bikes.

Screen Name Redacted

1/24/2023 08:58 AM

It would make it much more likely that I would bike through town as it's currently a bit sketchy to bike around that area.

Screen Name Redacted

1/24/2023 09:28 AM

Same as above but I can see the traffic backing up to both intersections when the train is going and taking a while to clean up before the flow returns. Tourists won't turn left to go the other way around. The GPS won't tell them to do it. It is already walkable and has plenty of room to add a bike lane already.

Screen Name Redacted

1/24/2023 09:31 AM

1. Again, making the North side lane one lane will not change much. Allowing two lanes for a left turn is welcome. Having two lanes straight through on the South side is almost mandatory given the amount of traffic moving through. Although we are doing a great job of increasing spaces for bikes and walking, a majority of the traffic in summer still have to drive into town first. There are no public parking lots outside of downtown for tourists to park first.... so they all drive downtown initially. This is problematic. So, with the elimination of one lane on the North side, there should still be room to accommodate new bikes and walking lanes. 2. I don't find walking an issue now. 3. I usually take the bike path by the railway tracks/EP and cross over at the fire station/railway to take a quieter street across downtown. OR, I usually take Spring Creek to get into downtown because it is quieter, safer and you can avoid all roads by being on a bike path the entire time. 4. N/A

Screen Name Redacted

1/24/2023 09:51 AM

So happy there is cycle/ pedestrian area but really the central section bringing to single lanes does that not cause traffic build up & when it snows will be even narrower?

Screen Name Redacted

1/24/2023 09:52 AM

1. Driving. Again, greatly impacted by the elimination of free flowing merge lanes. You're condensing 3 traffic movements into 1 especially travelling northbound on Main. This will undoubtedly cause traffic to backup into the downtown core. Does the town not realize what happens to traffic on the weekends? 2. Walking N/A 3 Cycling n/a - I will continue to use alternate pathways 4. Transit - n/a

Screen Name Redacted

1/24/2023 10:12 AM

Love the pedestrian zones

Screen Name Redacted

Love the bike and pedestrian spaces

1/24/2023 10:14 AM

Screen Name Redacted

1/24/2023 10:33 AM

The cycling lanes look great. Hopefully they will be extended from downtown to the Legacy trail as well.

Screen Name Redacted

1/24/2023 10:41 AM

Again, this is only going to cause more congestion for locals from South Canmore trying to go drivd to and from work. There is never an issue with bikes and pedestrians in this area, but always issues with too much traffic. Why make this worse. This makes zero sense.

Screen Name Redacted

1/24/2023 11:20 AM

I dont think this will effect my experience with driving, walking, or transit but will have a positive impact on cycling and I am in favour of it

Screen Name Redacted

1/24/2023 11:43 AM

1. Negatively impacted heavily. As someone with a business that relies on my staff driving along Railway Ave multiple times a day the changes proposed will have a significant effect. Having a single lane travelling back to BVT at 8th street will cause delays as traffic cannot move forward when a single vehicle needs to turn left. While not asked in this survey but planned, I believe the suggested changes to the intersection at 17th will result in far more grief than the current system. Rather than installing traffic lights and trying to get the traffic to go down 17th St. a roundabout could be used. The majority of traffic is continuing on Railway Ave and the traffic from 17th St. could easily funnel in. This would also prevent extra backups onto BVT that would occur during the summer periods. 2. Unchanged. There were sidewalks available beforehand and are sizeable enough for the number of people that use them. 3. It would be useful to have a bike lane continuing through this section of Railway Ave 4. Not impacted. Current transport stops are easily accessible.

Screen Name Redacted

1/24/2023 11:57 AM

Please stop with your self-absorbed virtue signalling destruction of Canmore. With all the Air BnB's you are approving our roads will not be able to handle the vehicles with what you are attempting to do. The intersection into the core is already tight but this proposal will make it all but impossible for transport to deliver goods, locals to access the core, and every business downtown will suffer.

Screen Name Redacted

1/24/2023 12:23 PM

I just cannot fathom the idea behind another congesting project. Personally I think the designers behind this should be drug tested. I live on Hospital hill and usually go east to the Trans Canada highway and then double back to town because of the inept planning decisions made by the town planners and usually backed by the sitting council

of the day. Clearly the inmates are running the asylum. Oh yeah, jack the taxes and then come up with this dogs lunch. But hey, it's all about the tourists and screw the locals.

Screen Name Redacted

1/24/2023 12:26 PM

All modes will improve aesthetically, but Driving will be impacted by the maintaining of only a single lane northbound from the the main street turnoff. Can we justify cycling lanes on both sides or simply a two-way cycling lane on one side. The existing Transit stops are going to cause huge slow-downs as they are in a one lane area. I would like to see modality studies and predictions to understand the tilt in infrastructure provision.

Screen Name Redacted

1/24/2023 12:46 PM

Same as above

Screen Name Redacted

1/24/2023 01:51 PM

This will greatly improve cycling access across town (right now, the cycling access to the grocery stores follows the railway tracks, which is fine, but *reaching* that path from pretty much anywhere involves some people/car dodging. Given the hopefully increased cycling and pedestrian traffic, that will make exiting the Safeway/Canadian tire driveway at the intersection (between F&G) even harder than it already is. It would be SUPER USEFUL to have a turning light for left turns coming from the shopping centre onto Railway Ave. As it is, if there is a pedestrian crossing, often only 1 (or zero) cars manage to turn left by the fire station, and the left turns are always a little sketchy given people making right turns from downtown (and left turns from the grocery stores) seem to casually ignore the "turn into the lane closest to you" law, and also sometimes blast straight through the intersection when they're in the turning lane from downtown and/or don't use their blinkers. That intersection is already dicey in both a car and on foot (and terrifying on a bike - I get off and walk like a pedestrian if I've got my bike around there), and increasing the pedestrian/cycling traffic without taking some mitigating measures to make the cars a little less dangerous will likely result in bad things happening.

Screen Name Redacted

1/24/2023 01:51 PM

1. Terribly. This will bottleneck an already busy and bottlenecked area of town, especially during the busy tourist season. 2. Not change much. I typically use the multi-use path behind Elevation Place to walk through this area. 3. Not change much. I typically use the multi-use path behind Elevation Place to bike through this area. 4. I would imagine the busses will struggle with the constricted traffic flow. Extra note: I live on Kananaskis Way. During the busy times in the summer (particularly Saturdays) I frequently can't leave in a vehicle because traffic is backed up passed all 3 exits after changing to the new lights.

I am a regular biker in town and I commute by bike whenever possible, but there are times when I need to use my vehicle, and these designs make that incredibly difficult. These proposed changes will affect how people access essential services, such as the area's main grocery stores, and will continue to back up an already backed up system. I feel this area is already simple and safe to navigate by bicycle, while there are other areas in town (BVT between the new lights and the Visitor Centre, or the Elk Run area, for example) that would greatly benefit from this type of redevelopment.

Screen Name Redacted

1/24/2023 02:11 PM

1. I think the intersections will be a huge improvement. After getting used to the new intersection, I think it works well for all modes. As a driver I appreciate that there is less going on when you are making your movement. 2. Same comments as above - huge improvement. 3. Same comments as above. The improved cycle lanes will encourage more people to use the area. I very much appreciate having more choice in how to move around town. 4. Same comments as above - likely space to make transit stops more appealing. In my opinion this thinking will serve the community well in the future. People need options in how they travel and the ability to make choices also impacts affordability in the community.

Screen Name Redacted

1/24/2023 02:21 PM

I don't know how to imagine my use during either shoulder or peak seasons.

Screen Name Redacted

1/24/2023 03:04 PM

Again like mentioned above, this the route I take daily for work reasons. This will slow down traffic and will not be an improvement in my opinion. Railway Ave works fine as it is. I don't understand the spending on this when the Town could invest in low cost housing. Maybe I don't see the long term goals and what we will all benefits from this. Catering to bikers(I am one of them) and pedestrians is fine, but remember that many of us need our vehicles to work and travel in this town. Do not reduce the lanes on roads that are already busy. This will create more traffic jam from locals residents and visitors alike. Looking forward to hear more about it. Thanks.

Screen Name Redacted

1/24/2023 05:57 PM

The comments I made for the first diagram apply to this one as well. In addition, I would comment that this is the busiest part of town for traffic flow. While you have introduced very short turning lanes for the intersections, they will not help to keep the flow when pedestrians and cyclists are crossing. The turning lanes will back up and impede the through traffic lanes causing congestion and more air pollution not to mention increased noise levels. All my concerns are exacerbated when you add in the confusion and flow uncertainty of tourists who

are unfamiliar with the town layout. It's going to be hard enough for locals to get used to the bottleneck design, the tourist issue will be ongoing year round. Add in snow issues and train activity and everything gets worse. By all means, there are other ways to beautify Railway Ave. that won't adversely affect traffic flow. Please reconsider this design. The underlying thought of encouraging less vehicular traffic is honourable, but not very realistic. Cars are a reality and while we can include a better and safer cycling and walking environment, it cannot and should not be effected at the expense of vehicular movement.

Screen Name Redacted

1/24/2023 06:04 PM

Driving - This will create further traffic congestion going from 2 lanes to 1 lane.

Screen Name Redacted

1/24/2023 07:09 PM

As a banff resident with small children I often drive to the superstores in canmore. I think this design will mean it takes significantly longer to enter and exit the superstore parking areas. Driving with small children is already a time sensitive and stressful experience and I think this will make it worse. I fully support integrated transport solutions but having bike lanes on both sides of the road seems a little unnecessary. I have lived in many cities all over the world where bike lanes were readily available. Cities with much larger populations than canmore. I have never seen enough bike congestion to justify bike lanes on both sides of the road. There are enough crossing options for bikes to be able to use one side. I also understand your desire to separate bikes to make it seem safer for them. However again as a Banff resident I do think it would be much simpler to implement a lower speed limit on the roads and simple encourage bikes to share the road. My 3 year old happily bikes alongside me on the road around all of Banff - including Banff Avenue, Lynx Street and Buffalo Street and we have never encountered any issues or had any safety concerns.

Screen Name Redacted

1/24/2023 07:19 PM

Has the bus stop at Shoppers been removed? Where will the nearest bus stop be if this has been removed? I do not see a stop on the plan and certainly if the bus did stop there it would hold up traffic as it is now a single lane road. If this stop has been removed, how far would a pedestrian now have to walk to access the bus if they had been shopping at save on or shoppers? Or visiting other stores in this area? This does not seem conducive to encouraging people to access transit. The stop at shoppers is often particularly busy with commuters waiting for the number 3 bus back to Banff, people who work in the nearby area. The extra distance to walk to and from the bus may be enough - especially in winter - to discourage these people from catching the bus at all.

Screen Name Redacted

1/24/2023 07:47 PM

Driving: won't be any room for emergency services to get by unless I drive up onto the bike and walking lanes. Can a transit bus get out of the way even?

Screen Name Redacted

1/24/2023 08:33 PM

This design is going to back vehicle traffic across the railway tracks with even low flow, it only takes 2 vehicles trying to turn into shoppers to cause an immediate blockade

Screen Name Redacted

1/24/2023 11:33 PM

Elimination of turning lane into save on is not ideal

Screen Name Redacted

1/25/2023 04:21 AM

Only taxpayers in canmore should be able to vote. Call a town hall

Screen Name Redacted

1/25/2023 06:39 AM

I really like the separation between the road and the bike lane. This will encourage me to keep cycling with my kids to the downtown. We currently avoid this intersection because of the narrow sidewalks and proximity to the road.

Screen Name Redacted

1/25/2023 06:50 AM

1. The inner medians are totally redundant, especially if their grass and require consistent maintenance. Costly to build and maintain and makes snow removal less effective. Better too have more lanes than greenspace in the road after all the roads will be narrower and we have more traffic. Must keep it double lane between the drake and firehall 2. good 3. better than ever 4. i dont see a bus stop General note I appreciate the fact we get a danish team to design our street and make it more friendly for different user groups. I think simpolicy and keeping maintenance in mind is important. This does not look like snow removal has been seriously considered.

Screen Name Redacted

1/25/2023 09:33 AM

It would be nice to see a larger close-up of the area. What are the squares on the road??

Screen Name Redacted

1/25/2023 10:12 AM

Will the overhead traffic lights at these intersections be similar to the new style at Benchlands+BVT? (with the lights close to the cars, not across the intersection from the cars)

Screen Name Redacted

1/25/2023 10:14 AM

will the overhead traffic lights at these intersections be similar to the new style at Benchlands+BVT? (with the lights close to the cars, not across the intersection from the cars)

Screen Name Redacted

1/25/2023 10:52 AM

It would appear as though current traffic lanes are being removed in this section. Absolutely irresponsible and illogical. We are on track to see more visitors predominantly driving into Canmore in the years to come. We need better traffic flow with one way streets and less traffic lights. We do not need to be taking away lanes that will cause bottlenecks and frustrations for locals, visitors and difficulties for delivery drivers. This is a terrible concept.

Screen Name Redacted

1/25/2023 11:27 AM

The reduction to a single lane in places looks like it will cause delays. Cars making a left turn into the Shoppers parking lot will block traffic. Same general comments as noted above.

Screen Name Redacted

1/25/2023 11:36 AM

1. Removing lanes is going to cause additional vehicular congestion. Not a good idea 2. Does not improve walking or cycling 4. Will cause additional congestion for cars/transit.

Screen Name Redacted

1/25/2023 12:05 PM

Please stop this waste of money and time as vehicles and transit are necessary to get to the businesses that depend on this traffic. With this plan many businesses will not survive the construction phase alone.

Screen Name Redacted

1/25/2023 03:31 PM

Same issues as above.

Screen Name Redacted

1/25/2023 03:42 PM

Same as above with one additional over riding concern. We cannot continue to spend money needlessly in this town for cosmetic so called improvements. We have a upcoming expenses for legal fees re: TSMV, taxes are at a VERY high rate, and we have a number of more urgent matters that need attention. Road repairs, aging sewage and water treatment facilities to mention a few. We simply cannot continue to spend money for "nice to have" or for some notion of being an innovator in traffic flow matters.

Screen Name Redacted

1/25/2023 05:09 PM

Same comments as the preceding; As traffic in our town continues to increase (hopefully in tourist visitation and likely in population), if I'm understanding the proposal correctly all I'm seeing is a decrease in travel lanes for motorized vehicles - cars, vans, suvs, commercial delivery trucks, buses (including town transit), etc. rather than the much needed increase. It also appears that various sections of the road are being completely wasted. Huge negative impact on driving and transit, positive impact on cycling with additional cycling lanes

and no impact on walking as it really doesn't matter what side of the street one walks on. Given that our cycling season (the main group to benefit) is only half of the year I can't support such a major change affecting motorized vehicles for all 12 months of the year. Two lanes of vehicle traffic in each direction is needed, could do one bike lane with flow in both directions and one walking lane with flow in both directions.

Screen Name Redacted

1/25/2023 07:27 PM

All that is needed here is to fix/widen the sidewalk on the east flowing direction, define bike and walking lanes on the west flowing side. Are busses going to stop in the middle of the street?? Maybe add a proper bus pull over lane in that large set back on the east flowing side as that would make things easier for all road users and everyone's travel experience.

Screen Name Redacted

1/25/2023 10:03 PM

Bikers and bike lanes should be part of traffic - do not teach people to ride across crosswalks.

Screen Name Redacted

1/26/2023 08:25 AM

Regarding the public consultation process: (i) the supporting documents are unclear and make it extremely difficult to gain a good understanding of the project's key variables (ie revised traffic capacity) and how this will affect me as a resident of Canmore. (ii) the scope of questions asked by the town in this consultation process (ie travel experience) seem limited in scope and do not seem to address the full project impact (iii) considering the scope & impact of the proposed project I am surprised to have initially heard of this on CBC and not in our local paper - I am also somewhat surprised by the limited consultation timeframe

Feedback on specific questions:

1. Driving: I believe this will significantly increase congestion and I have concerns on (i) increased CO2 emissions due to idling time (ii) livability of Canmore as a full time resident. My questions to the town are:
2. Walking - I walk along this route daily and have no concerns with the current infrastructure; I would prefer to see the monies spent on ice removal in winter to make it safer
3. Cycling - I cycle along this route routinely in the summer (never in the winter) and have no concerns with the current infrastructure.
4. Transit - I rarely take transit and have no opinion I hope my feedback is well received and I look forward to receiving information back from the town

jdbezanson@gmail.com.

Screen Name Redacted

1/26/2023 08:54 AM

It is difficult to see, but it looks like there is a left hand lane for vehicles wanting to access the Shoppers Drug Mart parking lot? Is there enough for a couple of vehicles in the turn lane or will they be holding up the through traffic?

Screen Name Redacted

1/26/2023 09:04 AM

Non-resident - when visiting Canmore I prefer to park at edge of town and travel by bike. Expanded bicycle lanes, separated from traffic and more room between bikes and pedestrians will make for improved cycling walking modes on Railway Ave.

Screen Name Redacted

1/26/2023 09:36 AM

This will be a tremendous improvement for cycling, walking and using transit. Yes please to these changes! I'm wondering about the access driveways to the businesses though - how will those conflict zones be handled with regard to the new wheeling lane? Hopefully green paint, elephant feet marks, bicycle symbols and new signage indicating where bikes have the right of way? I expect that these changes will make driving more predictable in terms of where people are walking and biking from. When you give dedicated space to cyclists, they are less likely to be riding among cars, which is safer and more predictable for everyone. I do wonder if the intersections are too rounded though? I think more squared off intersection turns are safer for pedestrians.

Screen Name Redacted

1/26/2023 10:12 AM

Two more European traffic lights. I'm already feeling sorry for the person who signs that piece of paper.

Screen Name Redacted

1/26/2023 11:02 AM

Without proper education for all users on how the pink paths are supposed to work, it's going to be a disaster. Drivers will get angrier at cyclists for using/not using the paths/roads properly (in drivers' opinions). Put more painted stencils on the path/sidewalks to indicate the difference between pedestrian/cyclist lanes. Indicate one way or two way traffic for pink paths. Keep pink paths clear year-round from snow and parked vehicles using them as loading zones.

Screen Name Redacted

1/26/2023 11:41 AM

Maybe lets not put a bunch of obstacles that do nothing but get in the way right in the middle of the street? These don't make things safer, they create distractions for drivers instead of focusing on the road. I know this, because the town recently just put a bunch of obstacles in the middle of a road by my house, and it's now more dangerous for everyone to drive on. If you are going to do this, don't waste money landscaping it. Everywhere the town has tried this has failed, and it will continue to fail because the town refused to contract competent landscapers and maintaining grass that is in the middle of a roadway is unrealistic.

Screen Name Redacted

1/26/2023 12:38 PM

Driving - Not in favour - I understand the 2 current lanes will be reduced to 1 lane. This is certainly going to impact traffic especially

during the high seasons

Screen Name Redacted

1/26/2023 12:40 PM

Enough bike lanes. Should be two road lanes each way plus turn lanes. Wider sidewalks

Screen Name Redacted

1/26/2023 01:14 PM

1. I feel like this will have a negative affect on driving, this area backs up considerably already and will be even more challenging to navigate with a car in this area. During construction this will be even worse. 2. I think this will have a positive impact on walking as the trail system just comes to a dead end here, and it's very challenging and unsafe to navigate. 3. I think this will have a positive impact on b as the trail system just comes to a dead end here, and it's very challenging and unsafe to navigate. 4. I do not currently use transit.

Screen Name Redacted

1/26/2023 01:38 PM

All of the same comments above apply to this stretch of road for me.

Screen Name Redacted

1/26/2023 02:03 PM

Again, traffic heading Nw looks like it will back up at the lights, as people trying to turn left onto 10th will prevent those from continuing on Railway Ave. I appreciate revamped sidewalks and pedestrian safety.

Screen Name Redacted

1/26/2023 02:23 PM

The sidewalk from A&W past the dealership and into town is not great, but there's already an excellent paved pathway that goes along the other side of the road (right beside EP, and also the one beside the grocery store), so there are already a number of decent walking & cycling options. From a driving perspective, I am totally opposed to turning this into effectively a 2 lane road. That will be awful. Please do not do that.

Screen Name Redacted

1/26/2023 02:42 PM

Walking and riding a bike are great, but I think its important to remember that Railway ave is the main route to access EP and grocery stores. Two places that many require a vehicle to do so. Especially with the town expanding further to the East in Three Sisters, more and more people need to drive into this area for their jobs, groceries, recreational activities. Not all of us live in South Canmore and can walk and regularly avoid these points of increased congestion. Canmore is getting more busy, not less so pinching off traffic into one lane, denying the ability to turn on a red, and building intersections that take a much larger footprint than needed (and subsequently shrink the lanes that access them) is making it harder and harder to get oneself and one's kids to places they need to be. Canmore is a quite a spread out town for the size of its population.

Bike accessibility is hugely important but can it not be done along routes/roads that don't make the regular coming and going in and out of the railway ave area more challenging and time consuming? I haven't heard much if any positive feedback about the new intersection at A&W so would suggest that pursuing that model on future projects may not be the direction the citizens or visitors of this town will want.

Screen Name Redacted

1/26/2023 03:42 PM

Pedestrian road crossings should be raised to curb height to slow traffic and improve visibility of pedestrians using the crossing. Ensure bike lanes don't spit cyclists out into high traffic areas. I Like how visible cyclists and pedestrians are at the intersection in this proposal. Radius of the curbs in the intersection could be tightened.

Screen Name Redacted

1/26/2023 04:54 PM

Placing sidewalks between the roadway and the bike lane will result in increased pedestrian/cyclist conflicts. It is difficult to tell if this is the intent from the diagram. This proposal could be achieved on one side of the road without closing a lane of traffic to vehicles. It seems unnecessary to duplicate bike lanes on both sides of the road while still encouraging bike use on the roadways. As increasing numbers of cars become electric, the continued war on four-wheeled vehicles seems unwarranted. The town might consider the possibility that community members are better situated to make choices about transportation than a central authority. I invite the town planner and town counsel to engage in a consciousness-raising exercise by buying a week's worth of groceries and transporting them by non-electric bike or public transit to the affordable housing in the three sisters' parkway at -25 C. I also encourage the town to make the raw data on traffic safety and construction costs of the A&W intersection freely available so community members can assess the statistical significance of the collision data and cost-benefit ratio themselves.

Screen Name Redacted

1/26/2023 05:36 PM

Fully support this plan. Thank you for your action.

Screen Name Redacted

1/26/2023 06:02 PM

Again, this is great. This is how complete streets should be designed in a modern town/city. Huge kudos for prioritising walking, cycling, and the environment.

Screen Name Redacted

1/26/2023 06:03 PM

Will the cut overs to allow west-bound traffic to turn into the businesses (eg Shoppers Drug Mart) on the south side of R/W ave without impeding the main flow ? Better to have an extended turn lane if possible

Screen Name Redacted

1/26/2023 06:11 PM

I would appreciate the separation between people walking and cycling. While driving, I hope this project will encourage lower travel speeds and improve visibility for people walking and cycling around me

Screen Name Redacted

1/26/2023 06:53 PM

This is the core of the community I live in, with grocery, pharmacy's etc. Not a fan of this concept.

Screen Name Redacted

1/26/2023 06:56 PM

Without knowing the big picture, it's impossible to give real valuable advice on this specific plan. Where is the intercept parking lot(s) where residents/visitors convert to walking/biking? If vehicles need to travel this roadway to get to a parking area where they convert to walking/biking, then this plan needs a complete overhaul. The reduction in lanes and tiny turn lanes, will have a huge effect on vehicular gridlock (as it currently is at the new intersection). Instead of incorporating the biggest possible turn lanes, you've limited them to what appears to be 3 vehicles. As soon as you have a fourth vehicle attempting to turn, the entire roadway is blocked until the turn lane is vacated. There is no through lane for those to pass through without slowing for traffic entering/exiting the roadway. Again, why is Walking/Cycling being incorporated into driving infrastructure when every other resort town separates the two? The walking/cycling trail should be moved to the opposite side of the commercial buildings, with access to the commercial lots from the back, away from vehicles. Why are we encouraging modes of transportation that are inherently dangerous to each other, to be incorporated together? Would you rather ride/walk next to and across roadways, or would you rather ride on a completely separated trails that don't slow vehicular traffic or cross vehicular entrances? Why not build trails on the rear of the commercial lots, completely separate from the roadway? The backside appears to already have a trail, it would just need to be moved closer to the lots so you can access the businesses. Same thing on the north side. Why have hundreds of people walking/biking across the major intersections? It would provide a faster, safer commute without the danger of crossing as many active roadways. If you look at whistler, you'll see vehicle centred roads accessing parking lots and then walking and cycling paths providing access to all the same areas but from completely separated routes, with little to no vehicle access. Why not focus on that approach? Again, where is the intercept parking lot going to go? How can we plan anything to do with our future infrastructure without seeing the big picture? Where are the vehicles from Calgary, or tourists from all over the world, going to park, to switch to walking/biking? Virtually everyone arrives here via car and that will not change. While there has been some

growth in other modes of transport the amount of vehicular traffic has seen the largest growth. Why are we not planning how to deal with this? Elevation Place is full to the point where we can't find parking on a weekday to use our recreation centre/library and cannot be used as the sole intercept parking lot. What is the plan for vehicles, and why are we limiting vehicle capacity on our major arterial roads when we don't know where they will be parking in the future? Is the goal to have gridlock backed up to the exit ramp so people don't stop and just pass by Canmore? Or do we have a plan for parking in close enough proximity to the downtown core to allow for walking/biking to restaurants/shops/events. If so where is the future parking planned and are we focusing solely on vehicular travel to the parking lot with pedestrian/cycle traffic elsewhere.

Screen Name Redacted

1/26/2023 07:10 PM

1 Driving going down to a single lane on main road way will cause more congestion and traffic flow won't move smoothly. Cause more accidents and more road rage because individuals will become impatient and possibly more pedestrians getting hit as well. With there being restaurants and grocery store there going to be issues getting into those areas, there to many businesses in that area that with a single lane on a main road way to do that with out any consequences

4. Using transit- there will be a delayed around town because of any congestion that is going to happen and so it going to in packed individual schedules for work and or any other plans; especially in the summer with the heavy amount of traffic from tourists. It's already a struggle with bus running behind due to traffic. If you carrying groceries and using the bus and it congested it's really hard to use with the bus being such a tight space especially if it's recommended as one of the main ways of transportation with this new design

Screen Name Redacted

1/26/2023 07:21 PM

My e-bike is my primary method of transportation and one of the biggest annoyances/hazards of being on my bike is having to use the road on the Drake and Shoppers Drug Market side of Railway Ave. I frequently have to go to the pharmacy and right now it is absolutely not safe nor conducive for active transportation methods. There is also very little sidewalk room near the bus stop in front of Shoppers, so this plan will greatly improve that. This plan will also help me tremendously as a cyclist because I will no longer have to cut through parking lots to get to the safer path next to the train tracks and Elevation Place. Thank you for your attention to detail in the making of this traffic proposal. This plan will make my life so much easier and safer for getting around town by bike and on foot.

Screen Name Redacted

1/26/2023 07:48 PM

A thru-bike lane in this area would be amazing. it's tricky to ride in the slush on the side of the road in winter, the shoulders are very narrow,

and it often feels unsafe. Changing lanes to turn left on 10th can be nearly impossible during the summer. I usually use the path along the train tracks, but it would be nice to have options on ways to go from that path towards downtown without having to squeeze in on the bridge and ride like mad to not get run over, or try to squish past pedestrians who are walking in groups.

Screen Name Redacted

1/26/2023 08:00 PM

It's all probably going to work out fine for biking or driving, but please, please, please don't put the lights on the far side of this intersection. It's dangerous, hard to see and EVERYONE hates it. I hate being stuck in the middle of the intersection and not knowing if the light has changed until someone honks at me like on Bow Valley Trail. I think it would be hard to do something that is worse than that intersection, and I hope you don't try to overcomplicate the signals. Maybe try to make it as clear and simple as possible for tourists and locals? I'm sure that tourists don't appreciate being yelled at when they're trying to figure out where they are going.

Screen Name Redacted

1/26/2023 09:06 PM

Simply spectacular. Bravo with the phased protected intersections.

Screen Name Redacted

1/26/2023 09:16 PM

1. Driving will be slowed slightly, but smoothed significantly by the provision of left turn bays. This, in combination with single thru-lanes, will also make this route easier to drive (particularly for visiting/tourist traffic). Removal of the dedicated right turn lanes at Main St will slightly slow vehicle traffic, but will significantly reduce conflicts with other road users. (The current eastbound right onto main has particularly bad sightlines. And is located at the exit of a Pub.) This will also make driving easier by reducing the number of potential conflicts to watch for. The removal of one westbound travel lane will allow eastbound left-turning traffic (to Nutters) to establish in the intersection between the medians. At the 10 St intersection, deconfliction of traffic from 10th and from the stores may require some fancy light phasing. It's currently a mess with two lanes each way and pedestrian crossings simultaneously. 2. Walking will be vastly improved on the south side. The sidewalk gains separation from the vehicle lanes, which will improve perceived safety and reduce splashing. Frequent sidewalk grade/slope changes due to vehicular accesses could cause issues for accessibility and snow/ice clearing if the sidewalk is not kept at the same grade across all these accesses (raised crossing). Walking will be slightly improved on the north side. Use/mode separation from a dedicated bike lane will reduce bike/pedestrian conflicts. (Though not many cyclists use the sidewalk north of EP currently.) Crossing at the Main St intersection will be vastly improved. Nearside lights will reduce vehicle violations of the crosswalks. Additional vehicular separation will improve safety.

The elimination of right turn lanes will vastly improve pedestrian safety. Crossing at 10 St, additional vehicular separation will improve safety. 3. Cycling will be vastly improved. Even as an avid and seasoned cyclist, the current state of Railway is unusably unsafe for cyclists. The addition of dedicated cycling lanes makes this an excellent route to access locations along Railway and to/from downtown. Cycling paths along Railway provide an alternative access for east-side Railway locations (groceries, etc) in addition to the path along the tracks. This is especially helpful if riding to locations on the north end of Railway (JK, new Eclipse, etc) because it avoids the need to cross the Safeway parking lot. More notably, the paths along Railway provide the first proper cycling access to west-side Railway locations (Shoppers in particular). These cycling paths will reduce cyclist use of the creek boardwalk to access Shoppers and will reduce conflicts with pedestrians. Dedicated intersection crossings for the cycling paths will greatly increase usability and safety, as we've seen at the BVT intersection. When Main St is closed to cars, these paths will almost complete a cycling network connecting neighbourhoods west of the Bow to the grocery stores and Shoppers. (Hopefully Main from Spring Creek to 6 Ave can be addressed in the future downtown plan.) Dedicated cycling paths can substantially improve winter cycling connectivity. Especially in winter, the separation from vehicular traffic is key for safety and user comfort. Dedicated, paved paths can also be maintained in winter (snow clearing.) 4. Using transit will be slightly improved by not getting splashed as much while waiting at the eastbound stop.

Screen Name Redacted

1/26/2023 09:37 PM

I foresee travelling on Railway Ave by car becoming more challenging and frustrating to a critical area of town that houses necessary services. I foresee walking and cycling to be no different currently offered levels. I foresee transit travel to be mildly improved under the proposed framework. While I understand the attempt to manage future levels of traffic to these areas and not forever catering to vehicles that an attempt to restrict or reduce from current levels is shortsighted and problematic.

Screen Name Redacted

1/26/2023 09:54 PM

It is going to make biking so much easier and safer to have these bike lanes and marked crosswalks. It is challenging to turn left from main street to railway av and even harder when turning left from the nutters parking lot- will this help that?

Screen Name Redacted

1/26/2023 10:17 PM

Can we stop letting [redacted] use our tax dollars to make this town worse?

Screen Name Redacted

1/27/2023 12:48 AM

1. Bottlenecks = slow travel. 3. Fabolous biking.

Screen Name Redacted

1/27/2023 07:05 AM

There is no where for people to pull off too if an emergency vehicle needs to get through. Again, this is an extremely bad idea. This will cost lives because of delayed treatment. This is shortsighted and reckless.

Screen Name Redacted

1/27/2023 08:08 AM

Driving: will add a minute to my normal exit from town from South Canmore (turning right onto railway from main), not sure if it will back up into crosswalks and spring creek intersection and farther down main. May lead me to leave town via Three Sisters. Walking: huge improvement, as almost none of this was pleasant at all, especially S side of railway between main and tracks (made worse by sloped driveways). Cycling: will now use. Had previously avoided this entire area on bike, except possibly to simply cross railway ave Transit: unsure

Screen Name Redacted

1/27/2023 08:38 AM

1,2,3, and 4: Negative. Are these the same sort of horrifically designed lights as in the Shops at Canmore intersection? If so then I'm sorry, but for God's sake please, please, do not do this to the town. It looks like the same project/engineering company that did the Shops intersection is involved again here? They couldn't even figure out sight distances to the lights, or turn lane loads, and yet they're working on this again? No. Please. Stop the madness. I broadly agree with the ideas behind this plan, but the implementation is, sadly, horrible, and this will only make it worse.

Screen Name Redacted

1/27/2023 08:59 AM

Living in the three sisters I mostly drive to town and this looks like it will make my driving experience much worse in similar ways to the new intersection.

Screen Name Redacted

1/27/2023 09:04 AM

This will impact me negatively. The design is not well thought out.

Screen Name Redacted

1/27/2023 09:13 AM

Same as above. Although it is visually more appealing cutting lanes for traffic will further enhance the traffic problem. Why is the town so adamant about keeping vehicle traffic out of the town centre. The town has provided no other alternatives. Tourism traffic is based off vehicle usage not bike or pedestrian usage. Do you think people are flying in, renting their bikes at the airport and biking into town. There is no back up infrastructure such as parking and transportation to facilitate people coming into town, parking their vehicles on the

outskirts and walking in which is what you clearly want. All this will do is cause locals and tourist alike to avoid travel into town due to the ability not to. Well done town another great idea that makes no sense.

Screen Name Redacted

1/27/2023 09:17 AM

The turning lanes are far too small to handle traffic during peak times. Traffic will end up backed up unnecessarily just as it does at the new intersection at Railway and Bow Valley Trail. Its nice to provide pedestrian and bike routes, but causing traffic congestion due to poorly sized turning lanes will only cause frustration which may result in aggressive driving. TOC should reflect on the problems with the new intersection, the unnecessary congestion it causes, combined with the number of backed up vehicles due to turning lanes which could have been sized much longer. It will be very difficult getting out of stores along this strip - as not only with the traffic be more congested during peak hours, but also there are less lanes to use to exit the parking lots when crossing the meridian. On top of it bike traffic will not flow with vehicle traffic making the problem harder to navigate when needing to cross the meridian. I believe this if poorly planned and will result in congestion. Its great to provide better pedestrain and bike routes, but I don't think you nailed it here.

Screen Name Redacted

1/27/2023 09:25 AM

Fucked

Screen Name Redacted

1/27/2023 09:25 AM

Aside from needing to widen the roads, the Town of Canmore has made it very difficult to get around and more dangerous with trying to rewrite road rules. I am surprised the people who have planned the last few changes are still employed.

Screen Name Redacted

1/27/2023 09:27 AM

That intersection sucked. Don't try anything similar.

Screen Name Redacted

1/27/2023 09:54 AM

Again, do not remove the existing lanes but instead use the space already there but in a smarter way. You do not need all this dead space between driving and biking/ waking lanes, use physical barriers instead. Add a path along the RBC section, lots of room there, Look at what they do in Europe, they have way less space than Canmore and way more users, and yet they make it work efficiently. Make sure to keep right turning lanes as these greatly help keeping traffic flowing or you will turn this section of the avenue into long lanes of idling cars. Make sure to have a spot for the bus stops off the lane, especially in front of shoppers. You are proposing a design that will increase my transit carbon footprint: I will not bike more than I already do because of the new design. Whenever I need to take my car (cold

months, larger grocery runs) this design will increase my carbon footprint (longer drive, more idling). The bus does not work for me (too infrequent, too often late, too slow) and I expect that fewer lanes and backed traffic will results in further unreliability. While I agree with the goal of encouraging green transit and keeping everyone safe, this design will NOT achieve these goals. Comparing it to the A&W intersection as a success story is a funny one. That intersection has made my commute longer both on my bike and in my car. When driving I very often have to wait 2 to 3 cycles before making it across the intersection - while I often see no cyclists nor pedestrians crossing. DO NOT go ahead with the railway avenue design as is. Find a way to keep traffic moving through there. Consider bike and walking paths in different locations or using the existing space on either side of the avenue.

Screen Name Redacted

1/27/2023 09:55 AM

I say the same comment from my last comments, we can do better, this council has been led down the garden path by Andy's ideas, this is insanity to complete the circle of mistakes here, we don't have the RTD system to handle the shuttle it of people , we also do not have the population base to afford this our RTD system subsidizes the riders 6 to 8 dollars a ride , so this is nuts

Screen Name Redacted

1/27/2023 10:41 AM

As above. Traffic flow needs to be facilitated here! This will also create major problems in emergency vehicle access. Rather than town spending money on this they should buy available undeveloped land and create parking for visitors.

Screen Name Redacted

1/27/2023 10:42 AM

Driving. Too much construction Nobody happy except construction workers

Screen Name Redacted

1/27/2023 10:50 AM

Same thing, my interactions in downtown are only by car since I live in three sis. Sometimes I park and walk to places but the existing pathways are already adequate for this purpose. The only hindrance now are the parking fees/apps etc. I don't see myself reducing the amount of time that I drive into town even if you make the pathways a little bigger.

Screen Name Redacted

1/27/2023 11:14 AM

Please do not proceed with this I have some serious concerns

Screen Name Redacted

1/27/2023 11:19 AM

Driving

Screen Name Redacted

1/27/2023 11:27 AM

If I'm reading this concept right, it looks as though there is a reduction of the road lanes to 2 in total? This level of roadway reductions will be a complete disaster causing even more backlogs of traffic heading into this primary artery for residents and visitors. This is a critical throughway to the Nordic Centre, Quarry Lake, Peaks, and beyond and we need to facilitate a realistic flow of traffic as we do not have other tools in place. This design will further impact downtown businesses as it will continue to harm the experience of going downtown. Instead, can you create a plan to better disperse where retail, grocery stores, etc. are? This is the actual issue that's not being addressed by any planning. We have a flawed consolidation of services that needs addressing before we contemplate ITS designs. Similar to the last comment, these steps are out of sync with logic and do not acknowledge the true issues of our congestion. This concept design will not be favourable or beneficial for our community in any way. I would like to see an option for keeping the roadways as is. It's also not a good time in terms of inflation, looming recession and our rising tax rates to add in a project of this nature. It's not supported by residents and is a costly layer on top of the sub-surface work that will be occurring. As well, please do not use the same contractors as those who worked on the Bow Valley Trail and Railway Ave intersection. There is a lack of confidence in those who worked on that project.

Screen Name Redacted

1/27/2023 11:32 AM

Thanks for choosing alternative transportation instead of automobiles.

Screen Name Redacted

1/27/2023 12:01 PM

Are there plans to continue to build out cycling infrastructure on 8th/10th? As mentioned above I've found it difficult to navigate where the cycling lane abruptly ends - ensuring there is a smooth connection onto the road or making it clear it's OK to stay on the path (where appropriate) will be key for these intersections.

Screen Name Redacted

1/27/2023 12:08 PM

Walking: With this plan, I see no difference from the existing arrangement. I walk this section several times a day and have never had any problems with it. Driving: Short lanes and insufficient lane length will cause congestion. Cycling: I don't cycle enough on this stretch to have a fair comment Transit: I can't comment, I don't use transit. Unfortunately no space is given for general comments. This strikes me as odd and prevents citizens from voicing their concerns in full. Here are mine: I have 3 principle comments/arguments against the project. A) The impression I get is the Town is trying to limit local driving through annoyance. This aversion tactic doesn't work. Locals need to drive to fulfill daily errands and as demonstrated by the BVT/RW intersection, traffic is only dissipated instead of removed. We all still drive, we just take a different route. A to B via C is the new

mentality. Arguably, this increases driving instead of eliminating it. I fully agree with the idea of less traffic in principle, but this isn't the best way to do it. As for pedestrian/cycling safety, there are currently 2 existing options for them to find their way around town. Funnel bike/foot traffic to those trails instead of building a 3rd. B) Tourists. They all drive here and will continue to. If there was a large lot outside of town to park in this plan would make more sense. Instead the Town is forcing them all through this bottleneck to access parking. C) Economics. I'm a 20 year tax paying resident of Canmore, I have a professional job and I can barely afford to live here. I'm also facing a large increase in property tax, that may tip the scales out of my favor. I would feel much better about Canmore if my valuable taxes were used for a more socially aware cause than a traffic fix. How about this project gets put on hold until the economy changes? Let the people that support this community get their feet under them. Give the residents a break. Especially those of us who live and work here fulltime. We don't NEED traffic calming/reduction, we NEED housing and affordable food first!

Screen Name Redacted

1/27/2023 12:09 PM

See above, moving driving lanes is a major concern. Also the implementation of the previous intersection is terrible, don't use the company who made that ever. Compared to almost all other intersections in Alberta and almost everywhere I've driven the signage is opposite. The traffic lights need to be on the opposite side of the intersection so they can be seen across the intersection without taking eyes off of road level. The current lights at benchlands and bow valley are terrible. They make you loose sight lines to look at them, especially when you approach the intersection.

Screen Name Redacted

1/27/2023 12:24 PM

Don't do it

Screen Name Redacted

1/27/2023 12:24 PM

More traffic More taxes Not needed

Screen Name Redacted

1/27/2023 12:28 PM

Much more comfortable and feeling safer when walking and cycling!
More pleasant when driving - less car dominated streetscape.

Screen Name Redacted

1/27/2023 12:32 PM

1. Driving: same as previous question, but if there are more than two cars turning towards businesses on the opposite side they will block all traffic. With one lane traffic will conceivably be backed all the way down Railway and there will be no chance to turn across the road. Remember when it was one way down Main Street and traffic east on Railway was so backed up no-one could make a turn? The whole

road will be clogged with traffic. 2. Walking: Sidewalks are already on both sides so no change to walking or enhanced experience. 3. Cycling: Probably better. Waste of space in the winter as pathways are icy and it's too cold to bike. 4. Transit same as above, sitting waiting for traffic to move.

Screen Name Redacted

same as above

1/27/2023 12:59 PM

Screen Name Redacted

Expect gridlock every weekend and all summer. Insane ideas!

1/27/2023 01:12 PM

Screen Name Redacted

The main intersection to Downtown will be vital. Safety for pedestrians, cyclists is paramount. The left hand turning lane needs to be a reasonable length & size to function. I don't think the Benchlands Intersection functions as well as it could just based on the turning lane lengths & design. Hopefully some of this trial & error will be reflected in these next phases of work. I personally would still like to see two lanes of traffic in both directions both entering & leaving downtown. I feel like single lane traffic will cause huge backlog & frustration at times. Train crossing backup will extend to Safeway if all the one lane ideas continue to construction. Even if you deter all of your residents from going downtown with vehicles we will still always have visitors driving downtown & trying to access businesses hopefully. Hopefully people provide feedback & your design has not already been cast in stone. Please spend our money wisely... what is the tax rate increase picture we will paint for the next 5-10 years.

1/27/2023 01:12 PM

Screen Name Redacted

The concept design appears to reduce traffic to a single lane in each direction. Id be interested in the towns justification how a road with an average 11,500 cars a day can handle single lane. Road is so tight that the boulevard wouldn't support trees in the middle due to visual blocking left hand turns. The restricted roadway would reduce the ability to move more cars to the 10th street bridge to reduce overload onto the Policeman's Creek bridge. Once again getting less out of the same space.

1/27/2023 01:27 PM

Screen Name Redacted

In a town where cars aren't supposed to idle, I see a whole lot of idling happening here with vehicle congestion and increased wait times at intersections. This is a winter town, not a summer one. For that reason, I'll mostly be in my car. Question is will Canmore still be home if you guys keep pushing this ideological agenda. Just stop and first fix the main intersection so you can learn before digging deeping

1/27/2023 01:31 PM

into this blackhole of mistakes.

Screen Name Redacted

1/27/2023 01:44 PM

Essential to maintain the right turning lane option off of Main Street without going to a single lane here. This will impact me as both a driver and cyclist. Turning left into Nutters from railway ave will also cause a backlog of drivers with the removal of two lanes here. Both options for these intersections do not actually address the reality of traffic flow and current vehicular traffic. Why not direct bike traffic next to railway and cross at 10th street to get downtown. There is simply not enough bike traffic compared to vehicular traffic to justify what is presented. I do not support this use of our tax increase to pay a huge expense for something that is not necessary and in fact would make travel (via bike or car) more challenging. I often have to travel down bow valley trail to get to work. In the tourist seasons, I often have to wait up to 5 lights to get through. This is unacceptable.

Screen Name Redacted

1/27/2023 01:58 PM

1. First if the lights are designed like the most recent road remodel, I will have to park a car or two behind the stop line to even see the light. Way more congestion, snow removal will be non existent, big trucks will find it extremely difficult to deliver groceries. 2. No change 3. Easier to bike. However, even with these lanes, there will still be people biking on the road, causing more traffic delays. Unsure why a bike lan being built removes two lanes of traffic. Maybe build it the other way if you're already spending that much money. 4. Times of arrival will always be late, especially in summer.

Screen Name Redacted

1/27/2023 02:14 PM

As my comment above, the reduction of car lanes

Screen Name Redacted

1/27/2023 02:34 PM

Will probably use Three Sister's to get into downtown and work. I'm sure the upgrades will help to unify the landscape in Canmore. It is a mish-mash of styles. On a side note, we really need a second firehall to service the Peaks of Grassi..)

Screen Name Redacted

1/27/2023 02:45 PM

At the intersections with the Shopping area there is no route for cyclists to join their lane until they actually reach the road. The interactions are bad enough at present with various vehicles and cyclists moving from one lane to another and turning left onto railway avenue needs a light phase to enable this safely.

Screen Name Redacted

1/27/2023 02:58 PM

This intersection at Main Street looks like a great opportunity for a roundabout. I'm disappointed not to see a roundabout option.

Screen Name Redacted

1/27/2023 02:58 PM

This intersection at Main Street looks like a great opportunity for a roundabout. I'm disappointed not to see a roundabout option.

Screen Name Redacted

1/27/2023 03:16 PM

These changes, along with the previously completed changes at the shops intersection will negatively impact my driving experience. They will do little to improve my walking experience, nothing to improve my cycling experience, and I do not use transit but I doubt it would improve that experience if I used it. Canmore's efforts to reengineer the shops intersection and railway avenue are perhaps noble in their vision. I presume it is to improve pedestrian and cyclist access and reduce vehicle congestion in the downtown. However, the implementation is majorly flawed. I suggest you consider the following.

1. Reducing driving access will not reduce traffic in the downtown, it merely increases congestion in other places. The shops intersection is a nightmare and has significant breakdowns at peak traffic flow periods. For example, there is not enough length for the separate lanes and they end up blocking one another (e.g. right turn is green but no one in the lane as they are trapped behind everyone waiting to go straight or left). To boot, I still have not heard a reasonable answer for why the traffic lights are on the wrong side of the intersection causing both issues with visibility and takes drivers vision further than necessary from where they should be looking (though/around the intersection).
2. Providing alternative routes/access and improving traffic flow will alleviate traffic issues. Not everyone can/will walk/drive into/through town. Provide an appealing option for visitors to town to park on the outside of town and walk in. Build increased parking capacity downtown (parkade?). Redesign the railway ave and bow valley trail to maximize flow by having two lanes and no unnecessary pedestrian/cyclist routes. Have a long term vision for moving traffic through/past downtown and onto three sisters parkway.
3. Recognize that major roads don't need, often should not be, and are often not used for pedestrians and cyclists. I for one choose to walk along quieter routes and often they are more direct. E.G. going through spring creek paths, through the backside of save-on/canadian tire, behind EP. Improve routes around town by connecting them where they are incomplete, improving them where they are in poor condition, adding them where they are warranted, and shelter paths as much as possible from vehicle traffic where necessary using distance or barricades. All this can be done without stealing space from vehicle traffic. As an additional note, sight lines for cyclists being able to see each other and other pedestrians on the roundabouts/intersections of the spring creek paths could be improved.
4. Cycling and walking in Canmore will never replace driving in Canmore. Some will walk and bike but the majority will still drive. We can support that reality rather than going overboard and giving up an unnecessary amount of driving space/flow.
5. Consider

using pedestrian/cyclist overpasses in high traffic locations such as bow valley trail.

Screen Name Redacted

1/27/2023 03:44 PM

Any safety improvements for walking and biking will enable my children, wife and I to live car-free, happy and healthy in Canmore, which has already done so much to promote active transportation.

Screen Name Redacted

1/27/2023 05:05 PM

again, a difficult plan to read as it does not indicate traffic flow. Looking at this plan, there seems to be no change to the current state. I am, however, appalled at the comments in the written plan with condescending remarks that only residents have to change their driving habits and that visitors are more likely to walk or cycle as they are athletes! This town is made up of athletes. And, no matter how athletic, cycling up the valley slopes is no mean feat and not everyone has an e-bike. This all needs to be reconsidered.

Screen Name Redacted

1/27/2023 05:20 PM

This will be a traffic nightmare

Screen Name Redacted

1/27/2023 06:21 PM

A very positive change from the car-centric design that is currently in place. As a person who both drives and walks this is a much welcome change from both transportation perspectives.

Screen Name Redacted

1/27/2023 06:47 PM

1. Congestion trying to turn into the grocery stores. Lane reduction makes it worse. If you want people to take transit or bike, you need a satellite lot for people to park at. Your not reducing the amount of people coming to Canmore.

Screen Name Redacted

1/27/2023 06:59 PM

This new design will add congestion to the already crowded greater downtown core. During the peak seasons it's nearly impossible for locals to get to the essential businesses (grocery stores, gear stores, drug stores) in an efficient manner, that doesn't involve waiting in the backlogged downtown and bow valley Covid corner. The new focus of "walking" or "transit" methodology will shift locals and TOURISTS to park in these essential areas listed above, in order to get around, thus limiting how us locals can get our essential groceries as tourists will take the very limited parking. I think a traffic study over the span of 1yr needs to be done to determine how many vehicles use this area, and if it's responsible city design to add congestion through one roadway either way compared to the two. This street is one of the busiest areas in town, and if it goes to single lane traffic... I'm not sure how essential vehicles (fire, ambulance, police) will reach all residences in this town. Canmore is a valley, and this is one of the

most important avenues in town.

Screen Name Redacted

1/27/2023 08:19 PM

1. I think having two lanes heading east in front of shoppers is a good thing. Mainstreet can back up due to tourist traffic in the summer times, this could potentially cause gridlock during the busy months. 2. Did anything change? 3. Once again, two bikes is overkill. Our tax dollars could be better spent elsewhere 4.transit is the same as driving.

Screen Name Redacted

1/27/2023 08:48 PM

All will be too compromised Not functional for level of traffic use . Ridiculous concept and waste of money just for looks...not function Nothing in it for the tax payer footing the bill ... And another huge upset for the citizens of canmore if happens despite majority saying no to this No

Screen Name Redacted

1/27/2023 08:57 PM

This seems like a terrible idea for people who live out of the town of Canmore like myself. It's not feasible for me to walk, cycle or use transit in Canmore. I have to drive. I imagine the same can be said of many visitors to Canmore and many tourists. So why reduce a main road from 2 driving lanes each way to 1? Seems to me like this will only make the already awful traffic in Canmore even worse.

Screen Name Redacted

1/27/2023 11:14 PM

I avoided bow valley trail with bike and walking before paths, walk/bike lights, and pedestrian crossing just before shops of Canmore. Now I frequent businesses on BV trail more, feel safer, and feel rewarded and appreciated for my efforts to use alternative transportation. (The big reseat thrill is the bike light and crossing lane, thank you!)

Screen Name Redacted

1/28/2023 12:55 AM

Driving - this will add congestion all seasons. With trains and confusing traffic lights for tourists it has become hazardous. Walking- not much change Biking - not much change

Screen Name Redacted

1/28/2023 01:22 AM

Won't change walking. Improvement for cycling. Serious problems for driving. Town planning must accept that vehicles are a necessity and need to accommodate volume efficiently. Stop hostile planning towards the inevitability of vehicles. No change to transit.

Screen Name Redacted

1/28/2023 07:56 AM

Already submitted, and am sure this has been considered, but am hoping there is something to prevent vehicles dangerously cutting through the rose and crown parking lot to avoid having to stop at a

red light before turning from main onto railway.

Screen Name Redacted

1/28/2023 11:13 AM

Again, add more if you'd like. But have you noticed that the railway ave/bow valley trail didn't actually improve traffic flow? It's so bad that a theory has popped up that it's a way to discourage cars and therefore encourage bikes. Whichever planners came up with an abomination such as this should be given a shameful pizza party and a new job in a quiet office where they can't do any more harm. I hear the ski resorts need lifties.

Screen Name Redacted

1/28/2023 11:31 AM

This will turn canmore into one giant parking lot. Way to take a step backwards fighting climate change, vehicle run times will be increased and emissions will be greatly increased. Canmore will now be nothing but smog and road rage.

Screen Name Redacted

1/28/2023 01:19 PM

Seriously!!! This has to be a joke. Why on earth would you go from an already 2 lane road down to a one lane..... Everyone involved with this plan needs to be fired immediately. Have you not learned anything from the absolute failure of a intersection at the shops of Canmore???? Give your heads a shake! STOP WASTING TAXPAYERS MONEY ON THESE HORRIBLE PROJECTS! JUST STOP!

Screen Name Redacted

1/28/2023 03:30 PM

Same as above. We are eliminating lanes on a road that is seeing heavy vehicle usage? This seems like the right approach? If so, I am shocked by the incompetence and blindness of town and the actual needs. By the way, the pedestrians/bikers are DRIVING to canmore from away locations to enjoy the town/surroundings. Time to get your heads out of your asses and connect with the town for a proper path forward. We have one nightmare intersection already in play. No need to completely ruin this town

Screen Name Redacted

1/28/2023 03:43 PM

1. Bottle necks will become increasing especially with the "no right turn on red" signs that have become widespread in town. I often wait while no one bikes or walks and traffic is backed up, engines idling longer, taking longer to reach a destination than previous. there is no reason you cannot turn right after looking for pedestrians and bike traffic. 2. What are the pedestrian stats for use in this area? Where will people park from out of town if they are intended to walk? Many locals that I commonly talk with avoid the downtown area currently due to the congestion created by the new intersection. We cant all afford bikes especially electric bikes to haul children in burlees in uphill to and from school day and day care etc. 3. Cycling will be

easier but there is a major cost to access. Plus its not hard to cycle here now.... Why not drive people to access downtown through the pathway network already developed in spring creek? Why are some paths not cleared in winter for good biking such as behind and along the railway near elevation place? 4. Same concerns as previous. I often go to groceries, liquor store, hardware store etc in one trip and transit it not feasible for large loads in 10% tuesday... the one offs it will work but still its not a solution to expect people to simply take transit now. My resounding vote in No. Dont raise taxes for a project such as this that will create more problems and drive more people out of downtown that it will encourage to go there due to frustrations with travel. Tourists drive here... we are a tourist town... they come in cars.

Screen Name Redacted

1/28/2023 03:56 PM

Will negatively impact driving. How does this project relate to town evacuation plans?

Screen Name Redacted

1/28/2023 04:35 PM

The left turn lane from Railway Ave onto 10th Street should be made as long as possible to avoid blocking vehicles that want to proceed NW.

Screen Name Redacted

1/28/2023 05:12 PM

The main intersection is a disaster. Is this going to be more of the same? Why make traffic even worse? This will make driving in Canmore even worse than when the main intersection was completed. I already don't have enough hours in the day to get things done because of all the bottle-necking. If this goes through, it'll be even more of a struggle for me. Move a grocery store and other services out of downtown if you want an organic approach to reducing traffic in this area.

Screen Name Redacted

1/28/2023 06:07 PM

These changes I don't think as as bad as the previous design as this road tends to be a bit less busy as many vehicles turn off/on from Main Street. I only hope that things won't back up too much if someone needs to turn left into Shoppers drug mart parking but can't as the east bound traffic is already piled up. I am a bit confused at the European style of intersections, if this is what the plan is for these intersections (a bit hard to tell from the design). I think that they just confuse a lot of people who have never seen them before (which is a lot of people as the new intersection by A&W is apparently the first in Canada). I also believe that its a bit of a waste of resources to have separate crossings for pedestrians and bikes as most people will just use them interchangeably (I know I do), if one group gets to go then everyone is going to go, why not just have one light.

Screen Name Redacted

1/28/2023 06:29 PM

Biking along this stretch is currently very unfriendly with rough pavement and potholes so much improved. I would currently avoid walking along this stretch in favour of the quieter pathway along Policeman's Creek and that may remain my preference? Water currently pools in the east corner of the Railway Ave / Main St intersection which is unfriendly to pedestrians waiting or walking that corner. In terms of driving, I think the separate right hand turning lane from Main St onto Railway Ave is important in reducing congestion on Main Street. That being said, that right turn has potential for accidents, having to watch for pedestrians on the right and traffic on the left to merge onto Railway Ave.

Screen Name Redacted

1/28/2023 06:36 PM

I don't walk down this way. There is a sidewalk that if and when I do walk it is sufficient for my walking commute. Money would be better spent building a pedestrian bridge over the trans Canada for residents Biking options are fine the way they are there are bike trails that are very adequate for getting to that area of town. If town wants to make the current bike paths better they could pave them rather than close off one lane for the vehicles.

Screen Name Redacted

1/29/2023 07:39 AM

This is a complete disaster for emergency response for egress and access to the downtown core - And yes, I know what I'm talking about (Scott Wing - I have been living here since 1976)

Screen Name Redacted

1/29/2023 07:59 AM

Firstly, what happens when there is an emergency? Where will vehicles pull off to let emergency vehicle go by???? How has this not been thought out. Also, snow removal...we already struggle with where the snow goes when roads need to be cleared in the winter. Now there will be NO where to put snow, what's the plan here?? Do you really think the thousands of city visitors coming to downtown canmore are going to plan to park and bike into town? No. They won't. There is just going to be worse traffic jams. People will still need to go through town to get to the quarry. I don't understand how this stuff isn't considered. Particularly the emergency response vehicles. This is dangerous and harmful for canmore residents.

Screen Name Redacted

1/29/2023 02:51 PM

1. This will again slow down the travel time to get my commercial vehicles through town. Snow plowing will make the lanes very narrow, and back log will happen from the traffic coming from Bow Valley Trail. This creates no area to pull over for emergency vehicles to pass. 2. no impact 3. I do not cycle 4. I do not use transit

Screen Name Redacted

Use roundabouts. They work better than all those stupid traffic lights

1/29/2023 03:22 PM

mounted on the wrong side of the intersection. In England, there is a seven way roundabout with no traffic lights that the Brits just love. They call it the magic roundabout. Think about that carefully. Plan carefully, not stupidly.

Screen Name Redacted

1/29/2023 05:29 PM

All the comments above apply. Of course, right turns from Main Street and 10th Street being held up behind vehicles going straight or turning left will only increase congestion on these roads. To get to work there may be no other alternative route to take, but it will be a deterrent for shopping at local stores. Again, just because you can make these changes, doesn't mean you should. Please reconsider before permanently impacting residents' daily lives negatively and affecting tourism with unpleasant visitor experiences.

Screen Name Redacted

1/29/2023 05:55 PM

1. Driving - turning lanes need to be long enough to not back up and obstruct traffic. Especially right turns eg. turning right at the new A&W intersection - currently traffic waiting to go straight blocks access to the right tuning lanes and right turners have to wait several lights to get through All, need more than one lane coming out of save on, a left turner will block all traffic. 2. walking - no change 3. cycling - no change. Comment as above 4. Transit - no change Overall comments -vehicle traffic is already congested here, we need more space not less. -It is winter in canmore much of the year, bike lanes and sidewalks will be under-utilized -whats going to happen when TSMV doubles the size and number of cars in our town???

Screen Name Redacted

1/29/2023 08:59 PM

Biking: Same issues as above - cars wanting to turn right into Save-On-Foods and cutting bikes off. Where do bikes go at 10th street? Too many parked cars on 10th street to make it safe for bikes.

Screen Name Redacted

1/29/2023 09:33 PM

While I do not like the way that the lights are set up as this is very confusing for people. I acknowledge that my driving experience may be worse however my walking and biking experience will be substantially improved.

Screen Name Redacted

1/30/2023 09:32 AM

See above comment

Screen Name Redacted

1/30/2023 10:11 AM

Again same as above. What will be my families evacuation route in case of a forest fire? thru that nightmare of a single lane traffic? And how about when my mother is staying with us, who is in a wheel chair, and needs to drive to the store? I don't see her being able to jump on a bike any time ever. This is an ableist plan. Please stop

Screen Name Redacted

1/30/2023 10:14 AM

This design will create such a disaster for all forms of transportation, whether it's driving biking, walking or transit. Tourists (and some locals aren't much better some times) are not use to this forms of intersection as is apparent when I use the intersection at railway Avenue and bow valley trail. I constantly get cut off, see people run lights or not go when their lights turn green because they can't see the lights. Reducing the flow and capacity of traffic on one of Canmore's busiest streets is horrible. Biking, walking and transit are not options for shopping trips to the grocery store when you only go once a week and have a family of 3 to feed. You should be looking at ways to increase flow of traffic to improve congestion. The studies taken in other towns will not translate to Canmore unless you have the same parameters. ie: snow 8 months of the year and lack of snow removal, increased volume not only thought the summer months but quite regularly throughout the year, a large senior population that don't ride bikes, and tourists that don't come to Canmore with bikes at the ready.

Screen Name Redacted

1/30/2023 11:33 AM

Putting obstacles in the middle of the road does nothing except take away driving lanes. It's a bad idea that keeps happening to the road in Canmore. It makes it dangerous for cyclists as it forces traffic into what used to be ample room for bike. Don't do it!

Screen Name Redacted

1/30/2023 01:35 PM

No impact at all, we have hundreds of trails around for biking. and I will be still drive or walking in the area. All neighbours I know they do not Cycling or walking around the town, mostly, walking and driving, when Cycling, they go to the mountains, lots of trails.

Screen Name Redacted

1/30/2023 02:02 PM

I like the effort to add bike lanes and pedestrian side walks but the balance between vehicles and bikes/foot traffic seems to far weighted against cars. You have a merge lane on 8th street which moves traffic away from Main Street currently. If you put in a "no right turn on red" light and take away the merge lane you back up traffic into downtown, plus there is no need for it. This is a case where a utopian vision is taking over from common sense. People like the bike and pedestrian improvements of the Railway/Bow Valley trail intersection but it seems as if there is a lack of appreciation for the need to still "move" traffic, eg, no right turn on red (pedestrian crossing can happen with right turn on red, happens everywhere else). The thought of one lane exiting 8th street on to Railway as conceived in this design leads me to believe that someone in roads/planning department has an agenda that in incongruent with the need to balance road/foot/bike traffic with common sense.

Screen Name Redacted

1/30/2023 05:09 PM

1 I don't anticipate any problems as this area doesn't seem to suffer volume delays. 2/3 Cycling, walking access to be vastly improved. This is currently the most treacherous part of Railway for a person on a bike as there's no place but in traffic lanes to ride. I expect to see a lot more people accessing Gateway Mall by foot or bike. Transition to downtown Canmore looks much better too. 4 I don't use transit enough to comment

Screen Name Redacted

1/30/2023 09:51 PM

Improve the walking and cycling experience. Make it safer and more convenient to not take a car. It may make driving less practical but this is what we need for change and then we can take transit if we don't want to walk or take a bike.

Screen Name Redacted

1/30/2023 10:03 PM

Great for cycling! Safer and no need for driving.

Screen Name Redacted

1/31/2023 12:21 PM

1) I expect everyone will dread these intersections more than they already do and it will become known as 'Krausert Lane'. It appears the collector lanes for left turns are far too short and there is no collector lane SE bound at mainstreet into nutters. Unlike the collector lanes in front of Shops of Canmore at 'Bowerman Corner' that see backlog beyond the collectors, there is significant space to add more turn lanes at 10th and Mainstreet. I am also concerned about the backup that will be created when a car doesn't fit in the boulevard when entering or exiting Shoppers / Drake. This is a common issue on Memorial Drive in Calgary when a car is turning left and doesn't quite fit into the boulevard to make a left turn and kills a lane of traffic, sometimes for minutes at a time. Also, what are tractor trailers that bring supplies for Shoppers and the drake supposed to do? I have seen both stores have tractor trailers in their parking lot and with the current design, they will have to drive over the boulevard. Although the boulevard is aesthetic, one long center turn lane might be much more practical. Can the fire station be torn down to make room for a roundabout? I haven't been following what that space is slated for, but a round about would be very nice. With all the space on the NE side between Shoppers and Saveon, can't there be a dedicated bus stop that would allow traffic to flow past a stopped bus and not back up traffic? ROAM to Banff does require payment and sometimes that bus sits there longer than a few seconds for passengers to quickly load/unload. 2/3) I expect a significant increase in usage - awesome. 4) no comment Overall I am excited about the changes to railway ave. great work.

Screen Name Redacted

2/01/2023 09:39 AM

Reducing lanes in this area is unreasonable given that this is a main artery into our large box stores and access to downtown. There are two existing pathway systems - one by the railway tracks and one behind the condos along the creek that could be improved substantially to enable cyclists and pedestrians in that area and keep the roads 2 lanes each direction for our high volume of cars that come into our town and use that street. Please do not do this!!! There are improvements that could be made to the area but this redesign is not the way to do it.

Screen Name Redacted

2/01/2023 10:17 AM

Same comments as question 1

Screen Name Redacted

2/01/2023 02:12 PM

Huge improvement for cycling as at the moment I don't know whether to be on the footpath or the road and swap back and forth making it dangerous for me, cars and pedestrians. I'm worried that there will still be conflict between bikes and pedestrians as it won't be clear enough for each user group to keep to their side. A lot of cyclists can travel at 20-30km/h, especially with e-bikes becoming more prevalent. We should enable these speeds with good design instead of having a design that attempts to curtail normal cycling speeds. Adding measures such as pylons, a small curb between lanes, bollards etc. would increase user experience, ease of use for cyclists, and decrease user conflict between cyclists and pedestrians.

Screen Name Redacted

2/01/2023 05:14 PM

The proposed cycling lanes are the same design as the current ones that have made cycling in town much worse. Before the old cycling lane was removed and the roads were narrowed I commuted to work and in town primarily by bike. Ever since the new intersection and pathways were put in, I found biking to be less safe, and less efficient way of getting around. I have decided to switch to driving as my primary way to get around town.

Screen Name Redacted

2/01/2023 07:16 PM

This project does not seem adapted to North America: This is not the Netherlands. Have you considered winter road conditions, the size of commercial & personal vehicles. Why would you want to recreate a European style town. In Europe the town exist for hundreds of years and the road infrastructure had to adapt to those pre-existing conditions....this is not the case here. Winters are mild in most of Europe, -35C is rare. How are delivery trucks going to travel on these roads to supply the local businesses. In Europe scooters are everywhere, is this what you are aiming? Bridges in European towns are everywhere, this is not the case for Canmore. This is a waste of taxpayers money.

Screen Name Redacted

2/01/2023 07:23 PM

Driving: again, line ups and bottle necks abound. One lane each way is not enough. I know council wants to pretty much stop us from driving but that is not going to happen. Walking: This new plan will not change my walking patterns whatsoever. I already have many paths to town and back. Cycling: As previously stated.. I can already ride to these areas safely and not on roads IN THE LATE SPRING, SUMMER AND EARLY FALL. I do not ride in the winter. What this will impact is those who do not currently own a bike, (E-bike?) to get up Benchlands trail to my home or up Three Sister's Drive to get home. Where are the subsidies? Where are the bike cages? Simple bike stands are not good enough for bikes worth thousands of dollars. Who will be keeping the new paths clean of snow and other debris? Bus: answer remains unchanged.

Screen Name Redacted

2/01/2023 07:33 PM

The bus parking outside Shoppers Drugmart is in a very useful place when doing food shopping etc. I do not think that should be move BUT with only one lane outside Shoppers and buses stationary there for some time this is going to create quite a snarl up of traffic even in quiet times. Could bus parking area there be made and the cars moved further out into middle of lane than current plan shows as a median...something to address this tight spot or bend the road over towards RBC to create space?

Screen Name Redacted

2/01/2023 07:35 PM

Might slow traffic a bit? More opportunities for safe biking and walking. I usually avoid this stretch when I'm commuting and take back paths since I don't like biking or walking next to faster vehicles.

Screen Name Redacted

2/01/2023 08:35 PM

1. Driving: No significant impact expected. 2. Walking: Proposal will greatly improve walking on the southwest side of the street by increasing the safety buffer space from fast moving cars. 3. Cycling: When heading south cycling I usually just ride in the car lanes with traffic. Proposal with separate bike lane seems much safer. When heading north, proposal would improve cycling speed by separating lane from pedestrians. 4. Using Transit: Proposal would enable me to walk on southwest side of street while heading south and then could catch the roam bus if it happens to go by. Currently I would walk on northeast side of street to be away from cars and then wouldn't have opportunity to catch bus so would walk the entire way.

Screen Name Redacted

2/01/2023 08:56 PM

Continued difficulty entering and exiting shoppers, nutters and Safeway. Main concerns are with increased congestion driving and with fewer lanes and the snowball effect this has on the other modes of travel. Increased cyclist safety with bike lanes a positive, when

used properly (ped and bikers staying in proper lanes). You can encourage walking and biking all you like but the reality that local people often need to drive due to physical limitations, time constraints, weather (6 months of winter) etc, plus visitors arriving in rental vehicles, means there will always be plenty of vehicles on our roads and limiting their ability to move through town by decreasing lanes will only cause more issues.

Screen Name Redacted

2/01/2023 09:14 PM

This intersection needs work. It's confusing for tourists and they don't know where to drive when facing nutters and turning left. The advance needs to stay on the traffic lights. It is a great way for the traffic to flow. Cutting down to 2 lanes is a terrible idea. It works great as it is. Left turn lane and going straight. If you're turning off to get groceries a slip lane is great. Turning into Shoppers Drug mart yoir not holding up traffic as there are two lanes. The traffic lights need to be normal Canadian traffic lights. That people are familiar with. And they work. Biking- same, the paths Ned to be updated, but they don't need to be wider than a driving lane. As people don't use them as they should. Just need to have paths that work and people can use. An easy straight smooth bike/walk lane is all that is needed. What I suggest before moving ahead with this dreadful plan is. The road should be cones off with traffic cone- as a "test period" and see how a full it is for everyone in town. Not to mention all the concrete medians that have to be maintained, get hit as we have snow and ice for a good 5 months of the year. And anyone that drives a bigger vehicle, as I do as I have 4 children, my husband is in construction and has a big vehicle plus trailer. Plus all the trucks that still have to do deliveries. It's just a terrible design. Trying to manoeuvre semi trucks through these little roads is ridiculous. Need to go back to the design stage and actually take into account, people drive to Canmore. From all over the world. That will never stop. Canmore is becoming busier and busier. You are just creating a headache for people that are trying to move around town. We have to go that way to buy groceries. Store owners are suffering as no one wants to go downtown now. I don't know any local that actually thinks any of these plans are a good idea. The town needs to listen to the people that live here full time.

Screen Name Redacted

2/02/2023 08:26 AM

In this area I'm mostly a pedestrian or cyclist, so I like to see what looks like separated vehicle lanes.

Screen Name Redacted

2/02/2023 09:52 AM

Same as above

Screen Name Redacted

The new bike path & walking path with be a fantastic

2/02/2023 09:58 AM

improvement, thank you. The intersections will be much safer, thank you. Please plant lots of trees.

Screen Name Redacted

2/02/2023 10:12 AM

The redesign will impact my commute to work negatively, as I must drive. Walking/biking/transit are not an option. This new concept will likely have huge negative impacts on vehicle traffic. Existing infrastructure for walking and biking are more than adequate. I drive this area multiple times a day and it is already terribly busy at times. I also walk/bike this area frequently, and it is never too busy, nor is it unsafe. This re-design is totally not needed. Many of us do not have the option of biking/walking to these areas, and it seems the Town is trying to fill a gap that doesn't actually exist. Vehicle traffic is bad and needs fixing. Bike/walking traffic is not bad and not unsafe, and doesn't require fixing.

Screen Name Redacted

2/02/2023 10:27 AM

hard to make any insights from this map.

Screen Name Redacted

2/02/2023 10:59 AM

same as above.

Screen Name Redacted

2/02/2023 12:05 PM

Please fix the giant speed bumps both mid intersection and going into the shopping centre. 10th needs better bike infrastructure to get onto the creek path

Screen Name Redacted

2/02/2023 12:30 PM

Driving, limited walking

Screen Name Redacted

2/02/2023 02:21 PM

Driving- To much traffic already for 2 lanes, new "turn lanes" not big enough locals don't bike everywhere! I live in three sisters and don't look forward to this at all.

Screen Name Redacted

2/02/2023 02:34 PM

Having more side walk space would be positive as railway avenue is a busy road and currently has narrow side walks. That being said, we should not decrease the number of lanes available for vehicular traffic on this road as that would create more backlogged traffic.

Screen Name Redacted

2/02/2023 02:35 PM

1. Like many Canmore residents, I don't have any fond feelings for the near-side traffic signals. If we are to have them, I would appreciate that the set-backs be at a distance so I can see the light better (which means more room for pedestrians, anyways!) and consider far-side signals as a complimentary addition given that we

are a tourist town and these are uncommon intersections in Canada/North America. 2. I rarely walk in this area and I don't know that the changes will affect that decision. I'll reserve the comments for those who do use the area in this way! 3. This is an area where I welcome cycling infrastructure. I have for many years avoided this area by bike as it's unsafe with my kids so we'll either ride the path behind the stores or the dirt paths beside the creek (between Shoppers & the fire hall). Options are good here. 4. I don't use transit.

Screen Name Redacted

2/02/2023 02:37 PM

This will hinder and stall vehicle traffic when there is no need for it. There is very limited bike/pedestrian traffic on this roadway. Money would be better spent on an under/over pass for either of the two railway crossings in Canmore. (I cant believe a town of this size does not have an underpass for the railway crossing on the trans Canada rail line.) Our tax dollars absolutely should not be wasted on this stupid un-needed change to Railway avenue.

Screen Name Redacted

2/02/2023 03:03 PM

When turning my bike onto Railway from 10th or crossing Railway Ave from 10th, I anticipate that I will have a safer experience. No concerns as a motorist on this section.

Screen Name Redacted

2/02/2023 04:56 PM

This plan is nuts. Traffic is getting worse and worse here and you want to get rid of lanes?? At least now it is possible to go around vehicles that are turning, with this plan traffic will be backed up behind anyone trying to turn.

Screen Name Redacted

2/02/2023 05:49 PM

1. Less people trying to double people for nothing before the other light at 10th. Traffic will be slower and safer because of the one line.
2. Walking will be better because now it's not fun to have cars at 50km/h at less a feet from you. Specialy when you have water on you at spring because of a car and a water spot. On the road side of the ford dealership.
3. Cycling will be better because of the dedicated line. I'ESS dangerous for bikers and pedestrian.
4. No big difference

Screen Name Redacted

2/02/2023 05:56 PM

Town must to remember we not all are able to ride a bike due to several physical conditions. We need safe spaces for it, I was amazed how BC has places exclusive for pedestrian which makes them safer and when you feel safe you are encouraged to use it more. By example when I had been in recovery after several surgeries I am afraid of the bicycles sometimes they expect pedestrian walk the roads to leave the spaces for them, sometimes getting off from the bus this cyclists where close to hit me and my

daughter.

Screen Name Redacted

2/02/2023 06:05 PM

1: Driving will slow me down, 2: I don't walk there. 3: There is already a bike path. 4: I don't use transit.

Screen Name Redacted

2/02/2023 06:13 PM

See above. Additionally, expecting our seniors or children to walk or ride their bikes in the snow, ice and slush, uphill and downhill when the roads and sidewalks haven't even been shoveled by the town is irresponsible.

Screen Name Redacted

2/02/2023 07:05 PM

We are DRIVERS. I'm a 25 year resident who drives for groceries from way up above Benchlands Trail. The bikes do not head the crossings at the lights at the overpass. What logic is taking two sidewalks and making bike lanes between the two grocery stores, Can Tire and all the other services and cause more traffic congestion. You can not demand that the tax payers pay for the few brave ones who would ride a bike in a blizzard -that is a grossly misused energy paying pencil pushing engineers to dream up a luscious design. Put green space that requires mainance over pavement? NO. NO. NO to this stupid waste of our taxes. Get all the snow removed in front of the garbage bins instead- in a timely manner. What a very STUPID idea. No one walks here - hardly ever. .

Screen Name Redacted

2/02/2023 07:13 PM

Don't make it a mess like the other intersection. I walk downtown all the time and tourists are totally confused . If you press the bike crossing button, the walk sign won't light. I've seen many people standing there wondering what's going on . Why the two different lights? With a train , traffic can be backed up to the hiway. That's dangerous.

Screen Name Redacted

2/02/2023 07:16 PM

1.For section 2 the main thing I would change is to keep the right turning lane (right turn on red allowed) coming out of Downtown from Main Street, it would only take one car turning left and block all other vehicles behind resulting in a car jam. I do understand that the design is to slow vehicles down but I would not go so far as implending driving as a whole. I understand that the intent is for people to take public transit or walk/bike in town but most tourist that come to Canmore still rent or drive in their personal vehicles to our town to come and visit, as a result the guest still brings a vehicle and has to get to their initial destination. Only after the person is in the town will it be possible to take public transit or walk/bike around the community. For the paths again I truly believe that two bike paths on both sides of the road a bit overkill, I would rather like to see a wide path on the

North side of the road, there is plenty of space to have an adequate bike lanes and a walking path beside to keep bikes and walkers separated like in Calgary along the Bow River. Additionally, I would ask to remove the speed hump at the entrance to Save on Foods, I have a quite low car and when I go to Save on Foods to go shopping, I scrap the front bumper of my car all the time. if the speed hump has to stay, I would like to request that it gets changed to a less steep angle. Another suggestion which is just outside the plans shown here is to lengthen the right turn lane into the Safeway parking lot or to remove it completely because the length of that turning lane is very poorly designed.

Screen Name Redacted

2/02/2023 07:33 PM

2. The east side looks like it has good, separate paths for bike and pedestrian but the west side looks a bit disastrous for a pedestrian. It's already a poorly maintained narrow sidewalk, I can't imagine adding a bike lane to it.

Screen Name Redacted

2/02/2023 07:46 PM

1. More congestion going into town. Don't use other forms of travel as I avoid going into town besides for some groceries

Screen Name Redacted

2/02/2023 10:12 PM

Again, this is already a highly congested road. Why limit vehicle traffic further?

Screen Name Redacted

2/02/2023 10:56 PM

Same here dividing roads increases the cost and time for cleaning the roads. The one-way road would be a more economical solution for these intersections and more space for trees and bicycles. Happiest local drivers who have to drive through the town every day. More money for useful stuff especially at times of economic depression

Screen Name Redacted

2/03/2023 07:39 AM

There is no need to change railway ave. there is already a wide side walk for bike and pedestrians

Screen Name Redacted

2/03/2023 07:58 AM

Loss of driving lanes has been a huge issue in the new intersection. I see the same issues here. I do like the idea of lowering the speed limit to 30 km an hour. This would be awesome in my neighbourhood of Cougar Creek.

Screen Name Redacted

2/03/2023 09:03 AM

If we were in Europe this may work, since we have 7 months of winter and only a small percentage are able to cycle. A huge waste of tax payers money.

Screen Name Redacted
2/03/2023 10:04 AM

More traffic will occur and people may be avoid driving in this road

Screen Name Redacted
2/03/2023 10:11 AM

This area is the most frequented area by car for local residents because we have to buy groceries. Please consider the convenience and livability for residents.

Screen Name Redacted
2/03/2023 10:20 AM

Not good plan for the traffic as well

Screen Name Redacted
2/03/2023 10:41 AM

My driving will be impacted negatively

Screen Name Redacted
2/03/2023 10:58 AM

People need to drive to get their shopping done

Screen Name Redacted
2/03/2023 11:48 AM

I am in favour of this improvement, especially on behalf of bicycle lane. Smooth ride through this area on bike will surely increase the bicycle traffic through the town of Canmore. It would be wise to not to close both crossing at the safe time for the construction though, to avoid congestion of intense summer traffic.

Screen Name Redacted
2/03/2023 12:21 PM

Driving will be greatly impacted and made much more cumbersome and difficult to get through in a timely manner. Walking would be fine if snow and ice are managed appropriately, which they aren't now, same for biking and I don't use transit. My thoughts about this proposal are the same as the one above. It will not make life easier for residents and will be a waste of our tax dollars.

Screen Name Redacted
2/03/2023 12:22 PM

This section as currently designed effectively takes the road from 4 lanes to 2. Their appears to be cut out turning sections however if more that one car wishes to turn, back ups are going to occur frequently. A grass boulevard also makes little sense as maintenance costs will increase year round. A better alternative would be to eliminate the boulevard and replace it with a multi directional left turn lane. The new wider pedestrian and cycling boulevards will remain but vehicular traffic will be improved. There is no question that going from 4 lanes to 3 will improve the pedestrian/cycling experience. If it is believed that going from 4 to 2 is going to make the driving experience so horrendous that people will now walk, bike or take public transit, I believe ToC is sorely mistaken. People are going to continue to drive particularly visitors from out of town. . As the population grows to 30,000 in Canmore, there will be more in town

traffic and congestion which result from decisions designed to cause congestion. No matter how hard ToC tries, this is not a quaint mountain village.

Screen Name Redacted

2/03/2023 12:28 PM

I'm all for adding bike lane here and i do not think it will impact any other form of transportation.

Screen Name Redacted

2/03/2023 01:05 PM

That area is already congested you are only going to make it worse

Screen Name Redacted

2/03/2023 03:01 PM

My only comment is I hope that traffic lights for cars will be located on the far side of the intersection and not on the near side as they are at Railway Ave and Bow Trail. I find it uncomfortable to have to lean forward and look up to see the traffic lights around the top of the windshield. It is such an unusual layout that visitors do not know where to look for the traffic lights. And there had better be a good backup system because the Railway Ave and Bow Trail intersection is so complicated that it was terrifying driving through it the time ALL of the lights were flashing.

Screen Name Redacted

2/03/2023 03:04 PM

Keep up the good work

Screen Name Redacted

2/03/2023 03:10 PM

Good thing I walk, bike or take transit. And maybe this design will prompt others to seriously reconsider their private-vehicle dependency. Critically, though, the real issue is where the heck are visitors to Canmore supposed to park?? We need an intercept parking lot or we're just going to have longer and longer traffic jams as people stop/go in their vehicles, looking for somewhere to park. Or we need a Calgary to Banff passenger train service. Or both!

Screen Name Redacted

2/03/2023 03:11 PM

1-Driving: Negatively: Well, without the right lane turns at the Rose and Drake, it goes without saying that the flow get stopped and it makes it for an unhappy drive out or into downtown.... I'm flabbergasted at all the efforts made to jam traffic in all ways possible, and spend so much money on it.... Shorting lanes here again is only good to create backed up traffic, which surprisingly, impact the driving experience negatively: the commutes are longer, slower, and enraging, especially knowing that there were two lanes once upon a time. One micro-lane, a field of concrete larger than the driving lane in the middle of the road, a bus stop in front of Shoppers/RBC, a bus stopping and dropping and picking up people.. That needs explanation on how wrong this is?? Has no one ever noticed the bus

can sometimes be stopped and waiting a few minutes in front of shoppers???

2-Walking: Neutral or Negatively: It depends if the lights get screwed up like the A&W intersection, and we have to wait 3 phases before being allowed to cross. then it would no be pleasant. otherwise, I guess the pink lane makes a wider sidewalk for pedestrian to stop bike flow too. yes, that's sarcasm...

3-Biking: Negatively with a potential pinch of positive: well there's one good thing, the only one of all the project, so we gotta highlight it: the lane (separated from the side walk, thank you) on the save-on side of the road could be nice. the path has a strange tendency to just ditch us bikers there as the entrance to save on cuts the path. a continuation could be appreciated, but no need to spend millions on it.. it's just a path. For the lights, same as above, timing. What's the waiting time gonna be to cross?? As a biker who cycles often on that road, I don't think two bike paths are needed on each side. just on the RBC/Save on side would be sufficient in my opinion.

4-Using Transit: Negatively: With the backed up traffic since the over pass/three sisters drive, it is sure a negative experience on the bus. Longer, slower, and depressing. The views are astonishing, don't get me wrong, but some people need to get to work.

5-Impact on mental health: very, very badly....

Screen Name Redacted

2/03/2023 04:05 PM

The ability to turn into Save On Foods having turned right from Shoppers Drug mart would be helpful. Unsure about the reduction to one lane in either direction here...are the bus stops moving in order to facilitate this? Otherwise traffic could be stuck for several minutes as busses load/unload. Not sure the filter lane for main street will be big enough. Great pathway, but what happens to cyclists as they get further down 10th? are they then pushed into the roadway like mainstreet after the spring creek entrance beside the rose & crown?

Screen Name Redacted

2/03/2023 04:59 PM

See above comment

Screen Name Redacted

2/03/2023 05:03 PM

Love it. It's better for all, except that the bus stops in from of Shoppers and RBC should be moved. There is a high amount of j-walking that occurs in that area. Having the stops be closer to 10th and Railway or Main and Railway would be beneficial.

Screen Name Redacted

2/03/2023 11:23 PM

Don't make any changes, it works just fine right now for walking, cycling, transit and driving. You are going to have a mess, just like you created at the very expensive and totally unnecessary Bow Valley Trail intersection. Spend the money on other more important initiatives.

Screen Name Redacted

2/04/2023 02:56 AM

See my above comment My answer here is the same

Screen Name Redacted

2/04/2023 04:06 AM

not a good use of tax dollars

Screen Name Redacted

2/04/2023 05:35 AM

Again one lane traffic? It's great your improving the entrance to nutters. Do not put in the lights that were installed on the new intersection in here. They do not work and cause more confusion than help.

Screen Name Redacted

2/04/2023 09:06 AM

1. Intersection looks somewhat better than currently. However I'm concerned about left hand turn into Home Hardware...why is there not a dedicated turn lane? With only one lane at that intersection will that not back up traffic? I assume no right turn lanes means no right turn on red...will that slow down traffic? 2. 3. Walking and cycling should be greatly improved by being separated from vehicles.

Screen Name Redacted

2/04/2023 09:48 AM

From a walking perspective: all sidewalks for pedestrians should be a minimum of 2.5 meters. Otherwise it is complicated for those with strollers, dogs, families walking together and meeting those walking towards them. Cycling and driving is suitable for the location. I look forward to the results

Screen Name Redacted

2/04/2023 09:56 AM

110 Settler Way

Screen Name Redacted

2/04/2023 12:03 PM

Again the ease of navigation with my car is important to me.

Screen Name Redacted

2/04/2023 01:11 PM

All I can see are bottlenecks. Can you?

Screen Name Redacted

2/04/2023 01:45 PM

Cycling will be improved here. Walking would remain unchanged, it's walkable now. Driving will be impacted. I don't understand why it would be going from 2 lanes to 1 lane with all sorts of medians. Who looks after the medians? Canmore Parks team. It's not super safe to maintain those medians (due to vehicles driving during the time of maintenance)

Screen Name Redacted

2/05/2023 09:03 AM

I am unsure. I already use that stretch for a things mentioned. Except for maybe the cycling. But I am ver concerned about the idea of forcing one 1 lane of traffic as opposed to the current two lanes.

Screen Name Redacted

2/05/2023 11:55 AM

I appreciate that the TOC wants to make the town more bike and pedestrian friendly. I don't understand why the TOC wants to make it impossible to drive in the town. We already have some pretty great trails. Build on that. But don't spend money removing roads, making two lanes into one lane removing turning lanes. Doing this is really just another tax on the local working-class people. Making it impossible for tradespeople to get around town makes everything cost more. I run or bike everywhere in town. Tradespeople don't have that options. They need tools parts, and materials. Chocking off all traffic flow might make more tourists walk and leave their car at the hotel and it might even discouraging tourist from coming together altogether but it is already making life here more expensive.

Screen Name Redacted

2/06/2023 10:44 AM

1. As proposed, the flow of traffic, and ease of use will be significantly reduced. Unnecessary green spaces are being installed where we could easily have more space for vehicles to move and flow(for example, right turn lanes to keep flow of traffic when one or more people are waiting to turn), both between lanes and on the outsides of the lanes. 2. Walking will become easier. However, as proposed it will be at the expense of an effective and functional vehicle traffic plan. 3. Biking will become easier. However, as currently proposed it will be at the expense of an effective and functional vehicle traffic plan. 4. It will make no difference to transit s proposed. Transit, as proposed will only become problematic for vehicle traffic.

Screen Name Redacted

2/06/2023 11:20 AM

Same as #1 above. Love the concept. Very concerned about the construction timeline and safety during that period. As this is where we do business, our hope is that during construction everything is safe & accessible. If we look at the construction time near The Shops - the level of safety for pedestrians was awful in both the summer and winter months.

Screen Name Redacted

2/06/2023 02:52 PM

Same comments: 1. Driving - this is ridiculous! It will have a major impact on my driving and the time it takes to get to work. The bus does not go to where I work therefore I have no choice but to drive. Bike you say!? - It takes me 40 minutes on a nice weather day in summer. From November to April you are saying that I should be encouraged to bike!??? So then, to get to work.... I would really need a fat bike since you expect us all to get on our bikes in winter. Or get studded tires for my old mountain bike. C'mon Town!! You want locals

to get on bikes or walk, yet on weekends and in the summer, when we have a ton of tourists, you think they will be coming by bike?? I don't know what is happening at the Town of Canmore these days. You say YES to all this development, but then you take away driving lanes on main roads!?? This is insane planning. 2. Walking - I live on the north side. The likelihood of me walking to get anywhere is very slim due to how long it takes. We are a spread out community - we are not Banff! I'm completely indifferent to the intersections if I'm walking, as it likely takes the same amount of time. Both sides of Railway Ave (the sidewalks) should be extended wider, but not into the roadways. The other way works way better. The businesses on the south side hamper this, but people in vehicles shouldn't suffer because there is a lack of a good solution on one side of the road. 3. Cycling - November to March or April, I guarantee you I am NOT biking because it's winter! Snow and ice make it treacherous for me to try and bike and I think it's crazy you expect us on our bikes all year. In summer, on my bike - the intersections won't make any difference with how I get anywhere. And just so you know - I love biking! I like to encourage biking - but this is not the way to do it. (also same comments as #2 for widening) 4. Using Transit - I don't use transit because it doesn't go to where I work. If it did, I would definitely consider it. But then of course, the poor bus is going to get stuck on all these roads trying to get anywhere! Especially in the summer! A lot of people in town work weekends due to the amount of visitors - and then you want people to use the bus on weekends to get to work, but build these roads and intersections which will slow down all the buses. The 30km/h speed limit is good, but only in certain areas. Canmore is NOT Banff. It has more residents and housing that stretches farther. You will have to really, really increase the bus service if you want less traffic because you are approving so much high density development. The residents will suffer because you can't say NO. Visitors are coming in their cars, no matter what. Are you planning a shuttle service from Calgary, Cochrane or the airport? Not that these are good solutions either. The Town needs an awesome parkade with free parking to encourage visitors to park and walk (or bike). Thanks for taking my feedback, although I know it won't change a thing.

Screen Name Redacted

2/06/2023 02:59 PM

Driving

Screen Name Redacted

2/06/2023 04:02 PM

driving

Screen Name Redacted

2/06/2023 05:00 PM

Driving wise, this concept would create alot of traffic and a lot more wait time for cars and public transit. walk wise, this concept would

assist pedestrians to cross the street without walking so far to the traffic light to cross which makes people jwalk because the distance is too far (the current road situation). Cycling wise, wouldnt be big of a problem except alot more wait time

Screen Name Redacted

2/06/2023 06:33 PM

I do not, nor will I ever be able to, cycle from my home to this area. This would make my driving slower and more chaotic. The way it is now is fine for when I can walk this area.

Screen Name Redacted

2/06/2023 09:36 PM

1-Any lane reductions/narrowing will slow traffic flow and increase idling. Also, green spaces in the middle sounds like unnecessary and may attract animals. 2 and 3- Unsure if will change much since I already use road or the already EXISTING DEDICATED bike/walk lanes along train tracks OR Bow Valley Trail. I use these 2 modes of transport the most and do not feel that more options are needed. Definitely do not like to see more idling of cars and frustrated drivers. 4-Probably more delays due to traffic congestion. Will there be more bus stops along the core, to encourage more ridership? For example, now that there is no longer 1 big loop but instead 5C and 5T, it takes long time to get across one side of town to other. Also, I mainly take 5T bus and there is only stop by Starbucks and then only main bus stop??? Instead of taking away road lanes, what about having dedicated bus/bike lane or a multi-passenger lane, and adding bus stops? Even though, the town declared a climate crisis, most projects/money spent by town do not support this declaration and seam to contribute to more emissions. If goal is to have less cars, maybe to increase bus service by adding bus stops especially main core area, and going to Nordic center and quarry lake.

Screen Name Redacted

2/07/2023 10:11 AM

Turning lanes need to be longer to accommodate more turning vehicles at main and tenth, so traffic doesn't back up in the single lane sections behind the turning lanes. the 4.5m central median is a waste of real estate. why so big? I'm pleased to see the slip lane turning right out of main onto railway removed, the existing slip lane is a pedestrian incident waiting to happen. Cycling and walking will be much better, this design would be a vast improvement to the existing narrow sidewalks. I predict driving will become significantly worse, I know that's part of the plan to encourage mode shift, but lengthening the turning lane queue space would reduce potential vehicle delays without compromising the improvements being achieved for active modes

Screen Name Redacted

2/07/2023 10:56 AM

This is very problematic to reduce the car lanes along here! In the town documents, there is an expectation of increased traffic even

when the relative share of vehicle traffic declines to accommodate more walking, cycling, and transit use. This is an important route for various trips around Canmore, and there are already occasional logjams given the railroad at both ends of the route, and the vibrant commercial sector. A car is needed over biking or walking to reach a number of businesses serving the community. I live in Runderview which is not well served by Roam transit, so I will continue to use my car to get groceries or other goods if they are larger than what I can carry any distance. I do bike and walk downtown extensively but will continue to rely on a car too. I do not see how narrowing major streets will help achieve what is envisioned. For example, I have arrived at the newest intersection connecting Benchlands/Railway Ave. with the 1A only to find I can't get into a turning lane when its light is green because the turning lane is too short and cars waiting to go straight are backed up. The same problem would develop at Railway and 10th or adjacent intersections. Finally, I would add that I am extremely concerned about what would happen in an emergency, especially once the new fire station is operating and the current one is abandoned. The hospital is also on the far side of the tracks from where so many live. While these fancy drawings make the plans look lovely but once snow and ice become a factor for at least a third of the year, then I suspect the streets will not be so walker friendly. When I walked to the hospital and explored downtown a while ago, I slipped a few times because the walkways were poorly cleared, including the crosswalk near the Bridge and beside the railroad. Use of different pavement surfaces needs to be done judiciously with our winters in mind. This will be important for those hoping to age in place. On a different matter but one that illustrates a problem outcome with traffic design, consider the Main Street/6th Avenue intersection. The intended two lanes beside The Tin Box should be widened and better marked as two lanes to allow cars turning right onto Main Street towards Policemen's Creek can turn when the flashing light is green, while the one lane beside the BMO should be narrowed (there should still be sufficient room for those turning off main onto 6th). Currently, it is not unusual for a car waiting to go straight blocks the cars from turning right.

Screen Name Redacted

2/07/2023 11:36 AM

1. Driving, reducing the lanes will increase traffic into the core in the morning and out of the core at the end of the day. With a train the congestion will continue further. Bus stops will also further congest the roads, cause drivers to become impatient= accidents. Suggestion- 2 lanes into the core in the morning, 2 lanes out of the core in the evening.

Screen Name Redacted

2/07/2023 01:13 PM

The design will greatly improve walking and cycling. Dedicated turn lanes for driving seems a great idea. I am wondering if the single

combined lane coming out of the Sobeys/Sotheby's lot will back up into that direction though.

Screen Name Redacted

2/07/2023 02:46 PM

1. Driving - Accessing the businesses on this stretch of road appears to be more difficult as lanes are reduced and traffic will be more backed up because of the reduction in lanes. 2. Walking - No change as there are already sidewalks on both side of the road. 3. Cycling - No change as there is already a cycling lane 4. Transit - I don't use transit

Screen Name Redacted

2/07/2023 06:56 PM

I don't agree with this.

Screen Name Redacted

2/08/2023 06:41 AM

As a cyclist, I agree that widening the side walks is a good idea, but take a second and actually THINK about what that means for traffic flow. Has the A&W corner not been a complete and significantly slowed down traffic and pedestrian crossing? I think you forget that people actually live here, and have for decades. Maybe take a second to consider your locals (ya know, the ones that have built this place from the ground up and not the Frank Kerniks of the world)

Screen Name Redacted

2/08/2023 06:44 AM

It will impact me greatly as Railway Ave is one of my main routes to and from work. Besides that I use the highway to AVOID the congestion caused at the intersection by A&W. This will only add to the congestion and increase travel time through town. At this time I only travel Bow Valley Trail when I absolutely have to, and I almost never go downtown any more due to paid parking.

Screen Name Redacted

2/08/2023 06:51 AM

As cycling or walking is impractical several months a year for where i live, there is no impact. I definitely think this idea is flawed when considering the need for emergency vehicles to get through. Also, the negative consequences outweigh any positives.

Screen Name Redacted

2/08/2023 06:55 AM

Same as above

Screen Name Redacted

2/08/2023 06:59 AM

Driving

Screen Name Redacted

2/08/2023 07:14 AM

This plan will severely, negativity affect driving experience. I know that's the point, but this is a part of town we're visitors and local alike

need their vehicles. Removing two lanes from an already congested area seems to me to be a mistake at this time. This plan may only marginally improve walking experience as the sidewalks are pretty good already in the area. I don't anticipate this plan improving my cycling experience. If I'm specifically riding to this area, I expect congestion and plan accordingly. I usually take the already existing bike paths along the train tracks, policeman's creek, or the river. Transit will be severely negatively affected by the reduction in lanes. My experience with transit through the area in the mornings has been an inability for the bus to keep on schedule, regularly falling 5-15 minutes behind going downtown from Cougar Creek. If I already can't depend on transit to deliver me to my destination by the time stated on the schedule, I will not plan to take it at all following these proposed measures.

Screen Name Redacted

2/08/2023 07:28 AM

Will make driving worse. No impact on walking or transit. No impact on biking since I use the path next to the tracks.

Screen Name Redacted

2/08/2023 07:39 AM

It will impact every form of Transportation

Screen Name Redacted

2/08/2023 07:43 AM

1 2 3 4 all positive, forward thinking, people oriented

Screen Name Redacted

2/08/2023 08:07 AM

Same comments as previous.

Screen Name Redacted

2/08/2023 08:19 AM

I come in from Exshaw. There is no public transit. I have already stopped shopping, banking and going to my dentist in Canmore. The town is no longer friendly to locals. These traffic impediments make it worse. It is very sad to see how ToC has alienated the locals and lost all their confidence by taking feedback this way. - too little too late. Figure out how to keep traffic moving when there are trains - don't make it worse!

Screen Name Redacted

2/08/2023 08:56 AM

really the same as above.

Screen Name Redacted

2/08/2023 09:33 AM

Do not build this mess.

Screen Name Redacted

2/08/2023 09:44 AM

1. Driving is will be a nightmare. Even more backed up than it already is! More confusion with the lights which is already dangerous. People

and pedestrians do not understand them and go when they shouldn't, get stuck in the intersection and even when you are at the stop light you can't see the colours well in bright light. You lane up in one lane so someone who is trying to turn now can't because it's so backed up. This summer the new intersection had backs ups past the highway bridge, past the traffic circle, past the railway ace intersection and down Main Street. This is going to make it sooo much worse and back up so much farther! Just think about the logical flow of traffic for one second and you'd see this. I and many Canmore locals actively avoid the shops of Canmore intersection and will get in and off the highway to avoid it. This is making the already unsafe and very busy (especially lined up when there is a train) intersection by the high school and crazyweed and Boston pizza even more unbearable. These 2 intersections have more than double my work and errand commute time so there is an environmental impact as well. I turning right at the lights on red is also a rule people can't wrap their head around since you can almost anywhere in Canada except Quebec and most of the states. Even the light at BVT and BP's by the shell people don't understand no saw a cop go thru it last week (no lights on and doing regular driving speed so no emergency). Worst idea ever. This is Canmore!!! It's winter more than 8 months a year. You keep making the roads skinnier so when pulled up with snow on the sides with bigger AB vehicles is so scary to drive. I work on one side of town and live on the other and bank in the core. I can't bike or bus with a huge wad of deposits and take over an hour of time to do this out of a business day. I'm disabled and can walk or bus or carry all my groceries far. I've lived here almost my whole life as has my family, own a home, paid the taxes for all sorts of things that don't benefit me or that I thought were stupid but this is the more idealic, impractical, ableist and waste of money yet. It's honestly driving friends and family away and we're not far behind. You are honestly ruining this town. 2. Walking. Maybe slightly faster to get around people but not really a significant improvement vs cost and effect on driving. 3. Biking. More trusting because most people still walk. I. Them and don't move over in a safe or timely manor. Is faster and safer to bike in the road. I was also almost hit in the bike lane by a car thinking that's where they go this summer. 4. N/A there is no transit stop close to my house so I do not use it You didn't listen to everyone who were fighting this even before you started the shops intersection, the even more people who complained and voiced concern when you completed it. Pleas be smart enough to listen to the actually residents who are impacted by this and drive it and live it this time. This is not a sleepy little European town. This is a busy tourist destination who infrastructure already can't handle its growth. Stop making things smaller by shrinking roads and removing parking spaces when every other place in the world would do the opposite. Everyone involved should be fired and actually bring in people that understand how to handle community growth and accessibility for everyone. You are not

going to reduce traffic. People who come here already have cars.
What you are doing is driving people away from this areas. THINK!

Screen Name Redacted

2/08/2023 10:14 AM

Same as above for all, plus there will be no more street parking for those who live on railway ave. We don't live there anymore but we used to live on railway ave and would park on the street so I can see that being an inconvenience for those who live there. With all businesses around adding time limits and fees for parking, where will those people now be able to park for free CLOSE to their homes? The only group of people this plan helps is cyclists who will have their own lane. There are already perfectly good sidewalks for those walking. The plan will impede other forms of transportation.

Screen Name Redacted

2/08/2023 10:40 AM

Please don't get rid of driving lanes it always creates more traffic. And don't make the turn lanes unnecessarily short like you did on bvt railway intersection. So many times I could have turned into the right turn lane going onto the highway but I can't because it only fits 3 cars when there was space for at least 5-6. I do really appreciate the red bike lanes but reality is summer is short and I only bike in the summer months and that will not change.

Screen Name Redacted

2/08/2023 11:33 AM

Driving

Screen Name Redacted

2/08/2023 11:34 AM

1. Slowed permanently. Increased potential for conflict/accidents as users navigate lane reductions. 2. I've found the current red path next to walking paved paths have increased conflict with cyclists and confused drivers. Diminished safety and use. 3. May cycle more on the south side of the road. Would continue to use trainside path on the north side to go behind EP, Can Tire, Save On etc, then join into downtown depending on which direction desired. 4. No impact. Expect delays. This is a very weak attempt at a survey and disappointing approach by the town. It shows no actual desire to garner feedback for potential alternatives.

Screen Name Redacted

2/08/2023 12:07 PM

I live here so I don't go downtown to walk around. Nor do I go downtown to ride a bike. This has no benefits for me, only negatives. Design also misses e-bikes. Many cities are finding the incompatibility between e-bikes and regular bikes as bad as regular bikes to walking.

Screen Name Redacted

2/08/2023 12:24 PM

I use the bike path along the tracks! Both sides of the tracks!!! Stop wasting our money and spend a bit upgrading bike/walking path

areas away from the traffic and build a multi level parking lot across from the Anglican Church. This is embarrassing and frustrating!!!

Screen Name Redacted

2/08/2023 12:28 PM

Again, travel will be much improved for pedestrians and cyclists travelling on the Shoppers Drug Mart/Drake side of the road. I believe there'll be minimal improvement on the Nutters/SaveOn side, as pathways are already quite pleasant along this stretch. As a driver, I feel strongly that right turns on reds should be permitted. There are large stretches time (i.e. after dark in winter, - where pedestrian/cyclist travel is non-existent - minimal at best and I don't understand why this needs to be a 24/7 requirement. Could there be "no rights on red from 9:00 - 18:00?". Also I think there needs to be a bus layby at the Shoppers if only one lane of traffic is permitted. I've seen the bus stop there for long periods of time, it's a popular loading and unloading spot. There will be long queues of cars behind a bus at this location. Same on other side of the street. With a few small tweaks to design I think you'd have a much better experience for all modes of traffic

Screen Name Redacted

2/08/2023 12:31 PM

1. Driving - NEGATIVE impact. The idea of bottle necking the main artery of which to access the services in the area serves no advantage to anybody, but especially not to drivers. People don't come to visit this town on bicycle - they come here in vehicles. The vast majority of people that live here don't bike/walk (especially in winter) to get groceries etc. - they drive there. People that don't have office jobs and have to get to point A to B to C in their day to day don't bike/walk - they drive. First responders have found it very difficult to navigate the new infrastructure and congestion created by famous new intersection and these plans will make all of those issues that much worse. 2/3. Walking/Bicycling - There is currently plenty of right away to widen the path system to achieve a more functional volume of traffic without shrinking the roadways with unnecessary meridians. 4. Transit - No positive impact. Intersections - Not sure what the plan is with the intersections. If the plan is to adopt the concept of the new intersection on Railway Ave. and Bow Valley Trail, then it will have a huge negative impact on all categories for many reasons, but most importantly safety. For starters, this will just add to the congestion that will be created by shrinking the roadways, but when traffic control and safety is concerned, consistency is paramount. If you have one set of rules to follow for one intersection, and then an entirely different set of rules to follow one block over, this creates confusion for not only people visiting who have never been here before, but also for people who live here. When pedestrians or drivers don't know which rules apply to which, people will get seriously injured and we've seen it happen already at the new intersection.

Screen Name Redacted
2/08/2023 01:07 PM

1/2/3/4. Stop this project

Screen Name Redacted
2/08/2023 01:20 PM

The design seems to encourage use of 17th Ave as the primary downtown corridor. This would greatly alleviate bottlenecks of left turning traffic at Main and 10th. The town could add additional signage promoting 17th Ave as “the” downtown corridor. The proposal seems to plan for additional use of the free municipal parking lot behind Home Hardware/Save on Foods. With the expectation that people will park and walk to downtown as is currently advertised. The design would make this more attractive by making multimodal travel safer/cheaper/faster. Than continued driving/parking.

Screen Name Redacted
2/08/2023 01:22 PM

1. A single lane dedicated to 3 directions of travel going SE will cause traffic to backup and make exiting the parking lots on that side frustrating, particularly during periods with heavy pedestrian traffic, as a single right-turning vehicle may have to wait through most of the light's cycle, blocking all other directions of traffic (same with those turning left, but that is relatively few vehicles). 2. Same 3. Same 4. Same.

Screen Name Redacted
2/08/2023 01:24 PM

Cycling improves, but Im OK on the path parallel to the rail line

Screen Name Redacted
2/08/2023 02:05 PM

1. This will cause increased congestion and traffic backups along Railway Ave. 2. No difference 3. Nice to have bike lane on both sides of the street.

Screen Name Redacted
2/08/2023 03:02 PM

traffic back up huge lines and always breathing in the pollution from ideling cars and trucks. Bikers who dont know rules of the road. this will cause massive congestion and a bottle neck. Name of the game is effecency this degin is anything but. ice removal snow removal will be difficult adding to the hazard of people falling and cars sliding through the intersection not to mention the massive snake of never ending traffic at other parts of railway. this degin is for bikes canmore has next to no bikes 6 months of the year. i do not aprove put a traffic circle at the rose and crown and a crosswalk at pine wood across railway

Screen Name Redacted
2/08/2023 03:33 PM

My day to day commuting patterns will be impacted by these changes, and not positively. When I am a pedestrian I am not using these areas, but, I use them to drive my vehicle and my family across

town. I foresee these changes increasing my commuting times in mornings and afternoons. I do agree some changes need to be made (and obviously the deep underground utilities will demand the roadway is repaved). But I do not think this is the right solution for Canmore. For visitors nor residing families.

Screen Name Redacted

2/08/2023 03:41 PM

I have no problem walking here the way it is. Leave it alone.

Screen Name Redacted

2/08/2023 04:16 PM

This seems like a short left-turning lane on to Main Street off Railway Ave., particularly given this leads to downtown. Going the opposite direction, having a single lane lead to the main exit from downtown will be very congested. Lots of traffic turns left here, to reach the grocery stores, and other large retailer (Canadian Tire), and traffic would back up along Main Street. This is already such a busy intersection with more traffic lanes than in the proposal, so congestion will only be worse. Having only one lane at 10 Street is also going to cause major congestion coming into or out of the shopping area to the east. Things are already backing up at times leaving the stores with a left-turn lane coming out to go south onto Railway Avenue, which will be much worse with a single lane. This will also cause issues for the buses. I do not see any advantage or changes for bikes or pedestrians. This entire project appears to be creating more congestion, not less. If the goal is for the town to have a large increase in population, and to increase tourist traffic, this is only going to get worse. As it is, in the summer locals avoid going downtown if possible, particularly during peak times, as it takes too long to get places. This is difficult for contractors and delivery vehicles. Traffic "improvements" should make traffic move more quickly and smoothly, not make it more difficult to get around. As it is now large trucks are having trouble at certain intersections. There is definitely a need to deal with these areas, but I believe this plan is contrary to effective traffic management.

Screen Name Redacted

2/08/2023 04:57 PM

For all 4, this project looks great in the 2 months of summer. But for inclement weather, especially winter, this design will become a nightmare. There is poor road clearing services at this point, and I can't guarantee that there will be no commitment to clearing these bike paths during winter months. As much as you would like people to ride their bikes year round, it just doesn't happen. We are not Holland, here. We are not the UK. We are not Germany. Those areas are where biking year round is feasible. Canmore, a winter mountain town, does not see bike traffic 9 months of the year. Expecting a mom with 3 kids to bike down from 3 Sisters in winter, on unmaintained paths, to get groceries in -31C weather is ludicrous. Seriously, stop with this project.

Screen Name Redacted

2/08/2023 05:39 PM

I like the new intersectin design and will feel much safer as a pedestrian and cyclist - though need more education and enforcement related to no right turn on red. On the flip side, the lack of 2 lanes/left turn lane to access businesses along Railway Ave (Shoppers, Esso, etc) will bring traffic to a halt as soon as someone is turning left there. It will not take long for traffic to back-up especially with volumes related to trains, etc. I can't see transit stops on the diagram for this location, but assume there is a plan to have a crosswalk across the bike paths on both sides - again, creating a hazard for passengers getting on/off as well as cyclists. I have one final comment, based on some comments I've seen on social media and in the local paper regarding pushing pedestrian and bike traffic to existing trails (Policeman's Creek and the paved path behind EP). This is not a safe solution for folks (especially females) who walk or cycle in the dark. Many would not feel comfortable walking, running or biking on isolated pathways away from roads. While walking along Railway Ave at 6am still has some risk for certain user groups, it is somewhat mitigated by vehicle traffic. If these plans were changed to remove pedestrian/bike access from alongside Railway Ave, there would be significant barriers to a large number of users in off-peak or dark times of day.

Screen Name Redacted

2/08/2023 05:46 PM

Again this seems like a terrible idea, this is the main route to the only grocery stores in town and it's going to create large traffic backlogs.

Screen Name Redacted

2/08/2023 05:47 PM

Please do not replicate the new intersection at Railway and Bow Valley Trail. The community has spoken strongly to this effect. Lane reductions will impact traffic flow in an extreme way. I believe money would be best spent on mitigating the railway crossing, if at all possible. I agree that a continued bike lane will benefit the downtown core, however as a pedestrian, cyclist and driver it is nearly impossible to commute to work through this area by vehicle as it is, and for those of us that have to drive to the downtown core this creates yet another barrier.

Screen Name Redacted

2/08/2023 05:53 PM

Driving. Loss of driving lanes will increase traffic congestion causing longer commutes, more idling thus increased air pollution and noise. As a retired truck driver, I believe access by delivery trucks to some businesses will be difficult if not impossible. 2. Walking. It seems the walking paths are in most cases sufficiently separated from bike and driving lanes. 3. I think that this plan will improve movement for cyclists. However, if the goal is to make driving so distasteful as to get more people to use bicycles, I think you have missed the mark.

Cycling is not for everyone especially during our long winters. Studded bike tires are not a safe option, especially for seniors. Also, a car is often necessary for errands to businesses along Railway Avenue. For example, weekly grocery shopping and many purchases at Canadian Tire or Home Hardware cannot be transported by bicycle or public transit. 4. Public transit. I believe the increased traffic congestion due to lane reductions will impede the timely flow of both local and regional busses.

Screen Name Redacted

2/08/2023 05:59 PM

Emergency services- EMS/RCMP/Fire are unable to get through if it's single lane with any sort of median

Screen Name Redacted

2/08/2023 06:03 PM

Please don't mess with it anymore. You help pedestrians but residents who live here all year round hate it

Screen Name Redacted

2/08/2023 06:10 PM

The town has too many signs and too many traffic lights - these slow everyone up.

Screen Name Redacted

2/08/2023 06:18 PM

The random islands in the middle of roadways only add to congestion and make snow clearing and road cleaning much more difficult. Pedestrians will notice no difference whatsoever. Cycling is improved however there's a very real chance that the widened sidewalk and cycle track will be used as a roadway as we've seen in the past! This design of intersection adds nothing but confusion. People don't know where to stop, run red lights and multiple other interesting things on a daily basis!

Screen Name Redacted

2/08/2023 06:42 PM

Again. We need grade separation on the railway crossing for any of this to function effectively. If this isn't in the plan it is destined to be a disast

Screen Name Redacted

2/08/2023 06:44 PM

This will back up traffic past EP if anyone wants to turn left into any business on the fire hall side of the road with the extra traffic in town during summer and be absolutely useless during winter. Do not go ahead with these changes, the A&W intersection backs things up far enough and with all the headaches of getting it working "properly" is ridiculous to consider making others like it!

Screen Name Redacted

2/08/2023 07:04 PM

1. Ridiculous, would cause much more congestion. What is the benefit of adding a median except for causing more congestion and longer commutes. 2. Same as it currently is 3. I don't cycle, a lot of

people don't 4. congestion, longer commute

Screen Name Redacted

2/08/2023 07:34 PM

1. will it be harder to get off mainstreet onto railway if there is only 1 lane to turn on to? Tip20 intersection can take a LONG time to get through pending when you hit the lights so I'm hesitant to think that putting that type of lighting system into this intersection or the one by the firehall is necessary. If folks are turning left into shoppers, will it back up traffic at the main street intersection if there's only 1 lane and cars can't drive around? 2. again, nice to have some separation between vehicles and pedestrians. also lower chance of getting wet if there are puddles 3. dedicated bike lane is nice, I personally tend to use the bike paths that already exists so I'm not sure this is necessary 4. has a pull out for the buses been considered? or will ++ vehicles have to wait behind numerous buses (Shopper's is a busy bus stop!) even if there are fewer cars on the road (which is moderately possible but not super realistic with all the tourists we get), there's a big push to encourage bus usage, so we can only assume that will get busier and perhaps cause more back ups in traffic if there is only 1 lane and no go around

Screen Name Redacted

2/08/2023 07:54 PM

Don't want any changes

Screen Name Redacted

2/08/2023 08:42 PM

I don't have any issues as is. I walk, drive and cycle frequently on this stretch. No point changing it. Don't think it will impact enough to be worthwhile. I do wonder if the town is subtly encouraging us to x-country ski or ice skate as an alternate means of transport. My street has nearly been suitable for skating all season and is certainly good enough to ski on. Walking however, proves treacherous without spikes. Could have been avoided by plowing immediately after the one time it has snowed this year. Thanks for your consideration!

Screen Name Redacted

2/08/2023 08:54 PM

This is complete garbage. We don't need 1 lane traffic, and massive bike.lanes! Wasting tax dollars to make things worse!

Screen Name Redacted

2/08/2023 08:57 PM

Or sure on the centre mediums. Hopefully it will deal with crowning and create a safe walking, ok'ing experience and flow traffic better. It's hard to see on the concept drawing.

Screen Name Redacted

2/08/2023 09:22 PM

This will make me more likely to walk or bike downtown

Screen Name Redacted

2/08/2023 09:33 PM

It doesn't make sense to fill the middle of the road and give up driving lanes unnecessarily. The huge extensions past the sidewalks just make it hard to turn. In the winter drivers can not see the concrete due to the snow and drive over them, as they are not normal anywhere else in this area. And I hope you will not change the street lights like the Shops of Canmore intersection as they are too close and if you pull up to the stop line you cannot see the lights.

Screen Name Redacted

2/08/2023 09:45 PM

Is the light grey in the middle of the road for pedestrians? This does not make sense; if it is a median, does not help move traffic out in an emergency egress situation; on my block in south Canmore we have over 50 residential units with over 50 cars; how our block alone leaves in an emergency I cannot imagine; all the cars in south Canmore trying to leave along with tourists in an emergency; the barriers that medians and narrow roads create does not make sense to me. Also please consider NO e-bikes on bike lanes in populated downtown areas; people use these e-bikes like motorcycles; some of the bikes weigh 90 pounds with tourists using them who have never ridden an e-bike; no motorized bikes should be allowed on downtown streets; last summer 2 tourists in their late 60s were on rented e-bikes , their first time, trying to ride down the hill next to the water plant - needless to say they crashed. I have seen tourists rent e bikes and ride on the sidewalk in downtown Canmore with their Grandmother on the back - they both were yelling for pedestrians to get out of the way as they did not know how to stop fast enough.

Screen Name Redacted

2/08/2023 10:02 PM

Reducing lanes does not "calm" traffic! It crates parking lots!

Screen Name Redacted

2/08/2023 10:07 PM

1. Driving - I like the idea of only 1 lane of traffic in each direction for the most part and the separation between lanes. I also like the dedicated turning lanes. Driving will feel safer. 2. Walking - The separation between the road and the pathway will be a big improvement on the town side. It will be great to have a good walking path between the two blocks on the commercial side of the road. 3. Cycling - A big improvement in both directions, having the dedicated bike lane on both sides of the road. 4. Using transit - should still be fine.

Screen Name Redacted

2/08/2023 10:34 PM

Make it more interesting to walk down railway ave .

Screen Name Redacted

2/09/2023 05:52 AM

Reducing driving lanes on an already congested road in the busy months is ridiculous.

Screen Name Redacted

2/09/2023 06:43 AM

1. Getting through town is a nightmare. I have to drive cause I can't walk my tools and material to different jobs. The first intersection is really pointless and just made it unbearable to live here while it was being built and now the town wants to do two more only a block away from each other. I hate it. This town loves building unnecessary stuff that helps with nothing and just causes confusion and frustration

Screen Name Redacted

2/09/2023 06:59 AM

Increased wait times at intersections. Will avoid use when possible as with Railway Ave and Bow Valley Trail intersection. Building obstacles in the roadway is a waste of limited public space. Best case to leave as it currently is.

Screen Name Redacted

2/09/2023 07:06 AM

Driving - Again it looks like getting cars out of town will be very very hard if there's no right-hand turning lane coming out of Main Street onto Railway. I would think you'd want to keep cars moving out. The left hand turning lane into Main Street also doesn't look long enough. We'll be trying to go to the grocery store and end up waiting for the left turners for ages before we can get through (and I'm sorry but you need to let people drive to the grocery store for accessibility). Biking and walking looks great, same winter concerns with accessibility. Walking to get groceries is only something someone super able bodied can do so you will need to accept that cars need to get to the grocery store. I'm fine with discouraging them from downtown. Bus - Are there pull outs for all the bus stops? I'm not seeing them, they're going to be so important if the street is one lane. And will the bus stops have large covered waiting areas, especially by the grocery store? You're going to need to make taking the bus a really pleasant experience if you want to reduce car traffic. It's going to be hard to both create a town where normal people can't afford to live and expect all the uber rich to take the bus, let's face it. Overall, I'm confused where out-of-town visitors are supposed to park to use all these reduced car roads and walking/biking/transit. Right now they're encouraged to park in elevation place or the downtown parking lots. But given this design, it's going to be a nightmare to get to those places. So where are they being flowed to park before they hit this "we don't want cars" zone? I like the idea of reducing traffic in the community but the reality is that the only way to get to Canmore is by car, so they will need to put their cars somewhere when they get here and that will need to be between the highway and this new design and well marked with a bus hub. So where's that plan? I just don't see this working otherwise except to frustrate everyone.

Screen Name Redacted

2/09/2023 08:38 AM

Biking and walking will be improved. Transit and driving relatively unaffected

Screen Name Redacted

2/09/2023 08:57 AM

Town of Canmore is increasing density with more Downtown housing and short rental for tourists. This mean more traffic (people don't come from the airport or Calgary by bikes) and it will be more difficult for locals on the north side of TCH to come downtown for their needs. If you look at the demographics, a good portion are seniors or younger families where using a a bike in doing their chores is an option. This project doesn't make sense to the average Canmorite and should be part of the next election agenda or we need a public publicite before pursuing.

Screen Name Redacted

2/09/2023 10:02 AM

I support this change as it will make it safer for me to walk and bike here.

Screen Name Redacted

2/09/2023 10:15 AM

Not needed. Waste of our tax money. Invest in affordable houses. Not bike lanes.

Screen Name Redacted

2/09/2023 10:28 AM

I can see the traffic backing up now. I understand that it if You "add a lane" you'll encourage more drivers. But we're in a unique situation where our volume of visitors is extremely high, and they're not visiting with the mindset of using their bikes for everything. As for traffic, the bottleneck creates a stressful scenario with congestion and confusion. Lastly, I may have missed out on this, but the parking is a constant burden. For my staff and myself. No one I schedule works 3 hours. Not everyone is able to ride a bike every shift. People work hard to make this town enjoyable for those visiting. It seems like they're all taken for granted. Want to go to Kananaskis, pay for a pass, Banff... pay for a pass. Come into town pay for a "pass" (parking). I understand some of this is out of your control, but at a certain point I'm having a hard time convincing people why they should stay in town or even myself at times. All because of the....mountains...? ♂ Thanks for your time in reading this rant. I hope it didn't come across to agressive. I'm sure you're hearing lots from the community as the temperature seems to be rising around these issues.

Screen Name Redacted

2/09/2023 10:55 AM

Same thing: - left hand lane to Main street too short - reducing number of lanes makes no sense - all the islands of green are waste of space, will require maintenance meaning putting people in the middle of a busy traffic road - hazzard - coming south to the 10st intersection - again not enough lanes, right hand traffic will be hindered and will need to stay in the same lane as traffic going straight, less cars will get thought, people will have to wait longer,

getting more frustrated and anxious = more potential for accidents than calm drivers that will get where they want in time. - just one lane for getting out of downtown going left/straight/right? And I assume right hand turn would be forbidden there as well? This can't be serious. - another example of adding bike lanes at whatever cost in a bad way I am very unsure who are you targeting with this so called improvements but it ain't the people that live in this town, pay its taxes and work in this town. All this is just a turn for the worse. Unless your design improve the traffic for EVERYONE, they are no good.

Screen Name Redacted

test

2/09/2023 11:03 AM

Screen Name Redacted

Test

2/09/2023 11:06 AM

Screen Name Redacted

This configuration does not recognize that the flow of vehicular traffic is currently overwhelmed at key points during the day - the resulting overflow and backing up of traffic onto Bow Valley Trail and other roads should not overwhelm these routes of travel. Furthermore, the issue which exists is that drivers not familiar with where they are actually traveling will create further and more substantial snarls or blockages which will further create accident potential and restrict emergency access. Other methods of transportation such as walking and biking are already supplied with a network of trails that connect the full length of Railway Avenue.

2/09/2023 11:24 AM

Screen Name Redacted

Same as above. The path along the railway provides a nicer way to move along railway ave.

2/09/2023 11:43 AM

Screen Name Redacted

RAILWAY IS ALREADY CONGESTED.. THIS IS A BAD IDEA!! I DONT CARE ABOUT BIKE LANES & PRETTY FLOWERS.. THIS IS NOT AMSTERDAN FFS!

2/09/2023 11:48 AM

Screen Name Redacted

In general my comments are the same as for diagram above. There are of course a couple of intersections here which presumably will be designed to slow down vehicle traffic and give priority to bikes and pedestrians, even if there are very few. There is no detail as to what the space consuming boulevards will look like but it appears they are just concrete which will result in a very industrial look, or perhaps there are plans to plant grass or shrubs there, which would be better, until budget cuts result in there being just a field of weeds. The City has proven conclusively through our collective lived experience at the

2/09/2023 12:21 PM

Bowvalley Tail and Railway Ave intersection that when it veers out of its lane into social engineering (or even major construction projects) that only frustration will result. It might be a good idea to take the many millions of dollars and decades of construction frustration that this plan would result in and direct them towards something that will have a positive result, such as low-cost housing.

Screen Name Redacted

2/09/2023 12:33 PM

Same as above.

Screen Name Redacted

2/09/2023 12:43 PM

Exiting Main street, not having a dedicated right hand turn looks like a poor decision. How it currently is, is an easy way for traffic to flow out of town. Without this I feel there will be unnecessary backups (which leads to unnecessary idling cars contributing to our emissions). There are a lot of cars that flow through here. I don't see any other major issues. Walking, the improvements to the exit out of Nutters complex is great. I often walk along here and it doesn't feel the safest as there isn't a defined sidewalk. As this sidewalk continues to the west, it also is a good improvement as this section currently feels very disjointed until you cross the first driveway entrance into the Save On parking lot. The crosswalk (running parallel to Railway) at 10 Street on the north side of the road is an improvement. People are often not stopping at the line, but across the crosswalk, I have almost been hit here by a car that did not realize they were driving across the crosswalk when they had a red light. Walking south of Railway, it is great to have more separation between the vehicles and pedestrians. In the winter, I often do not like walking along here as there is almost no definition between the roadway and sidewalk and the sidewalk is quite narrow. Cycling will be an improvement with these paths. I live on the south side of Railway, by Safeway. I currently come back to my home via Spur Line Trail as I don't want to have to ride my bike west on Railway Ave and be right on a busy road, turning left into my townhouse complex. Transit, if there will still be a bus stop outside of Shoppers, then there should be a pull in spot for the buses. This is a heavily used bus stop. I have seen buses stopped there for multiple minutes. I have also seen multiple buses stopped there. This would be poor planning to have cars back up behind a bus, that is stopped on a major traffic corridor, due to there being only one lane. If we are to take our climate emergency seriously, we also need to consider minimizing idling vehicles.

Screen Name Redacted

2/09/2023 12:45 PM

As previously stated, Railway Avenue is a main avenue which leads to the most important and busiest shopping district in Canmore. People drive to get groceries, to shop at Canadian Tire, the hardware store, to exit the townsite and to enter the townsite. For this reason I do not comprehend how reducing this roadway to one lane in each

direction, with a turning lane to add bicycle lanes is feasible. Traffic would get even more congested than it already is. Something that seems to be omitted from the communication, is a description of how the traffic lights would operate. This is something that was also omitted at the presentation for the traffic lights on BowValley Trail and Benchlands Trail. This is important information which might help to clarify the concept. I ride my bicycle all summer. I will not ride on Railway Ave because there is a perfectly good bike lane behind the businesses. I would much rather see that lane at the back, along the fence by the railway track, widened and properly developed for bicycles and pedestrians. The side walks along Railway Ave. could be widened slightly for pedestrians.

Screen Name Redacted

2/09/2023 12:46 PM

Eliminating lanes for driving will create unnecessary bottlenecks and slow down traffic. When I am riding my bike I use the path behind Save on Foods, or the path along the creek behind the fire hall. When I am walking I use the path behind the fire hall along the creek. I don't use the public transportation.

Screen Name Redacted

2/09/2023 01:03 PM

Shops of Canmore intersection is a complete disaster. Please do NOT do this, will make a bad situation worse.

Screen Name Redacted

2/09/2023 01:15 PM

My use of downtown is typically limited to work or grocery shopping I rarely come downtown for other reasons as the town has become overrun, from a driving standpoint I expect the proposed work will add significant delays, even with 2 lanes wide the traffic backs up now and dropping down to 1 lane will only make things work. I feel while the goal is to give each segment of travel style there own space the foot and bicycle traffic are being given way to much space at the expense of day to day traffic (Canmore Workers) and goes unused a large portion of the year due to weather. The 10th & railway Intersection if similar to BVT & Railway is way bigger than it needs to be, I also don't feel the light placing works, while it does force drivers to stop further back giving pedestrians and bicyclist space, routinely cars are still in the intersection when the light has gone red because they have to drive so far to clear the intersection. Also you cannot use your visor to block the sun out, if you do you cannot see the light change, all small items but they do cause increased probability of accidents.

Screen Name Redacted

2/09/2023 01:16 PM

weather. The crosswalk proposed at EP I suspect is going to cause a significant bottle neck My use of downtown is typically limited to work or grocery shopping I rarely come downtown for other reasons as the town has become overrun, from a driving standpoint I expect the

proposed work will add significant delays, even with 2 lanes wide the traffic backs up now and dropping down to 1 lane will only make things work. I feel while the goal is to give each segment of travel style there own space the foot and bicycle traffic are being given way to much space at the expense of day to day traffic (Canmore Workers) and goes unused a large portion of the year due to weather. The 10th & railway Intersection if similar to BVT & Railway is way bigger than it needs to be, I also don't feel the light placing works, while it does force drivers to stop further back giving pedestrians and bicyclist space, routinely cars are still in the intersection when the light has gone red because they have to drive so far to clear the intersection. Also you cannot use your visor to block the sun out, if you do you cannot see the light change, all small items but they do cause increased probability of accidents.

Screen Name Redacted

2/09/2023 01:41 PM

I have the same concerns as above for the intersections and roads being blocked by peeps trying to turn left. As well, without checking carefully, it looks like there are now places where we can't turn left into or out of thus making us need to drive cars and/or bicycles further thus contributing to more pollution and carbon dioxide production - the opposite of what this is supposed to accomplish. The one lane setup means that the on street parking is removed making it even more difficult for peeps with oversize vehicles to find a parking spot even temporarily. In my opinion, both this plan and the existing new intersection have been designed for bicycles with little to no thought of how this really works for pedestrians or vehicles - which will be with us for many years to come.

Screen Name Redacted

2/09/2023 01:46 PM

same as above with these additions: it looks like we won't be able to turn left into or out of some entrances meaning we will have to drive our vehicles further thus contributing more to pollution and carbon dioxide production - the opposite of what we are trying to achieve. As well, the one lane each way design appears to have removed all on street parking thus making it more difficult to find parking for oversize vehicles, etc.

Screen Name Redacted

2/09/2023 03:55 PM

Same issue with the bike/pedestrian lanes. If bikes are to be seen as road use vehicles, this contradicts that and becomes an issue for pedestrians. The fact that the bike/pedestrian paths are not consistent as per the cross section images could cause issue.

Screen Name Redacted

2/09/2023 04:36 PM

The Town has created an area where all residents need to go to for grocery shopping by having the only two grocery stores side by side. I will not cycle in the winter primarily because it's too cold, but also

because of the terribly icy roads and trails from my home in the Homesteads. I have tried to walk in the winter and nearly fallen hard, again on the poorly maintained icy roads and river trail. Transit is not readily available to me because the nearest stop is 1 km uphill, again on icy roads and sidewalks. Therefore, I must drive my car to the grocery stores, both of which will have access restricted by this new design. Please consider the demographics of this town. Many of us who were non-permanent residents for many years can now finally afford to retire here. In winter conditions that exist for a good portion of the year, seniors should not be expected to ride bikes or walk on these icy roads, trails, and sidewalks. Transit has limited accessibility in the majority of neighborhoods, and I cannot safely or comfortably carry groceries 1 km downhill from the nearest stop to my home. I accept that I live in a mountain community where I have to use my hybrid or electric car to get groceries and run errands for most of the year. Why can't the Town of Canmore accept this?

Screen Name Redacted

2/09/2023 04:45 PM

If you are attempting to restrict access, and increase travel times for emergency services such as K-Country public safety or residents accessing the only grocery stores in town this looks like a good way of doing it....

Screen Name Redacted

2/09/2023 04:50 PM

Please do not reduce traffic lanes on Railway Avenue. My feedback is exactly the same as what I commented in the section on Railway Avenue between Elevation Place and Main Street. I will add something regarding the two new planned intersections: I have no problem at Railway intersections (at Main St. and at 10th) to safely cross the street as a pedestrian or safely drive through. Redoing these intersections in a "fancy" way will affect me in that my tax dollars will be spent on something I don't see the need to change.

Screen Name Redacted

2/09/2023 05:03 PM

living in the MD of bighorn requires me to drive into canmore daily. I cannot bike to town and I have no secondary destinations to go to even if they were walkable. this seems like it would make my commute much less pleasurable

Screen Name Redacted

2/09/2023 05:03 PM

Again, I see no apparent significant advantage of this design to the existing design walking, cycling or using transit. However, by restricting the driving lanes in this area, it will greatly increase transit times through the area as has the new intersection at Bow Valley Trail. Is there any real purpose to eliminating a driving lane ove much of the area? This expenditure is not warranted.

Screen Name Redacted

2/09/2023 05:39 PM

Same comments from above. I do not approve the intersection design and if you narrow Railway Avenue you are creating the same bottleneck that occurs regularly on Bow Valley Trail.

Screen Name Redacted

2/09/2023 05:55 PM

1. Driving: My driving experience will depend on how these intersections are structured, whether there will be restrictions on the standard practice of turning right on red, etc. In general, my view is that anything that impedes traffic flow in these areas will negatively impact the driving experience and the resulting gridlock will, in turn, negatively impact the walking and cycling experience. It seems to me the only solution to too many vehicles in town is to provide intercept parking within a reasonable walking distance from downtown, or build a parkade to collect the vehicles. No amount of encouragement to ride bikes or walk will help people arriving in Canmore from out of town - they need a place to leave their vehicles. As mentioned in relation to the Main Street intersection, the left turn lane from Main Street onto 10th Street looks quite short, which could back up traffic along this stretch of Railway and back through the other intersection.

2. Walking: This area of town is very utilitarian, so any walking I do is simply to access the businesses I need - I'm not out for a pleasant stroll in this region. I imagine my walking experience will be unchanged.

3. Cycling: I ride my bike a lot in the summer, but I always choose to ride on the beautiful forested pathways that already exist in town, or along the path by the railway tracks, rather than beside traffic on the roads. A dedicated bike lane on the road next to traffic won't change this preference. I expect I will continue to use the other paths in town, rather than the road-based bike lanes.

4. Not applicable.

Screen Name Redacted

2/09/2023 06:21 PM

This is even worse than the last section and a complete waste of money. If we need to promote more pedestrian / cyclist traffic in Canmore we should first look at the problems that currently exist in Canmore.

1. One lane traffic backed up for 1km of the new intersection that we had created. This is in the down season and if a train comes through town, the back up becomes 2kms

2. Families crossing the hiway. Young girls being struck! Build an overpass for people and bikes.

3. No free parking lot to assist the tourists that NEED to drive here and spend their money. Good thing we want to allow people to camp for free and pee in my front yard when they get up. Guess that makes it a nice place to visit. Please consider the choices that are being made now. As they are expensive and do not fix any issues. They only affect the traffic flow and tourists will not want to come back if we do not start thinking about their experience while here.

Screen Name Redacted

2/09/2023 06:51 PM

This is an evacuation route. It is also a route that semis that service the grocery stores/Can Tire use. It is also a main route for the trades to connect to the shops on the other side of Safeway. I must use my car to access the stores. It would not work for me to walk or to use a bicycle. Stop putting obstructions in the roads used for evacuations. I hate this plan. Never-mind the terrible stoplights that will slow traffic. The town is not just a pedestrian zone. It must work also for seniors who use their vehicles, workers, access for our food. This plan addresses none of what I have talked about. Please Stop! I am a senior with asthma and covid is not finished for us. I am not getting on a cramped bus with a bunch of people not wearing masks! Science demonstrates that it is not enough for you to wear your own mask when in a cramped situation where no one else is. You entirely ignore seniors with your plans. Stop!

Screen Name Redacted

2/09/2023 07:30 PM

Same as aboce

Screen Name Redacted

2/09/2023 07:31 PM

This will cause gridlock in the downtown core when summer traffic returns. This will impede emergency response vehicles by not having sufficient room to move vehicles over. This will increase little used infrastructure for a town that is spreading east - as in needing vehicles to shop. This will kill the downtown core. 1. I will drive slowly to impede traffic.I will need to circle the block as you have ineffective left turn lanes into Shoppers. 2. I live in 3 Sisters so will never walk here. 3. I will never bike here during 8 months of inclement weather per year. 4. I will never use transit as it is unreliable and my time is worth money that I need to live in this town.

Screen Name Redacted

2/09/2023 07:42 PM

The median boulevards are going to be a very nice addition to the visual experience of this area whether driving, walking or cycling. Great idea...I am not a fan of the extra wide bike lane + sidewalk sections unless the sidewalk sections include a gravel part for the walkers. Walking on pavement or concrete is really hard on the joints - you will understand in a few years if you are still under 40...

Screen Name Redacted

2/09/2023 07:49 PM

Same as above. I'm an avid cyclist and I've lived in the valley for 30yrs. We don't live in a climate that is conducive to biking everywhere all year round. Cars are the main mode of transport for 90% of the community. Paid parking and narrow slow roads only make it slower to get around town. Stop catering to tourism and money. we live here too.

Screen Name Redacted

I believe the most impact would be for driving. Reducing the already

2/09/2023 09:02 PM

congested 2 lanes to 1 would have negative impact. I believe we can be safe with bike lane on only side of the street as oppose to bike lanes on both side of the streets

Screen Name Redacted

2/09/2023 09:20 PM

This will definitely be an improvement for walking and will actually give people space to ride, something that's lacking now. I think it will be more equitable. Canmore needs to make it easier for people of all ages to get around under their own power, especially with streets being much busier than they were when it was a small town.

Screen Name Redacted

2/09/2023 09:59 PM

A major concern I see and that I've heard mentioned numerous times is where will emergency vehicles get through? With a narrowing of lanes and new medians it seems there isn't room for vehicles to pull off to the side and allow them through. Unless they're supposed to share the bike lanes as well. In that case they'll have to run down distracted pedestrians with the cyclists. I'd love to know who's getting a kickback on implementing this new system. The number of near misses I've seen with traffic at the new intersection is astounding. Running red lights, turning right on the red arrow into pedestrians, stopping across crosswalks. Infrastructure upgrades are a necessity and long overdue, however, this seems the wrong way to do it. A tourist town already near bursting is not the place to experiment with new traffic systems.

Screen Name Redacted

2/09/2023 10:31 PM

It's already a very busy stretch of roadway so reducing vehicle lanes would create more congestion. Most locals drive cars and the vast majority of tourists prefer to drive around town. Of the few are that park their cars they walk or cycle only in summer and fall during peak tourist times. The rest of the us need to use cars to get to work, grocery shop, take kids to school and practices. Congested roads due to train traffic is bad enough but reducing major thoroughfare lanes is a mistake.

Screen Name Redacted

2/09/2023 10:33 PM

Canmore has grown ten fold and has significantly higher tourist number from when Railway Ave was rebuilt in the late 1970's. How could anyone suggest that making the road narrower and able to handle less traffic possibly be a wise idea?

Screen Name Redacted

2/09/2023 10:50 PM

This plan will negatively affect my driving travel. The loss of the right turn lane from Main to Railway will back up traffic onto Main street and be a problem. This plan will not affect my travel by walking. This plan will improve cycle travel slightly with the extra cycle paths. However, I will still likely select the pathway beside the creek from the

fire hall to the "big head" instead of using the path in front of the Shoppers Drug Mart for eastbound travel. This pathway should also be improved. I am unsure how this plan will affect transit. It does seem from the plan view and the cross section views that there is ample space on the north side that could be utilized and that the cycle paths could be added and the current 2 lanes each way on Railway Ave could be preserved. I sincerely hope that the traffic light placement will not emulate those at the new intersection next to A&W. This was a disaster in planning and even after several attempts by the town to fix the sightlines, I am still not able to properly see the traffic lights from any of the different types of vehicles I have driven through the intersection.

Screen Name Redacted

2/09/2023 11:03 PM

This section is currently challenging to navigate by bike and unpleasant to walk. Separate biking pathways and enhanced sidewalk will greatly improve these modes of travel. Not sure about the medians. May see pedestrians using them to cross the road and I question the ongoing maintenance of medians and snow removal

Screen Name Redacted

2/10/2023 12:19 AM

Again, this is an example of where motorized are being hammered. Why drop the lane? What's the actual purpose? Not everyone can commute by foot, by bike or by transit. Canmore is still a destination arrived by vehicle transport. Some might choose ROAM, bike or walk, but dropping the vehicular capacity is a disaster in the making. I'm all for greening Canmore, but the Town's already made it tough to park downtown with the parking program and the seasonal Main Street closure. Add in more traffic challenges, (the right hand turn at the Wood is another example). I'd ask the Town this simple question, what are you attempting to do here? It's already a challenge to drive around downtown Canmore. Please, save the tax dollars, re-pave these roads, add some trees, but please, do not remove any lanes for traffic, you'll only compound the tensions felt by many in the community that Administration simply looks at make work projects.

Screen Name Redacted

2/10/2023 09:52 AM

Clearly there will be more issues with vehicle traffic with these changes. This is the main artery into our town. We have many out of town visitors who are driving to come here. For locals, our climate is not often "cycling-friendly". I believe most of us who live here are happy to ride bicycles or walk as much as possible. However, being in a car is more more comfortable at -20C. Please reconsider this proposal.

Screen Name Redacted

2/10/2023 10:42 AM

Driving: Turning left into the Drake and Shoppers will hold up traffic.
Walking: No change. Cycling: Does not need to be on both sides. I

only bike in early spring to early fall. Transit: Do not use. Comments: I think this will only add to congestion.

Screen Name Redacted

2/10/2023 10:42 AM

1. I don't anticipate any change in travel experience when travelling in a vehicle. 2. There will be more space to walk, especially on the west (Drake / Shoppers) side of the street. 3. We are grateful for designated space for people riding a bike on the west (Drake / Shoppers) side of the street. When riding with our children in the chariot currently, we have to actively avoid this area, as there is no safe space to ride. 4. Using transit - no impact to current service / availability.

Screen Name Redacted

2/10/2023 11:04 AM

I have been a resident of Canmore for over 40 years, I walk, bicycle, drive and have even cross country skied down main street. I have children and grandchildren who live in Canmore. I am dismayed and concerned about the "improvements" that are being proposed for Railway Ave Central for actual functionality AND safety. There are numerous obvious places where traffic will be choked, causing traffic backups and frustration that we witnessed now on Bow Valley Trail. Many times I have sat through no movement of traffic (sometimes for several light cycles) as the left lane turn has been shortened and blocks the through lane of traffic. The traffic backed up extends to the eastern end of Bow Valley Trail where the car dealerships are!! This is being duplicated in this design of Railway Ave. And again, the ability to turn right on a red light will be lost. When I first moved here, 10th street had a pedestrian bridge over the creek to access downtown. I appreciate the foresight/vision/action of our community at that time. Of interest, the same solution was proposed for a later date of extending 7th Street across the creek. Where would we be now without the 10th Street bridge? And what happened to the 7th Street extension?

Screen Name Redacted

2/10/2023 11:20 AM

This is a very flawed project and should be immediately shelved and better designs sought. The Town completely ruined the Bow Valley Trail, Railway Ave intersection and this new project will bring that disaster all the way through the main access into the town. Look at the traffic chaos that the Bow Valley Trail, Railway Ave intersection has brought. People sitting idling for 25 minutes plus to try to get through that disaster of an intersection. How does hundreds of cars a day idling for extended periods of time help the environment or is good for walkers or cyclists? Whether the town administration likes it or not, people own, drive, and park cars. That includes people who live in the town or are visiting the town. Having them stuck in unending traffic jams due to a terribly designed road is not going to solve any problems, it will just create frustration for anyone using the

town's infrastructure. Town Administration and Council, please admit that this redesign is a mistake and rethink this proposal, thanks. Granted, it will be beneficial to bikers and walkers. I both bike and walk Railway Ave with no issues to date. But I, like most people, only bike in the area for at most six months a year. Canmore is a mountain town with lots of snow and cold weather. Not too many people bike during those six months. Why ruin a perfectly good road for almost no benefit, only drawbacks?

Screen Name Redacted

2/10/2023 11:58 AM

This hasn't changed much with respect to driving when heading West. However, when heading East, having it go to one lane at 10th St, will cause a backup at the intersection, just like what has happened at Bow Valley Trail westbound at intersection at the Coast Hotel. It gets backed up past the roundabout every day at 5:00pm and on weekends!

Screen Name Redacted

2/10/2023 12:02 PM

Driving: The single lane on Main St. for turning right or left onto Railway Ave. will cause traffic to backup on Main St.! This design doesn't work for the amount of traffic we have in Canmore, especially on weekends.

Screen Name Redacted

2/10/2023 12:05 PM

The same issues exist for vehicle and transit traffic although it should be to a lesser extent as Main St. and the grocery stores will ease some of the load on the street. Cycling and walking options will be excellent.

Optional question (352 response(s), 26 skipped)

Question type: Essay Question



Briefing

DATE OF MEETING: May 16, 2023 **Agenda #:** D-2

To: Committee of the Whole

SUBJECT: 2023 Utility Master Plan Update

SUBMITTED BY: Andreas Comeau, Manager of Public Works

PURPOSE: To provide the Committee of the Whole with a summary of the updated Utility Master Plan.

EXECUTIVE SUMMARY

The Town completes a Utility Master Plan (UMP) update typically every 5-6 years to ensure there is adequate capacity within the water and wastewater systems to accommodate growth and corresponding demand. The list of recommended projects included in a UMP update allows the Town to develop a long-term plan to meet demand and pressures on the utility, specifically around reserve balances, capital funding and utility rates.

The UMP also reviews each project to determine the percentage of a project that is related to growth – to ensure growth pays for growth. These details are used to update to the Off-Site Levy Bylaw to ensure development fees are transparent and appropriate.

BACKGROUND/HISTORY

The Town completes a Utility Master Plan (UMP) every 5-6 years to ensure it can provide for future demand while planning its capital plan to ensure reserve balances, funding and rates are appropriate. The last review was completed in 2017. The current UMP update was delayed due to COVID and the uncertainty around development. The delay has allowed for the evaluation of the Wastewater Treatment Plan as part of the proposed changes to the Town's Approval to Operate to be included in the UMP update.

DISCUSSION

The UMP update can best be summarized into two categories: Growth and Regulatory. Historically, growth and its impact on the Town's water and wastewater systems has been the main driver for identifying projects, however the Town is undergoing a significant renewal of its Approval to Operate with the Province so more analysis was required.

GROWTH

The development of a UMP update includes the following four main steps:

1. Growth assumptions: Determine where and when growth is projected to occur in the short, mid, and long term.
2. Validate water and wastewater models: Ensure models mirror the systems.
3. Run growth assumptions through models: Determine areas of the system that cannot meet demand (producing a list of recommended upgrade projects).

4. Detail projects: Include high level detail, project triggers, recommended date, a high-level budget (+/- 40%) and any costs share details (if applicable).

BOWDA is a key stakeholder with the UMP update as UMP projects feed the Off-Site Levy Bylaw, impacting development fees. Administration has increased the level of engagement with BOWDA over the past two updates. BOWDA reviewed the 2017 UMP final draft, and it was agreed that the next update should engage them at the outset of the process, including reviewing the approach, assumptions and cost share scenarios earlier. The Town also committed to ensuring agreements affecting the update such as the servicing agreement with Dead Man’s Flats be included. The Town appreciates the feedback and robust review provided by BOWDA. The UMP is a better document through their involvement.

REGULATORY

New to this update is the requirement to meet changes to the conditions being placed on the Town as part of the Approval to Operate renewal from the Province, which occurs every 10 years. The main change is more stringent conditions for phosphorous removal from 1.00 mg/L to 0.50 mg/L and the addition of a Total Nitrogen limit of 15 mg/L prior to 2031. The Wastewater Treatment Plant (WWTP) is currently 26 years old and will be unable to achieve these limits without a significant upgrade and potentially a change in secondary treatment technology. The WWTP evaluation of alternatives is part of the UMP update and included as an appendix.

FINANCIAL IMPACTS

There are no specific financial impacts as part of this briefing report. Administration will be inputting the recommended capital projects into a draft capital plan and updating the Utility Rate Model, to better understand the long-term impact on reserves, debentures and rates.

STAKEHOLDER ENGAGEMENT

Internal stakeholders were the Engineering, Finance, and Planning & Development departments. External stakeholders included EPCOR and BOWDA, who had a more robust involvement in the update including the stages to review the development projections, individual projects, cost share and reviewing the final draft.

ATTACHMENTS

- 1) 2023 Utility Master Plan
- 2) 2023 WWTP Capacity Evaluation

AUTHORIZATION

Submitted by:	Andreas Comeau Manager of Public Works	Date: <u>April 27, 2023</u>
Approved by:	Whitney Smithers General Manager of Municipal Infrastructure	Date: <u>April 27, 2023</u>
Approved by:	Sally Caudill Chief Administrative Officer	Date: <u>May 8, 2023</u>

Town of Canmore 2022 Utility Master Plan

CAP 7203 C04-00496



Town of Canmore

2022 Utility Master Plan

CAP 7203 C04-00496

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CIMA+ file number: C04-00496
May 2, 2023 – Review FINAL

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Review and submission register			
Review No.	Reviewed by	Date	Description of the change or submission
DRAFT	JP / SD / CC / DL / NN	Jan. 19 2023	Draft report
FINAL	JP / SD	May 2, 2023	Final Report

Executive Summary

Introduction

In March 2022, the Town of Canmore retained CIMA+ to prepare an updated Utility Master Plan (UMP). This Utility Master Plan update will encompass a review of the water and wastewater infrastructure under existing conditions and constraints, as well as under future demands at growth projections of 5, 15, and 25 years.

This Utility Master Plan will assess the following infrastructure elements:

- + Wastewater collection and transmission
- + Water supply, treatment, storage and distribution

This report was developed to assist the Town's administrators to direct and plan for development, improve system utilization and plan for future upgrades. This study will also assist the Town's Administrators to develop projects that will apply to the Town's Offsite Levy Model.

A collection of existing infrastructure plans, studies and planning documents have been reviewed and incorporated into this study.

The stated objectives of the Utility Master Plan are as follows:

- + To conduct a detailed assessment of the existing water and sanitary systems' capacities. This will be done using real and historical data collected from the Town of Canmore's facilities and networks.
- + To identify system deficiencies and provide recommendations for system improvements.
- + To develop a servicing strategy for future growth and development for the 5 Year, 15 Year, and 25 Year growth scenarios.
- + To develop a list of capital projects that serve to improve system resiliency and facilitate development. The list will include a high-level estimated cost, an approximate timeline for implementation over the planning period, and inform on the application of these projects to the Town's Offsite Levy Model.

Methodology

The following methodology was used to meet the objectives of the UMP:

- + Work with the Town of Canmore's to establish the projected growth in the Town over the next 25 years and delineate the expected locations and gross developable area of the projected growth. These growth projections needed to align with the Town's Offsite Levy Model, with discrete growth in each of the 17 Offsite Levy Areas in the Town.
 - o Participate in round-table meetings with members of BOWDA (Bow Valley Builders and Developers Association). This input was taken into consideration when preparing the Growth Projections and Design Basis Memo
- + Collect and review historical data and onsite measurements. SCADA logs of facility were collected and processed to extract data-driven demand information used to populate the hydraulic models.

- Analyze customer water meter demands for periodic demand information and assign water model demands to the specific locations throughout the Town.
- Review lift station draw down tests, water distribution meter data, water service meter data, meter reading routes and other available data.
- Install a total of 5 temporary wastewater flow monitors, which in tandem with lift stations with flow meters, were used to chart the flows in the wastewater system during dry weather and wet weather / high groundwater periods.
- + Create/update hydraulic models for the water and wastewater systems that reflect the existing systems. This was completed using information from the Town's previous water model, the Town's GIS system and record drawings.
 - New in this version of the Utility Master Plan - the wastewater hydraulic model was updated to an extended period simulation to better account for inflow and infiltration's affect on the Town's existing system.
- + Conduct a capacity evaluation of the Wastewater Treatment Plant to inform this Utility Master Plan on any limitations of the existing facility to service future populations, performed as a separate submission.
- + Evaluate the existing systems against design criteria established with the Town and utility operators to identify deficiencies.
- + Expand the hydraulic model to service future developments and identify utility improvements required to support for growth and development
- + Provide a prioritized list of required projects along with cost estimates, project triggers, and forecasted need.

Water System

The Town of Canmore has two primary water sources; two deep wells which supply ground water to the Pumphouse 1 Treatment Plant, and surface water from the Rundle Forebay which supplies the Pumphouse 2 Treatment Plant.

The treated water is then stored and distributed from five storage reservoirs and five pump stations / booster stations. The distribution system is divided into three supply areas: Western, Central, and Eastern.

The distribution system can be further divided into a total of 18 pressure zones, which are controlled through Pressure Reducing Valves (PRVs) and pump stations.

Wastewater System

The existing wastewater infrastructure has four main components; gravity (manholes and pipes), pumping (lift stations), pressure (forcemains) and treatment. These four systems all operate in conjunction to collect and treat the wastewater at the wastewater treatment plant and ultimately discharge clean water to the Bow River.

The first component of the system is the gravity system which collects the wastewater from its many sources (residential, institutional, commercial and industrial). The gravity system starts at the private property line where services are collected and conveys it through a pipe and manhole system to a lift station at the low point. The gravity pipes are mostly PVC with some sections of concrete, steel and unknown (unconfirmed) materials. The pipe diameters range from 100mm to 600mm.

In addition to the gravity collection system, there are a number of low pressure forcemain systems with individual grinder pumps at each service. These low pressure systems typically discharge into the gravity collection system.

The second component of the piped system are the forcemains. The forcemains convey the wastewater from a series of lift stations to the wastewater treatment plant. The forcemains are mostly made of PVC and HDPE pipe, though some sections of forcemain are unknown (unconfirmed). The size of the forcemains range in diameter from 100 mm to 500 mm.

The third component of the wastewater system are the 13 lift stations operated by the Town of Canmore.

The final component of the wastewater system is wastewater treatment plant. A full wastewater treatment plant assessment and capacity evaluation was performed in tandem with the UMP.

To determine wastewater flow generation rates, diurnal usage patterns, and assess groundwater infiltration and rainfall derived infiltration, a flow monitoring program was developed. Inline flow monitors were installed in key locations.

A total of 5 flow monitors were installed across the Town of Canmore, which in tandem with lift stations that have flow meters installed on their discharge, was used to chart the flows in the wastewater system during dry weather and wet weather periods. The flow monitors were in place from April 12, 2022 to July 20, 2022.

Generally, it was observed that the Town is split into two areas with different wet weather influences. The valley bottom, generally bounded by the Bow River to the southwest, and Highway 1 to the northeast, is influenced through inflow and infiltration into the system by ground water, which raises significantly during the spring snow melt.

The valley slopes, generally bounded by being southwest of the Bow River, and northeast of Highway 1, have minimal groundwater influence. Inflow and infiltration would be caused by rain events, with runoff water entering the system through manholes and some pipe infiltration from local soil saturation.

Water System Projects

A total of 16 water system projects were identified to meet the Town's service criteria, support future growth, or will need to be replaced due to aging infrastructure. They are summarized as follows:

Projects recommended to meet recommended service criteria:

- + EX W1 – Grassi Booster Station Capacity Upgrade (Phase 1)
- + EX W2 – WTP2 Upgrades. Backwash Water Reuse
- + W1 – TeePee Town Water Line Upgrade

- + W3 – Canyon Ridge Booster Station Decommissioning

Projects recommended to support growth and development:

- + W2 – Smith Creek Reservoir and Booster Station
- + W4 – Silvertip Trail Looping
- + W6 – Grassi Booster Station Waterline Twinning
- + W7 – Grassi Storage Reservoir Capacity Upgrade
- + W8 – Grassi Booster Station Capacity Upgrade (Phase 2)
- + W9 – Smith Creek Booster Station Upgrade (Phase 2)

Projects recommended due to end of estimated service life:

The following project were identified because the pipes will exceed the anticipated 75-year life span before the 25-year horizon considered in this report.

- + EX W3 – PumpHouse #1 Gas Chlorine Disinfection Replacement to Liquid Chlorine
- + W10 – South Canmore Waterline Replacement
- + W11 – Downtown Canmore Waterline Replacement
- + W12 – 7th Avenue Waterline Replacement
- + W13 – Rundle Waterline Replacement
- + W14 – TeePee Town / Railway Ave Waterline Replacement

Wastewater System Projects

A total of 11 wastewater system projects were identified to meet the Town’s service criteria, support future growth, or will need to be replaced due to aging infrastructure. They are summarized as follows:

Projects recommended to meet recommended service criteria:

- + EX S1 – Lift Station 3 Replacement

Projects recommended to support growth and development:

- + S1 – Bow Valley Trail Sewer Upgrade
- + S2 – Lift Station Upgrade Phase 1
- + S3 – Lift Station 8 Upgrade
- + S4 – Lift Station 10 Upgrade
- + S5 – Lift Station 11 Upgrade

Projects recommended due to end of estimated service life:

- + S6 – South Canmore Sewer Line Replacement
- + S7 – Downtown Canmore Sewer Line Replacement
- + S8 – 7th Avenue Sewer Line Replacement
- + S9 – Rundle Sewer Line Replacement

+ S10 – TeePee Town / Railway Ave / Bow Valley Trail Sewer Line Replacement

Previous UMP Projects

The following major projects have been completed or are currently underway since identified in the 2016 Utility Master Plan.

- | | |
|---|--|
| + Project WW1 – LS2 Upgrade | + Project W7 – South Bow River Loop |
| + Project WW2 – LS6 Upgrade | + Project W8 – Spring Creek Loop |
| + Project WW10 – BVT at Benchlands Trail | + Project W9 – Hubman Water Pressure / PRV |
| + Project W1 and W2 – Pumphouse 2 Upgrade | |

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1. Introduction

1.1 Authorization and Terms of Reference

In March 2022, the Town of Canmore retained CIMA+ to prepare an updated Utility Master Plan (UMP). This Utility Master Plan update will encompass a review of the water and wastewater infrastructure under existing conditions and constraints, as well as under future demands at growth projections of 5, 15, and 25 years.

This Utility Master Plan will assess the following infrastructure elements:

- + Wastewater collection and transmission
- + Water supply, treatment, storage and distribution

1.2 Background

This report was developed to assist the Town's administrators to direct and plan for development, improve system utilization and plan for future upgrades. This study will also assist the Town's Administrators to develop projects that will apply to the Town's Offsite Levy Model.

A collection of existing infrastructure plans, studies and planning documents have been reviewed and incorporated into this study.

1.3 Objectives

The stated objectives of the Utility Master Plan are as follows:

- + To conduct a detailed assessment of the existing water and sanitary systems' capacities. This will be done using real and historical data collected from the Town of Canmore's facilities and networks.
- + To identify system deficiencies and provide recommendations for system improvements.
- + To develop a servicing strategy for future growth and development for the 5 Year, 15 Year, and 25 Year growth scenarios.
- + To develop a list of capital projects that serve to improve system resiliency and facilitate development. The list will include a high-level estimated cost, an approximate timeline for implementation over the planning period, and inform on the application of these projects to the Town's Offsite Levy Model.

2. Growth and Development Analysis

In order to assist the development of the Utility Master Plan, a technical memo outlining the growth projections and water and wastewater demands design basis was prepared and finalized in May 2022. The full memo can be found in Appendix A – Growth Projections and Design Basis Memo.

2.1 Summary of Existing Planning Documents

CIMA+ reviewed available planning documents and discussed growth goals with Town staff to better understand the development goals for the study area. The following planning documents and studies were reviewed:

- + Town of Canmore UMP Report Final (EPCOR- December 2010)
- + Town of Canmore UMP Report 2016 (CIMA+)
- + Town of Canmore Sanitary Master Plan (Stantec - June 2010)
- + Municipal Census (various years)
- + Town of Canmore – Engineering Design & Construction Guidelines
- + Area Structure Plans
 - Stewart Creek
 - Indian Flats
 - Silvertip
 - Three Sisters Village
 - Smith Creek
- + Area Restructure Plans
 - Bow Valley Trail
 - Spring Creek
 - TeePee Town

2.2 Growth Areas and Projections

CIMA+ worked with the Town of Canmore’s planning staff to establish the anticipated growth in the Town over the next 25 years and delineate the expected locations and gross developable area of the projected growth. The growth projections are intended to be very high level and are not intended to anticipate the precise locations of growth in each Offsite Levy Area.

These growth projections align with the Town’s Offsite Levy Model, with discrete growth in each of the 17 Offsite Levy Areas in the Town.

Growth was divided into three horizons, 5 Years, 15 Years, and 25 Years.

The projected growth is established as units of the following land use types:

- + Industrial, Commercial, Institutional (ICI)
- + Hotels
- + Low Density Residential
- + Medium / High Density Residential

ICI and Hotel land uses do not have a population equivalent assigned to them, and as such water and wastewater demands will be assigned on a per unit basis.

Residential land uses are assumed to have 2.5 people per unit, which is consistent with the previous UMP and previous planning directives from the Town. This includes non-permanent occupancy along with full time residents. Water and wastewater demands for these land uses will be assigned on a per capita basis.

Each land use type has an associated per unit density, in order to determine the gross developable area. The densities, in units per hectare, are as follows:

Table 2-1 Land Use Unit Densities

Land Use	Units Per Hectare
Industrial, Commercial, Institutional (ICI)	37
Hotels	109
Residential - Low Density	14
Residential - Medium / High Density	43

The following table shows the projected growth for each land use type, for each growth horizon. The projected growth in each offsite levy area can be found in Appendix A – Growth Projections and Design Basis Memo.

Figures showing the projected growth in each offsite levy area for each growth horizon can be found in Appendix B – Figures G1 to G3

Table 2-2 Growth Projections Summary

Land Use	5 Year	15 Year	25 Year
	Units	Units	Units
ICI	319	575	938
Hotels	1,104	2,325	3,545
Residential - Low Density	186	478	770
Residential - Medium / High Density	1,060	2,499	3,937
Total	2,669	5,877	9,190

The gross developable areas for each land use type, under each growth horizon, are summarized in the following table:

Table 2-3 Gross Developable Area Summary

Land Use	5 Year	15 Year	25 Year
	Area (ha)	Area (ha)	Area (ha)
ICI	8.5	16.8	25.1
Hotels	10.1	21.3	32.5
Residential - Low Density	13.1	33.7	54.2
Residential - Medium / High Density	24.5	57.7	90.9
Total	56.2	129.5	202.7

2.3 Development Community Engagement

To facilitate consensus on the growth projections and design basis with the Canmore area development community, CIMA+ and the Town of Canmore held roundtable meetings with members of BOWDA (Bow Valley Builders and Developers Association).

In these discussions, the methodology of developing the growth projections and design basis was outlined to BOWDA, whose members provided feedback and comments. This input was taken into consideration when preparing the Growth Projections and Design Basis Memo.

2.4 Offsite Levy Cost Allocation Methodology

To determine cost allocation for projects recommended in the UMP which feed into the offsite levy model, a cost allocation strategy needed to be created. This should account for projects that are initiated by development, whether existing areas benefit directly from the upgrades, and the impact that remaining lifecycle of existing infrastructure has on the cost allocation.

The two primary project elements are:

- + Facilities, such as wastewater lift stations, and water pump stations
- + Linear infrastructure, such as wastewater lines, water lines, and related appurtenances

The cost sharing methodology will have two components when an asset is considered for replacement due to growth. The first component will consider the costs of replacing an existing asset, like for like, and will be known as the “Base Cost”. This involves performing a residual value calculation based on remaining asset lifecycle. The reasoning behind this is that without growth triggering an asset replacement, the Town would not have to incur any capital costs until the end of its lifecycle. The newer the asset is, the larger the share of the cost of replacement should be borne by developers. Facilities are estimated to have a total life cycle of 50 years. Linear infrastructure has a lifecycle of 75 years.

The residual value of the asset is ratio of the service life remaining to the life span of the asset, multiplied by the base cost, and is the developers share of the cost. The inverse of this is the Town’s share.

The second component will consider the full upgrade cost of the asset, and will be known as the “Upgrade Cost”. The difference between the Town’s share of the Base Cost, and the Upgrade Cost, will be fully borne by developers. The reasoning behind this is that these are costs that would not need to be incurred by the Town without growth.

The formula for the cost sharing methodology is as follows:

$$\text{UpgradeCost} - \left(1 - \frac{\text{ServiceLifeRemaining}}{\text{LifeSpan}}\right) * \text{Basecost} = \text{DeveloperCost}$$

Calculation Example

A 25 year old 200 mm water line is recommended to be upgraded to 300 mm in order to service future growth. A direct replacement with a new 200 mm water line is estimated to cost \$1,000,000, and the upgraded 300 mm water line is estimated to cost \$1,200,000. With a 75 year life cycle, the water line would have 50 years of service life remaining.

$$\$1,200,000 - \left(1 - \frac{50}{75}\right) * \$1,000,000 = \sim\$870,000$$

As the water line still has the majority of it’s service life remaining, it has a high residual value, and as such a lower Town’s share of the cost. In this example, the residual value of the asset would be approximately \$670,000 and Town’s share would be approximately \$330,000. Subtracting the Town’s share from the upgrade cost of \$1,200,000 results in a developers share of approximately \$870,000.

3. Water System

3.1 System Characterization

The Town of Canmore has two primary water sources; two deep wells which supply ground water to the Pumphouse 1 Treatment Plant, and surface water from the Rundle Forebay which supplies the Pumphouse 2 Treatment Plant.

The treated water is then stored and distributed from five storage reservoirs and five pump stations / booster stations. The distribution system is divided into three supply areas: Western, Central, and Eastern.

The distribution system can be further divided into a total of 18 pressure zones, which are controlled through Pressure Reducing Valves (PRVs) and pump stations. The Pressure zones can be seen in Appendix C – Figure W1

3.1.1 Pipe Diameters, Material and Age

The water mains in Canmore consist of approximately 65% PVC and 30% ductile iron. The average age of the water lines in the system are approximately 30 years old. The following tables show the distribution by age, diameter, and pipe material of Canmore’s water system. The existing water system can be seen in Figure W2 (Appendix C)

Table 3-1 Water Pipe Age

Age	Length (km)	% of Total
>50 Years	11.9	10%
41-50 Years	9.9	8%
31-40 Years	20.9	18%
21-30 Years	39.5	34%
11-20 Years	22.9	19%
0-10 Years	10.5	9%
Unknown	2.0	2%
Total	118	100%

Table 3-2 Water Pipe Materials

Material	Length (km)	% of Total
PVC	76.2	65%
DI	35.4	30%
PE	1.5	1%
CON	0.1	0.1%
UNK	4.4	4%
Total	118	100%

Table 3-3 Water Pipe Diameters

Diameter (mm)	Length (km)	% of Total
<100/Unknown	3.3	3%
100	0.8	1%
150	30.8	26%
200	31.5	27%
250	12.1	10%
300	16.1	14%
350	10.2	9%
400	11.3	10%
450	1.6	1%
Total	118	100%

3.1.2 System Elevations and Pressure Zones

Due to large elevation differences across the Town of Canmore, the water distribution system is divided into multiple pressure zones to deliver normal water pressures are sustained across the Town’s distribution system.

In total, there are 18 pressure zones, named from Zone 2 to Zone 19, with Zone 1 not currently in use. Zone 18 was a recent addition, with three new PRVs installed near Miskow Close and Our Lady of the Snows school, creating a new pressure zone along Hubman Landing, and Zone 19 was created when the WWTP was connected to the new South Bow River Loop.

There are a total of 40 PRVs across the Town, with two of them considered to be private, two inactive and one closed.

Table 3-4 PRV Settings

Label	Description	Elevation (m)	HGL Setting (m)	Pressure Setting (kPa)
PRV 1	Above 100 Grassi	1345.29	1381.81	358
PRV 2	West side Benchlands, #126	1389.13	1430.68	407
PRV 3	East side Benchlands near 210 Benchlands Terrace	1380.88	1421.73	488
PRV 4	Benchlands Reservoir	1394.95	1454.81	586
PRV 5	Glacier Dr. and Sandstone Terrace (Glacier Dr.) - East	1332.43	1381.72	483
PRV 6	Boulder Crescent and 200 Glacier Dr. - West	1332.08	1381.38	486
PRV 8	Homesteads Phase I, Mountain Greens Emergency Rd. (14 205 Carey)	1332.99	1364.49	308
PRV 9	Homesteads Phase I (177 Carey near the intersection of Carey and Three Sisters)	1342.50	1384.75	414
PRV 10	Homesteads Phase II Upper (167 McNeil Dr.)	1346.03	1384.75	379
PRV 11	Highway 1A (Near 516 Bow Valley Trail)	1309.36	1362.00	515
PRV 12	Alley off of Rundle Crescent (Mount Rundle Penstock Station)	1312.25	1355.00	489

PRV 13	Olympic Dr. Rundle View	1346.12	1364.49	180
PRV 14	Near 16 Prospect Heights	1316.34	1364.49	471
PRV 15	Pump House 1 - West Feed	1309.68	1362.00	512
PRV 17	Silvertip - Block 7 (Blue Grouse and Silvertip Rd.)	1395.11	1472.57	759
PRV 19	Three Sisters Dr. and 200 Grassi Pl.	1330.26	1364.49	335
PRV 20	Outside Three Sisters Booster Station	1383.70	1417.49	331
PRV 21	Lions Park CTFM	1312.73	1362.00	482
PRV 22	Behind Recreation Centre CTFM	1312.96	1355.00	480
PRV 23	On the line from Grassi Reservoir to Miskow	1384.46	Inactive	Inactive
PRV 24	Cairns on the Bow Three Sisters Parkway	1323.78	1371.06	482
PRV 25	Three Sisters Mountain Village (Fitzgerald)	1345.16	1372.97	272
PRV 26	Ridge Rd and Elkrun Blvd (Modelled as Closed)	1357.80	Closed	Closed
PRV 27	Near 561 Silvertip road	1457.80	1510.68	518
PRV 28	Not modelled- considered a private PRV	1340.43	-	-
PRV 29	Not modelled- considered a private PRV	1340.48	-	-
PRV 30	Montane Rd. near Lincoln Park	1324.47	1361.90	367
PRV 31	Bow Valley Trail (near Ray McBride St. CTFM)	1315.90	1362.00	451
PRV 32	Palliser Trail By Cross Z ranch	1326.70	1389.94	656
PRV 33	Near Spring Creek Gate. (Currently inactive)	1307.31	Inactive	Inactive
PRV 34	Branched off from Grassi line near Miskow Close	1359.80	1395.01	405
PRV 35	Branched off from Grassi line near Hubman Landing	1362.00	1409.89	469
PRV 36	Near Stewart Creek Dr and Out Lady of the Snows school	1366.00	1401.21	345
PRV DMF	Dead Man's Flats	1295.30	1362.20	655
PRV T1	Morris and Van Horne Intersection	1316.54	1364.49	469
PRV WWTP	Wastewater Treatment Plan off of South Bow River Loop	1303.96	1367.34	621
PRV SBL	Off of South Bow River Loop near Montane Road	1321.45	1389.76	707

A number of the PRV settings were revised within the model during the calibration process of the 2020 Water Model Update performed by CIMA+, where hydrant flow tests were performed across the Town. The PRV settings were changed within the model in order to have the model results match real world observations.

3.1.3 Raw Water Supply

The Town has two primary raw water supplies, which supply the Town's two water treatment plants: Pumphouse 1 and Pumphouse 2. Pumphouse 1 is supplied through two deep groundwater wells, and Pumphouse 2 is supplied with surface water from the Rundle Forebay.

Pumphouse 1 has a maximum annual diversion of 2,121,965 m³ at a combined maximum rate of 589.5 L/s. Diversion from Well #2 under license 31682 is subject to instream flow objectives in the Bow River. Flow objectives are stated on a weekly basis.

Table 3-5 Pumphouse 1 Licenses

License #	31681	31682	Total
Description	Well #1	Well #2	
Point of Diversion	SW33-024-10-W5		
Source		Policeman Creek	
Max Annual Diversion (m3)	1,195,620	926,345	2,121,965
Max Rate of Diversion	49.5 L/s	540 L/s	589.5 L/s
Notes		Instream Objectives – License Amendment 2	

Pumphouse 2 has a maximum annual diversion of 2,994,329 m³, and a combined maximum diversion rate of 760 L/s as stated on the two licenses. However, during the design process of Pumphouse 2 treatment upgrades, it was discovered that there is a superseding agreement with TransAlta, who provided the original licenses for diversion from the Rundle Forebay for the Town. In those agreements, there is a maximum stated diversion rate of 6 cubic feet per second (cfs), or 170 L/s.

In discussions with TransAlta, it was determined that the limitations from this earlier license agreement still stand, and as such the maximum diversion rate is capped at 170 L/s. There were no limitations on annual diversion volume in this agreement, and as such the annual volumes on the current licenses still stand.

Table 3-6 Pumphouse 2 Licenses

License #	31000	31001	356706	Total
Description			For use by Canmore and Deadman's Flat	
Point of Diversion	SW30-022-10-W5 and re-diverted at SE31-024-10-W5 (Rundle Forebay)			
Source	Spray River through the works of TransAlta Utilities Corporation			
Max Annual Diversion (m3)	1,110,134	1,554,195	280,000	2,944,329
Max Rate of Diversion	363 L/s	380 L/s	17 L/s	760 L/s
Notes	Due to superseding Transalta Agreement, Max diversion rate from Rundle Forebay is capped at 6 cfs (170 L/s)			

Licenses 30999 and 31682 were originally intended to supply water to the wastewater treatment plant through a well on the plant site. The wastewater treatment plant has since been connected to the Town's water distribution network through the South Bow River Loop project, and as such these licenses are not actively being drawn against. Transferring these licences to be utilized by Pumphouse 1 should be investigated.

Table 3-7 WWTP Supplemental Licenses

License #	30999	31682	Total
Description	Wastewater Plant Well	Wastewater Plant Supplemental Flow	
Point of Diversion	SW28-24-10-W5		
Source	Bow River		
Max Annual Diversion (m3)	3,700	71,300	75,000
Max Rate of Diversion	3 L/s	3 L/s	3 L/s
Notes	Instream Objectives – License Amendment 2		

The following table shows the summary of the active licenses in the Town, and their respective withdrawal rates.

Table 3-8 Water Licenses Summary

License Use	Total Annual Diversion (m³)	Average Daily Diversion (m³)	Max Daily Diversion (m³)
Pumphouse 1	2,121,965	5,814	50,933
Pumphouse 2	2,944,329	8,067	14,705
WWTP Supplemental	75,000	205	259

3.1.4 Water Treatment Systems

Water is treated at Pump House 1 by adding gas chlorine to the well water and then storing it in a contact tank. After sufficient contact time, treated water is pumped into the distribution system.

Pump House 2 is a direct filtration treatment plant that treats water from Rundle Forebay. The plant’s treatment processes include coagulation, filtration, chlorination and UV disinfection systems.

Pumphouse 1 has a treatment capacity of approximately 93 L/s, and Pumphouse 2 has a current treatment capacity of approximately 94 L/s.

There are current plans to upgrade the Pumphouse 2 treatment capacity to 170 L/s, with construction occurring in 2023.

Table 3-9 Existing Water Treatment System

Facility	Pumphouse 1	Pumphouse 2
Treatment Process	Disinfection by Chlorination	<ul style="list-style-type: none"> + Coagulation and flocculation + Rapid Sand Filtration + Four filters for a total rate of 94 L/s + Disinfection by ultraviolet (UV) light. Limited to 126 L/s maximum through each of two reactors + Disinfection by chlorination
Treatment Rate	8,000 m ³ /day (92.6 L/s) based on 2010 / 2016 UMP	<ul style="list-style-type: none"> + Four filters for a total rate of 94 L/s + UV process limited to 126 L/s maximum through each of two reactors. + Existing Limit: 94 L/s
Treatment Levels	<ul style="list-style-type: none"> + 4-Log reduction for viruses + 3-Log reduction for Giardia and Cryptosporidium 	

3.1.5 Potable Water Storage

There are a total of five potable water storage reservoirs in the Town of Canmore.

- + Pumphouse 1 – Primarily serves the Central and Eastern supply zones
- + Benchlands Reservoir - Primarily serves the Central and Eastern supply zones. Is typically filled by Pumphouse 1, however the South Bow River Loop PRV, which was recently commissioned, can fill Benchlands using a flow control valve on the PRV.
- + Silvertip Reservoir – Primarily serves the Eastern supply zone. It is filled from Benchlands
- + Pumphouse 2 – Primarily services the Western and Central supply zones, can service the Eastern supply zone up to Benchlands
- + Grassi Reservoir – Primarily Services the Western and Central supply zones. It is filled by an inline booster station that is supplied by Pumphouse 2.

Table 3-10 Potable Storage Reservoirs

Facility	Supply Zone	Volume (m ³)
Pumphouse 1	Central, East	166
Pumphouse 2	West, Central	1,100
Benchlands	East, Central	7,300
Silvertip	East	5,400
Grassi	West, Central	5,000
Total		18,966

Previous documents reported that Benchlands Reservoir had a volume of 11,200 m³. However, a review of the original design drawings indicated the total active volume of the reservoir is calculated to be 7,300 m³.

3.1.6 Water Distribution Systems

The Town operates six water distribution facilities. Four of them are pump stations, and two of them discharge through gravity. The following table summarizes these facilities.

Table 3-11 Distribution Facility Summary

Facility	Treatment	Distribution Type
Pumphouse 1	Yes	Pump
Pumphouse 2	Yes	Pump
Benchlands Reservoir	No	Pump and Gravity
Silvertip Reservoir	No	Gravity
Grassi Reservoir	No	Gravity with booster fill
Pumphouse 5 (Canyon Ridge Booster Station)	No	Pump

3.1.6.1 Pumphouse 1

Pumphouse 1 has six vertical turbine pumps that pump water from the clear well into the distribution system.

Table 3-12 Pumphouse 1 Existing Pump Summary

Pump	Manufacturer	Model	Motor HP	Design Flow
1	Grundfos		30	16.2
2	Grundfos		30	16.2
3	Grundfos		30	16.2
4	Floway	10 LKM	50	28.1
5	Floway	10 LKM	50	28.1
6	Floway	10 LKM	50	28.1

The pumps at Pumphouse 1 are staged off and on according to the water level in Benchlands Reservoir. The pump staging set points for the distribution pumps, as reproduced from the PH1 Control Philosophy Revision H, are listed in the table below:

Table 3-13 Pumphouse 1 Pump Staging Set Points

Pumps In Order of sequence	Distribution Pump Start Level Set Point	Distribution Pump Stop Level Set Point
1st	3.65 meters	3.80 meters
2nd	3.49 meters	3.80 meters
3rd	3.35 meters	3.60 meters
4th	3.20 meters	3.55 meters
5th	3.04 meters	3.55 meters
6th	2.90 meters	3.45 meters

A PRV located in the pump station controls the pressure entering the Central Supply Zone / downtown area, ensuring appropriate pressures are maintained.

3.1.6.2 Pumphouse 2

Pump House 2 has three vertical turbine pumps that pump water from the clear well into the distribution system. The pump station discharges at approximately 165 kPa because it is located at a high elevation in its pressure zone. These three pumps are also used to backwash the filters at Pump House 2.

Pumphouse 2 has planned pump capacity upgrades, where the pumping capacity will be increased to approximately 200 L/s (300 L/s with Backwash pumps discharging into the distribution header). The pump capacity upgrades are planned to be constructed in 2023.

Table 3-14 Pumphouse 2 Existing Pump Summary

Pump	Manufacturer	Model	Motor HP	Design Flow
1	Aurora	12RM	15	66.3
2	Aurora	12RM	15	66.3
3	Aurora	12RM	15	66.3

3.1.6.3 Benchlands Reservoir

The Benchlands Reservoir has three vertical turbine pumps which supply water to the Silvertip reservoir, the Silvertip area, and areas around the Benchlands reservoir, where a PRV is used to maintain service pressures. The reservoir also backfeeds water through the supply line, providing water to the lower elevation areas that Pumphouse 1 also distributes to.

Table 3-15 Benchlands Pump Summary

Pump	Manufacturer	Model	Motor HP	Design Flow
1	Peerless	12 LTD	100	39.7
2	Peerless	13 LTD	100	39.7
3	Peerless	14 LTD	100	39.7

3.1.6.4 Silvertip Reservoir

The Silvertip Reservoir distributes water through gravity, by being at a higher elevation than the downstream service area. Water from this reservoir is supplied by the Benchlands Reservoir pump station. Water from Silvertip is distributed to the downstream system utilizing the same supply line. Due to the facility configuration at Benchlands, water cannot be transferred from Silvertip back to Benchlands.

3.1.6.5 Grassi Reservoir

The Grassi reservoir supplies water to the same areas as Pumphouse 2, and serves to provide fire flows and fire storage. The Grassi reservoir is filled by a booster station near Grassi Peaks, along Peaks Dr.

Table 3-16 Grassi Reservoir Booster Existing Pump Summary

Pump	Manufacturer	Model	Motor HP	Design Flow
1	Grundfos	CR60-30U	15	20.2
2	Grundfos	CR60-30U	15	20.2

3.1.6.6 Pumphouse 5 (Canyon Ridge Booster)

Pumphouse 5, also known as the Canyon Ridge Booster Station, has three inline booster pumps which provide water to its own pressure zone in a higher elevation area. This booster station can be supplied water from both Pumphouse 1 and the Benchlands Reservoir gravity line.

Table 3-17 Pumphouse 5 Existing Pump Summary

Pump	Manufacturer	Model	Motor HP	Design Flow
1	Peerless	C-610-AMBF	5	3.2
2	Peerless	C1215-AMBF	15	12.6
3	Peerless	4AE11	ENGINE	69.4

3.2 Design Criteria

This section outlines the criteria that will be used to evaluate the current and future systems and details the evaluation of each component of the system. The design criteria are based on the most recent version of the Canmore Engineering Design and Construction Guidelines (EDCG) and Alberta Environment and Protected Areas (AEPA) Standards and Guidelines.

3.2.1 Water Demands Criteria

Existing average day water demands were developed by assessing the total volume of water distributed to the Town over a period of several years, and reviewing SCADA data and daily water distribution records.

Future water demands will be based on the unit rates established in the EDCG, the 2017 Utility Master Plan, analysis of consumption rates by land use, and the projected growth for each growth scenario and horizon. The water demands were updated to include unit rates for ICI and Hotel land uses, which were previously only present in the Wastewater portion of the EDCG. The ICI land use area based unit rates were updated, as the unit density was assessed against unit consumption, and was shown to be significantly higher than the EDCG. The Hotels land use consumption rates were also updated from that shown in the EDCG, following an analysis of water demands by land use performed by the Town of Canmore.

Table 3-18 Water System Unit Demands

Demand Type	Rate	Units
Water Treatment Plant Production (composite rate)	360	L/c/d
Residential	250	L/c/d
Hotels	700	L/unit/d
ICI	30	m ³ /ha/d
	810	L/unit/day
Maximum Day Demand Peaking Factor (per EDCG)	2 x ADD	PF
Peak Hour Demand Peaking Factor (per EDCG)	4 x ADD	PF

3.2.2 Water Supply Requirements

Alberta Environment and Protected Areas requires that a community's water supply must be capable of the maximum day demand (MDD).

Water supply will be assessed individually at each of Pumphouse 1 and Pumphouse 2. Deficits at Pumphouse 1 water supply can be supported by Pumphouse 2, as the Western supply zone can feed into the Central supply zone.

3.2.3 Level of Service Criteria

One of the intentions of the master plan is to maintain an adequate level of service for the existing and future systems. The level of service criteria has been set in accordance with the Canmore EDCG, which are in line with the recommendations from the AEP Standards and Guidelines.

The service pressure in the Town should be between 350 kPa (50 psi) and 620 kPa (90 psi). The Town may accept minimum pressures of 280 kPa (40 psi) when it is clearly demonstrated that the target minimum pressure of 350 kPa cannot be achieved due to existing boundary conditions.

The maximum pressure in the Downtown pressure zone should not exceed 496 kPa (72 psi)

Table 3-19 Level of Service Summary

Parameter	Design Criteria
Minimum Pressure in Distribution System	350 kPa (50 psi)
Maximum Pressure in Distribution System	620 kPa (90 psi)
Maximum Pressure in Downtown Pressure Zone	496 kPa (72 psi)
Maximum Allowable Velocity in Distribution System	3.0 m/s

3.2.4 Available Fire Flow Criteria

The Municipal Government Act does not categorize Fire Protection as a core service. Therefore, it is at the discretion of municipalities to choose to provide the service or not, and if so to what level. There are many guidelines throughout North America, the basic precept is that a municipality chooses a level of service for Fire Protection and then ensures they meet or exceed that level.

The fire flow requirements that were developed were based on land use designation and building type. The required fire flows for large residential, commercial or industrial developments shall be determined in accordance with the latest edition of the Fire Underwriters Survey Guide to Recommended Practice. However, the required fire flows shall not be less than those specified for general land use categories or types of development indicated in Table 3-20.

Table 3-20 Available Fire Flow Requirements

Land Use Category or Development Type	Fire Flow (L/s)	Design Criteria Time)
Detached and Duplex Residential	85 L/s	2 h
Multi-Family, Small to Medium Size Units	120 L/s	2 h
Commercial, Institutional, Industrial – adequately separated, 3 floors or less	200 L/s	2.5 h
Multi-Family, Medium Density (4-plex to 6-plex)	200 L/s	2.5 h
High Density, Multiple Closely Spaced or Contiguous Buildings of 3 or More Floors	300 L/s	3.5 h

The available fire flow is calculated in the hydraulic model by assessing how much water can be pulled from each system node, before another system node reaches 140 kPa (20 psi).

3.2.5 Water Distribution / Pumping Requirements

Alberta Environment and Protected Areas requires that a water distribution pumping system should be able to provide the greater of PHD or MDD + Fire Flow.

AEPA also requires that the water distribution system facility be designed to deliver maximum design flow with the largest pump out of service to maintain system redundancy.

As the Town for Canmore has several reservoirs that are filled and supported by pump stations, the pump stations should also be able to provide MDD to the reservoirs and their associated service areas.

3.2.6 Water Storage Requirements

AEPA guidelines recommend the storage requirements where the supply of treated water is only capable of satisfying the maximum daily design flow.

For a storage facility to meet these recommendations it must be sufficiently sized to store the sum of the following, using the formula $S = A + B + C$

- + A - Fire storage (As per fire flow requirements)
- + B - Equalization storage (25% MDD)
- + C - Contingency storage (15% ADD)

3.3 Water Demand Analysis

3.3.1 Existing Water Demands

Average daily water demands were developed by assessing the total volume of water distributed to the Town over the past four years. These were assigned to the hydraulic model through geolocated customer water meters data, which has been scaled such that the total volume of consumption is equivalent to the total volume of distribution. This accounts for any water losses in the water distribution system, or any unaccounted for flows, and ensures appropriate distribution of water demands.

Maximum daily water demands were developed by reviewing SCADA data and daily water distribution records to find the day with the highest volume of water distributed. This maximum day, divided by the average day, will determine the Maximum Day Demand peaking factor for the existing system and will only be applied to existing demands. Peak hour demands will be assumed to be 2x Maximum Day Demands, in line with the EDCG.

The following table shows the annual water consumption as recorded by customer water meters, versus the annual water distribution volumes. The loss factor is the ratio between the two total volumes, and can be comprised of system losses, fire hydrant operations, and unmetered water connections that the Town might control. In total, approximately 30% of the water distributed in Canmore is unmetered.

Table 3-21 Water Consumption Versus Distribution

Year	Consumption (m ³)	Distribution (m ³)	Loss Factor
2018	1,814,544	2,724,788	1.50
2019	1,787,659	2,589,814	1.45
2020	1,827,189	2,512,425	1.38
2021	1,912,420	2,749,175	1.44
Average	1,843,365	2,670,847	1.45

Using the annual water distribution volumes, average day demands were determined for each year. Daily water distribution records and SCADA data were then reviewed to determine the maximum daily demand for each year. The ratio between these are the MDD peaking factors. These values were averaged across the four years to determine the overall systems ADD, MDD and peaking factor.

2021 had a significantly higher max day than previous years due to a high turbidity event which required extensive water line flushing across the system.

Table 3-22 Annual ADD and MDD

Year	ADD (m ³)	MDD (m ³)	Pf
2018	7,465	11,007	1.47
2019	7,095	12,169	1.72
2020	6,865	11,364	1.66
2021	7,532	14,767	1.96
Average	7,239	12,327	1.70

The following table shows the summary of the existing system water demands.

Table 3-23 Existing Water System Demand Summary

Demand Scenario	Demand (L/s)
ADD	84
MDD	143
PHD	285

3.3.2 Future Water Demands

The future water demands are determined by applying the unit rates to the projected growth, in units, for each land use. The units were distributed as shown in the Growth Projections and Design Basis Memo. There are three growth horizons, 5 years, 15 years, and 25 years, and two separate growth scenarios. MDD Peaking factor is 2x ADD, and PHD is 4x ADD, as per the design criteria.

Dead Man’s Flats was projected as linear growth, where the 25 Year Horizon maxes out the current Memorandum of Agreement for water supply, which is 8.8 L/s ADD and 17.6 L/s MDD. The existing ADD is approximately 1 L/s.

The following are the system wide demands for each growth horizon, which represents the full projected growth across 25 years.

The following table shows the system wide demands for the 5 Year

Table 3-24 5 Year Horizon Water Demands

Land Use	ADD (L/s)	MDD (L/s)	PHD (L/s)
Existing	83.8	142.7	285.3
Commercial	1.9	3.9	7.7
Hotels	8.9	17.9	35.8
Residential - Low Density	1.3	2.7	5.4
Residential - Medium / High Density	7.7	15.3	30.7
Dead Man's Flats	1.6	3.2	6.4
Total	105	186	371

The following table shows the system wide demands for the 15 Year Horizon.

Table 3-25 15 Year Horizon Water Demands

Land Use	ADD (L/s)	MDD (L/s)	PHD (L/s)
Existing	83.8	142.7	285.3
Commercial	5.2	10.5	21.0
Hotels	18.8	37.7	75.3
Residential - Low Density	3.5	6.9	13.8
Residential - Medium / High Density	18.1	36.1	72.3
Dead Man's Flats	4.7	9.4	18.7
Total	134	243	486

The following table shows the system wide demands for the 25 Year Horizon.

Table 3-26 25 Year Horizon Water Demands

Land Use	ADD (L/s)	MDD (L/s)	PHD (L/s)
Existing	83.8	142.7	285.3
Commercial	8.6	17.1	34.2
Hotels	28.7	57.4	114.9
Residential - Low Density	5.6	11.1	22.3
Residential - Medium / High Density	28.5	57.0	113.9
Dead Man's Flats	8.8	17.6	35.2
Total	164	303	606

3.3.3 Water Demands Summary

The following is a summary of the system wide water demands for each growth scenario.

Table 3-27 Water Demands Summary

Demand Scenario	Existing	5 Year Horizon (l/s)	15 Year Horizon (L/s)	25 Year Horizon (L/s)
ADD	84	105	134	164
MDD	143	186	243	303
PHD	285	371	486	641

3.4 Hydraulic Model Development

3.4.1 Existing Water Model Update

In 2020/2021 CIMA+ updated the Town's hydraulic water model from the one developed for the 2016 UMP using the software Bentley WaterCAD. Water system assets were updated using the most recent GIS provided by the Town, including water lines, PRVs, and pumping stations. Asset information such as pipe diameters and materials were updated, and new assets were included.

Pump curves for pumping and booster stations, PRV settings and reservoir elevations were carried over from the previous model and verified against record information.

Hydrant flow testing was performed by AltaWest in 9 different locations throughout Canmore, distributed to capture major pressure zones in each supply area. The model was then calibrated against the hydrant flow tests, and PRV settings were adjusted as needed to match the field tests.

The water demands were updated by taking the previous three years of geolocated customer water meters that were scaled to equal the total water distribution volume using the loss factor of 1.45 as discussed in Section 3.3. These were assigned to the nearest node in the water model. This results in proportional demands across the system according to water usage, that sum to the system wide ADD of 84 L/s.

ADD, MDD and PHD demand scenarios were established, using the existing system peaking factors.

3.4.2 Future Water System

The growth projections have individual projections for each of the OSL areas for all the land uses. The breakdown for each of the OSL areas can be found in Appendix B. The unit demands described in Section 3.2.1 were set up in the hydraulic model. Six demand scenarios were developed, covering the three growth horizons for each of the growth projection options.

Approximate water networks were added for the major ASP / ARDP areas according to their servicing drawings, including the following:

- + Three Sisters Village
- + Smith Creek
- + Spring Creek Mountain Village
- + Silvertip

As the exact phasing of the future development areas are unknown, the full buildout network of each ASP area will be assumed for all growth horizons. Developers will be required to validate the level of service each phase of development will provide on a case by case basis.

Under each growth horizon, the number of units for each land use were added into the model at the boundaries of the existing system. The unit counts and unit demands added into the model results in the ADD, as per the locations shown in Appendix B – Growth Figures.

Peaking factors for future demands were 2x ADD for MDD, and 4x ADD for PHD.

3.5 Existing System Evaluation

3.5.1 Water Supply Analysis

The water supply analysis was performed at each of the water treatment plants individually, as they tend to operate independently. Maximum day demand and annual demand was determined by reviewing annual water reports from 2018 – 2021, which records the water distributed from each plant. The average of these four years was used for this analysis.

Table 3-28 Pumphouse 1 & 2 Annual Demands

Year	Pumphouse 1 (m ³ /year)	Pumphouse 2 (m ³ /year)	Total (m ³ /year)	PH2/Total
2018	758,455	1,885,914	2,644,369	0.71
2019	819,398	1,770,416	2,589,814	0.68
2020	1,047,926	1,428,552	2,476,478	0.58
2021	1,181,917	1,516,778	2,698,695	0.56
Average	951,924	1,650,415	2,602,339	0.63

Table 3-29 Pumphouse 1 & 2 Maximum Day Demands

Year	Pumphouse 1 MDD (m ³ /day)	Pumphouse 1 MDD (L/s)	Pumphouse 2 MDD (m ³ /day)	Pumphouse 2 MDD (L/s)
2018	3,734	43	7,273	84
2019	5,296	61	6,873	80
2020	5,044	58	6,320	73
2021	7,208	83	7,559	87
Average	5,321	62	7,006	81

Pumphouse 1 has an annual diversion of 951,924 m³, and a maximum diversion rate of 62 L/s. Pumphouse 2 has an annual diversion of 1,650,415 m³, and a maximum diversion rate of 81 L/s.

Pumphouse 1 has a total annual licensed diversion of 2,121,965 m³, at a maximum rate of 589.5 L/s over two licenses. However, the license for Well #2, which accounts for 44% of the total annual diversion, and 92% of the maximum diversion rate, is subject to instream objectives. If the instream objectives are not met, Well #2 cannot be relied upon. On-going analysis of water from Well #2 will be presented to AEPA in 2023 and if found not to be GWUDI (ground water under direct influence of surface water) then the expectation is that the instream objective limitation will be removed.

Table 3-30 Pumphouse 1 Water Supply Analysis

	Current Demand	License (Well #1)	License (Well #2)	License (Total PH1)
Annual Demand (m ³ /year)	951,924	1,195,620	926,345	2,121,985
Maximum Day Demand (L/s)	62	50	540	589.5

With Well #2 not operating, either due to instream objectives or operational issues, Pumphouse 1 may not meet the water supply criteria

Pumphouse 2 has a total annual licensed diversion of 2,944,329 m³ over three licenses, and a maximum diversion rate of 170 L/s, as per the standing restrictions from the TransAlta agreement which supersedes those stated on the newer licenses.

Table 3-31 Pumphouse 2 Water Supply Analysis

	Current Demand	License (Total)
Annual Demand (m ³ /year)	1,650,415	2,944,329
Maximum Day Demand (L/s)	81	170

Pumphouse 2 meets the water supply criteria and has the capacity to supplement Pumphouse 1 in instances of Well #2 not meeting instream objectives, or during operational challenges. This ability to supplement Pumphouse 1 was further reinforced by the recent completion of the South Bow River Loop project, which connects into the Central supply zone southeast of Kananaskis Way.

3.5.2 Water Treatment Analysis

As defined in the design criteria, a water treatment plant should be able to supply a community with its maximum day demand. The maximum day demand for each pumphouse is shown in Table 3-32 and Table 3-33.

Pumphouse 1

Pumphouse 1 has a treatment capacity of approximately 8000 m³ per day, or 92.6 L/s. This value is based on the 2010 Canmore UMP Update report, which states: “A review of operational data from the last few years suggests that the maximum capacity for Pump House 1 is approximately 8,000 m³/day.”

Table 3-32 Pumphouse 1 Water Treatment Analysis

	Current Demand	Treatment Capacity
Maximum Day Demand (L/s)	62	92.6
Maximum Day Demand (m ³ /day)	5,321	8,000

Pumphouse 1 is currently using approximately 70% of it’s available treatment capacity on a max day, as calculated over the past four years. However, in August 2021 there was a turbidity event which required significant system flushing, resulting in an abnormally high period of water usage. The max day during that event was still within the treatment capacity, and occurred during the August long weekend, which is typically the period of highest water usage each year.

Pumphouse 2

Pumphouse 2 has a treatment capacity of approximately 94.4 L/s, or 360 m³/hour. The treatment is currently limited by the filtration system, with the next bottleneck being the UV system, with a capacity of 126 L/s.

Table 3-33 Pumphouse 2 Water Treatment Analysis

	Current Demand	Treatment Capacity
Maximum Day Demand (L/s)	81	94
Maximum Day Demand (m ³ /day)	7,006	8,156

Pumphouse 2 is currently using approximately 86% of it’s available treatment capacity on a max day, as calculated over the past four years. Pumphouse 2 also experienced an abnormally high max day in August 2021 due to the noted turbidity event, however the increase was measurably less than at Pumphouse 1, as the majority of the flushing occurred in the Central and Eastern supply zones.

Pumphouse 2 has a treatment capacity upgrade planned for 2023 or 2024, which will increase the capacity up to 170 L/s.

3.5.3 Level of Service Analysis

Figure W3 (Appendix C) shows the hydraulic model results for the existing system at Peak Hour Demand. Pressure nodes that are below the standard minimum pressure requirement of 350 kPa (50 psi) as set out in the design criteria are shown in orange. Pressures below the conditional minimum pressure of 280 kPa (40 psi) are shown in red. Pressures above the 625 kPa (90 psi) limit are shown in purple.

In total there are four areas that fall below the conditional minimum pressure of 280 kPa (40 psi), which would have an impact on the level of service.

- + Coyote Way
- + Downstream of Pumphouse 5
- + Northwest Extent of Silvertip Trail
- + Olympic Drive and Prendergast Place
- + Canmore Nordic Centre

Coyote Way

The northeast corner of Coyote Way has a minimum pressure of approximately 245 kPa (36 psi), which is below the Town's minimum.

The 2016 UMP recommended a project (Water Project 10) which created a new pressure zone for the Coyote Way and Kodiak Road area, by connecting it to Pressure zone 5 which is supplied by the Benchlands pump station and installing a PRV along Cougar Creek Drive.

There is no record of customer complaints of low service pressure in that area, so the Town may find it acceptable to leave the system in that area as is.

Downstream of Pumphouse 5

The water line on the downstream end of Pumphouse 5, along Elk Run Blvd, has a minimum pressure of approximately 200 kPa (29 psi). There are no services directly connected to this low pressure area, however there have been incidences of the booster pumps at Pumphouse 5 crashing or being unable to maintain pressure during high flow events nearby, such as during water line flushing, or fire events.

The 2016 UMP recommended a project (Water Project 10) which, along side the Coyote Way improvement, created a new pressure zone for the Canyon Road and Lady MacDonald areas by connecting it to Pressure zone 5, decommissioning Pumphouse 5, and installing a PRV along Lady MacDonald Road.

Further review of Water Project 10 from the 2016 UMP indicates that the project might not be the best avenue for overall system reliability and operational costs, as it removes the northern connection of the Avens area across Cougar Creek from Pumphouse 1 and the Benchlands gravity line. If there were a failure or operational issue with the southern crossing of Cougar Creek, adjacent to Highway 1, the entirety of the Avens neighbourhood would be reliant on the Benchlands pump station.

An alternative to the proposed Water Project 10 that can still allow for the decommissioning of Pumphouse 5 would be to connect pressure zone 5 directly to the inlet side of Pumphouse 5 with a new water line crossing Cougar Creek, along the same alignment as the current crossing on Elk Run Blvd. The additional costs of crossing Cougar Creek would likely be offset by only requiring one new PRV, instead of the three or four that would be needed in the previously proposed project.

This would maintain the current system redundancy, with the trade off that current Coyote Way pressures would be maintained.

Northwest Extent of Silvertip Trail

The northwest extent of Silvertip Trail has a minimum pressure of approximately 220 kPa (32 psi). As this is at the extent of the system, and pressures are currently bounded by the height of the Silvertip reservoir, there is no practical way to increase pressures to that area through changes to the existing system.

Development at or past that extent may require a booster station to provide adequate service pressures.

Olympic Drive and Prendergast Place

The area along Olympic Drive and Prendergast Place, downstream of PRV 13, has a minimum pressure of approximately 180 kPa (26 psi) immediately downstream of the PRV, and 255 kPa (37 psi) where services tie in.

Inspection reports from EPCOR of PRV 13 indicate a downstream pressure of 320 kPa (50 psi), however this does not line up with field observations. During the 2021 Water Model Update, a hydrant test was performed along Van Horne and Prospect Heights, which is in the same pressure zone as Prendergast Place. The observed static pressure was 65 psi, and all PRV settings for the pressure zone were adjusted to a set point that result in that pressure (1364.49 m Hydraulic Grade Line). If PRV 13 were operating at the 320 kPa (50 psi) set point as noted, the residual measured at the hydrant would be approximately 590 kPa (85 psi).

The pressures at Prendergast Place are marginally below the conditional minimum of 280 kPa (40 psi). As there are no records of complaints from the public regarding low service pressures, the Town can consider leaving the pressures as it. However, if public complaints do arise, the Town could consider increasing the pressure set point for PRVs 8, 13, 14, 19 and T1.

This would increase the pressures zone 8 on the west side of the Bow River, and have a minimal impact on the Downtown portion of zone 8. This is due to the long 150 mm pipe along Rundle Place that connects this portion of zone 8 to Downtown. Pressures drop rapidly in long portions of small diameter pipe, and would have a negligible impact on the pressures in Downtown.

Canmore Nordic Center

The custody transfer point for the Canmore Nordic Centre water supply has a minimum pressure of approximately 200 kPa (29 psi). The Nordic Centre is supported by a booster station that fills an on site reservoir.

The existing pressures appear to be adequate for the current booster station set up, however if upgrades to the booster station are required in the future for further servicing, the lower supply side pressures will need to be considered.

3.5.4 Fire Flow Analysis

Figure W4 (Appendix C) shows the hydraulic model results for the MDD+ Fire Flow scenario. The water model was used to calculate the available fire flow at each node while maintaining at least 138 kPa (20 psi) residual at every point in the distribution system. The nodes are color coded corresponding to whether or not the fire flow requirements were met, based on the surrounding land use.

There are five main areas in the existing system that are not meeting the fire flow requirements according to their land use:

- + Bow Valley Trail northwest of 15th Street
- + Elk Run Industrial Area
- + Railway Ave adjacent to the rail line
- + Industrial Place / 8th Avenue
- + Hospital

There is a single node in the water model that has a significant impact on the available fire flow for the existing system, which is very sensitive to the discharge pressure from Pumphouse 2. It is on the service line that leads to the Canmore Nordic Center. Due to the high elevation on the end of the line, its connection to the cross town feeder main, and the low discharge pressure of Pumphouse 2, high flows out of Pumphouse 2 can drop the hydraulic grade line low enough for that service line to go below the minimum pressure requirements during fire flow runs. If this service line were to be ignored in the modelling, the fire flow results in the affected areas increase dramatically, however this would impact the service to the Nordic Center.

The proposed distribution capacity upgrade to Pumphouse 2 resolves this issue, and allows the first three affected areas to meet the design criteria for fire flow.

The hospital has an available fire flow of approximately 160 L/s along the 150 mm line that services it, when 200 L/s is required. This is largely due to the small pipe size of the line, as the connection points on Hospital Place and Bow Valley Trail have available fire flows above the requisite 200 L/s. It may not be worth the risk of service disruption to the hospital to facilitate a moderate increase in fire flows to the hospital, however when the water main servicing it is nearing its lifecycle, it should be replaced with a larger diameter pipe.

The fire flow capacity of the existing system is otherwise adequate and meets the design criteria. There are some other minor areas that do not meet the fire flow targets, however these are largely along dead end lines from small diameter pipes, which would not be practical to loop or to upsize.

Figure W5 shows the available fire flow after the Pumphouse 2 distribution capacity upgrade has been implemented.

3.5.5 Water Distribution Analysis

Pipe Lifecycle

The Town of Canmore's water distribution system contains aging water distribution infrastructure, particularly in the Downtown area. The service life of water mains, as per Canmore's asset management standards, is 75 years.

Currently there are pipes dating back to 1965, making the oldest pipes in the system approximately 58 years old. Figure W6 (Appendix C) shows the pipes according to age.

Currently no pipes in the system are approaching the end of their lifecycle, however replacement programs should be considered in the future when pipe lifecycle is approaching its end.

Pipe Turbidity

In August 2021, there was a significant turbidity event that occurred around Kananaskis Way, Cougar Creek and Avens neighbourhoods. This turbidity event occurred during the commissioning of the South Bow River Loop. It was suspected that the high flows through the pipe disturbed settled material in pipes that were previously experiencing low flows.

Historically Canmore has not had an active pipe flushing program, and when low velocity flushing was performed during the turbidity incident, and follow up high velocity flushing, significant turbidity was encountered. This indicates that deposited material is likely an issue across the Town’s water network, particularly in older areas like Downtown.

The Town should develop an active pipe flushing program to mitigate future turbidity risks.

3.5.6 Pump Station Analysis

The level of service analysis and available fire flow analysis demonstrate that the Town’s water distribution system can provide adequate service pressures during PHD and available fire flow during MDD, however these scenarios have gravity assisted reservoirs supplementing flows into the system.

An investigation into the ability for the Town’s system to fill the storage reservoirs while providing MDD to the reservoirs and their associated service areas is also necessary to ensure adequate and reliable service.

Currently there are three storage reservoirs which are filled by pump stations, and supply the system with water through gravity or pumping:

- + Grassi Reservoir
- + Benchlands Reservoir
- + Silvertip Reservoir

SCADA data of the reservoir levels was reviewed to determine approximately the observed fill rate of each of the reservoirs.

The MDD of each reservoir was determined in the model by running each demand scenario without the reservoirs being filled. The modelled discharge from each reservoir represents the reservoir’s MDD.

Table 3-34 Existing System Pump Station Analysis – Reservoir Demands

Reservoir	Required MDD (L/s)	Available MDD (L/s)
Grassi	30	20
Silvertip	3	70
Benchlands + Silvertip	28	50

Grassi Reservoir

The Grassi reservoir is supplied by a booster station on Peaks Drive, south of Lawrence Grassi Ridge. The booster station is in turn supplied by Pumphouse 2.

The Grassi booster station is noted as having two pumps, each of which have a capacity of approximately 20 L/s. The SCADA data indicates that Grassi has two different fill rates. It regularly fills at approximately 15 - 20 L/s, and after high demand periods fills at roughly 30 L/s with both pumps running.

With both pumps running, the booster station for the Grassi reservoir would not meet the design criteria for pump stations, where the largest pump should be considered offline for the purpose of redundancy. An upgrade to the booster station, with a redundant pump or higher pumping capacity should be considered, and should cover up to the 15 Year horizon, which as shown in Section 3.6.6.2, is a rate of approximately 80 L/s. The existing booster station also is noted as not having a backup generator, and the nearby PRV 20 is noted as needing repairs. These should be included in the booster station upgrade.

With the booster station operating at 30 L/s in the MDD scenario, Pumphouse 2 is able to provide adequate water to the station and maintain the required level of service for the rest of its service area.

Silvertip Reservoir

The Silvertip reservoir is filled by the Benchlands pump station. Modelling predicts that Benchlands can fill it at a rate of approximately 80 L/s, and SCADA data indicates a fill rate of approximately 70 L/s.

The current demand on the reservoir is quite low, with a total pumping requirement of 5 L/s to serve the ADD and MDD of the Silvertip area. During ADD, benchlands also has a demand of 5 L/s to the area directly supported by it. As such, it should be capable of a minimum of 10 L/s in order to fill the Silvertip reservoir, which it is more than capable of.

Benchlands Reservoir

The Benchlands reservoir is supplied by Pump Station 1. Pumphouse 1 fills benchlands reservoir by staging pumps on and off depending on the reservoir level. Modelling predicts that Pumphouse 1 can fill it at a rate of approximately 50 L/s, and the SCADA indicates a fill rate of approximately 50 L/s.

For MDD there were 2 small pumps online and 5 L/s from the SBRL PRV. The MDD also included the demands from Silvertip.

According to both the SCADA fill rates, and the modelled fill rates, Pumphouse 1 has sufficient pumping capacity to fill Benchlands reservoir while still supplying an adequate level of service to its service area.

3.5.7 Water Storage Analysis

The Town's water system is a dynamic network where pressure zones can be serviced from multiple storage reservoirs at once. In order to simplify these interactions, the distribution system is divided into three supply areas; Western, Central, and Eastern.

The ADD and MDD of each supply zone was determined by summing up the demands in the model.

Table 3-35 Existing Supply Zone Demands

Supply Zone	ADD (L/s)	MDD (L/s)
Western Supply Zone	13.6	23.2
Central Supply Zone	45.5	77.3
Eastern Supply Zone	21.7	33.7
Silvertip	1.9	3.2
Total	82.7	137.4

The Western supply zone relies solely on Pumphouse 2 and Grassi Reservoir, and as such the volume required for the Western supply zone will be reserved from those reservoirs in this analysis.

The Central supply zone and portions of the Eastern supply zone can be supported by Pumphouse 2, Grassi Reservoir and Benchlands, however with Grassi and Pumphouse 2 reserved, the majority of the storage will come from Benchlands. Any remaining capacity in the Western supply zone can be attributed to the Central and Eastern supply zones.

The Silvertip area is part of the Eastern supply zone, and can be supplied by both Benchlands and Silvertip, but the Silvertip reservoir has no practical way to transfer water back into Benchlands. As such, the Silvertip area will be considered separately.

Table 3-36 Existing System Water Storage Analysis

	Western Supply Zone	Central and Eastern Supply Zone	Silvertip
ADD (m ³ /day)	1,177	5,803	164
MDD (m ³ /day)	2,002	9,866	279
Fire Storage (300 L/s for 3.5 hours)	3,780	3,780	3,780
Equalization Storage - 25% MDD (m ³ /day)	500	2,466	70
Emergency Storage - 15% ADD (m ³ /day)	177	870	25
Recommended Storage (m ³)	4,457	7,117	3,874
Available Storage (m ³)	6,100	7,300	5,400

Overall, all supply zones have adequate water storage. The Central and Eastern zones are approaching the limit of the Benchlands reservoir, however since the Central and Eastern Zones can be supported by the Western supply zone, which has approximately 1,350 m³ excess capacity, this can be added to the 7,300 m³ storage capacity of Benchlands.

3.6 Future System Evaluation

3.6.1 Water Supply Analysis

Future water demands were divided between the two water treatment plants dependant on what supply zone the demands fall in. Demands in the Western supply zone, which represent the bulk of the growth in Canmore, were assigned to Pumphouse 2. Demands in the Central and Eastern Supply Zones were assigned to Pumphouse 1.

Table 3-37 Future System Annual Demands

Horizon	Pumphouse 1 ADD (m ³ /day)	Pumphouse 1 Annual Consumption (m ³ /year)	Pumphouse 2 ADD (m ³ /day)	Pumphouse 2 Annual Consumption (m ³ /year)
5 Year Horizon	3,796	1,385,544	5,307	1,937,235
15 Year Horizon	4,654	1,698,665	6,870	2,507,406
25 Year Horizon	5,559	2,029,005	8,519	3,109,397

Table 3-38 Future System Maximum Day Demands

Horizon	Pumphouse 1 MDD (m ³ /day)	Pumphouse 1 MDD (L/s)	Pumphouse 2 ADD (m ³ /day)	Pumphouse 2 MDD (L/s)
5 Year Horizon	7,697	89	8,578	99
15 Year Horizon	9,412	109	11,702	135
25 Year Horizon	11,222	130	15,001	174

5 Year Horizon

Under typical conditions, Pumphouse 1 meets the water supply criteria under the 5 Year Horizon, however if instream objectives are not met for Well #2 during a maximum day event, Pumphouse 1 would not be able to receive adequate water supply.

Table 3-39 5 Year Horizon Pumphouse 1 Water Supply Analysis

	5 Year Demand	License (Well #1)	License (Well #2)	License (Total PH1)
Annual Demand (m ³ /year)	1,385,544	1,195,620	926,345	2,121,985
Maximum Day Demand (L/s)	89	50	540	589.5

Pumphouse 2 meets the water supply criteria under the 5 Year Horizon, and has enough additional spare capacity to support Pumphouse 1 during events where Well #2 cannot be relied on.

Table 3-40 5 Year Horizon Pumphouse 2 Water Supply Analysis

	5 Year Demand	License (Total)
Annual Demand (m ³ /year)	1,937,235	2,944,329
Maximum Day Demand (L/s)	99	170

15 Year Horizon

Under typical conditions, Pumphouse 1 meets the water supply criteria under the 15 Year Horizon, however if instream objectives are not met for Well #2 during a maximum day event, Pumphouse 1 would not be able to receive adequate water supply.

Pumphouse 2 no longer has the spare capacity to support Pumphouse 1 during these events. Prior to the 15 year horizon, the Town should consider investigating increasing the maximum allowable flow from Well #1, or constructing a new well that would not be subject to instream flow objectives.

The alternative is to have Pumphouse 2 support Pumphouse 1, however limitations in the maximum withdrawal rate by the previous TransAlta agreement means that is not feasible until those limitations are renegotiated.

Table 3-41 15 Year Horizon Pumphouse 1 Water Supply Analysis

	15 Year Demand	License (Well #1)	License (Well #2)	License (Total PH1)
Annual Demand (m ³ /year)	1,698,665	1,195,620	926,345	2,121,985
Maximum Day Demand (L/s)	109	50	540	589.5

Pumphouse 2 meets the water supply criteria under the 15 Year Horizon, however it no longer has enough additional spare capacity to support Pumphouse 1 during events where Well #2 cannot be relied on. Pumphouse 2 is nearing the annual withdrawal limit of the existing licenses.

Table 3-42 15 Year Horizon Pumphouse 2 Water Supply Analysis

	15 Year Demand	License (Total)
Annual Demand (m ³ /year)	2,507,406	2,944,329
Maximum Day Demand (L/s)	135	170

25 Year Horizon

Under typical conditions, Pumphouse 1 meets the water supply criteria under the 25 Year Horizon, however if instream objectives are not met for Well #2 during a maximum day event, Pumphouse 1 would not be able to receive adequate water supply. The annual withdrawal limits are at approximately 95% of capacity.

Table 3-43 25 Year Horizon Pumphouse 1 Water Supply Analysis

	25 Year Demand	License (Well #1)	License (Well #2)	License (Total PH1)
Annual Demand (m ³ /year)	2,029,005	1,195,620	926,345	2,121,985
Maximum Day Demand (L/s)	130	50	540	589.5

Pumphouse 2 does not meet the water supply criteria under the 25 Year Horizon, with both the annual withdrawal limits and the maximum rate of withdrawal. In order to support the 25 year horizon, additional water licences may have to be acquired, and the existing withdrawal limit under the TransAlta agreement would have to be extended. However, these deficiencies are very minor, and should be re-examined when further development in Canmore has occurred, allowing for better water demand projections.

Table 3-44 25 Year Horizon Pumphouse 2 Water Supply Analysis

	25 Year Demand	License (Total)
Annual Demand (m ³ /year)	3,109,397	2,944,329
Maximum Day Demand (L/s)	174	170

3.6.2 Water Treatment Analysis

As defined in the design criteria, a water treatment plant should be able to supply a community with its maximum day demand. The maximum day demand for each pumphouse and each growth horizon was shown in Table 3-38.

Pumphouse 1

Pumphouse 1 currently has a treatment rate of approximately 8,000 m³/day, or 92.6 L/s.

According to the way demands were distributed for future growth, Pumphouse 1 will exceed its treatment capacity shortly after the 5 year horizon. Pumphouse 2 will be able to supplement Pumphouse 1 with spare capacity in its treatment rate past the 15 year growth horizon. By the end of the 25 year horizon, Pumphouse 2 will no longer be able to make up this treatment deficit.

Table 3-45 Future System Water Treatment Analysis for Pumphouse 1

	Future Demand	Treatment Capacity
5 Year -Maximum Day Demand (L/s)	89	93
15 Year - Maximum Day Demand (L/s)	109	93
25 Year - Maximum Day Demand (L/s)	130	93

Pumphouse 2

Pumphouse 2 is slated to have the treatment capacity upgraded to 170 L/s in the near future and is assumed to be complete for the future system evaluations.

Pumphouse 1 has a 37 L/s deficit for treatment in the 25 year horizon, so if Pumphouse 1 were to remain as-is, Pumphouse 2 would need to be capable of treating that alongside its max day demand, for a total of 211 L/s. Pumphouse 2 was initially planned to have a treatment rate of 225 L/s, but was reduced to 170 L/s in accordance with the licence limitations. If that withdrawal rate is ever increased, the Pumphouse 2 design will be able to accommodate an additional filter, which could bring the treatment rate up to 225 L/s. However this space could be used for the proposed backwash reuse system, which would serve to reduce the overall raw and treated water demands.

Table 3-46 Future System Water Treatment Analysis for Pumphouse 2

	Current Demand	Treatment Capacity
5 Year -Maximum Day Demand (L/s)	99	170
15 Year - Maximum Day Demand (L/s)	135	170
25 Year - Maximum Day Demand (L/s)	174	170

25 Year Horizon Water Treatment Deficit Options

The following are some potential options to address the treated water deficit for the 25 year horizon. A water supply and treatment study should be performed prior to the 15 year horizon in order to determine the best course of action for the Town.

- + Increased withdrawal from the Rundle Forebay and additional treatment at Pumphouse 2
 - Withdrawal rates from the Rundle Forebay are currently constrained by a third party. At this time it does not seem likely that the third party would allow the increase.
- + Additional Storage
 - In order to supplement the peak demands that are higher than the treatment rate, additional storage could possibly be used. No design criteria has been defined for this use case, however a conservative approach would be to allow for at least two consecutive max days of water demand. This would mean additional storage equal to two times the current max day deficit of 40 L/s, which equals a volume of approximately 7,000 m³. This would be a significant increase in the required storage volume in the Town, and would be reflected by a very high capital cost.
- + Pumphouse 1 Upgrades
 - Pumphouse 1 could possibly be upgraded to increase the treatment capacity. If the water supply can be officially designated as not under the direct influence of surface water, which is supported by a report being submitted to Alberta Environment, then the treatment system of chlorine contact time can remain the same. Pumphouse 1 is nearing life cycle, so the upgrade would likely involve a completely new treatment plant. A new raw water well would also likely be required.

3.6.3 Level of Service Analysis

Figures W7 – W9 (Appendix C) shows the hydraulic model results for each of the future growth horizons at Peak Hour Demand. Pressure nodes that are below the standard minimum pressure requirement of 350 kPa (50 psi) as set out in the design criteria are shown in orange. Pressures below the conditional minimum pressure of 280 kPa (40 psi) are shown in red. Pressures above the 625 kPa (90 psi) limit are shown in purple.

The full buildout network for the growth areas has been implemented for all growth horizons.

5 Year Horizon

The five year horizon contains two major modifications to the Canmore water distribution system; Pumphouse 2 upgraded to >225 L/s distribution capacity, and Pumphouse 5 (CRBS) decommissioned and its service area connected to Pressure zone 5, which is supported by Benchlands.

Modifying Pressure Zone 8 was also investigated in order to raise the service pressure at Prendergast Place, as noted in Section 3.5.3. It was found that this encouraged flows into Downtown through the communities along Rundle Drive, instead of the crosstown feeder through PRV 12. If PRV 12 were adjusted upwards to promote flows through it, a marked increase in the Downtown pressures was observed. As such, it is recommended that the PRVs be maintained at their current pressure set points, barring any customer complaints from the low-pressure area in Prendergast Place.

The pressures along Elk Run Blvd in the existing line that previously connected to the CRBS are still below the 40 psi minimum, however there is no longer any service connected to in in the low pressure area. Down the hill along Lady McDonald Dr, enough elevation is lost to maintain adequate service pressures. The areas that were served by the CRBS now have consistent, adequate service pressures with the booster station decommissioned.

15 Year Horizon

The fifteen-year horizon contained no major modifications to the Town's water distribution system, and the only deficient areas were the ones originally indicated in the existing system analysis.

25 Year Horizon

The twenty-five-year horizon contained no major modifications to the Town's water distribution system, and the only deficient areas were the ones originally indicated in the existing system analysis.

3.6.4 Fire Flow Analysis

Figures W10 – W13 (Appendix C) shows the hydraulic model results for the MDD+Fire Flow scenario for each of the growth horizons. The water model was used to calculate the available fire flow at each node while maintaining at least 138 kPa (20 psi) residual at every point in the distribution system. The nodes are color coded corresponding to whether or not the fire flow requirements were met, based on the surrounding land use.

The full buildout network for the growth areas has been implemented for all growth horizons. All growth areas were assumed to have a 200 L/s fire flow requirement.

5 Year Horizon

The 5 year horizon included the following upgrades to the Town's water distribution system and network:

- + Pumphouse 2 upgraded to 225 L/s capacity
- + CRBS decommissioned and supply area connected to Pressure zone 5
- + Bow Valley Trail water line upgraded to 250 mm up to Hospital Place

In addition to these upgrades, the TeePee town area also has a land use change to high density according to the growth projections, and as such has the available fire flow requirement increased to 200 L/s. Previously available fire flows were at approximately 120 L/s in the area and met the fire flow requirements. With the density increase, an upgrade to the main waterline along 1 Ave from 150 mm to 250 mm will be required. This has been implemented for the analysis.

The southeast extent of the Smith Creek development does not meet the estimated 200 L/s available fire flow. This is in part due to the assumed pressure zone distribution, with the high level network in the ASP this area is serviced off of a single line from the new reservoir as is not a looped system. That is likely the creating the limitation in available fire flow This will have to be a consideration when developers begin designing the neighbourhood.

15 Year Horizon

The fifteen year horizon contained no major modifications to the Town's water distribution system, and the only deficient areas were the ones originally indicated in the existing system analysis.

25 Year Horizon

The twenty five year horizon contained no major modifications to the Town's water distribution system, and the only deficient areas were the ones originally indicated in the existing system analysis.

3.6.5 Water Distribution Analysis

The lifecycle of pipes are approximately 75 years in the Town. Pipes approaching the 75 year lifecycle should be considered for replacement.

5 Year Horizon

No pipes are approaching their lifecycle in the 5 year horizon.

15 Year Horizon

By the end of the 15 year horizon, the earliest recorded pipes in the water network (Installed in 1965) are approaching their end of their lifecycle, however no replacement programs are required under this growth horizon.

25 Year Horizon

A replacement program should be developed for pipes installed between 1965 and 1972, to be executed starting from the end of the 15 year horizon and replacing sections of pipe each year. This would ensure that there are no assets older than the 75 year lifecycle by the end of the 25 year horizon, and are represented by pipes that are currently older than 50 years.

There are approximately 12 km of water lines older than 50 years. They are primarily located in the Downtown area, Railway Ave, TeePee town, and Rundle Drive.

150 mm pipes should be replaced with 200 mm pipes where possible. 150 mm pipes are hydraulically restrictive, and generally can't provide the required fire flows needed for future densification.

The replacement program will be broken out into five separate areas, for the purposes of project time lines and cost estimates. They are as follows:

- + South Canmore (6th Street to 3rd Street) – 2 km
- + Downtown (6th Street to 10th Street) – 3 km
- + 7th Avenue (10th St to Industrial Place) – 2.5 km
- + Rundle (Bridge Road to Three Sisters Drive) – 2 km
- + Teepee Town / Railway Ave – 1.5 km

3.6.6 Pump Station Analysis

Along with the three existing reservoirs assessed in Section 3.5.7 for the existing system, the proposed Smith Creek reservoir was also assessed in the future system evaluation.

The MDD of each reservoir and its associated service area was determined in the model by running each demand scenario without the reservoirs being filled. The modelled discharge from each reservoir represents the reservoir's MDD.

The Grassi and Smith Creek reservoirs are fully reliant on Pumphouse 2 to deliver water to them, with daisy chained booster stations required to fill Smith Creek reservoir.

In order to consider the impacts of Dead Man's Flats with consideration for existing infrastructure agreements, the Grassi Booster Station was additionally reviewed with no contribution from Dead Man's Flats.

3.6.6.1 5 Year Horizon

The following are the MDD demands of each of the reservoirs under the 5 year horizon.

Table 3-47 5 Year Horizon Pump Station Analysis

Reservoir	Required MDD (L/s)	Available MDD (L/s)
Grassi + Smith	47	80
Grassi + Smith (No DMF)	44	80
Silvertip	8	80
Benchlands + Silvertip	39	50
Smith Creek	6	0

Grassi Reservoir

The Grassi booster station needs a pumping capacity of 47 L/s to support the Grassi and Smith Creek reservoirs. The existing system identified the Grassi booster station as not meeting standards and it is recommended that the pump station be upgraded to satisfy the 15 year horizon., which has a pumping rate of 80 L/s. Without demands from Dead Man's Flats, 44 L/s pumping capacity would be required.

With the booster station operating at 80 L/s, Pumphouse 2 is able to provide adequate flow to the system during MDD, and the pump stations are able to maintain adequate levels of service.

Smith Creek Reservoir

The Smith Creek reservoir will require a booster station to fill it. The need for the booster station and reservoir is dependent on development staging and the elevations that phases are being built at, however it is assumed that the reservoir will be required at the start of development for the portion of Smith Creek that is on the east side of the cross valley corridor.

Initially a booster station in Smith Creek capable of 6 L/s is required to support the Smith Creek reservoir. However, construction of the booster to support up to the 15 Year horizon, for a capacity of 20 L/s, is recommended.

With the Smith Creek booster station operating at 20 L/s, the Grassi booster upstream can provide adequate flow to the system, and the pump stations are able to maintain adequate levels of service.

Silvertip Reservoir

During MDD, the Silvertip reservoir can fill at a rate of 80 L/s from the Benchlands pump station, satisfying the MDD requirements of 8 L/s.

Benchlands Reservoir

The operating conditions for Benchlands for each demand scenario were as follows. For ADD there was two small pumps online at Pumphouse 1 and the new PRV from the South Bow River Loop (SBRL) online with a flow control valve set to 5 L/s in place. For MDD there were 2 small pumps online and 5 L/s from the SBRL PRV. MDD also included the demands from Silvertip.

In the reservoir filling scenario, Benchlands fills at a modelled rate of 50 L/s, which satisfies the MDD requirement of 39 L/s.

3.6.6.2 15 Year Horizon

The following are the ADD and MDD demands of each of the reservoirs under the 15 year horizon.

Table 3-48 15 Year Horizon Pump Station Analysis

Reservoir	MDD (L/s)	Available MDD (L/s)
Grassi + Smith	78	80
Grassi + Smith (No DMF)	68	80
Silvertip	17	81
Benchlands + Silvertip	49	50
Smith Creek	18	20

Grassi Reservoir

The Grassi booster station needs a pumping capacity of 78 L/s in order to support the Grassi and Smith Creek reservoirs. The existing system evaluation identified the Grassi booster station as not meeting standards, and it is recommended that the pump station be upgraded to 80 L/s to satisfy this 15 year horizon. Without demands from Dead Man’s Flats, 68 L/s pumping capacity would be required.

With the booster station operating at 80 L/s, Pumphouse 2 is able to provide adequate flow to the system during MDD, and the pump stations are able to maintain adequate levels of service.

Of the 80 L/s required pumping capacity, 30 L/s is from the existing system, 38 L/s is from OSL areas 13 and 14, and 10 L/s is from Dead Man’s Flats.

Smith Creek Reservoir

The Smith Creek booster station needed a pumping capacity of 18 L/s in order to support the Smith Creek reservoir, and was recommended in the 5 year horizon to be constructed to support up to 20 L/s. With the booster station operating at 20 L/s, the Grassi booster upstream is able to provide adequate flow to the system, and the pump stations are able to maintain adequate levels of service.

Silvertip Reservoir

During ADD, the Silvertip reservoir fills at a modelled rate of 80 L/s from the Benchlands pump station, satisfying the MDD requirements of 17 L/s.

Benchlands Reservoir

The operating conditions for Benchlands for each demand scenario were as follows. For ADD there was two small pumps online at Pumphouse 1 and the new PRV from the South Bow River Loop (SBRL) online with a flow control valve set to 5 L/s in place. For MDD there were 2 small pumps online and 5 L/s from the SBRL PRV. MDD also included the demands from Silvertip.

In the reservoir filling scenario, Benchlands fills at a modelled rate of 50 L/s, which satisfies the MDD requirement of 49 L/s.

3.6.6.3 25 Year Horizon

The following are the MDD demands of each of the reservoirs under the 25 year horizon.

Table 3-49 25 Year Horizon Pumping Analysis

Reservoir	MDD (L/s)	Available MDD (L/s)
Grassi --+ Smith Creek	133	80
Grassi + Smith (No DMF)	115	80
Silvertip	27	80
Benchlands + Silvertip	59	50
Smith Creek	45	20

Grassi Reservoir

The Grassi booster station needed a pumping capacity of 133 L/s in order to support the Grassi and Smith Creek reservoirs and will require an upgrade. Without demands from Dead Man’s Flats, 115 L/s pumping capacity would be required, which will still result in an upgrade. 135 L/s is the recommended upgrade target, an increase of 55 L/s.

Of the 55 L/s upgrade, 47 L/s is from OSL areas 13 and 14, and 8 L/s is from Dead Man’s Flats.

With the booster station operating at 135 L/s, an adequate level of service is not able to be maintained. The draw to fill both Grassi and Smith Creek reservoirs at max day demand creates low pressures along Three Sisters Drive, and is a result of the headlosses created by the high flows from Pumphouse 2 along Three Sisters Drive.

Increasing the pumping capacity at Pumphouse 2 does not resolve this, and as such the upgraded pumping capacity at Pumphouse 2 is adequate. The main issue is that the discharge pressure out of Pumphouse 2 is too low to combat the headlosses created during this high flow event.

Dependant on its risk Tolerance, the Town may want to consider only filling one of the Grassi or Smith Creek reservoirs at a time, or filling them at a maximum rate of less than MDD, such as 1.5 times ADD. However this does result in the potential for the reservoirs to trend downwards in volume during abnormally high demand periods.

In order to meet these design criteria, one of the following would need to be implemented:

- + Higher Discharge Pressure – Pumphouse 2 would have to discharge at ~5 psi higher than it currently is to match the pressure losses caused during peak demand and meet the minimum level of service. This does not resolve low pressures on the suction side of the Grass booster station, and would have to be a consideration in its design, and the accompanying PRV.
- + New water line from Pumphouse 2 to Grassi Booster – A new water line which would connect Pumphouse 2 to the Grassi booster, effectively twinning the existing water line, would reduce the headlosses from the high flow scenario dramatically, and resolve what is currently a long single point of failure in the water network. Everything supplied by the Grassi reservoir is reliant on the water line that runs along Spray Lakes Rd and Three Sisters Dr.

While increasing the discharge pressure out of Pumphouse 2 would be the simplest solution, a new water line from Pumphouse 2 to the Grassi Booster would provide the best balance between resolving the level of service and improving system redundancy, and when implemented allows enough flow to reach the Grassi booster to supply it at the needed fill rate.

As the proposed water line would have the benefit of redundancy for the Town as a whole, a benefitting areas assessment was performed as an alternative to the cost allocation methodology. This compares the existing developed area to the gross developable area at the 25 year growth horizon for all offsite levy areas with projected growth. The following table shows the benefitting area and their relative percentages of the total area, which can be attributed to cost allocation.

Table 3-50 Grassi Reservoir Twinned Line Benefitting Areas

OSL Zone	Area (ha)	% of Total
Existing	750.0	73.1%
1	21.7	2.1%
2	20.5	2.0%
6	8.4	0.8%
7	3.0	0.3%
9	10.5	1.0%
10	5.3	0.5%
13	56.9	5.5%
14	70.1	6.8%
15 (DMF)	75.0	7.3%
16	2.3	0.2%
17	2.7	0.3%
Total Growth	276.2	26.9%
Total Area	1026.2	

Smith Creek Reservoir

The Smith Creek booster station needed a pumping capacity of 45 L/s in order to the Smith Creek reservoir. The booster station, which was recommended to be designed to service up to the 15 year horizon, would need to be upgraded.

With the booster station operating at 45 L/s, the Grassi booster upstream is able to provide adequate flow to the system, and the pump stations are able to maintain adequate levels of service, when the proposed water line from Pumphouse 2 to Grassi booster is implemented.

Silvertip Reservoir

During ADD, the Silvertip reservoir fills at a modelled rate of 80 L/s from the Benchlands pump station, satisfying the MDD requirements of 27 L/s.

Benchlands Reservoir

The operating conditions for Benchlands were as follows. For MDD there were three small pumps online and 5 L/s from the SBRL PRV. The MDD also included the demands from Silvertip.

In the reservoir filling scenario, Benchlands fills at a modelled rate of 50 L/s, which does not satisfy the MDD requirement of 59 L/s.

Adjusting the flow rate at the Flow Control Valve on the SBRL PRV was investigated, and modelling indicated it could provide a maximum of 30 L/s.

Pumphouse 1 may be able to achieve the required flow rates by raising the discharge pressure out of the station. The current set point is 120 psi, increasing this to 125 psi would allow for sufficient flow to fill the Benchlands reservoir at the required MDD. Testing would need to be performed to ensure the pumps are capable of this, however that flow rate and discharge pressure does fall on the current pump curves.

3.6.7 Water Storage Analysis

In addition to the three supply zones previously analysed in the existing system, a new reservoir will be required to support the growth in the Smith Creek development. This new reservoir will be sized and assessed separately from the Western supply zone.

The ADD and MDD of each supply zone was determined by summing up the demands in the model for the supply area, including the future demands for each growth horizon.

Table 3-51 Future Supply Zone Demands

Supply Zone	Demand Scenario	5 Year Horizon	15 Year Horizon	25 Year Horizon
East	ADD (m ³ /day)	2,126	2,424	2,769
	MDD (m ³ /day)	3,689	4,285	4,976
Central	ADD (m ³ /day)	4,638	4,792	4,946
	MDD (m ³ /day)	8,098	8,407	8,714
West	ADD (m ³ /day)	1,963	3,525	5,091
	MDD (m ³ /day)	3,573	6,697	9,828
Smith Creek	ADD (m ³ /day)	129	389	648
	MDD (m ³ /day)	259	777	1,296
Silvertip	ADD (m ³ /day)	227	633	1,039
	MDD (m ³ /day)	454	1,266	2,077

The Western supply zone relies solely on Pumphouse 2 and Grassi Reservoir, and as such the volume required for the Western supply zone will be reserved from those reservoirs in this analysis.

The Central supply zone and portions of the Eastern supply zone can be supported by Pumphouse 2, Grassi Reservoir and Benchlands, however with Grassi and Pumphouse 2 reserved, the majority of the storage will come from Benchlands. Any remaining capacity in the Western supply zone can be attributed to the Central and Eastern supply zones.

The Silvertip area is part of the Eastern supply zone, and can be supplied by both Benchlands and Silvertip, but the Silvertip reservoir has no practical way to transfer water back into Benchlands. As such, the Silvertip area will be considered separately.

5 Year Horizon

Under the five-year horizon, all the supply zones have adequate storage when considering the dynamic system. The Eastern and Central supply zones have a storage volume requirement greater than just Benchlands reservoir, however Grassi and Pumphouse 2 have sufficient spare capacity to supplement those areas.

Table 3-52 5 Year Horizon Water Storage Analysis

	Western Supply Zone	Central and Eastern Supply Zone	Silvertip
ADD (m ³ /day)	1,963	7,216	391
MDD (m ³ /day)	3,573	12,691	733
Fire Storage (300 L/s for 3.5 hours)	3,780	3,780	3,780
Equalization Storage - 25% MDD (m ³ /day)	893	3,173	183
Emergency Storage - 15% ADD (m ³ /day)	294	1,082	59
Recommended Storage (m ³)	4,968	8,035	4,022
Available Storage (m ³)	6,100	7,300	5,400

The Central and Eastern zones are above the limit of the Benchlands reservoir, however since the Central and Eastern Zones can be supported by the Western supply zone, which has approximately 1,100 m³ excess capacity, this can be added to the 7,300 m³ storage capacity of Benchlands for an available storage of approximately 8,400 m³.

15 Year Horizon

Under the 15 year horizon, there is no longer adequate storage across the supply zones. The Western supply zone is approaching the limit of the available storage, and can no longer spare sufficient capacity to supplement the Eastern supply zone

Table 3-53 15 Year Horizon Water Storage Analysis

	Western Supply Zone	Central and Eastern Supply Zone	Silvertip
ADD (m ³ /day)	3,525	7,216	797
MDD (m ³ /day)	6,697	12,691	1,545
Fire Storage (300 L/s for 3.5 hours)	3,780	3,780	3,780
Equalization Storage - 25% MDD (m ³ /day)	1,674	3,173	386
Emergency Storage - 15% ADD (m ³ /day)	529	1,082	120
Recommended Storage (m ³)	5,983	8,035	4,286
Available Storage (m ³)	6,100	7,300	5,400

Ultimately an expansion to the existing reservoirs should be constructed to support the future growth in Canmore. An expansion of the Grassi reservoir would have the greatest impact, as it has the capability to support all of the supply zones.

In the interim, a new water line along Silvertip Trail can be constructed, connecting pressure zones 3 and 4 together. This would allow the system to utilize the remaining capacity in the Silvertip reservoir and defer the Grassi reservoir expansion.

With the pressure zones connected along Silvertip Trail, the design criteria for water storage can be met. There is approximately 1,100 m³ excess capacity in the Silvertip reservoir, allowing for an available storage in the Central and Eastern zones of 8,400 m³.

25 Year Horizon

In the 25 Year Horizon, there is insufficient storage capacity in both the Western and Central/Eastern supply zones.

Table 3-54 25 Year Horizon Water Storage Analysis

	Western Supply Zone	Central and Eastern Supply Zone	Silvertip
ADD (m ³ /day)	5,091	7,716	1,203
MDD (m ³ /day)	9,828	13,690	2,242
Fire Storage (300 L/s for 3.5 hours)	3,780	3,780	3,780
Equalization Storage - 25% MDD (m ³ /day)	2,457	3,423	560
Emergency Storage - 15% ADD (m ³ /day)	764	1,157	180
Recommended Storage (m ³)	7,001	8,360	4,521
Available Storage (m ³)	6,100	7,300	5,400

Prior to the buildout of the 25-year horizon, an expansion to the Grassi Reservoir will be required to service the Town’s supply zones.

Overall, approximately 2,000 m³ of additional storage is required to meet the design criteria for water storage.

The storage expansion will be required once the MDD of the Western supply zone reaches approximately 40 L/s, which is projected to occur shortly after the 15-year horizon.

In order to account for Dead Man’s Flats contribution to the additional storage requirement, following table shows the storage needed for the Dead Man’s Flats 25 Year demands. No fire storage was considered, as that was allocated in the existing system.

Table 3-55 25 Year Dead Man’s Flats Storage Requirements

	Dead Man’s Flats
ADD (m ³ /day)	760
MDD (m ³ /day)	1520
Equalization Storage - 25% MDD (m ³ /day)	380
Emergency Storage - 15% ADD (m ³ /day)	114
Storage Required (m ³)	494

This shows that Dead Man’s Flats accounts for approximately 25% of the total volume of additional recommended storage.

Smith Creek Reservoir

To support the Smith Creek development area, a new reservoir will be required to service the higher elevation portions of the ASP area.

Table 3-56 Smith Creek Reservoir

	5 Year	15 Year	25 Year	Full Buildout
ADD (m ³ /day)	129	389	648	1,800
MDD (m ³ /day)	259	777	1,296	3,600
Fire Storage (300 L/s for 3.5 hours)	3,780	3,780	3,780	3,780
Equalization Storage - 25% MDD (m ³ /day)	65	194	324	900
Emergency Storage - 15% ADD (m ³ /day)	19	58	97	270
Recommended Storage (m ³)	3,864	4,033	4,201	4,950

The water network has a hydraulic grade line of approximately 1398 m near Dead Man’s Flats. Therefore, the highest elevation that can be developed from the existing network while maintaining a minimum service pressure of 320 kPa (50 psi) is approximately 1360 m.

The reservoir should be located at an elevation such that it can provide adequate service pressures to the development area. The highest point in the Smith Creek ASP area is approximately 1400 m, so a gravity reservoir should be placed at a point higher than approximately 1435 m to provide a minimum of 50 psi to the highest points of the network.

The ASP has a full buildout population of approximately 4,500 people, and 20 ha of ICI for an approximate ADD of 1,800 m³ per day. The reservoir should be sized to accommodate the full buildout of the ASP area. As per the reservoir design criteria, this is a reservoir of approximately 5,000 m³ in volume.

3.7 Water Projects

3.7.1 EX W1 – Grassi Booster Station Capacity Upgrade (Phase 1)

Formerly part of UMP2016 – Project W3

Project Description

Upgrade the Three Sisters / Grassi Booster Station to have a firm pumping capacity that meets both existing and 15 Year Horizon demands, for a firm pumping capacity of approximately 80 L/s.

Project Rationale

Currently the booster station utilizes both pumps present in the station to achieve higher flow rates for filling the Grassi reservoir. This is not in line with the design criteria for pump stations, which dictates that the largest pump should be considered offline for the purpose of redundancy.

The booster station should be upgraded so that it's firm pumping capacity (with one pump offline) can meet the existing and 15-year demands.

Upgrading the booster station would likely involve new electrical equipment, process equipment, and standby generator, and could be considered a full replacement.

Considerations should be made that would allow for upgrading to the full buildout pumping requirements.

Project Details

- + Upgrade to firm pumping capacity of 80 L/s
- + New electrical and process equipment
- + New standby generator
- + New building, if additional space is required

Project Trigger

- + Triggered by existing conditions
- + Triggered by growth in OSL Zone 13, 14 and 15
- + Recommended Project Year – 2024-2025

Project Cost

Engineering	\$	233,000.00
Implementation	\$	1,550,000.00
Contingency	\$	530,000.00
Total	\$	2,310,000.00

Project Cost Sharing

This project is necessary for both existing and growth-related conditions.

Facilities have an estimated life cycle of 50 years. The recorded installation date for the booster station is 1997, resulting in a remaining lifecycle of 25 years. As per the cost allocation methodology, the formula is as follows:

$$UpgradeCost - \left(1 - \frac{ServiceLifeRemaining}{LifeSpan}\right) * Basecost = DeveloperCost$$

Where:

- + Base Cost = \$1,950,000
- + Upgrade Cost = \$2,310,000
- + Service Life Remaining = 25 Years
- + Life Span = 50 Years
- + $\$2,310,000 - \left(1 - \frac{25}{50}\right) * \$1,950,000 = \$1,335,000$ developer cost

Using the cost sharing methodology, 58% of the total cost should be borne by development, and 42% of the cost should be borne by the Town of Canmore.

Of the recommended 80 L/s pumping capacity, 48 L/s is attributable to growth. Of that, 38 L/s is from OSL Areas 13 and 14, and 10 L/s is from OSL Area 15 (DMF)

- + 79% of developer cost (46% of project cost) should be borne by OSL Areas 13 and 14 (\$ 1,057,000)
- + 21% of developer cost (12% of project cost) should be borne by OSL Area 15 (\$280,000)

3.7.2 EX W2 – Pumphouse 2 Upgrades Backwash Water Reuse

New

Project Description

Add a clarifier for WTP2 backwash water treatment. Provide associated piping and pumping to add the treated backwash water upstream of Direct Filtration Trains.

Project Rationale

The existing water diversion license limits the instantaneous flow to WTP2

WTP2 filtration system utilizes 6 – 8% of the treated water for filters backwash. The backwash water is stored on site and slowly released to the Town sewer system.

A backwash reuse system may be designed to recover and reuse between 50 to 80% of the backwash water. Therefore, up to 5% of raw water diversion volume could potentially be saved.

Project Details

- + Install a clarifier with approximately 17 L/s flow (10% of the total WTP2 capacity)
- + Add a small pump to Backwash Tank
- + Piping, flowmeters and control valves to supply clarified water to the upstream of Direct Filtration Trains.
- + Electrical. Controls

Project Trigger

- + The Maximum Daily Flow reaches the capacity of WTP2
- + Recommended Project Year – 2035

Project Cost

Engineering	\$	150,000.00
Implementation	\$	1,000,000.00
Contingency	\$	350,000.00
Total	\$	1,500,000.00

Project Cost Sharing

This project will initially be considered 100% borne by the Town, however this project could assist with growth related conditions. Cost allocation will be further considered in the propose Water Treatment and Supply Study. . Potential to explore governmental grant programs for water reuse.

3.7.3 EX W3 – Pumphouse 1 Gas Chlorine Disinfection Replacement to Liquid Chlorine

New

Project Description

Existing Pumphouse #1 uses gas chlorine for disinfection. Gas chlorine is potentially dangerous to handle and store.

Chlorination can be accomplished with liquid chlorine (Sodium Hypochlorite) which is safer.

Project Rationale

Pumphouse #1 is located in Canmore downtown. Any incident with gas chlorine storage on site may require evacuation of the surrounding communities.

Additionally, the Water Treatment Plant #2 after the upgrade will use Sodium Hypochlorite for disinfection. Bulk liquid chlorine delivery to both WTP2 and PH1 by the same tanker truck will make the chemical delivery cheaper.

Project Details

- + Add a room to existing PH1 for Sodium Hypochlorite storage
- + Provide storage and day tanks, metering and transfer pumps
- + Remove existing gas chlorine injection equipment and scrubber

Project Trigger

- + The project can be initiated when the existing gas chlorine equipment require lifecycle replacement.

Project Cost

Engineering	\$	100,000.00
Implementation	\$	700,000.00
Contingency	\$	200,000.00
Total	\$	1,000,000.00

Project Cost Sharing

This is existing infrastructure and is 100% attributable to the Town of Canmore.

3.7.4 W1 – TeePee Town Waterline Replacement

New

Project Description

Upgrade approximately 750 m of existing water line from 150 mm to 250 mm along 1st Ave, connecting to Bow Valley Trail.

This project was assumed to be coordinated with a roadworks program, and only captured deep utility installation costs.

Project Rationale

Redevelopment of Teepee town is projected in the next 5 years, with Medium-High density residential development units projected. Due to the land use change, higher available fire flows will be required to service the area. To achieve these higher fire flows, an upgrade to the existing pipe size will be required.

Project Details

- + 750 m of 150 mm to 250 mm water pipe upgrade

Project Trigger

- + This project should be completed prior to redevelopment of Teepee town, and before any roadworks programs
- + Triggered by growth, OSL Zone 7
- + Recommended Project Year – 2024

Project Cost

Engineering	\$	90,000.00
Implementation	\$	600,000.00
Contingency	\$	210,000.00
Total	\$	900,000.00

Project Cost Sharing

This project is necessary for growth-related conditions.

Deep utility assets have a prescribed life cycle of 75 years. The recorded installation date for the water lines is 1966, resulting in a remaining lifecycle of 19 years.

As per the cost allocation methodology, the formula is as follows:

$$UpgradeCost - \left(1 - \frac{ServiceLifeRemaining}{LifeSpan}\right) * Basecost = DeveloperCost$$

Where:

- + Base Cost = \$870,000
- + Upgrade Cost = \$900,000
- + Service Life Remaining = 19 Years
- + Life Span = 75 Years
- + $\$900,000 - (1 - \frac{19}{75}) * \$870,000 = \$250,000$

Using the cost sharing methodology, 27% of the total cost should be borne by development, and 81% of the cost should be borne by the Town of Canmore.



3.7.5 W2 – Smith Creek Reservoir and Booster Station

Formerly UMP2016 – Project W6

Project Description

Construct a new 5000 m³ storage reservoir and a booster station capable of being upgraded to 45 L/s, which can support the full 25-year growth horizon.

Initial stages of the booster station would require a flow rate of 20 L/s to fill the reservoir and support the surrounding area while filling, which would fulfill the requirements up to the 15 year horizon.

Project Rationale

The Smith Creek ASP area has areas that are higher elevation than what can be serviced off the existing system. A new reservoir and supplementary booster station will be required to service the full development area.

Project Details

- + 5000 m³ storage reservoir
- + Booster station capable of 20 L/s, upgradeable to 45 L/s
- + All requisite mechanical, electrical, and process equipment

Project Trigger

- + This project should be completed prior to development of Smith Creek ASP area
- + Triggered by growth, OSL Zone 14
- + Recommended Project Year – 2027

Project Cost Sharing

This is new infrastructure, and is 100% attributable to growth

Project Cost

Engineering	\$	1,283,000.00
Implementation	\$	8,550,000.00
Contingency	\$	2,950,000.00
Total	\$	12,780,000.00

3.7.6 W3 – Canyon Ridge Booster Station Decommissioning

Formerly part of UMP2016 – Project W10

Project Description

Decommission the Canyon Ridge Booster Station (Pumphouse 5) and connect the service area to pressure zone 5. This connection would be completed by drilling a new water line underneath Cougar Creek, along Elk Run Blvd.

Project Rationale

The CRBS currently only operates on a narrow band of pressure on the suction side of the booster station and has crashed during recent high flow events when the suction side pressure has dropped too low. To remove the reliance on the booster station, the area that it currently services can be adequately serviced by connecting it to pressure zone 5.

Project Details

- + 220 m of 200 mm water line, tunnelled or directional drilled underneath Cougar Creek
- + One new PRV
- + Decommissioning of existing booster station

Project Trigger

- + This project resolves an existing deficiency, and should be completed in the next 5 years
- + Recommended year of construction: 2026-2027

Project Cost

Engineering	\$	120,000.00
Implementation	\$	800,000.00
Contingency	\$	280,000.00
Total	\$	1,200,000.00

Project Cost Sharing

This is existing infrastructure, and is 100% attributable to the Town of Canmore

3.7.7 W4 – Silvertip Trail Looping

Formerly UMP2016 – Project W5

Project Description

Connect Pressure Zone 2 to Pressure Zone 4 by installing a new water line and PRV along Silvertip Trail.

Project Rationale

The net water storage for the central supply area will be running low by the 15-year horizon. Connecting the Silvertip reservoir in the Eastern Supply Zone to the Central Supply Zone will expand the available capacity available to the system and delay the need for significant reservoir upgrades.

Project Details

- + 400 m of 300 mm water line along Silvertip Trail
- + One new PRV

Project Trigger

- + Development of the following number of units in the Central Supply Zone (Based on 5-year growth horizon):
 - 110 ICI Units
 - 680 Hotel Units
 - 560 Medium / High Density Residential Units
- + MDD of 12,700 m³/day on the Central and Eastern Supply Zone
- + Recommended Project Year: 2027-2028
- + Triggered by OSL Zones 2, 6, 7, 9, 10, 16 and 17

Project Cost

Engineering	\$	129,000.00
Implementation	\$	860,000.00
Contingency	\$	300,000.00
Total	\$	1,290,000.00

Project Cost Sharing

This is new infrastructure that is 100% attributed to growth.

3.7.8 W5 – Grassi Booster Station Waterline Twinning

New

Project Description

Construct a new water line, from Pumphouse 2 to the Grassi booster station, that effectively twins the existing water line. The line would follow the alignment of Spray Lakes Rd / Three Sisters Parkway.

Project Rationale

To support the peak flows seen during a reservoir filling scenario for Grassi and Smith Creek reservoirs, an additional water line should be constructed. The high flows needed to support the upgraded Grassi booster result in low pressures downstream of it, particularly on Three Sisters Drive. A new waterline would reduce the headlosses seen during high flows and increase system redundancy.

Project Details

- + 2,200 m of new 400 mm water line
- + 5 connections to the existing system

Project Trigger

- + Development of the following number of units in OSL Area 13 and 14:
 - 265 ICI Units
 - 920 Hotel Units
 - 440 Low Density Residential Units
 - 2215 Medium / High Density Residential Units
- + MDD of 60 L/s from Grassi Reservoir and 20 L/s from Smith Creek Reservoir
- + Triggered by growth in OSL Zone 13, 14 and 15
- + Recommended Project Year: 2037-2038

Project Cost

Engineering	\$	300,000.00
Implementation	\$	1,990,000.00
Contingency	\$	690,000.00
Total	\$	2,980,000.00

Project Cost Sharing

As the proposed water line would have the benefit of redundancy for the Town as a whole, a benefitting areas assessment was performed as an alternative to the cost allocation methodology. This compares the existing developed area to the gross developable area at the 25 year growth horizon for all offsite levy areas with projected growth. The following table shows the benefitting area and their relative percentages of the total area, which can be attributed to cost allocation.

OSL Zone	Area (ha)	% of Total
Existing	750.0	73.1%
1	21.7	2.1%
2	20.5	2.0%
6	8.4	0.8%
7	3.0	0.3%
9	10.5	1.0%
10	5.3	0.5%
13	56.9	5.5%
14	70.1	6.8%
15 (DMF)	75.0	7.3%
16	2.3	0.2%
17	2.7	0.3%
Total Growth	276.2	26.9%
Total Area	1026.2	

3.7.9 W6 – Grassi Storage Reservoir Capacity Upgrade

Formerly part of UMP2016 – Project W3

Project Description

Construct a new 2000 m³ storage reservoir cell in the Grassi reservoir.

Project Rationale

The Western and Central supply zones will eventually run out of available storage capacity and will be unable to meet the design criteria for potable water storage.

The most reasonable place to upgrade the available storage is in the Grassi reservoir, as it has the capability to provide water to all areas of Canmore.

While the storage upgrade will serve all of Canmore, the trigger to upgrade will come from the Western Supply Zone, as it is entirely reliant on the Grassi reservoir and has “priority” on the remaining capacity.

Project Details

- + 2000 m³ storage reservoir cell

Project Trigger

- + Development of the following number of units in the Western Supply Zone:
 - 265 ICI Units
 - 920 Hotel Units
 - 440 Low Density Residential Units
 - 2215 Medium / High Density Residential Units
- + MDD of 6,700 m³ in the Western Supply Zone
- + Triggered by OSL Zones 2, 6, 7, 9, 10, 13, 14, 15, 16 and 17
- + Recommended Project Year: 2038-2039

Project Cost

Engineering	\$	540,000.00
Implementation	\$	3,580,000.00
Contingency	\$	1,140,000.00
Total	\$	5,360,000.00

Project Cost Sharing

This is new infrastructure, and is 100% attributable to growth. Of the 2000 m³ upgrade, Dead Man's Flats requires 494 m³.

- + 25% of the project cost should be borne by OSL Area 15 (\$ 1,340,000)
- + 75% of the project cost should be borne by all other OSL areas (\$ 4,020,000)

3.7.10 W7 – Grassi Booster Station Capacity Upgrade (Phase 2)

New

Project Description

Upgrade the Three Sisters / Grassi Booster Station to have a firm pumping capacity that meets the 25-year horizon demands, for a firm pumping capacity of approximately 135 L/s.

Project Rationale

Development in the Three Sisters Resort Area, Stewart Creek, Smith Creek, and Dead Man’s Flats drives the needs for higher pumping capacity through the booster station to support Grassi reservoir and its service area.

Project Details

- + Upgrade to firm pumping capacity of 135 L/s

Project Trigger

- + Development of the following number of units in OSL Area 13 and 14:
 - 265 ICI Units
 - 920 Hotel Units
 - 440 Low Density Residential Units
 - 2215 Medium / High Density Residential Units
- + MDD of 60 L/s from Grassi Reservoir and 20 L/s from Smith Creek Reservoir
- + Triggered by growth in OSL Zone 13, 14 and 15
- + Recommended Project Year: 2037-2038

Project Cost

Engineering	\$	80,000.00
Implementation	\$	500,000.00
Contingency	\$	170,000.00
Total	\$	750,000.00

Project Cost Sharing

This is upgrading infrastructure that will be designed to be upgraded, and is 100% attributable to growth

Of the 55 L/s upgrade, 47 L/s is from OSL areas 13 and 14, and 8 L/s is from Dead Man’s Flats.

- + 85% of the project cost should be borne by OSL Areas 13 and 14 (\$ 640,000)
- + 15% of the project cost should be borne by OSL Area 15 (\$ 110,000)

3.7.11 W8 – Smith Creek Booster Station Upgrade (Phase 2)

Formerly part of UMP2016 – Project W6

Project Description

Upgrade the Smith Creek Booster Station to have a firm pumping capacity that meets the 25-year horizon demands, for a firm pumping capacity of approximately 45 L/s.

Project Rationale

Development in the Smith Creek area drives the needs for higher pumping capacity through the booster station to support Smith Creek Reservoir and its service area.

Project Details

- + Upgrade to firm pumping capacity of 45 L/s

Project Trigger

- + Development of the following number of units in OSL Area and 14 (Smith Creek):
 - 440 Low Density Residential Units
 - 185 Medium / High Density Residential Units
- + MDD of 20 L/s from Smith Creek Reservoir
- + Triggered by growth in OSL Zone 14
- + Recommended Project Year: 2037-2038

Project Cost

Engineering	\$	70,000.00
Implementation	\$	480,000.00
Contingency	\$	170,000.00
Total	\$	720,000.00

Project Cost Sharing

This infrastructure upgrade is fully in a future development area and is 100% attributable to developers.

3.7.12 W9 – South Canmore Waterline Replacement

New

Project Description

Replace aging water infrastructure in the South Canmore area, between 3rd Street and 6th Street.

Project Rationale

Water lines in the older areas of Canmore are nearing their lifecycle, and the Town should begin a program to replace the infrastructure that is nearing its lifecycle. The oldest pipes in Canmore were installed in 1966, and will reach their 75-year lifecycle by 2041, approximately 19 years after this study.

150 mm pipes should be upsized to 200 mm pipes.

For the best use of resources, the utility replacement program should be paired with a roadworks program.

Project Details

- + 2,000 m of 200 mm water line replacement
- + 12,000 m² of road replacement

Project Trigger

- + Recommended Project Year: 2037-2038

Project Cost

Engineering	\$	860,000.00
Implementation	\$	3,430,000.00
Contingency	\$	1,720,000.00
Total	\$	6,010,000.00

Project Cost Sharing

This is existing infrastructure replacement that is 100% attributable to the Town of Canmore.

3.7.13 W10 – Downtown Canmore Waterline Replacement

New

Project Description

Replace aging water infrastructure in the Downtown area, between 6th Street and 10th Street.

Project Rationale

Water lines in the older areas of Canmore are nearing their lifecycle, and the Town should begin a program to replace the infrastructure that is nearing its lifecycle. The oldest pipes in Canmore were installed in 1966, and will reach their 75 year lifecycle by 2041, approximately 19 years after this study.

150 mm pipes should be upsized to 200 mm pipes.

For the best use of resources, the utility replacement program should be paired with a roadworks program.

Project Details

- + 3,000 m of 200 mm water line replacement
- + 18,000 m² of road replacement

Project Trigger

- + Recommended Project Year: 2038-2039

Project Cost

Engineering	\$	1,260,000.00
Implementation	\$	5,050,000.00
Contingency	\$	2,520,000.00
Total	\$	8,830,000.00

Project Cost Sharing

This is existing infrastructure replacement that is 100% attributable to the Town of Canmore.

3.7.14 W11 – 7th Avenue Waterline Replacement

New

Project Description

Replace aging water infrastructure in the 7th Avenue area, 10th Street and Industrial Place.

Project Rationale

Water lines in the older areas of Canmore are nearing their lifecycle, and the Town should begin a program to replace the infrastructure that is nearing its lifecycle. The oldest pipes in Canmore were installed in 1966, and will reach their 75 year lifecycle by 2041, approximately 19 years after this study.

150 mm pipes should be upsized to 200 mm pipes.

For the best use of resources, the utility replacement program should be paired with a roadworks program.

Project Details

- + 2,500 m of 200 mm water line replacement
- + 15,000 m² of road replacement

Project Trigger

- + Recommended Project Year: 2039-2040

Project Cost

Engineering	\$	1,050,000.00
Implementation	\$	4,190,000.00
Contingency	\$	2,100,000.00
Total	\$	7,340,000.00

Project Cost Sharing

This is existing infrastructure replacement that is 100% attributable to the Town of Canmore.

3.7.15 W12 – Rundle Waterline Replacement

New

Project Description

Replace aging water infrastructure in the Rundle area, including Bridge Road, Rundle Plant Lane, Rundle Crescent, Rundle Drive, MacDonald Place and St. Barbara’s Terrace. This project would include a river crossing at Bridge Road.

Project Rationale

Water lines in the older areas of Canmore are nearing their lifecycle, and the Town should begin a program to replace the infrastructure that is nearing its lifecycle. The oldest pipes in Canmore were installed in 1966, and will reach their 75 year lifecycle by 2041, approximately 19 years after this study.

150 mm pipes should be upsized to 200 mm pipes.

For the best use of resources, the utility replacement program should be paired with a roadworks program.

Project Details

- + 2,000 m of 200 mm water line replacement
- + 12,000 m² of road replacement

Project Trigger

- + Recommended Project Year: 2040-2041

Project Cost

Engineering	\$	860,000.00
Implementation	\$	3,430,000.00
Contingency	\$	1,720,000.00
Total	\$	6,010,000.00

Project Cost Sharing

This is existing infrastructure replacement that is 100% attributable to the Town of Canmore.

3.7.16 W13 – TeePee Town / Railway Ave Waterline Replacement

New

Project Description

Replace aging water infrastructure in the TeePee Town and Railway Ave area, from Gateway Street to Benchlands Trail along Railway Ave. This project also involves crossing Policeman’s Creek along 8th Street.

Project Rationale

Water lines in the older areas of Canmore are nearing their lifecycle, and the Town should begin a program to replace the infrastructure that is nearing its lifecycle. The oldest pipes in Canmore were installed in 1966, and will reach their 75 year lifecycle by 2041, approximately 19 years after this study.

150 mm pipes should be upsized to 200 mm pipes.

For the best use of resources, the utility replacement program should be paired with a roadworks program.

Project Details

- + 1,500 m of 200 mm water line replacement
- + 9,000 m² of road replacement

Project Trigger

- + Recommended Project Year: 2041-2042

Project Cost

Engineering	\$	650,000.00
Implementation	\$	2,610,000.00
Contingency	\$	1,300,000.00
Total	\$	4,560,000.00

Project Cost Sharing

This is existing infrastructure replacement that is 100% attributable to the Town of Canmore.

3.7.17 W14 – Water Treatment and Supply Study

New

Project Description

Perform an engineering study to determine the optimal way to increase the available water supply and treatment for the Town of Canmore, in order to facilitate growth to the 25 year horizon and beyond.

Project Rationale

There is a projected deficit to the available water treatment rate in Pumphouse 1 and Pumphouse 2 prior to the 25 year horizon, which could potentially limit growth in the Town until it is addressed.

There are several potential options for increasing the water treatment rate, or further ensuring water security, which should be assessed in detail prior to the town committing funds to upgrade their infrastructure.

The three potential options are as follows:

- + Increase the available water withdrawal rate from the rundle forebay and subsequent treatment rate from Pumphouse 2 (Approximate Cost - \$3,000,000)
- + Upgrade the withdrawal rates and treatment rates at Pumphouse 1 through a new deep well and a replacement of the treatment facility (Approximate Cost - \$12,000,000)
- + Construct a large (~7,000 m³) storage reservoir which could accommodate the deficits during peak demand. (Approximate Cost - \$14,000,000)

Project Trigger

- + Triggered by development in all Offsite Levy Areas
- + Assessment, recommendations and resultant capital projects should be completed prior to a system wide MDD of 260 L/s

Project Cost

Engineering	\$	150,000.00
Contingency	\$	50,000.00
Total	\$	200,000.00

Project Cost Sharing

The costs for this study will be 100% borne by the Town.

4. Wastewater System

4.1 System Characterization

The Town of Canmore’s wastewater system consists of approximately 80 km of gravity sewer, 30km of forcemain, thirteen Town operated lift stations and eight privately operated lift stations. Currently, all of the Town’s wastewater is collected at the wastewater treatment plant, treated and discharged into the Bow River.

There are also a few private systems on septic tanks and fields.

4.1.1 Pipe Diameters and Material

Gravity Mains

The wastewater gravity mains in Canmore consist of approximately 70% PVC and 30% unknown material, which is likely a mix of Concrete and Vitreous Clay Tile (VCT) pipe. The average age of the wastewater lines in the system is approximately 30 years old. The following tables shows the break down of the age, diameter, and pipe material of Canmore’s wastewater system.

The existing wastewater system can be seen in Figure S1 (Appendix D)

Table 4-1 Wastewater Gravity Pipes Age

Age	Length (km)	% of Total
>50 Years	9.9	12%
41-50 Years	7.6	9%
31-40 Years	18.5	22%
21-30 Years	29.0	34%
11-20 Years	16.1	19%
0-10 Years	3.2	4%
Unknown	0.8	1%
Total	85.1	100%

Table 4-2 Wastewater Gravity Pipes Diameters

Diameter (mm)	Length (km)	% of Total
100	0.4	0.5%
150	1.3	1%
200	57.0	67%
250	13.8	16%
300	4.9	6%
375	2.2	3%
450	3.3	4%
>450	1.7	2%
Unknown	0.6	1%
Total	85.1	100%

Table 4-3 Wastewater Gravity Pipes Materials

Material	Length (km)	% of Total
CON	0.3	0.3%
PVC	60.0	70%
VCT	0.5	1%
UNK	24.3	29%
Total	85.1	100%

Forcemains

The wastewater forcemains in Canmore consist of approximately 40% PVC, 20% HDPE, and the remaining a mix of Ductile Iron, Polyethylene, and Unknown materials. The average age of the wastewater forcemains in the system are approximately 25 years old. The following tables shows the break down of the age, diameter, and pipe material of Canmore’s wastewater system

Table 4-4 Wastewater Forcemains Age

Age	Length (km)	% of Total
>50 Years	0.3	1%
41-50 Years	2.0	7%
31-40 Years	10.9	36%
21-30 Years	2.7	9%
11-20 Years	5.3	17%
0-10 Years	7.5	25%
Unknown	1.6	5%
Total	30	100%

Table 4-5 Wastewater Forcemains Diameter

Diameter (mm)	Length (km)	% of Total
<100	4.8	16%
100	2.1	7%
150	3.4	11%
200	6.7	22%
250	6.4	21%
300	3.0	10%
350	2.5	8%
>350	1.1	4%
Unknown	0.1	1%
Total	30	100%

Table 4-6 Wastewater Forcemains Material

Material	Length (km)	% of Total
DI	0.7	2%
PE	0.8	3%
HDPE	4.9	17%
PVC	10.8	36%
UNK	12.5	42%
Total	30	100%

4.1.2 Low Pressure Systems

The southeast area of downtown Canmore is serviced by a low-pressure sanitary sewer system, and is the largest in the Town. Each service has its own wetwell and pump system and discharges into a common forcemain in the roadway. Low pressure systems were not individually modelled, however their contributions to the collection system were included.

The main low-pressure system discharges into the gravity sewer on 2nd Street and on 5th Avenue and then flows by gravity to Lift Station 1.

There are also some homes on Spring Creek Drive, and homes on the north side of 7 Street and east of 6th Avenue that are serviced by a low-pressure system, along with other localized low pressure systems and services across the Town.

4.1.3 Wastewater Collection Areas

There are a total of thirteen lift stations, and fourteen collection areas in the Town of Canmore. Three of the lift stations have other lift stations upstream discharging into its collection area, those areas were included in the downstream lift station collection area. One area of Canmore is not supported by a lift station, and instead the gravity collection system discharges directly into the triple forcemain, with the higher elevation facilitating flow through it. These areas include Benchlands, and portions of Avens and Cougar Creek neighbourhoods.

Table 4-7 Wastewater Collection Areas

Lift Station	Collection Area (ha)	Upstream Lift Stations
LS1	148	LS 3, LS 5
LS 2	107	None
LS 2A	57	None
LS 3	7	None
LS 4	105	LS 9
LS 5	45	None
LS 6	50	None
LS 7	70	None
LS 8	175	LS10, LS 11, LS 12
LS 9	8	None
LS 10	92	LS 11, LS 12
LS 11	14	LS 12
LS 12	5	None
No Lift Station	115	None
Total	998	

4.1.4 Lift Stations

The following is a summary of the thirteen lift stations operated by the Town of Canmore. Private lift stations were not included.

Firm pumping capacity is defined as the capacity of the facility with its largest pump out of service. i.e. with one pump running at a two-pump facility, or two pumps running at a three-pump facility. The pumping capacities were determined through a mix of SCADA flow meter information, interpolation from pump curves, and draw down testing that was performed for the previous UMP.

Lift Station 2 was recently replaced, and the new lift station was commissioned in 2019. Lift Station 6 was also replaced since the previous UMP. Two new lift stations, LS 11 and LS 12, were also constructed since the previous UMP.

The lift stations and their respective catchment areas can be seen in Figure S2 (Appendix D)

Table 4-8 Lift Station Summary

Lift Station	Pumps	Power / Voltage / Phases	Firm Pumping Capacity (L/s)	Discharge Location
Lift Station 1	1 x Vaughan S4K2 2 x Vaughan SE8N5	10HP / 460V / 3 100HP / 460V / 3	200+	WWTP
Lift Station 2	3 x KSB KRTK 150-317	40HP / 600V / 3	130	Triple FM to WWTP
Lift Station 2A	2 x Flygt NP3171.091-453	34HP / 600V / 3	51	WWTP
Lift Station 3	2 x Flygt CP3085.182MT	3.2HP / 460V / 3	Unknown	LS 1 Collection Area
Lift Station 4	2 x Flygt NP3153.181-435	15HP / 208V / 3	85	WWTP
Lift Station 5	1 x Flygt CP3102.180-432 1 x Zoeller 6221 HD Series	5HP / 208V / 3 7.5HP / 208V / 3	40	LS 1 Collection Area
Lift Station 6	2 x Flygt CP3201.180 HT	20HP / 460V / 3	30	Triple FM to WWTP
Lift Station 7	3 x Flygt CP3152.181-436	47HP / 600V / 3	120	Triple FM to WWTP
Lift Station 8	2 x Flygt CP3152.181-436	20HP / 600V / 3	72	WWTP
Lift Station 9	2 x Flygt MP3127.170-212	11HP / 208V / 3	7	LS 4 Collection Area
Lift Station 10	3 x Flygt CP3152.181-454	20HP / 600V / 3	80	LS 8 Collection Area
Lift Station 11	2 X Vaughan S3F-060	7.5 HP / 600V / 3	15	LS 10 Collection Area
Lift Station 12	2 x Lowara 1315M S35	4 HP / 600V / 3	5	LS 11 Collection Area

Most of the lift stations operate on a Start/Stop level control philosophy with the following exceptions; Lift Station 1 operates on a flow control philosophy and ramps the pump speed up and down as needed. Lift Station 4 appears to operate on a hybrid Start/Stop level control at lower flow rates with the pumps operating at lower speeds, and a wet well level control during the day at higher flow rates where the pump speeds are adjusted to maintain a consistent wet well level

The following table summarizes the basic Start and Stop elevations for the main duty pumps at each lift station.

Table 4-9 Lift Station Operating Points

Lift Station	Pump Name	Ground Elevation (m)	Pump Elevation (m)	Pump Start Elevation (m)	Pump Stop Elevation (m)
LS 1	P1	1308.20	1303.20	1304.80	1304.00
LS 2	P101	1309.50	1301.20	1302.50	1301.90
	P102	1309.50	1301.20	1302.50	1301.90
LS 2A	P1	1309.30	1302.05	1303.40	1302.60
LS 3	P1	1311.30	1306.80	1307.70	1307.10
LS 4	P1	1310.10	1304.21	1305.30	1305.00
LS 5	P1	1311.60	1306.37	1307.27	1306.77
LS 6	P1	1313.60	1308.20	1309.60	1309.10
LS 7	P1	1308.60	1305.00	1306.40	1305.60
	P2	1308.60	1305.00	1306.40	1305.60
LS 8	P1	1312.10	1304.50	1305.41	1304.60
LS 9	P1	1383.50	1378.00	1379.00	1378.60
LS 10	P1	1311.04	1304.40	1305.80	1305.35
	P2	1311.04	1304.40	1305.80	1305.35
LS 11	P1	1356.75	1350.2	1350.58	1350.08
LS 12	P1	1358.26	1350.62	1351.82	1351.32

4.1.5 Wastewater Treatment

Alongside the UMP, a full Wastewater Treatment Plant Capacity Evaluation report was performed and is attached in Appendix G.

4.2 Flow Monitoring Program

To determine wastewater flow generation rates, diurnal usage patterns, and assess groundwater infiltration and rainfall derived infiltration, a flow monitoring program was developed. Inline flow monitors were installed in key locations.

A total of 5 flow monitors were installed across the Town of Canmore, which in tandem with lift stations that have flow meters installed on their discharge, was used to chart the flows in the wastewater system during dry weather and wet weather periods. The flow monitors were in place from April 12, 2022 to July 20, 2022. Two rain gauges were also installed for the duration, which tracked rainfall volume and intensity. One was installed on top of Pumphouse 1 and one on top of Pumphouse 2.

Inline flow monitors determine pipe flow by measuring depth and velocity of the water flowing past them and calculate and record flow rate every 5 minutes for the duration of the monitoring period.

SFE Global was contracted to supply, install, maintain, and report on the flow monitors. Their Flow Monitoring Report can be found in Appendix F.

The following is a summary of the flow monitors and lift stations used for the flow analysis. Figure S3 (Appendix D) shows the flow monitor locations and their respective catchment areas.

Flow Monitor 1 (FM1)

Installed in SMH 1414 along 4th Street, the catchment area for this flow monitor is the southwestern portion of the South Canmore / Downtown area. The total catchment area is approximately 22 ha.

Originally one flow monitor was intended to be installed for the Lift Station 1 catchment area, however discussions with SFE Global indicated that the location for this, on the upstream end of the lift station inlet pipe, would not be ideal due to the turbulence created by flow coming from two other directions in the manhole. Flow monitors operate best in manholes with a straight line of flow. As such, it was decided to split the Lift Station 1 catchment area into two flow monitors.

Flow Monitor 2 (FM2)

Installed in SMH 0279 along 5th Street, the catchment area for this flow monitor is the northern portion of the Downtown area, and up to and including the Larch and Industrial Place areas. Lift Stations 3 and 5 both discharge into the catchment area for this flow meter. The total catchment area is approximately 103 ha.

Flow Monitor 3 (FM3)

Installed in SMH 0249 at the upstream end of the triple forcemain, the catchment area for this flow monitor includes the Cougar Creek, Benchlands, and Avens Neighbourhoods. Lift Station 6 also discharges into this catchment area. The total catchment area is approximately 160 ha.

Flow Monitor 4 (FM4)

Installed in SMH 1200 along Silvertip Trail, the catchment area for this flow monitor is the Silvertip area, upstream of Lift Station 7. The total catchment area is approximately 58 ha.

Flow Monitor 5 (FM5)

Installed in SMH 1251 upstream of Lift Station 8, the catchment area for this flow monitor includes Cairns Landing, Miskow Close, Stewart Creek and Dead Man's Flats. Lift stations 10, 11 and 12 discharge into this catchment area. The total catchment area is approximately 100 ha.

Lift Station 2 (LS2)

Lift Station 2 was also utilized to track flow patterns, as it has a flow meter on its discharge. While the lift station operates on a start/stop level control, the hourly averages of the flows recorded in the SCADA system give a good representation of the flows. Its catchment area includes Railway Avenue and Bow Valley Trail, and Harvey Heights discharges into the catchment. The total catchment area is approximately 107 ha.

Lift Station 2A (LS2A)

Originally a sixth flow monitor upstream of Lift Station 2A was planned, however access constraints made it not feasible to install in the field. SCADA data of the lift station water level was instead used to calculate flows and patterns of its catchment area. Using the wet well level recorded in the SCADA system, and the cross-sectional area of the wetwell, the change in volume during each pump and fill cycle can be calculated, which effectively provides the flow rate in and out of the lift station. The hourly averages of these flow rates give a good representation of the flows.

The catchment area for Lift Station 2A includes Kananaskis Way and the southeastern portion of Bow Valley Trail. The total catchment area is approximately 57 ha.

Lift Station 4 (LS4)

Lift Station 4 was also utilized to track flow patterns, as it has a flow meter on its discharge. While the lift station operates on a start/stop level control for lower flows, and a wet well level control for higher flows, the hourly averages of the flows recorded in the SCADA system give a good representation of the flow patterns. The catchment area includes the Rundle, McNeil, and Grassi Peaks areas. Lift Station 9 also discharges into the catchment area. The total catchment area is approximately 107 ha.

Lift Station 6 (LS6)

Lift Station 6 was also utilized to track flow patterns, as it has a flow meter on its discharge. While the lift station operates on a start/stop level control, the hourly averages of the flows recorded in the SCADA system give a good representation of the flows. The catchment area includes the Elk Run Industrial area, and portions of the Avens and Canyon ridge area. The lift station discharges into the FM3 catchment area. The total catchment area is approximately 50 ha.

4.3 Design Criteria

The following criteria are used to assess the existing and future systems.

4.3.1 Flow Generation Criteria

Existing wastewater generation rates were calibrated using SCADA data records and results from the flow monitoring program.

Future wastewater flow is based on the unit rates established in the Canmore Engineering Design and the 2017 Utility Master Plan. These unit rates are applied to the hydraulic model using the number of units for each land use type in each of the growth areas. The ICI land use area-based unit rates were updated, as the unit density was assessed against unit consumption, and was shown to be significantly higher than the EDCG.

Table 4-10 Future System Wastewater Flow Generation Parameters

Demand Type	Rate	Units
Wastewater Treatment Plant (Composite Rate)	360	L/c/d
Residential	250	L/c/d
ICI	30	m ³ /ha/d
Hotels	700	L/unit/day
Residential Peaking Factor	$1+14 / (4+P \frac{1}{2})$	Harmon's Formula
Commercial / Industrial Peaking Factor	3.5	PF
Hotel Peaking Factor	4	PF

4.3.2 Collection System Criteria

The gravity collection system of Canmore was modeled using the Peak Wet Weather Flow scenario. The pipes were evaluated based on the following criteria

- + Hydraulic capacity
 - o The capacity of a gravity sewer is evaluated based on the peak expected flow and the flow capacity of the pipe which is calculated using pipe slope and diameter at 86% flow depth. Pipe capacity must be greater than the expected peak flow or surcharging of the collection system can occur. This value is represented as a percentage which is calculated by dividing the peak flow by the pipe's flow capacity. A percentage less than 100% means that peak flow is less than the capacity of the pipe.
- + Hydraulic grade line should not exceed the top of the pipe
- + Pipe velocity should not exceed 3.0 m/s

4.3.3 Lift Station Pumping Requirements

Under peak wet weather flow conditions, a lift station should be able to convey peak flows using the station's firm flow capacity (i.e. with the largest pump out of service).

4.4 Wastewater Flow Generation Analysis

Wastewater flow generation in the Town of Canmore was broken into two periods: dry weather period where there was no appreciable rainfall and the river level / groundwater is low, and wet weather period where there is significant rainfall.

4.4.1 Dry Weather Flow Generation

The following sections discuss how the dry weather flows were calculated in the existing system. The average dry weather flows represent the average day, with the diurnal patterns showing the low flows and peak flows throughout the day.

4.4.1.1 Average Day Dry Weather Flows

Dry weather flow generation for the existing system was developed by first establishing baseline flows, which represent the Average Dry Weather Flow (ADWF). This was done in a similar way to the water system.

Average Dry Weather Flows were developed by assessing the total volume of water distributed to the Town over the past four years, versus the total volume of wastewater collected and treated in the same time period. The annual water volumes were scaled to match the annual wastewater collection volumes, which on average was a factor of 1.15 times more wastewater than water each year.

These were assigned to the hydraulic model through geolocated customer water meter data, which has been scaled such that the total volume of consumption is equivalent to the total volume of wastewater collection.

Table 4-11 Wastewater Collection vs Water Distribution

Year	Annual Water (m ³)	Annual Wastewater (m ³)	Wastewater to Water Ratio	Wastewater to Water Meter Ratio
2018	2,724,788	2,943,504	1.08	1.62
2019	2,589,814	3,167,849	1.22	1.77
2020	2,512,425	3,095,458	1.23	1.69
2021	2,749,175	2,971,909	1.08	1.55
Average	2,644,051	3,044,680	1.15	1.67

The flow monitors and lift stations discussed in Section 4.2 were then reviewed to develop diurnal patterns for each of the catchment areas. Diurnal patterns represent the changes in flow through the system throughout the day, with the lowest point typically being during the night and early morning hours, and two peaks during the morning and evening. A separate diurnal pattern for Saturdays, Sundays, and Weekdays were developed, as they all have distinct characteristics.

The dry weather period was determined to be between April 12, 2022 (the day of the flow monitor installation) and May 10, 2022. No significant rainfall events occurred during this period, and there was no visible increase in flows due to groundwater or rising river levels.

The flows for each catchment were developed as an hourly average, and the average of these were taken to create separate diurnal flows for Saturdays, Sundays, and Weekdays. These hourly flows, divided by the average flow for each catchment, were used to develop the diurnal patterns, which act as a multiplier for the baseline demands.

The following table shows the average dry weather flows calculated for each catchment from the customer water meter data, versus the measured average dry weather flows from the flow monitors and lift station SCADA data.

Table 4-12 Average Dry Weather Flows – Calculated vs Measured

Catchment Area	Calculated Average Flow (L/s)	Measured Average Flow (L/s)
FM 1	2.7	1.6
FM 2	8.4	5.1
FM 3	17.0	21.5
FM 4	1.7	1.8
FM 5	7.2	4.2
LS 2	17.0	17.1
LS 2A	7.5	7.6
LS 4	6.6	13.4
LS 6	5.7	4.3
LS 7	4.8	11.2
LS 8	7.6	10.9
LS10	6.3	8.2
WWTP Influent	74.0	74.0

Overall, the calculated average flows and the measured average flows correlate well, but with some notable outliers.

Both FM1 and FM2 catchments had higher calculated flows than measured flows. There are some possible explanations for this, such as increased water usage that does not translate into wastewater generation. To be conservative, the higher calculated average flows will still be used as the baseline flows.

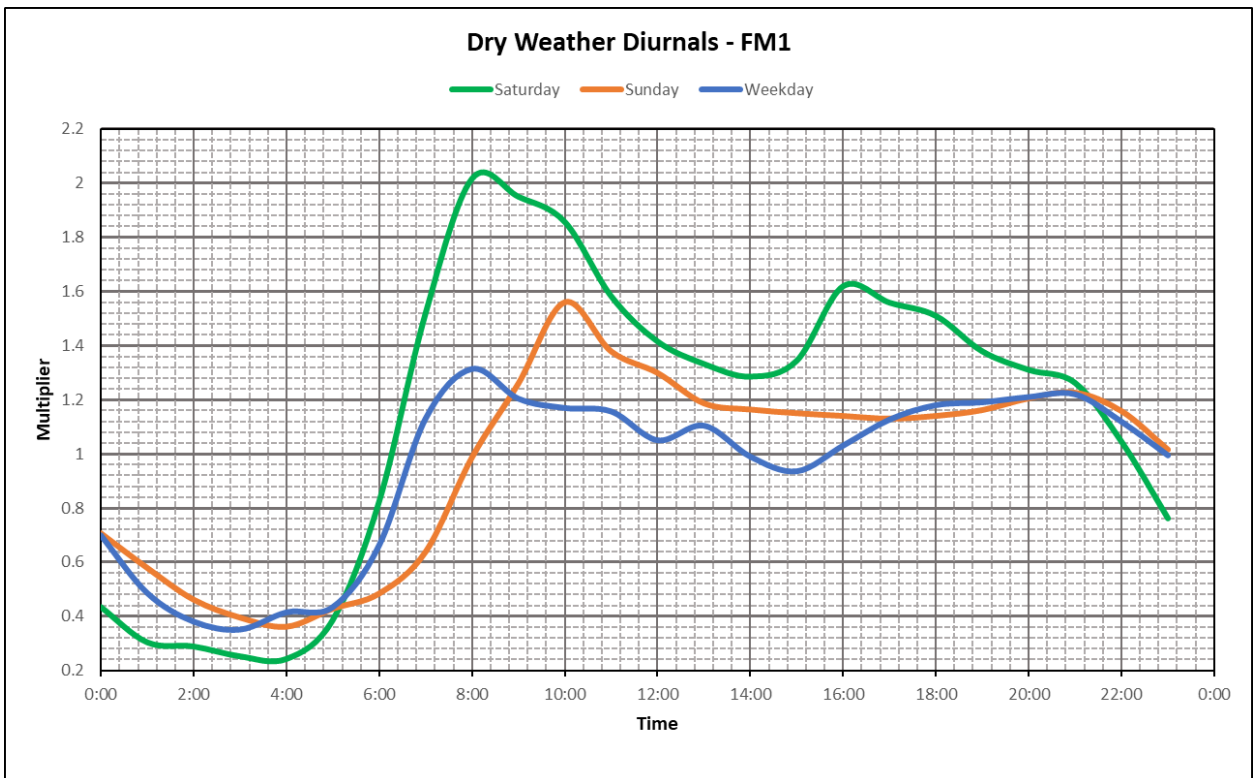
FM5 had notably lower measured flows than calculated flows, and the measured flow was half of that of Lift Stations 8 and 10, which have largely the same catchment areas. The likely explanation for this discrepancy is due to the five-minute recording increment of the flow monitor. The upstream flows all come from Lift Station 10, and the recording increment could be missing the spikes in flows that come from frequent pump cycles. Due to this large discrepancy, information from Lift Station 8 will be used to determine the diurnal patterns of the catchment area. If future flow monitoring programs are executed, efforts should be made to record that catchment at a higher frequency to account for frequent lift station pump cycles.

Lift Station 4 had significantly higher measured flows than calculated flows. This is due to the Pumphouse 2 filter backwash schedule which discharges directly into the Lift Station 4 catchment area. Filter backwash generally happens between 9 am and 3 pm daily, and is observable in the lift station diurnal flow patterns. To account for this, the difference in calculated and measured flows (~7 L/s) will be added to the catchment area near Pumphouse 2 as a separate demand, with its own pattern of entering the system between 9 am and 3 pm. The diurnal pattern of the catchment area is still influenced by this, and as the backwash flows are inconsistent and not tracked, there was no practical way to adjust the pattern to account for this. As such, the Lift Station 4 diurnal patterns do not reflect typical usage patterns but do represent the flows in the catchment area as a whole.

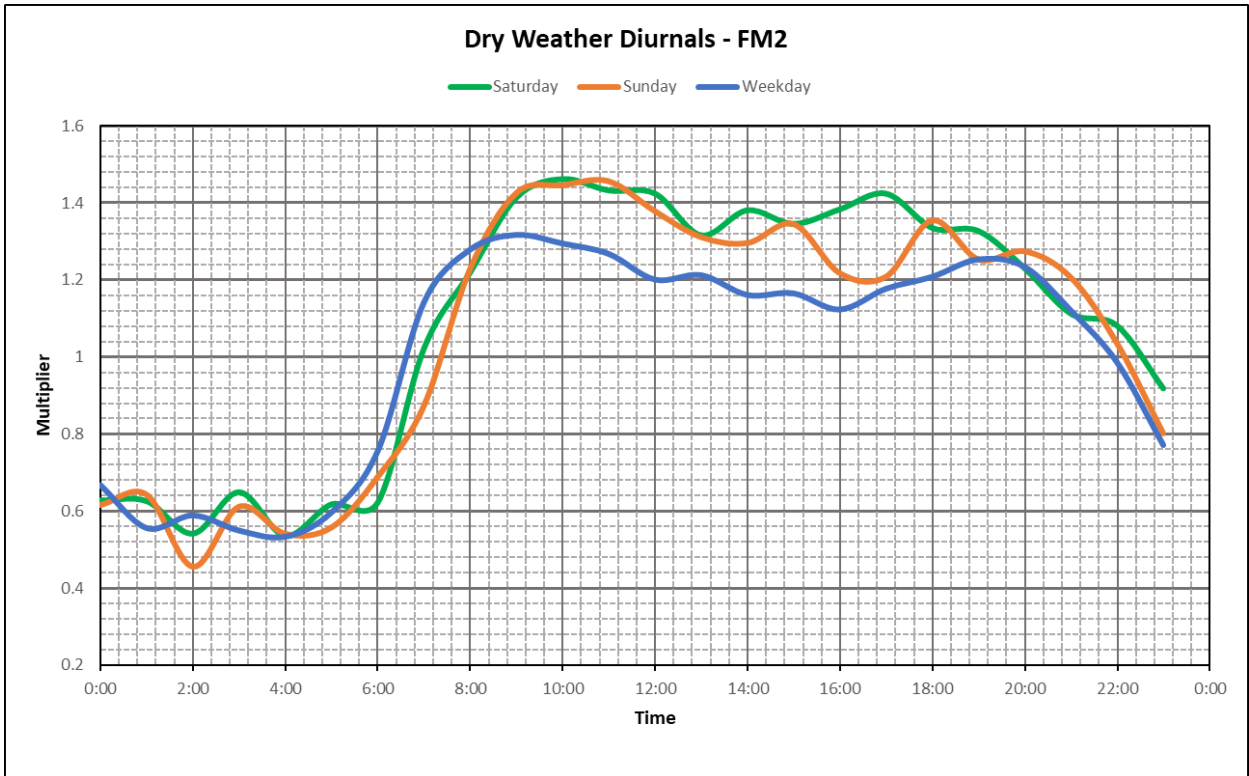
Lift Station 7 had significantly higher measured flows than calculated flows. Upon reviewing the lift station flow patterns, there is no apparent consistency to the flows, and they do not create a discernable diurnal pattern. As such it is assumed that the wet well levels reported to the SCADA system are unreliable. FM4 patterns, which are in the same catchment area, will be applied to any demands downstream of it that enter Lift Station 7.

The following are the diurnal patterns that were developed using the above information, and which will be applied to their respective catchment areas to develop the time based average dry weather flows.

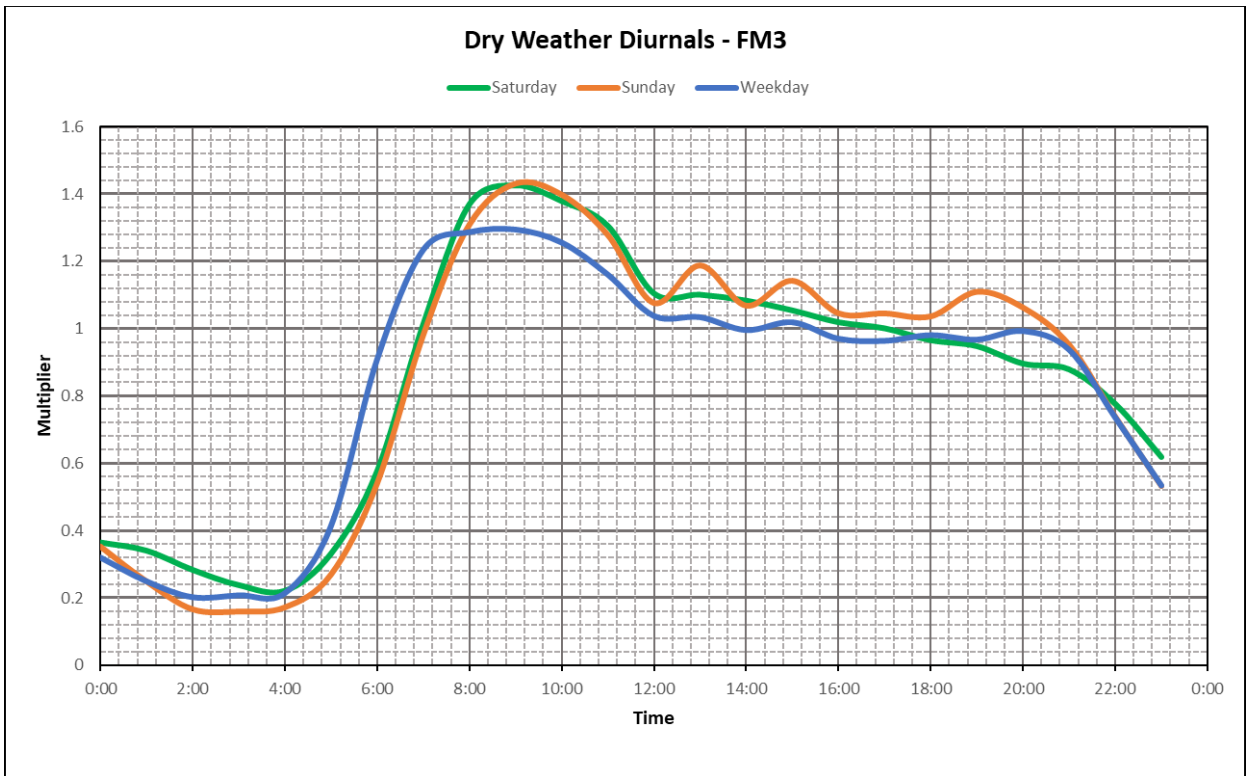
Flow Monitor 1



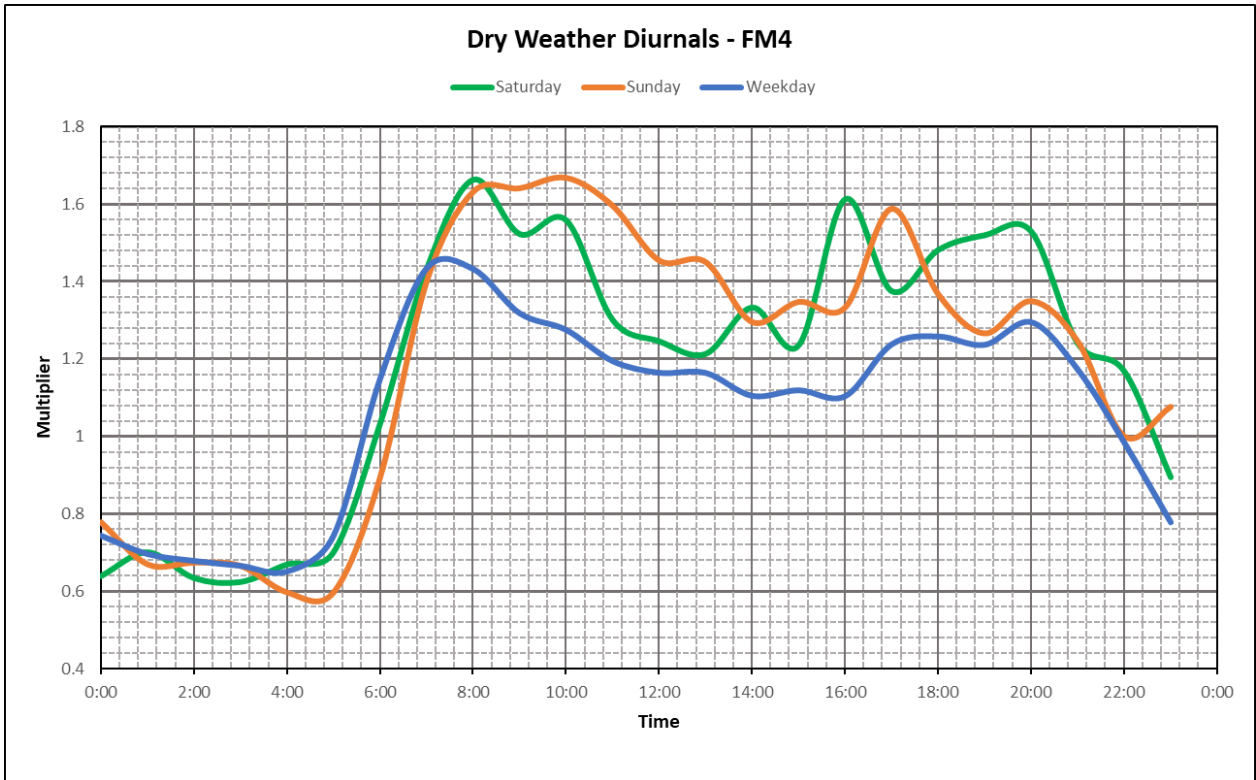
Flow Monitor 2



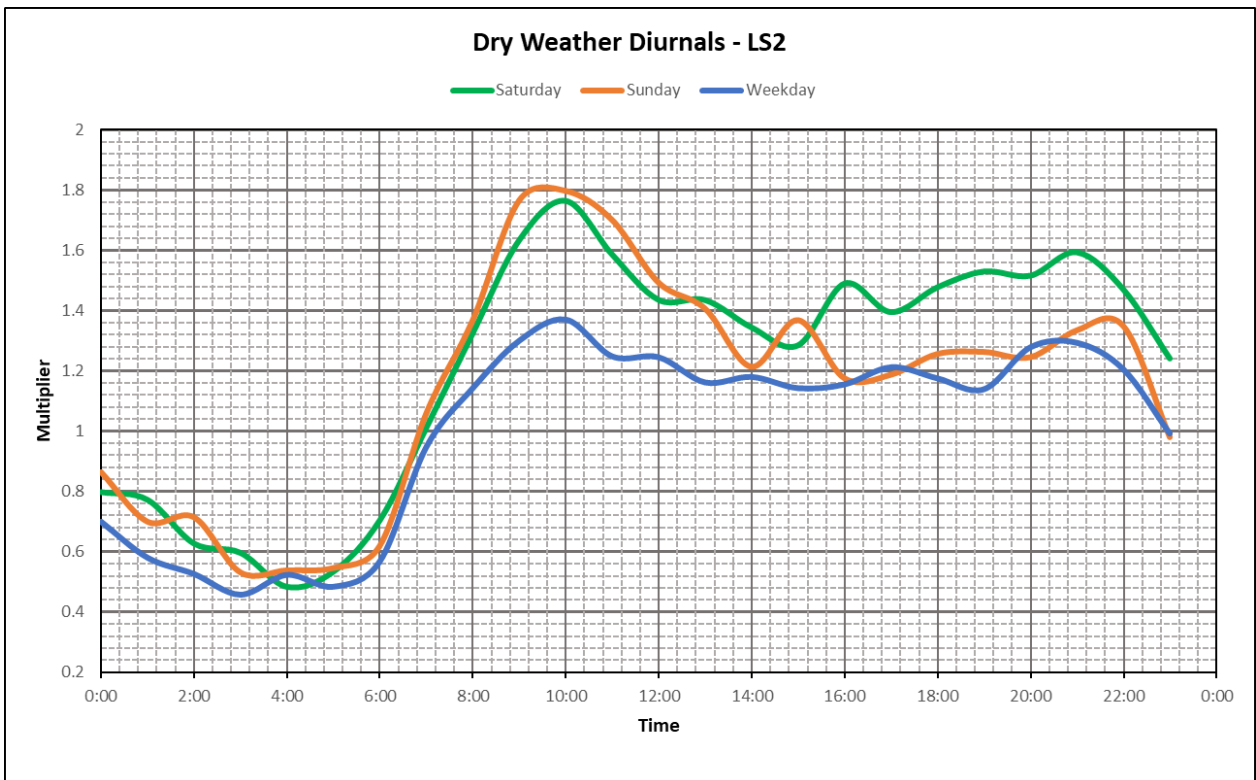
Flow Monitor 3



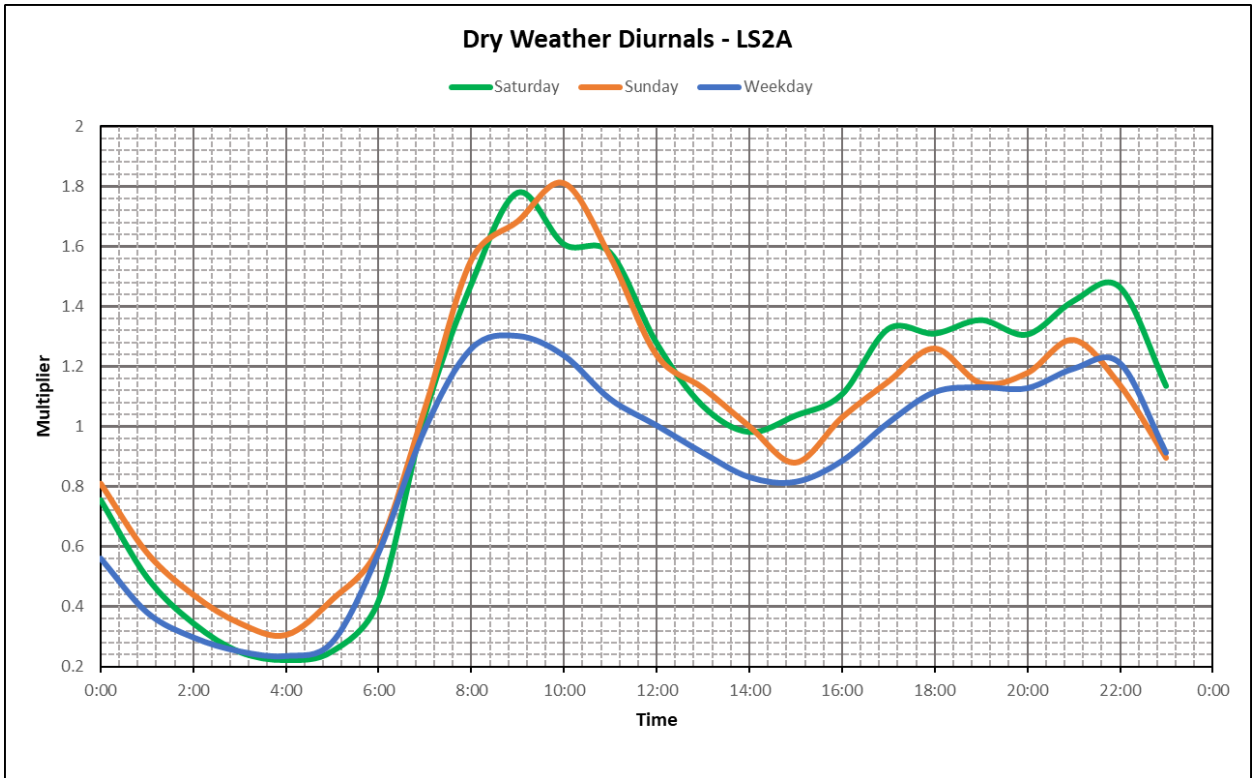
Flow Monitor 4



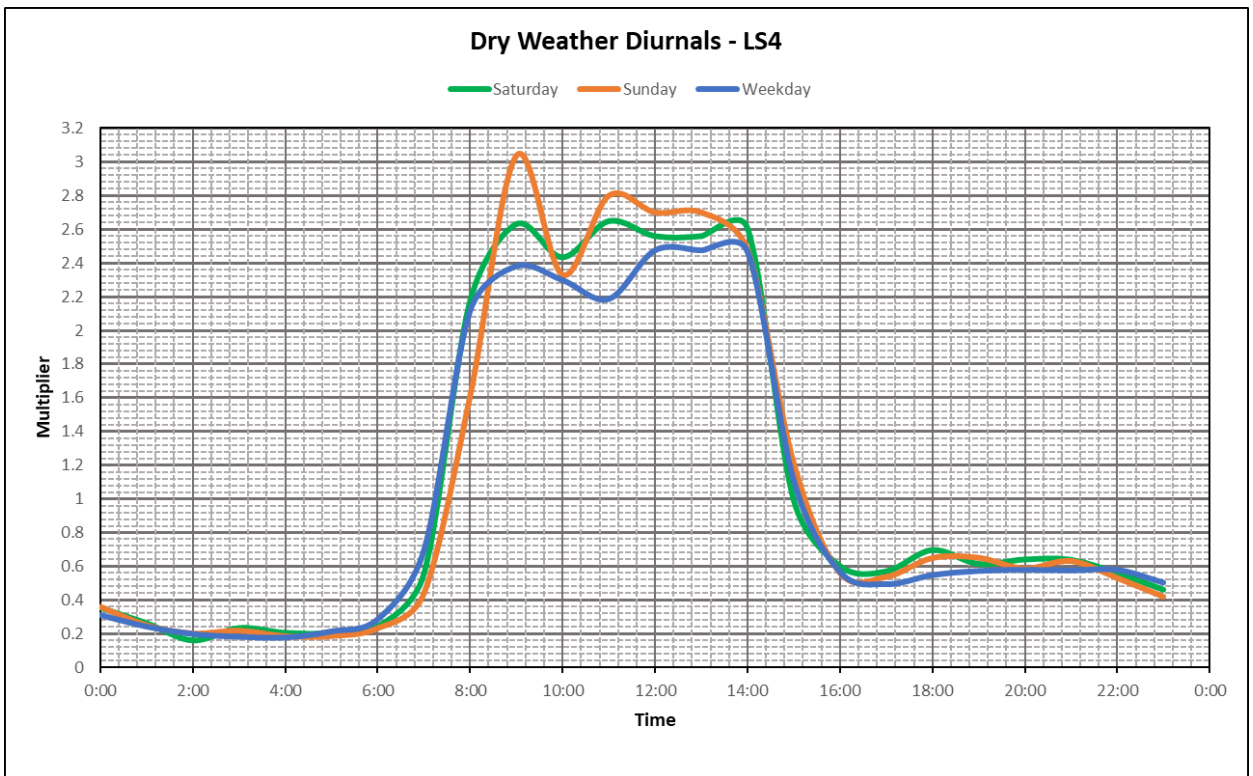
Lift Station 2



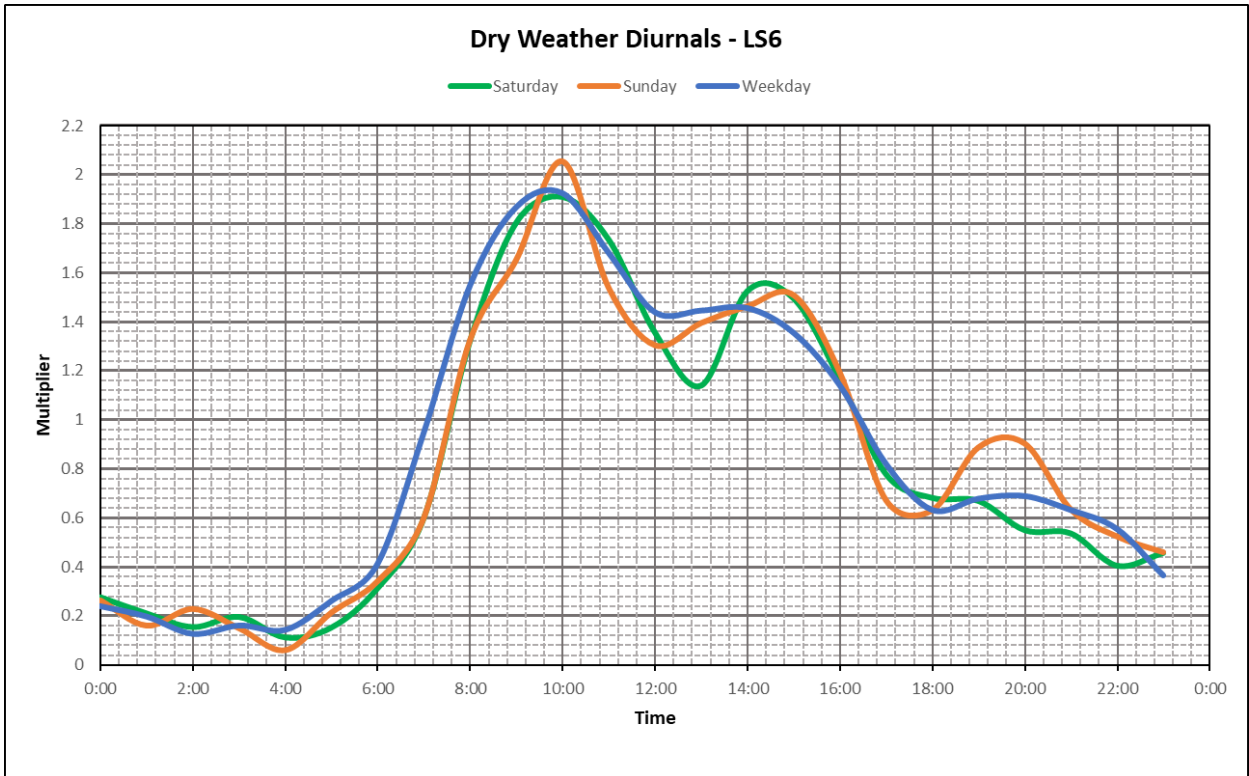
Lift Station 2A



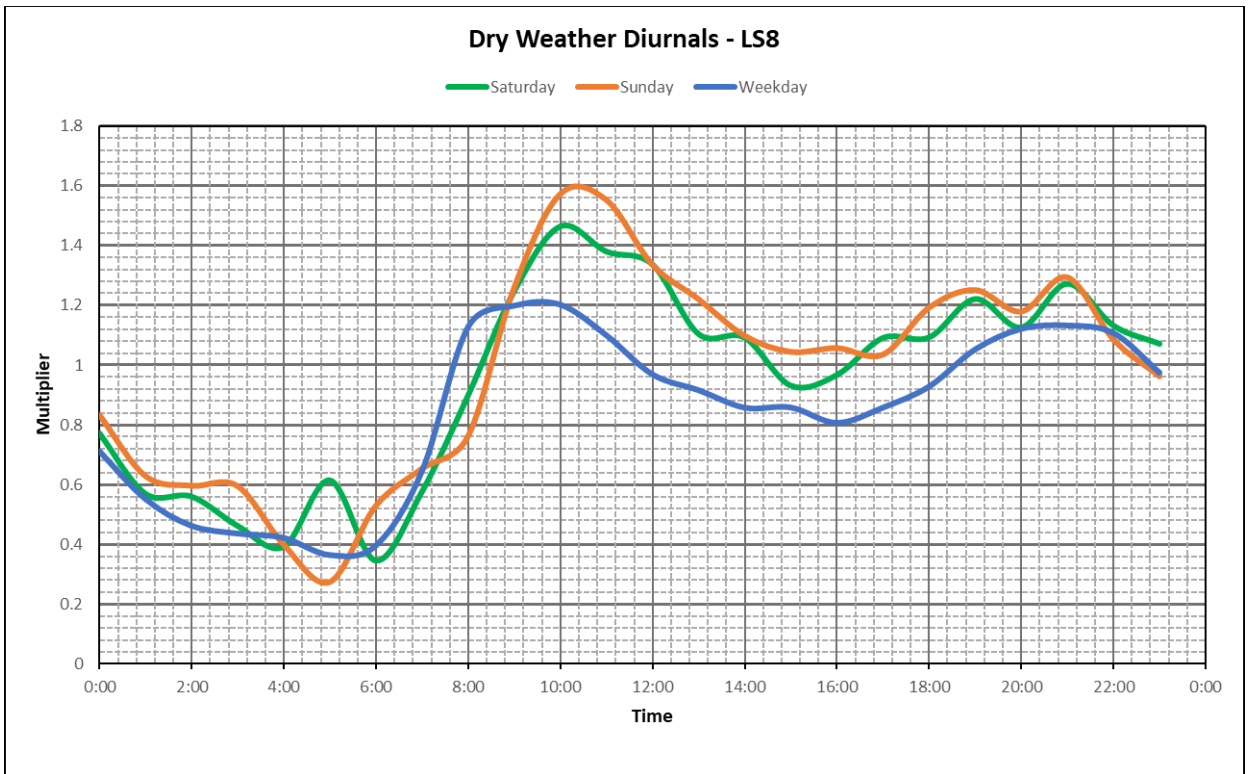
Lift Station 4



Lift Station 6



Lift Station 8



4.4.1.2 Maximum Day Dry Weather Flows

The maximum day flows are an estimate of the same flow patterns as the average days for the highest usage days of the year.

The maximum day flows take the baseline flows, and multiply them by the water Maximum Day Demand peaking factor of 1.7 times. The maximum daily flows entering the wastewater system are not representative of the dry weather flows, as they are heavily influenced by inflow and infiltration that occurs during wet weather periods and high river levels.

The following table shows the maximum day dry weather flows for each catchment area that a diurnal pattern was developed for.

Table 4-13 Maximum Day Dry Weather Flows Summary

Catchment Area	Average Day Dry Weather Flows (L/s)	Maximum Day Dry Weather Flows (L/s)
FM 1	2.7	4.5
FM 2	8.4	14.2
FM 3	17.0	28.9
FM 4	1.7	2.9
LS 2	17.0	28.9
LS 2A	7.5	12.7
LS 4	6.6	11.2
LS 6	5.7	9.6
LS 8	7.6	12.9

4.4.2 Wet Weather Flow Generation

Generally, the Town is split into two areas with different wet weather influences. The valley bottom, generally bounded by the Bow River to the southwest, and Highway 1 to the northeast, is influenced through inflow and infiltration into the system by ground water. During the snowmelt period which can include large rainstorms, a groundwater surge occurs and a dramatic increase in flows can be observed.

The valley slopes, generally bounded by being southwest of the Bow River, and northeast of Highway 1, have minimal groundwater influence. Inflow and infiltration would be caused by rain events, with runoff water entering the system through manholes and some pipe infiltration from local soil saturation.

Valley Bottom

The valley bottom consists of the FM1, FM2, LS2 and LS2A catchment areas, which generally includes downtown Canmore, Bow Valley Trail, and Kananaskis Way.

In reviewing the flow monitors and lift station flow data in the valley bottom, the peak wet weather period was determined to be between June 13, 2022 and June 24, 2022. The figure below shows the trend for increased flows as the river levels rise, peaking between the noted period. This period also contained the most significant rainfall event observed during the monitoring period, which occurred between June 13-June14

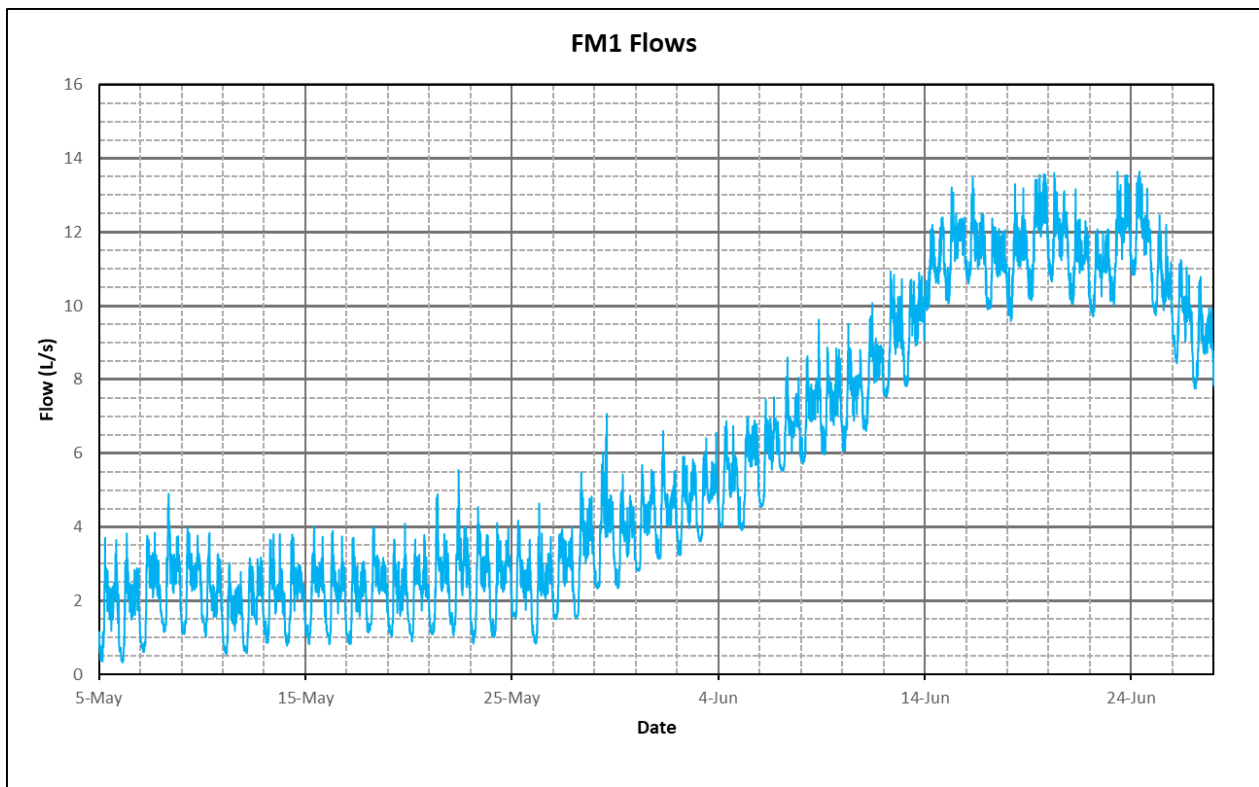


Figure 4-1 FM 1 Flows – Wet Weather Period

The additional wet weather flow for each catchment was determined by reviewing the minimum night flow during the dry weather period and comparing it against the maximum night flow during the wet weather period. Using the night flows ensures that flow generated by connections to the system are at a minimum, allowing for the best comparison.

The following table shows the dry weather and wet weather night flows for each catchment area, and the calculated additional flows due to the wet weather. Also shown are the approximate area based inflow and infiltration rates for each catchment.

Table 4-14 Valley Bottom I&I Rates

Catchment Area	Area (ha)	Night Flow Dry (L/s)	Night Flow Wet (L/s)	I&I (L/s)	I&I Rate (L/s/ha)
FM 1	21.6	0.3	11.0	10.7	0.50
FM 2	105.0	2.3	18.9	16.6	0.16
LS 2	107.3	8.4	63.8	55.4	0.52
LS 2A	48.3	1.6	2.8	1.2	0.02

All catchments in the valley bottom had I&I rates lower than the 0.66 L/s originally determined in the 2014 Flow Monitoring Program, however the FM 1 and LS 2 catchments were still notably high.

The LS 2A catchment had a significantly lower I&I rate, at 0.02 L/s/ha. This is possibly due to the overall newer construction of the area, and a change in underlying soil type. Due to the low I&I rate observed in the catchment, the LS 2A catchment area will have wet weather flow generation applied to it in the same way as the Valley Slopes, which is at a rate of 0.1 L/s/ha.

Valley Slopes

The original intent to assess wet weather flows on the valley slopes was to utilize the flow monitoring program to identify rainfall events and the additional flow introduced into the system during these rain events. Using this data, the model could be calibrated to the observed storm event, to project the effects of the system during a 1:50 year storm event.

However, across all the flow monitor and lift station locations that were used to assess flow on the valley slopes, there was minimal rainfall response observed in the collection system. Because of this, the rainfall response was not significant enough to derive calibration parameters for storm events.

The primary rainfall event was between June 13, 2022 and June 14, 2022. The following figure shows the flow recorded at FM 3 and the rainfall intensity. Overall, approximately 43 mm of rain fell in that time period. This would typically induce a noticeable response to flows in the system. Flow Monitor 3 also has the largest catchment area in the system

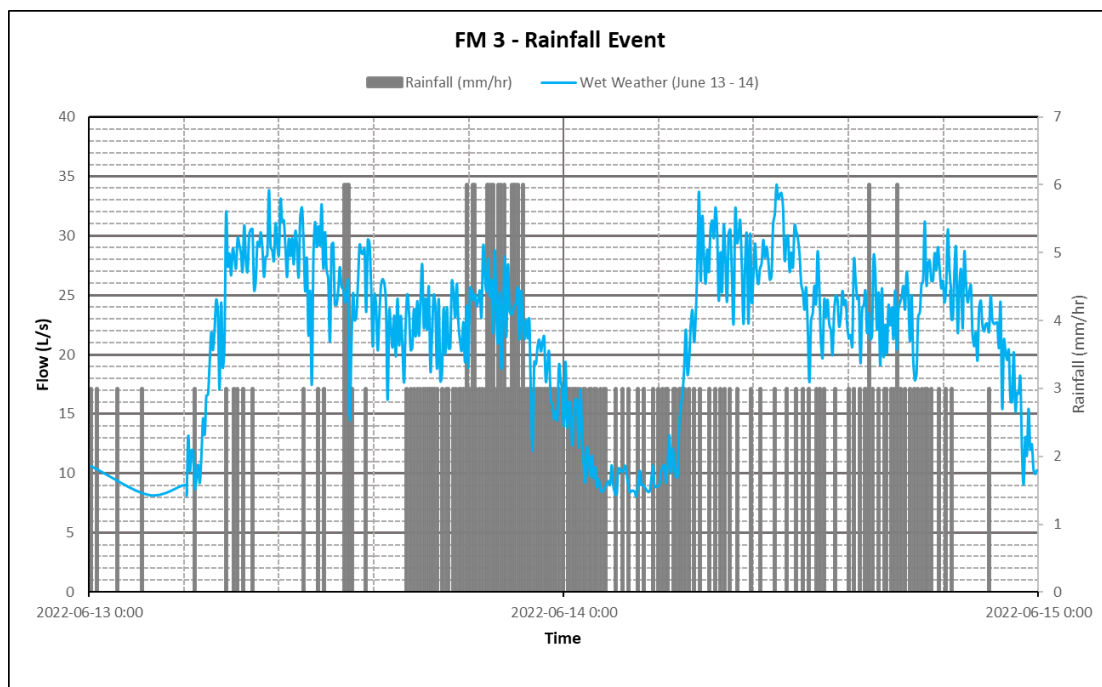


Figure 4-2 Flow Monitor 3 Rainfall Event

These two days were on a Monday and a Tuesday. As a comparison, the flows on this day were compared against the next Monday and Tuesday, June 20 – June 21, which had no notable rainfall. The period of time with the highest rainfall intensity shows almost no difference in flows from the dry weather comparison.

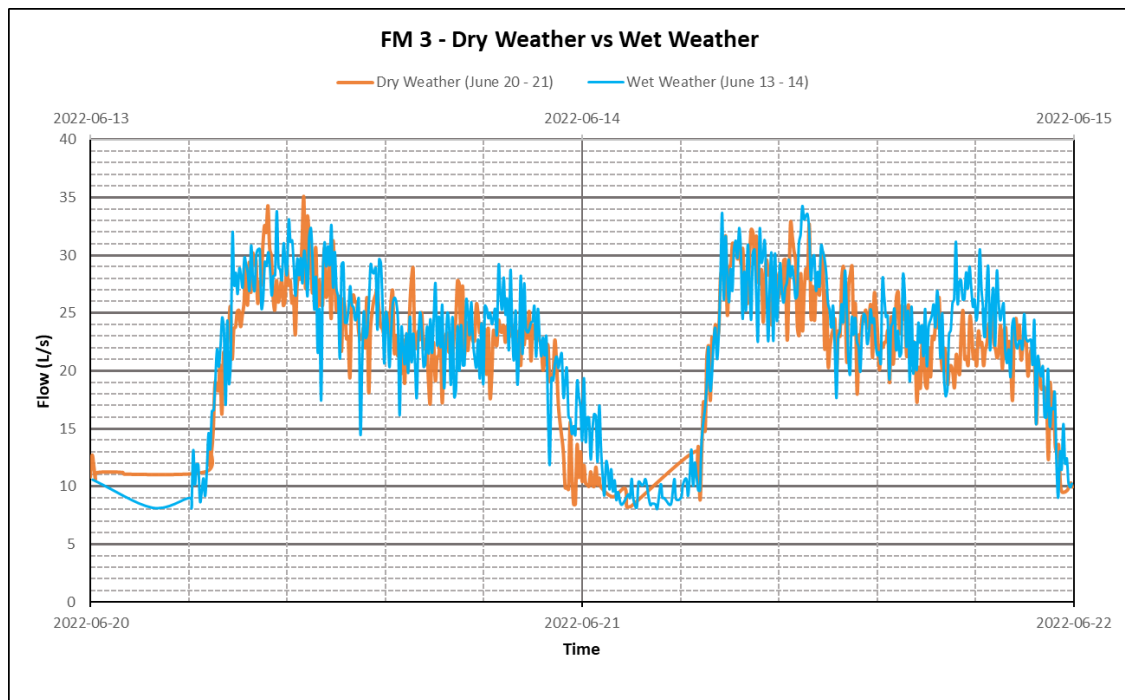


Figure 4-3 Flow Monitor 3 Dry Weather vs Wet Weather

This leads to the conclusion that the valley slopes have minimal responses to rainfall events, for the intensity of storms that were observed during the monitoring period.

To account for some level of rainfall derived inflow and infiltration, an assumed I&I rate of 0.1 L/s/ha was applied to the valley slopes to simulate an extreme wet weather event.

The following table shows the I&I for the valley slopes catchment areas with the assumed 0.1 L/s/ha rate applied.

Table 4-15 Valley Slopes I&I Rates

Catchment Area	Area (ha)	I&I Rate (L/s)
LS 2A	48	5
FM 3	160	16
FM 4	58	6
LS 4	107	11
LS 6	50	5
LS 8	175	18

4.4.3 Future Flow Generation

The future wastewater demands are determined in the same way as the water network, by applying the unit rates to the projected growth, in units, for each land use. The units were distributed as shown in the Growth Projections and Design Basis Memo. There are three growth horizons, 5 years, 15 years, and 25 years, and two separate growth scenarios.

Dead Man’s Flats was projected as linear growth, where the 25 Year Horizon maxes out the current Memorandum of Agreement for wastewater flow, which is 7.5 L/s ADWF and 37.2 L/s PWWF. Using these flow maximums, a peaking factor of 5x was assumed, and accounts for I&I. Current PWWF is approximately 5 L/s.

As per the design criteria, each land use has its own peaking factor for Peak Dry Weather Flow. I&I rates were assigned to the system using the estimated gross developable area of each growth area, determined by the unit densities discussed in Section 1.2.

Growth Scenario 1

The following are the system wide wastewater flows for each growth horizon in Growth Scenario 1, which represents the full projected growth across 25 years. They do not include the existing demands.

The gross developable areas are shown in the following table.

Table 4-16 Wastewater Gross Developable Areas

Land Use	5 Year	15 Year	25 Year
	Area (ha)	Area (ha)	Area (ha)
Commercial	8.5	15.4	25.1
Hotels	10.1	21.3	32.5
Residential - Low Density	13.1	33.7	54.2
Residential - Medium / High Density	24.5	57.7	90.9
Total	53.4	128.1	202.7

The following table shows the system wide demands for the 5 Year Horizon.

Table 4-17 5 Year Horizon Wastewater Flows

Land Use	ADWF	PF	PDWF	I&I	PWWF
	L/s		L/s	L/s	L/s
Commercial	2.0	3.5	6.9	2.4	9.3
Hotels	9.1	4.0	36.3	2.8	39.1
Residential - Low Density	1.3	3.1	4.2	3.7	7.9
Residential - Medium / High Density	7.7	3.1	23.9	6.9	30.7
Dead Mans Flats	1.3	5.0	6.7	-	6.7
Total	20.1	-	71.3	15.7	87.0

The following table shows the system wide demands for the 15 Year Horizon.

Table 4-18 15 Year Horizon Wastewater Flows

Land Use	ADWF	PF	PDWF	I&I	PWWF
	L/s		L/s	L/s	L/s
Commercial	5.4	3.5	18.9	4.3	23.2
Hotels	19.1	4.0	76.4	6.0	82.4
Residential – Low Density	3.5	2.8	9.5	9.4	18.9
Residential – Medium / High Density	18.1	2.8	49.7	16.2	65.9
Dead Mans Flats	4.0	5.0	20.1	-	20.1
Total	50.0	-	174.6	35.9	210.5

The following table shows the system wide demands for the 25 Year Horizon.

Table 4-19 25 Year Horizon Wastewater Flows

Land Use	ADWF	PF	PDWF	I&I	PWWF
	L/s	L/s	L/s	L/s	L/s
Commercial	8.8	3.5	30.8	7.0	37.8
Hotels	29.1	4.0	116.5	9.1	125.6
Residential - Low Density	5.6	2.6	14.2	15.2	29.4
Residential - Medium / High Density	28.5	2.6	72.8	25.5	98.3
Dead Mans Flats	6.7	5.0	33.5	-	33.5
Total	72.0	-	234.4	56.8	291.2

4.5 Hydraulic Model Development

4.5.1 Existing System Implementation

A wastewater hydraulic model of the Town's wastewater system was developed for the 2016 UMP, however due to it being six years old, and the intent to move to a time-based model, the decision was made to remake the model utilizing Bentley SewerGEMS.

Schematic linework, manhole locations, and asset attributes such as pipe diameter, material, and invert elevations were established from the Town's most recent GIS data. All assets were associated to the GIS IDs from the Town's asset management system, which will result in easily updating and removing assets as the GIS information is updated. All new assets as of March 2022 were included in the model.

The inputs, particularly the invert elevations at pipes and manholes, were reviewed for completeness and to ensure all pipes in the network had their inverts oriented in the proper direction.

Lift station pump curves and operating points were retained from the previous UMP inputs, and were reviewed for accuracy and updated where necessary as per information provided from EPCOR. Lift Station 2 was notably updated since the previous UMP, and had its new wet well location, orientation and inputs updated, in addition to updated lift station pump curves.

Any missing ground level or manhole rim inputs were updated as per the most recent LiDAR information provided by the Town.

Wastewater flows were implemented into the model utilizing the customer water meter data, as discussed in Section 4.4.1. Each catchment area was divided into smaller sub catchments for each manhole in the system using Thiessen geometry. All water meters that fell into a particular manhole's sub catchment had their demands assigned to that manhole. The sum of demands in each of these sub catchments equals the Average Dry Weather Flow for each catchment area.

4.5.2 Extended Period Simulation

The model was developed as a time-based model, also known as an extended period simulation. This form of model simulates the daily demands and operational information such as pump cycles in real time, and is a more accurate way of representing the flow patterns and characteristics in the system. The flows and hydraulic grade lines of the system can be charted over time to see when and how long particular events affect the system.

As discussed in Section 4.4, diurnal patterns were developed for each of the flow monitor and lift station catchment areas. These diurnal patterns act as peaking factors or multipliers for the demands, creating the peak and low flows throughout the day.

4.6 Existing System Evaluation

4.6.1 Collection System Analysis

Flow Capacity

The existing collection system was reviewed under the Peak Wet Weather flow scenario, with particular focus on the peak flows during the day. The simulation results during the peak flows, showing pipe flows and any surcharging pipes can be found in Figure S4 (Appendix D).

Overall, there were only two pipe sections that did not meet the design criteria for pipe capacity, hydraulic gradeline, or velocity.

- + SNG1263 – Located on Bow Valley Trail in front of the Canmore Rocky Mountain Inn, this pipe segment has a flow that is 109% of the pipe’s capacity. As it is a short pipe segment with a lower slope than downstream, no surcharging is observed during or after the peak flows. No action will need to be taken for the existing system, however this pipe should be monitored during future scenarios, as it will act as a bottleneck if additional flows are introduced.
- + SNG0800 – Located on Hospital place and is the connection for TeePee town into Bow Valley Trail. This pipe segment has a flow that is 100% of the pipe’s capacity. No surcharging is observed during or after the peak flows. No action will need to be taken for the existing system, however this pipe should be monitored during future scenarios, as it will act as a bottleneck if additional flows are introduced.

Pipe Lifecycle

The Town of Canmore’s wastewater collection system contains aging infrastructure, particularly in the Downtown area. The service life of wastewater mains as per Canmore’s asset management standards is 75 years.

Currently there are pipes dating back to 1965, making the oldest pipes in the system approximately 58 years old. Figure S5 (Appendix D) shows the pipes according to age.

Currently no pipes in the system are approaching the end of their lifecycle, however replacement programs should be considered in the future when pipe lifecycle is approaching its end.

4.6.2 Lift Station Analysis

The existing lift stations were reviewed under the Peak Wet Weather flow scenario. All lift stations had a firm pumping capacity greater than the peak flows, and meet the design criteria.

Table 4-20 Existing Lift Station Analysis

Lift Station	PWWF (L/s)	Firm Pumping Capacity (L/s)
LS 1	57.3	200+
LS 2	88.6	130
LS 2A	21.3	51
LS 3	1.2	Unknown
LS 4	32.2	85
LS 5	9.3	40
LS 6	26.4	30
LS 7	10.9	120
LS 8	28.9	72
LS 9	2.1	7
LS 10	26.4	80
LS 11	4.0	15
LS 12	0.5	4

From a lifecycle and operational standpoint, Lift Station 3 is in severely deteriorated condition and does not operate reliably. The lift station should be replaced when practical for the Town.

4.7 Future System Evaluation

4.7.1 Collection System Analysis

The existing collection system was reviewed under the Peak Wet Weather flow scenario, with particular focus on the peak flows during the day. The results during the peak flows, showing pipe flows and any surcharging pipes can be found in Figures S6 – S11.

5 Year Horizon

The 5-year horizon saw significantly increased flows along the Bow Valley Trail area, as the growth projections accelerated all projected development in Bow Valley Trail and TeePee town to the 5-year horizon. These increased flows result in surcharging along Bow Valley Trail. The following figure shows the hydraulic grade line between Hospital Place and 17th Street. Figure S6 shows the hydraulic model results for this scenario.

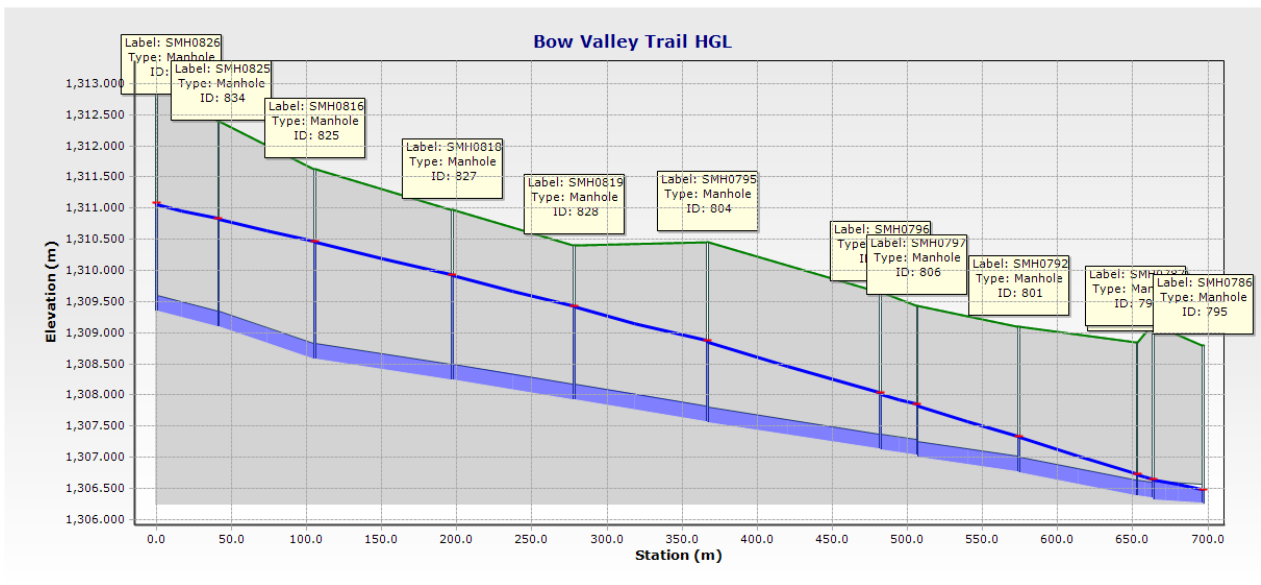


Figure 4-4 BVT Hydraulic Grade Line

The flow through these pipes is significantly higher than the pipe capacity and act as a bottleneck for upstream flows, resulting in surcharging. The surcharging under these conditions carries on to the upstream end of the Bow Valley Trail collection system.

The pipes between Hospital Place and 17th Street will need to be upgraded to at least 300 mm diameter to increase pipe capacity and eliminate surcharging. Figure S7 shows the model results after upgrading Bow Valley Trail.

The following figure shows the hydraulic grade line of the same pipes, when upgraded to 300 mm.

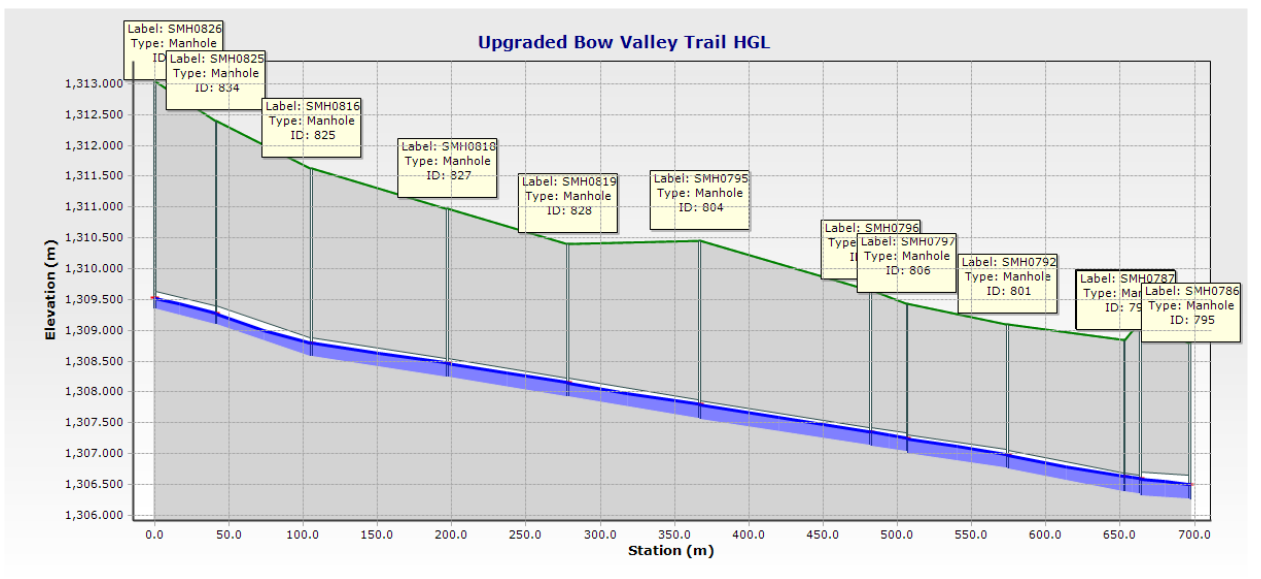


Figure 4-5 Upgraded BVT Hydraulic Grade Line

Outside of the noted surcharging, there are five other pipe segments which do not meet the design criteria for flow capacity. All of these pipe segments are part of the Bow Valley Trail collection system, and do not result in any surcharging. These sections should be monitored if development beyond what has been projected for the Bow Valley Trail area occurs.

- + SNG0810
- + SNG0273
- + SNG0657
- + SNG1649
- + SNG1263

15 Year Horizon

Figure S8 shows the hydraulic model results for the 15 Year Horizon. Surcharging is seen upstream of Lift Station 11, as it over capacity in this horizon, as per Section 4.7.2. Figure S9 shows the hydraulic model results after the proposed lift station upgrade, which resolves the noted surcharging.

25 Year Horizon

Figure S 10 shows the hydraulic model results for the 15 Year Horizon .In the 25-year horizon, there are two additional pipe segments that are above their design capacity. Both are on the trunk line down stream from Stewart Creek and Lift Station 10, just before it ties into Three Sisters Parkway. No surcharging occurs in either pipe, and no action needs to be taken.

- + SNG1327
- + SNG11325

Surcharging is seen upstream of Lift Stations 8, 10 and 11. Figure S11 shows the hydraulic model results after the proposed lift station upgrades, which resolves the noted surcharging

Pipe Lifecycle

A replacement program should be developed for pipes installed between 1965 and 1972, to be executed starting from the end of the 15-year horizon and replacing sections of pipe each year. This would ensure that there are no assets older than the 75-year lifecycle by the end of the 25 year horizon, and are represented by pipes that are currently older than 50 years.

There are approximately 10 km of wastewater lines older than 50 years. They are primarily located in the Downtown area, Railway Ave, Bow Valley Trail / TeePee town, and Rundle Drive.

The replacement program will be broken out into five separate areas, for the purposes of project time lines and cost estimates. These are the same areas as the water distribution system, and the replacement programs should be done in tandem. They are as follows:

- + South Canmore (6th Street to 3rd Street) – 2 km
- + Downtown (6th Street to 10th Street) – 3.5 km
- + 7th Avenue (10th St to Industrial Place) – 1.5 km
- + Rundle (Bridge Road to Three Sisters Drive) – 0.75 km
- + Teepee Town / Railway Ave – 2.5 km

Cured in Place Pipe (CIPP) lining is a possible alternative to outright replacement for aging sewer infrastructure, it can effectively extend the lifespan of gravity collection systems, even if they are severely deteriorated.

Typically, CIPP lining is significantly more cost effective than open cut replacement, however these cost savings would be less significant than replacing just the sewer, as the intention of the replacement program is to perform it in tandem with water replacement where possible. With that in mind, CIPP lining should still be investigated, as it may still be more cost effective and result in less consumer and environmental impact than direct replacement.

To be conservative, costs for replacement will be used to estimate the project costs, however an allowance for CCTV which can determine the viability of CIPP lining will be included.

4.7.2 Lift Station Analysis

In order to consider the impacts of Dead Man’s Flats to available lift station capacity, timing of upgrades, and extent of upgrades, along with consideration for existing infrastructure agreements, Lift Station 8 and Lift Station 10 were additionally reviewed with no contribution from Dead Man’s Flats.

5 Year Horizon

The lift stations were assessed under the 5-year scenario during peak flow conditions. All lift stations are within their firm pumping capacity, with the exception of Lift Station 11, which has peak flows slightly above its firm pumping capacity. No surcharging occurs during the peak flows, however the lift station should be upgraded to accommodate the 15 year flows prior to additional development.

The peak flow into Lift Station 11 at the end of the 15-year horizon is approximately 40 L/s.

Table 4-21 5 Year Horizon Lift Station Analysis

Lift Station	PWWF (L/s)	Firm Pumping Capacity (L/s)
LS 1	65.0	200+
LS 2	112.6	130
LS 2A	24.5	51.0
LS 3	1.2	Unknown
LS 4	32.5	85.0
LS 5	9.3	40.0
LS 6	26.6	30.0
LS 7	27.4	120.0
LS 8	59.5	72.0
LS 9	2.1	7.0
LS 10	50.7	80.0
LS 11	15.5	15.0
LS 12	0.5	4.0

The existing Lift Station 11 was designed as an interim lift station, with future phases planned for higher flows. The future phases include a new building, process piping, and other appurtenances. This upgrade should trigger the first phases of the ultimate lift station design.

5 Year Horizon – No DMF

Under the 5 year horizon with no future DMF flow, Lift Station 8 and Lift Station 10 are within their firm pumping capacity.

Table 4-22 5 Year Horizon – No DMF Lift Station Analysis

Lift Station	PWWF (L/s)	Firm Pumping Capacity (L/s)
LS 8 – No DMF	47.1	72
LS 10 – No DMF	43.2	80

15 Year Horizon

The lift stations were assessed under the 15-year scenario during peak flow conditions. Lift station 11 was upgraded to 40 L/s pumping capacity as recommended in the 5-year horizon in this assessment.

Lift Stations 8 and 10 both have peak flows higher than their firm pumping capacities with Dead Man’s Flats online. Surcharging can occur upstream of these lift stations at their peak flow rates.

Table 4-23 15 Year Horizon Lift Station Analysis

Lift Station	PWWF (L/s)	Firm Pumping Capacity (L/s)
LS 1	64.7	200+
LS 2	118.2	130
LS 2A	31.2	51.0
LS 3	1.2	Unknown
LS 4	33.0	85.0
LS 5	9.3	40.0
LS 6	27.7	30.0
LS 7	62.3	120.0
LS 8	93.1	72.0
LS 9	2.1	7.0
LS 10	91.1	80.0
LS 11	38.9	40
LS 12	0.5	4.0

Lift Station 8 currently operates two pumps and was designed to be easily upgraded to three pumps. Adding the third pump will increase the firm pumping capacity to approximately 150 L/s, which will be sufficient to satisfy the 15 year and 25-year horizons.

Lift Station 10 currently operates three pumps and will require pump replacements in order to upgrade its pumping capacity. Due to the relatively small increase in pumping capacity required to satisfy the design criteria for the 15-year horizon, it is recommended that the lift station be upgraded for the 25 year horizon, for a total pumping capacity of approximately 125 L/s.

15 Year Horizon – No DMF

Under the 15 year horizon with no future DMF flows, Lift Station 8 would still be over it's firm pumping capacity, and require the recommended upgrade to three pumps. Lift Station 10 would still be below it's firm pumping capacity, and an upgrade would not be triggered under this horizon.

Lift Station 8 had an existing incoming PWWF of 28.6 L/s. As such, the TSMV developments could contribute 43.4 L/s to the lift station prior to an upgrade being required.

Table 4-24 15 Year Horizon – No DMF Lift Station Analysis

Lift Station	PWWF (L/s)	Firm Pumping Capacity (L/s)
LS 8 – No DMF	76.2	72
LS 10 – No DMF	69.2	80

25 Year Horizon

The lift stations were assessed under the 25-year scenario during peak flow conditions. Lift station 8 was upgraded to 150 L/s pumping capacity and Lift Station 10 was upgraded to 125 L/s pumping capacity, as recommended in the 15-year horizon in this assessment.

All lift stations are within their firm pumping capacity, with the exception of Lift Station 11, which has peak flows of approximately 65 L/s, compared to the previously upgraded capacity of 40 L/s. A final upgrade up to 65 L/s will satisfy the design criteria for the 25-year horizon.

Table 4-25 25 Year Horizon Lift Station Analysis

Lift Station	PWWF (L/s)	Firm Pumping Capacity (L/s)
LS 1	67.1	200+
LS 2	118.7	130
LS 2A	36.7	51.0
LS 3	1.2	Unknown
LS 4	33.0	85.0
LS 5	9.3	40.0
LS 6	26.6	30.0
LS 7	98.0	120.0
LS 8	127	150.0
LS 9	2.1	7.0
LS 10	125.0	125.0
LS 11	62.8	40.0
LS 12	0.5	4.0

25 Year Horizon – No DMF

Under the 25 year horizon with no future DMF flows, Lift Station 10 would be over its firm pumping capacity and would require an upgrade. Lift Station 8 would be within its firm pumping capacity, when upgraded to 150 L/s.

Lift Station 10 had an existing incoming PWWF of 26.4 L/s. As such, the TSMV developments could contribute 53.6 L/s to the lift station prior to an upgrade being required.

Table 4-26 25 Year Horizon – No DMF Lift Station Analysis

Lift Station	PWWF (L/s)	Firm Pumping Capacity (L/s)
LS 8 – No DMF	93.6	150
LS 10 – No DMF	92.2	80

Lift Station 8 and Lift Station 10 Contributing Flows Summary

In total, TSMV contributes 65 L/s to Lift Station 8. The lift station had 43.4 L/s of remaining capacity, resulting in 21.6 L/s contributing to the upgrade if the existing capacity were assigned to TSMV. DMF contributes 33.5 L/s to the lift station upgrade.

In total, TSMV contributes 65 L/s to Lift Station 10. The lift station had 53.6 L/s of remaining capacity, resulting in 12.2 L/s contributing to the upgrade if the existing capacity were assigned to TSMV. DMF contributes 33.5 L/s to the lift station upgrade.

4.8 Wastewater Projects

4.8.1 EX S1 – Lift Station 3 Replacement

New

Project Description

Replace the existing Lift Station 3 with a new wet well, pumps, electrical and building structure.

Project Rationale

Lift Station 3 is in poor condition and is eligible for a life cycle replacement. Regrading the collection system to connect to downstream lift stations by gravity is not feasible. New developments in the immediate area may increase risks associated with the lift station’s failure.

Project Details

- + New wet well
- + New pumps and electrical
- + New building

Project Trigger

- + This project should be completed in the next 5 years
- + 100% attributed to lifecycle

Project Cost

Engineering	\$	110,000.00
Implementation	\$	750,000.00
Contingency	\$	240,000.00
Allowance for care of water	\$	400,000.00
Total	\$	1,500,000.00

4.8.2 S1 – Bow Valley Trail Sewer Upgrade

Formerly UMP2016 – Project S6

Project Description

Upgrade approximately 430 m of existing wastewater line from 250 mm to 300 mm along Bow Valley Trail between approximately 13th St and 17th St.

This project was assumed to be coordinated with a roadworks program, and only captured deep utility installation costs.

Project Rationale

Significant growth is projected in the northwestern portion of Bow Valley Trail, and was captured in the 5 Year development horizon. Due to this growth, Peak Wet Weather Flows will exceed current pipe capacity and could cause pipe surcharging.

Project Details

- + 430 m of 250 mm to 300 mm wastewater pipe upgrade

Project Trigger

- + This project should be completed prior to further development along Bow Valley Trail, and before any roadworks programs
- + Triggered by growth, OSL Zone 6

Project Cost

Engineering	\$	60,000.00
Implementation	\$	400,000.00
Contingency	\$	140,000.00
Total	\$	600,000.00

Project Cost Sharing

This project is necessary for growth-related conditions.

Deep utility assets have a prescribed life cycle of 75 years. The recorded installation date for the sewer lines is 1990, resulting in a remaining lifecycle of 43 years.

As per the cost allocation methodology, the formula is as follows:

$$\text{UpgradeCost} - \left(1 - \frac{\text{ServiceLifeRemaining}}{\text{LifeSpan}}\right) * \text{Basecost} = \text{DeveloperCost}$$

Where:

- + Base Cost = \$580,000
- + Upgrade Cost = \$600,000
- + Service Life Remaining = 43 Years
- + Life Span = 75 Years
- + $\$600,000 - \left(1 - \frac{43}{75}\right) * \$580,000 = \$350,000$ developer cost

Using the cost sharing methodology, 58% of the total cost should be borne by development, and 42% of the cost should be borne by the Town of Canmore.



4.8.3 S2 – Lift Station 11 Upgrade Phase 1

New

Project Description

Upgrade Lift Station 11 to a pumping capacity of 40 L/s. The existing lift station is an interim phase, this upgrade would include the first phases of the ultimate design for the lift station.

Project Rationale

Growth in Stewart Creek and Smith Creek both discharge flow into Lift Station 11. The lift station needs to be upgraded to support the initial flows. This upgrade will trigger the planned future phases of the lift station.

Project Details

- + New process piping
- + 40 L/s pumping capacity
- + Electrical and mechanical equipment
- + New standby generator
- + Lift Station Building

Project Trigger

- + Development of the following number of units in OSL 14:
 - 30 ICI Units
 - 150 Low Density Residential Units
 - 130 Medium / High Density Residential Units
- + Peak Wet Weather Flow of 15 L/s into lift station
- + Triggered by growth, OSL Zone 14

Project Cost

Engineering	\$	230,000.00
Implementation	\$	1,530,000.00
Contingency	\$	530,000.00
Total	\$	2,290,000.00

Project Cost Sharing

This is a planned future phase to support development. Cost is 100% attributable to development

4.8.4 S3 – Lift Station 8 Upgrade

Project Description

Add a third pump in Lift Station 8, upgrading the pumping capacity to approximately 150 L/s

Project Rationale

Growth in the Stewart Creek, Smith Creek and Deadman’s flats all contribute flows to Lift Station 8. Once the Peak Wet Weather Flow is greater than the firm pumping capacity an upgrade is required. Lift Station 8 was designed to install a third pump, effectively doubling the firm pumping capacity.

The upgrade will satisfy pumping requirements past the 25 year horizon.

Project Details

- + Install third pump
- + Install new VFD and update electrical system and programming

Project Trigger

- + Development of the following number of units in OSL 14:
 - 60 ICI Units
 - 310 Low Density Residential Units
 - 280 Medium / High Density Residential Units
- + In approximately 10 years of development
- + PWWF of 72 L/s into Lift Station 8
- + Triggered by growth, OSL Zone 14 and 15
- + Recommended Project Year: 2032-2033

Project Cost

Engineering	\$	60,000.00
Implementation	\$	400,000.00
Contingency	\$	140,000.00
Total	\$	600,000.00

Project Cost Sharing

This is new infrastructure installed in existing infrastructure designed for the upgrade, and the costs are 100% attributable to development. If available capacity were assigned to TSMV, then TSMV would contribute 21.6 L/s to the upgrade, and DMF would contribute 33.5 L/s to the upgrade, resulting in the following cost allocation:

- + 39% of the project cost should be borne by TSMV (\$ 235,000)
- + 61% of the project cost should be borne by DMF (\$ 365,000)

4.8.5 S4 – Lift Station 10 Upgrade

Project Description

Replace the existing pumps in Lift Station 10 for a peak wet weather flow of approximately 125 L/s, along with possibly existing electrical equipment and backup generator

Project Rationale

Growth in the Stewart Creek, Smith Creek and Deadman’s flats all contribute flows to Lift Station 10. Once the Peak Wet Weather Flow is greater than the firm pumping capacity an upgrade is required. Lift Station 10 will have to be upgraded to reach the required flows, including the pumps, some electrical equipment, and potentially the backup generator. VFDs would also be beneficial to install.

The upgrade will satisfy pumping requirements past the 25 year horizon.

Project Details

- + Replace 3 pumps for a firm pumping capacity of 125 L/s
- + Upgrade electrical equipment
- + Replace backup generator if required
- + Add VFDs

Project Trigger

- + Development of the following number of units in OSL 14:
 - 75 ICI Units
 - 400 Low Density Residential Units
 - 360 Medium / High Density Residential Units
- + 18 L/s from Dead Man’s Flats
- + In approximately 13 years of development
- + PWWF of 80 L/s into Lift Station 10
- + Triggered by growth, OSL Zone 14 and 15
- + Recommended Project Year: 2035-2036

Project Cost

Engineering	\$	230,000.00
Implementation	\$	1,530,000.00
Contingency	\$	530,000.00
Total	\$	2,290,000.00

Project Cost Sharing

This project is necessary for both growth-related conditions.

Facilities have an estimated life cycle of 50 years. The recorded installation date for Lift Station 10 is 2001, resulting in a remaining lifecycle of 30 years. As per the cost allocation methodology, the formula is as follows:

$$UpgradeCost - \left(1 - \frac{ServiceLifeRemaining}{LifeSpan}\right) * Basecost = DeveloperCost$$

Where:

- + Base Cost = \$1,950,000
- + Upgrade Cost = \$2,290,000
- + Service Life Remaining = 30 Years
- + Life Span = 50 Years
- + $\$2,290,000 - \left(1 - \frac{30}{50}\right) * \$1,950,000 = \$1,510,000$ developer cost

Using the cost sharing methodology, 66% of the total cost should be borne by development, and 34% of the cost should be borne by the Town of Canmore.

If available capacity were assigned to TSMV, then TSMV would contribute 21.6 L/s to the upgrade, and DMF would contribute 33.5 L/s to the upgrade, resulting in the following cost allocation:

- + 39% of developer cost (26% of project cost) should be borne by TSMV (\$ 590,000)
- + 61% of developer cost (40% of project cost) should be borne by DMF (\$ 920,000)

4.8.6 S5 – Lift Station 11 Upgrade Phase 2

Project Description

Upgrade Lift Station 11 to a pumping capacity of 60 L/s.

Project Rationale

Growth in Stewart Creek and Smith Creek both largely end up discharging flows into Lift Station 11. The lift station needs to be upgraded to support the initial flows. This upgrade will trigger the planned future phases of the lift station.

Project Details

- + 60 L/s pumping capacity

Project Trigger

- + Development of the following number of units in OSL 14:
 - 80 ICI Units
 - 440 Low Density Residential Units
 - 400 Medium / High Density Residential Units
- + Peak Wet Weather Flow of 40 L/s into lift station
- + Triggered by growth, OSL Zone 14

Project Cost

Engineering	\$	60,000.00
Implementation	\$	380,000.00
Contingency	\$	130,000.00
Total	\$	570,000.00

Project Cost Sharing

This is a planned future phase to support development. Cost is 100% attributable to development

4.8.7 S6 – South Canmore Sewer Line Replacement

Project Description

Replace aging wastewater infrastructure in the South Canmore area, between 3rd Street and 6th Street.

Project Rationale

Wastewater lines in the older areas of Canmore are nearing their lifecycle, and the Town should begin a program to replace the infrastructure that is nearing its lifecycle. The oldest pipes in Canmore were installed in 1966, and will reach their 75 year lifecycle by 2041, approximately 19 years after this study.

CIPP lining can be investigated instead of replacement, with CCTV performed to determine viability

For the best use of resources, the utility replacement program should be paired with a roadworks program and the water replacement program.

Project Details

- + 2,000 m of 200 mm wastewater line replacement

Project Trigger

- + Recommended Project Year: 2037-2038

Project Cost

Engineering	\$	390,000.00
Implementation	\$	1,560,000.00
Contingency	\$	780,000.00
Total	\$	2,730,000.00

Project Cost Sharing

This is existing infrastructure replacement that is 100% attributable to the Town of Canmore.

4.8.8 S7 – Downtown Canmore Sewer Line Replacement

Project Description

Replace aging wastewater infrastructure in the Downtown area, between 6th Street and 10th Street.

Project Rationale

Wastewater lines in the older areas of Canmore are nearing their lifecycle, and the Town should begin a program to replace the infrastructure that is nearing its lifecycle. The oldest pipes in Canmore were installed in 1966, and will reach their 75 year lifecycle by 2041, approximately 19 years after this study.

CIPP lining can be investigated instead of replacement, with CCTV performed to determine viability

For the best use of resources, the utility replacement program should be paired with a roadworks program and the water replacement program.

Project Details

- + 3,500 m of 200 mm wastewater line replacement
- + 3,000 m² road replacement

Project Trigger

- + Recommended Project Year: 2038-2039

Project Cost

Engineering	\$	760,000.00
Implementation	\$	3,030,000.00
Contingency	\$	1,520,000.00
Total	\$	5,310,000.00

Project Cost Sharing

This is existing infrastructure replacement that is 100% attributable to the Town of Canmore.

4.8.9 S8 – 7th Avenue Sewer Line Replacement

Project Description

Replace aging wastewater infrastructure in the 7th Avenue area, 10th Street and Industrial Place.

Project Rationale

Wastewater lines in the older areas of Canmore are nearing their lifecycle, and the Town should begin a program to replace the infrastructure that is nearing its lifecycle. The oldest pipes in Canmore were installed in 1966, and will reach their 75 year lifecycle by 2041, approximately 19 years after this study.

CIPP lining can be investigated instead of replacement, with CCTV performed to determine viability

For the best use of resources, the utility replacement program should be paired with a roadworks program and the water replacement program.

Project Details

- + 3,000 m of 200 mm wastewater line replacement
- + 3,000 m² road replacement

Project Trigger

- + Recommended Project Year: 2039-2040

Project Cost

Engineering	\$	670,000.00
Implementation	\$	2,690,000.00
Contingency	\$	1,340,000.00
Total	\$	4,700,000.00

Project Cost Sharing

This is existing infrastructure replacement that is 100% attributable to the Town of Canmore.

4.8.10 S9 – Rundle Sewer Line Replacement

Project Description

Replace aging wastewater infrastructure in the Rundle area, Rundle Drive, MacDonald Place and St. Barbara's Terrace.

Project Rationale

Wastewater lines in the older areas of Canmore are nearing their lifecycle, and the Town should begin a program to replace the infrastructure that is nearing its lifecycle. The oldest pipes in Canmore were installed in 1966, and will reach their 75 year lifecycle by 2041, approximately 19 years after this study.

CIPP lining can be investigated instead of replacement, with CCTV performed to determine viability

For the best use of resources, the utility replacement program should be paired with a roadworks program and the water replacement program.

Project Details

- + 750 m of 200 mm wastewater line replacement

Project Trigger

- + Recommended Project Year: 2039-2040

Project Cost

Engineering	\$	180,000.00
Implementation	\$	710,000.00
Contingency	\$	360,000.00
Total	\$	1,250,000.00

Project Cost Sharing

This is existing infrastructure replacement that is 100% attributable to the Town of Canmore.

4.8.11 S10 - Railway Ave / Bow Valley Trail Sewer Line Replacement

Project Description

Replace aging wastewater infrastructure in the TeePee Town and Railway Ave area, from Gateway Street to Benchlands Trail along Railway Ave. This project also involves crossing Policeman’s Creek along 8th Street.

Project Rationale

Wastewater lines in the older areas of Canmore are nearing their lifecycle, and the Town should begin a program to replace the infrastructure that is nearing its lifecycle. The oldest pipes in Canmore were installed in 1966, and will reach their 75 year lifecycle by 2041, approximately 19 years after this study.

CIPP lining can be investigated instead of replacement, with CCTV performed to determine viability

For the best use of resources, the utility replacement program should be paired with a roadworks program and the water replacement program.

Project Details

- + 3,000 m of 200 mm wastewater line replacement
- + 9,000 m² road replacement

Project Trigger

- + Recommended Project Year: 2041-2042

Project Cost

Engineering	\$	540,000.00
Implementation	\$	3,590,000.00
Contingency	\$	1,240,000.00
Total	\$	6,290,000.00

Project Cost Sharing

This is existing infrastructure replacement that is 100% attributable to the Town of Canmore.

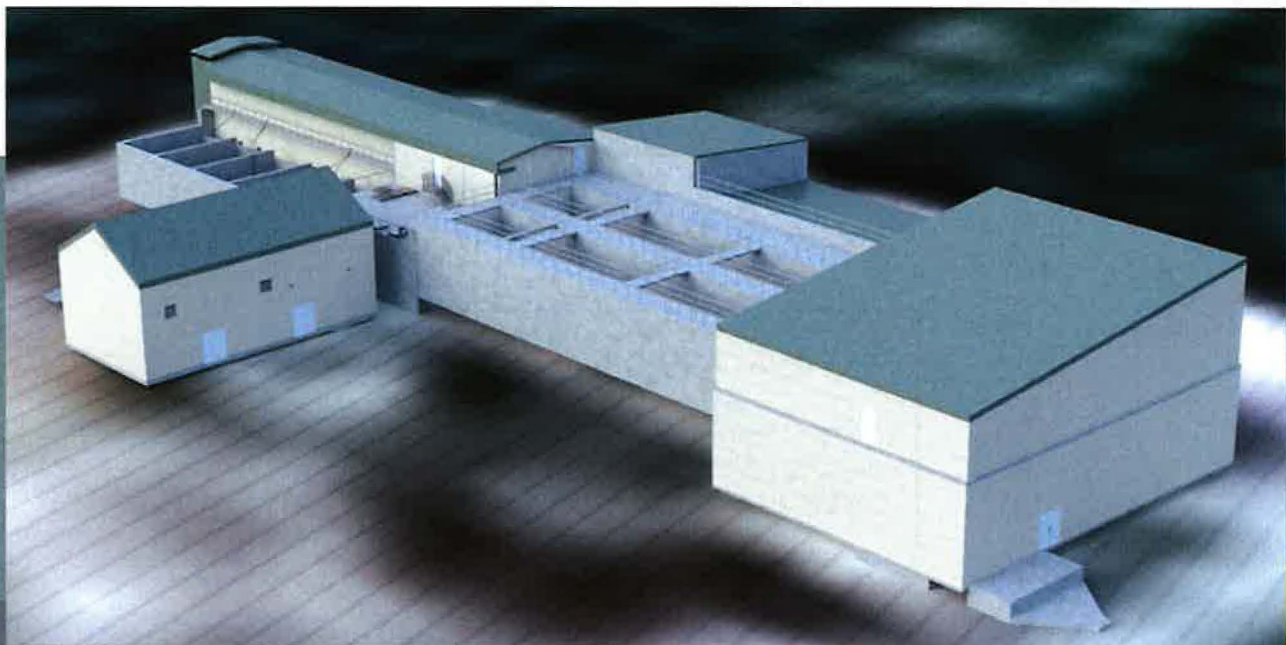
5. Summary of Projects

Project	Name	Timeline	Trigger	Infrastructure	Cost	ToC Share	Dev Share	DMF Share
EX W1	Grassi Booster Station Capacity Upgrade (Phase 1)	2025	Existing /Growth	Facilities	\$2,310,000.00	42%	46%	12%
EX W2	Pumphouse 2 Backwash Water Reuse	2035	Existing	Facilities	\$1,500,000.00	100%	0%	-
EX W3	Pumphouse 1 Gas Chlorine to Liquid	TBD	Existing	Facilities	\$1,000,000.00	100%	0%	-
W1	TeePee Town Waterline Replacement	2024	Growth	Linear	\$900,000.00	81%	19%	-
W2	Smith Creek Reservoir and Booster Station	2027	Growth	Facilities	\$12,780,000.00	0%	100%	-
W3	Canyon Ridge Booster Station Decommissioning	2027	Existing	Facilities	\$1,200,000.00	100%	0%	-
W4	Silvertip Trail Looping	2028	Growth	Linear	\$1,290,000.00	0%	100%	-
W5	Grassi Booster Station Waterline Twinning	2038	Growth	Linear	\$2,980,000.00	73.1%	19.6%	7.3%
W6	Grassi Storage Reservoir Capacity Upgrade	2039	Growth	Facilities	\$7,590,000.00	0%	75%	25%
W7	Grassi Booster Station Capacity Upgrade (Phase 2)	2038	Growth	Facilities	\$750,000.00	0%	85%	15%
W8	Smith Creek Booster Station Upgrade (Phase 2)	2037	Growth	Facilities	\$720,000.00	0%	100%	-
W9	South Canmore Waterline Replacement	2037	Lifecycle	Linear	\$6,010,000.00	100%	0%	-
W10	Downtown Canmore Waterline Replacement	2038	Lifecycle	Linear	\$8,830,000.00	100%	0%	-
W11	7th Avenue Waterline Replacement	2039	Lifecycle	Linear	\$7,340,000.00	100%	0%	-
W12	Rundle Waterline Replacement	2040	Lifecycle	Linear	\$6,010,000.00	100%	0%	-
W13	TeePee Town / Railway Ave Waterline Replacement	2041	Lifecycle	Linear	\$4,560,000.00	100%	0%	-
W14	Water Treatment and Supply Study	2025	Growth	Facilities	\$200,000.00	100%	0%	-
					\$65,970,000.00	\$40,530,000.00	\$22,940,000.00	\$2,500,000.00

Project	Name	Timeline	Trigger	Infrastructure	Cost	ToC Share	Dev Share	DMF Share
EX S1	Lift Station 3 Replacement	2027	Lifecycle	Facilities	\$1,500,000.00	100%	0%	-
S1	Bow Valley Trail Sewer Upgrade	2024	Growth	Linear	\$600,000.00	43%	57%	-
S2	Lift Station 11 Upgrade Phase 1	2027	Growth	Facilities	\$2,290,000.00	0%	100%	-
S3	Lift Station 8 Upgrade	2032	Growth	Facilities	\$600,000.00	0%	39%	61%
S4	Lift Station 10 Upgrade	2035	Growth	Facilities	\$2,290,000.00	34%	26%	40%
S5	Lift Station 11 Upgrade Phase 2	2037	Growth	Facilities	\$570,000.00	0%	100%	-
S6	South Canmore Sewer Line Replacement	2037	Lifecycle	Linear	\$2,730,000.00	100%	0%	-
S7	Downtown Canmore Sewer Line Replacement	2038	Lifecycle	Linear	\$5,310,000.00	100%	0%	-
S8	7th Avenue Sewer Line Replacement	2039	Lifecycle	Linear	\$4,700,000.00	100%	0%	-
S9	Rundle Sewer Line Replacement	2040	Lifecycle	Linear	\$1,250,000.00	100%	0%	-
S10	Railway Ave / Bow Valley Trail Sewer Line Replacement	2041	Lifecycle	Linear	\$6,290,000.00	100%	0%	-
					\$28,130,000.00	\$22,820,000.00	\$4,030,000.00	\$1,280,000.00

Town of Canmore

Wastewater Treatment Plant Capacity Evaluation and Capital Upgrades



CIMA+ file number: C017 | C04-00496.12
April 5, 2023



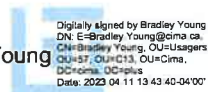
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PERMIT NUMBER: P 8204	
The Association of Professional Engineers and Geoscientists of Alberta	



Executive Summary

The Canmore WWTP is a two stage BAF plant for BOD removal and Nitrification. A detailed capacity assessment was conducted on all the major process units to determine bottleneck process units and aid capital planning for the 5, 15 and 25 year horizon.

The historical flow rates through the plant, loadings and effluent concentrations from 2017 through 2021 were analyzed. The historical performance was generally good with the ability to treat the wastewater within compliance limits across the challenging wet weather flows due to the spring freshet as well as the winter and max month loading scenarios. The projected flows and loads were estimated from population projections at the 5, 15 and 25 year horizon.

The Canmore WWTP is nearing its capacity for major process units and is expected to experience challenges within the next 5 years. Between the 5 and 10 year horizon, the BAF system is expected to experience difficulties to reliably achieve the effluent ammonia limits. A BioWin model was initially calibrated and aligned well with the capacity assessment demonstrating the facility will be challenged to achieve the final effluent limits by the 10 year-horizon. Process optimizations and potential stress testing are recommended to identify the empirical limitation of the nitrification process prior to reaching the capacity limit.

The water quality based effluent limits study has identified draft limits that will come into effect c. 2031. The new limits are more stringent with the inclusion of a total nitrogen limit. The existing facility will not be able to achieve these limits without a significant upgrade and potentially a change in secondary treatment technology. A separate report is being produced to identify the preferred alternative for achieving the new limits.

The capital planning identified in this report focus on the next 10 years to support the existing facility in operating prior to the large capital upgrade. The capital planning prioritized upgrades that can be re-used beyond 2031 and reduce wasted capital investment. The following table outlines the list of identified projects.

Project	Description	Project Justification	Priority	Year Required	Probable Cost
Headworks					
Inlet Lift Station Upgrade (Mechanical)	Replacement of existing lower flow pumps and discharge piping	Life Cycle Population Growth	Medium	2027	\$1.17M

Wastewater Treatment Plant Capacity Upgrade Evaluation and
Capital Upgrades

Inlet Lift Station Upgrade (Wetwell)	Increase the size of the Inlet LS Wetwell, Provide Actuated valving to EQ tank	Undersized Population Growth	Medium	2027	\$2.9M
Odor Control Unit for EQ Tank, Headworks Bldg	Add odor control building near the Headworks to treat odors from EQ tank, Headworks	Potential Complaints, Future Regulatory Requirements	Medium	2027	\$2.9M
Septage Receiving Station	Add septage receiving station with flow monitoring and payment system [Odor Control project required before]. Include EQ tank upgrades	Population Growth	Low	2032	\$1.17M
Influent Piping between Inlet LS and Headworks	Piping Replacement, Actuated isolation valves at high point	Life Cycle	High	2027	\$1.17M
Inlet Screen Replacement	Replacement of older inlet screen with smaller mesh, and sludge press unit	Life Cycle	High	2024	\$900k
Grit Separator Replacement	Replace Existing Grit Separator	Life Cycle	Medium	2027	\$720k
Grit Separator Exhaust Fan	Redesign, replace. Existing fan full of grease	Process Improvements	High	2025	\$290k
Headworks Channel Valves	Add sluice gate valve at the Clarifier Distribution Channel Actuation on Clarifier sluice gates and screen inlet gates	Process Improvements	Medium	2027	\$530k

Water Heating System, MUA Replacement	Replace existing boiler, piping, MUAs	Life Cycle Process Improvements	Medium	2025	\$2.17M
Scum Removal Piping	Rearrange Scum Removal Piping to pump to digester instead of Headworks	Process Improvements	High	2025	\$720k
Third Clarifier Addition	Add third Clarifier [high flow fluctuations]. North of ex. clarifier	Process Improvements Population Growth	Medium	2027	\$10.2M
BAF, DAF					
Intermediate Transfer Pumps Upgrade	Upgrade existing pumps	Life Cycle	Medium	2026	\$1M
UV					
UV 1, 2 upgrade	Replace existing UV 1, 2	Life Cycle	High	2023	700k
UV 3 addition	Add UV3	Population Growth	Medium	2028	500k

Update after the report completion (April 5, 2023)

The Town has completed the Water Quality Based Effluent Limits study and the Environment and Protected Areas (EPA) assigned the new effluent limits that includes the requirements for Total Nitrogen and deeper Phosphorus treatment.

CIMA+ has issued a separate report "Wastewater Treatment Plant Technology Evaluation" (April 5, 2023). This report provides the upgrade recommendations for Canmore WWTP to achieve the effluent limits required by EPA. The complete capital costs required for Canmore WWTP upgrade are combined in the "Wastewater Treatment Plant Technology Evaluation" (April 5, 2023) report, and include the costs noted in the "Capacity Evaluation" report.

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Appendix A: BioWin Modelling Results



1 Introduction

The Canmore Wastewater Treatment Plant (WWTP) is in the Town of Canmore in Alberta, Canada and has been in service since 1997. The plant provides secondary treatment with biological aerated filtration (BAF) and ultraviolet (UV) disinfection prior to discharging effluent to the Bow River. The wastewater treatment system consists of the following processes:

- + Septage receiving
- + Influent pumping
- + Mechanically cleaned influent bar screening
- + Flash mix chemical addition
- + Enhanced primary clarification
- + Primary effluent screening
- + Two stage biological aerated filtration
- + Ultraviolet Disinfection
- + Backwash storage tank
- + Dissolved air flotation (DAF)
- + Two open-air holding tanks “digesters”
- + Centrifuging

The following figure is the process flow diagram (PFD) of the Canmore WWTP.

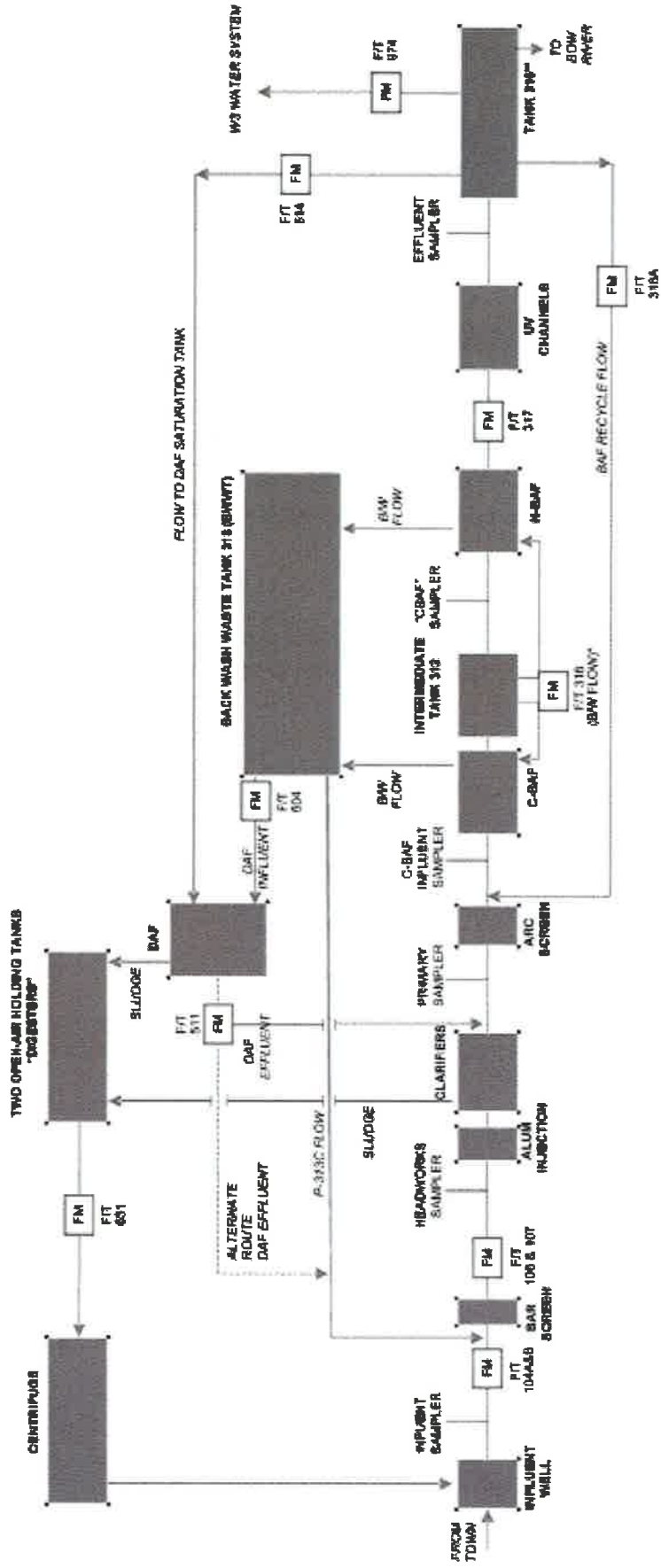


Figure 1-1 Process flow diagram (PFD) of the Canmore WWTP

The Town of Canmore is planning to increase its permanent population while maintaining significant seasonal population fluctuations due to tourism in both the summer and winter months. This growth will increase the hydraulic and constituent loading to the treatment plant. To understand the impacts of this growth, a capacity assessment of the existing wastewater plant is required to properly plan for short and long-term upgrades that may be required to maintain compliance within existing effluent limits.

1.1 Work Scope

The tasks that were completed for this report were as follows:

- + Analyze historical data to formulate trends and max flow factors
- + Assess the existing capacity of each process unit at the Canmore WWTP
- + Assess the capacity of the Canmore WWTP at 5, 15, and 25 year horizons
- + Use BioWin modelling to simulate the current and future scenarios

1.2 Objectives

The objective of this capacity assessment report is to identify bottlenecks in the existing processes at the Canmore WWTP. The findings will help steer planning for short and long-term planning of upgrades.

2 Historical Data

The capacity assessment of the process units within the Canmore WWTP relies on plant data to determine existing flows and loads entering the facility. The historical data was synthesized from 2017 to 2021 to establish various flow rates and loading scenarios to assess the plant and individual process units to determine the capacity at existing conditions. The established historical data is also used as the baseline flows and loadings for future projections at the 5, 15 and 25 year horizons.

2.1 Population

The reported population for the Town of Canmore was 19,865 in 2021 inclusive of permanent and non-permanent residents. The population for the Town of Canmore has been projected for the time intervals of 5, 15, and 25 years; the following table illustrates the projections for the population.

Table 2-1: Population Projections

Population	Current	2027	2037	2047
Permanent	15,990	20,982	25,308	27,758
Non-Permanent	3,875	5,820	10,462	16,982
Total	19,865	29,802	35,770	44,740

With these population projections, future flows and loadings entering the WWTP will be determined in the proceeding sections, and then the plant can be deemed to have sufficient capacity or require upgrades to handle the future flows and loadings.

2.2 Influent Flowrate

The influent flowrates were analyzed for the study period from 2017 to 2021 (Table 2-2). The annual average daily flow (ADF) for the study period corresponded to a per capita wastewater generation rate of 435 L/p/d. As the population of Canmore is set to increase (Table 2-1), the flows entering the WWTP will increase. The future flow projections were based on a historic per capita wastewater generation of 435 L/p/d, which is close to the general typical value of 450 L/p/d for planning purposes.

The more granular flows were analyzed for max month flow (MMF), peak daily flow (PDF) and peak hourly flow (PHF). From Figure 2-1 the peak flow occurs during June of each year. This is likely due to the large snow melt that occurs around the Canmore area that contributes to elevated extraneous flows entering the sanitary system. Extraneous flows are common for most communities and are typically challenging to identify and quantify. At Canmore, the peaks are relatively consistent over the five-year period and isn't during a noticeably high traffic time of year. This indicates the primary source of the peak flows is likely driven by the spring freshet.

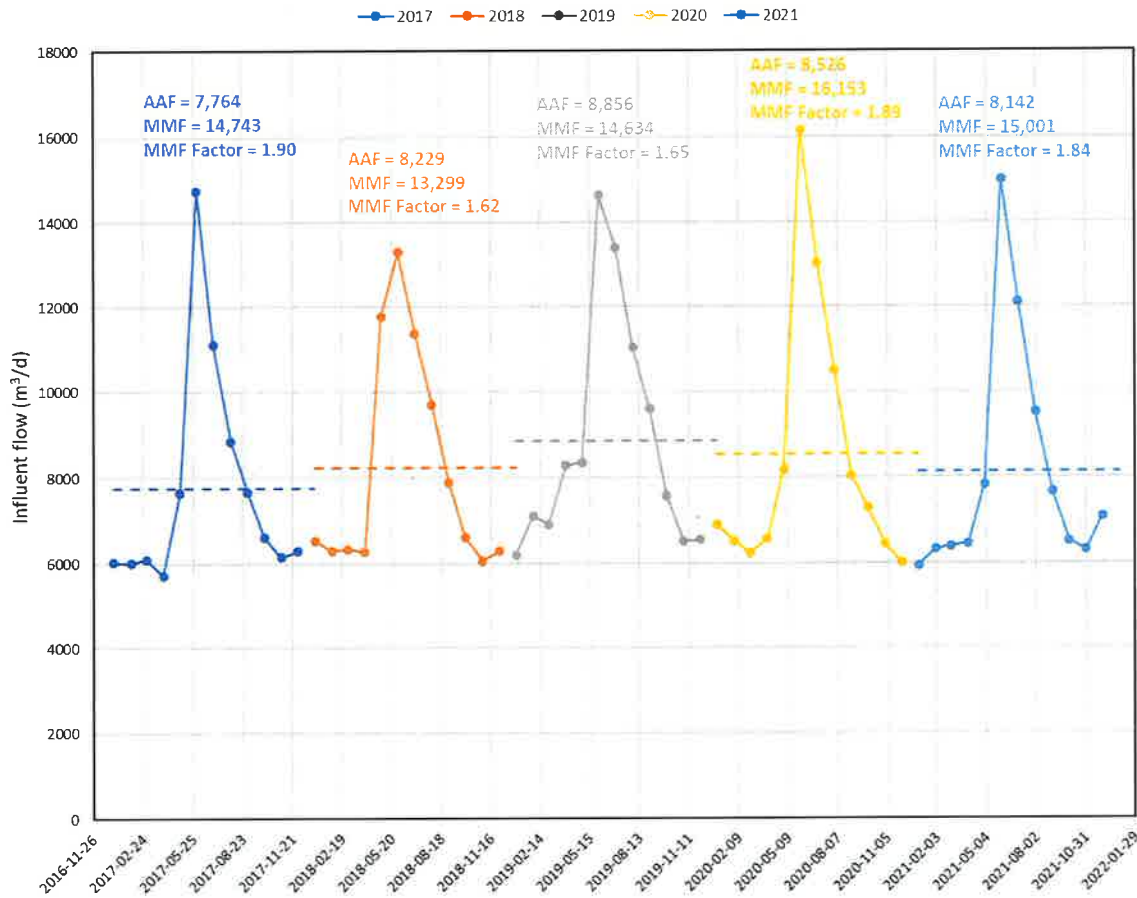


Figure 2-1: Historic Influent Flows for 2017 – 2021

The future MMF, PDF, and PHF were calculated using the historic ratios of each parameter to the ADF. The calculated peaking factors (PF) for the MMF is higher than typically observed, however, the PDF and PHF are within typical expectations for a network this sized facility. These factors were carried forward to the future projected flows as the design basis.

Table 2-2: Canmore WWTP Design Influent Flows

	2017 - 2021	2027	2037	2047
Average Annual Flow – ADF (ML/d)	8.3	11.3	15.2	19.1
Maximum Monthly Flow – MMF (ML/d)	16.2 (PF 1.95)	22.0	29.6	37.2
Peak Daily Flow – PDF (ML/d)	20.9 (PF 2.52)	28.5	38.3	48.1
Peak Hourly Flow – PHF (ML/d)	30.2 (PF 3.64)	41.1	55.4	69.5

2.3 Influent Characteristics

At the Canmore WWTP, the characteristics regularly measured in the influent water are biological oxygen demand (BOD), chemical oxygen demand (COD), total suspended solids (TSS), total ammonia nitrogen (TAN), and total phosphorus (TP). The following graphs present the historic loading of these constituents for the past 5 years (2017-2021). The constituent loadings are used to size biological process units; hence it is important to understand the monthly loadings to assess the capacity during the “worst-case scenario”. For all parameters, the maximum influent loadings typically occur in the summer months (July-August) of each year, correlating with the increased tourist population during these months.

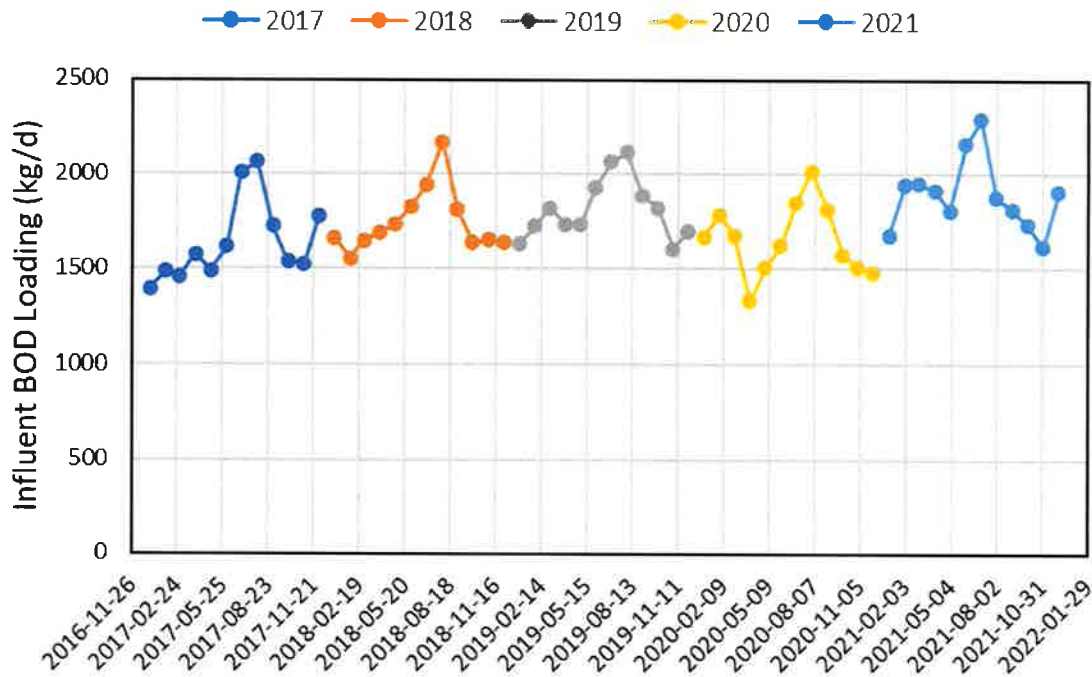


Figure 2-2: Influent BOD Loading from 2017-2021

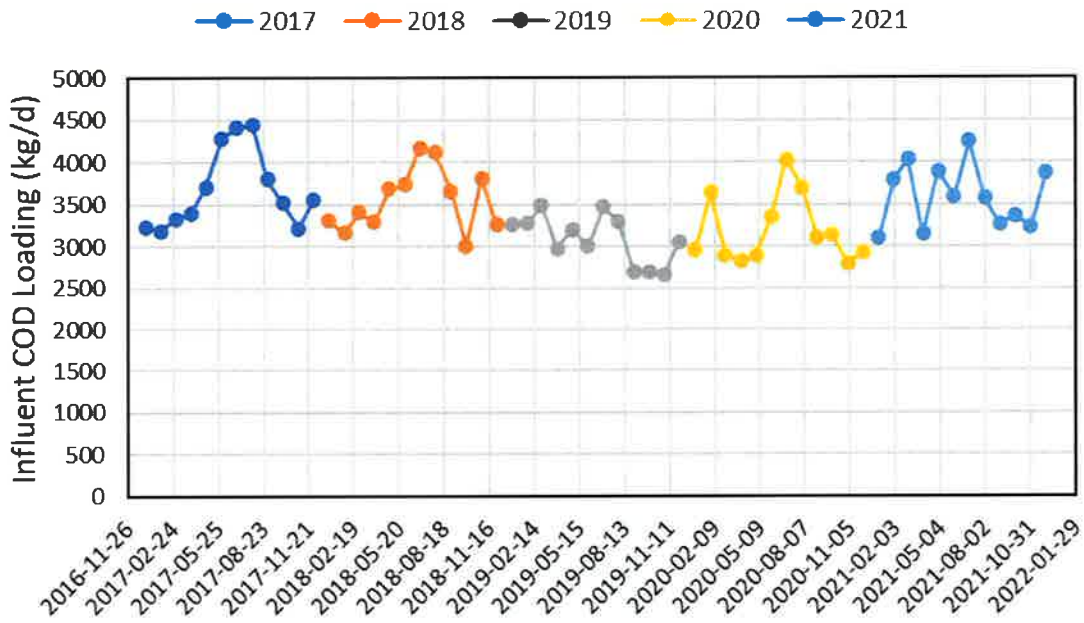


Figure 2-3: Influent COD Loading from 2017-2021

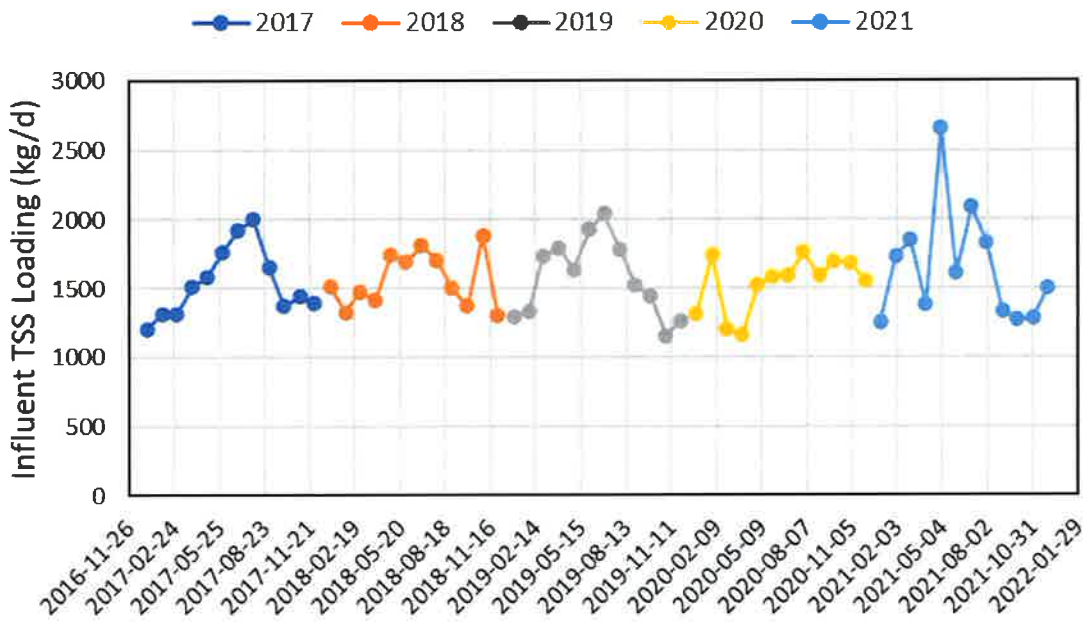


Figure 2-4: Influent TSS Loading from 2017-2021

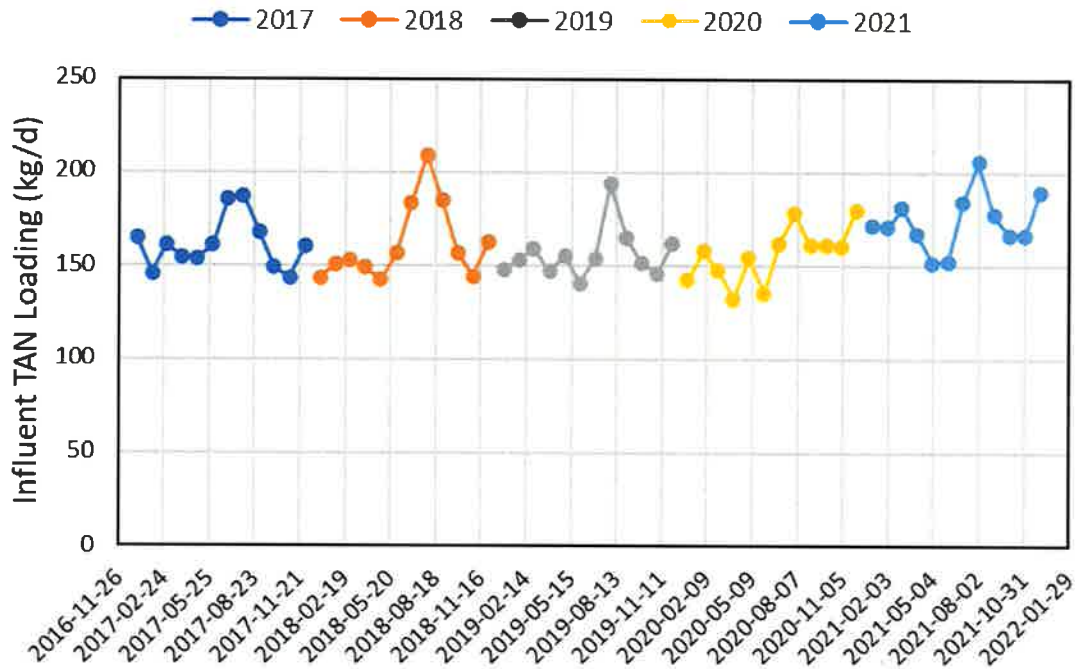


Figure 2-5: Influent TAN Loading from 2017-2021

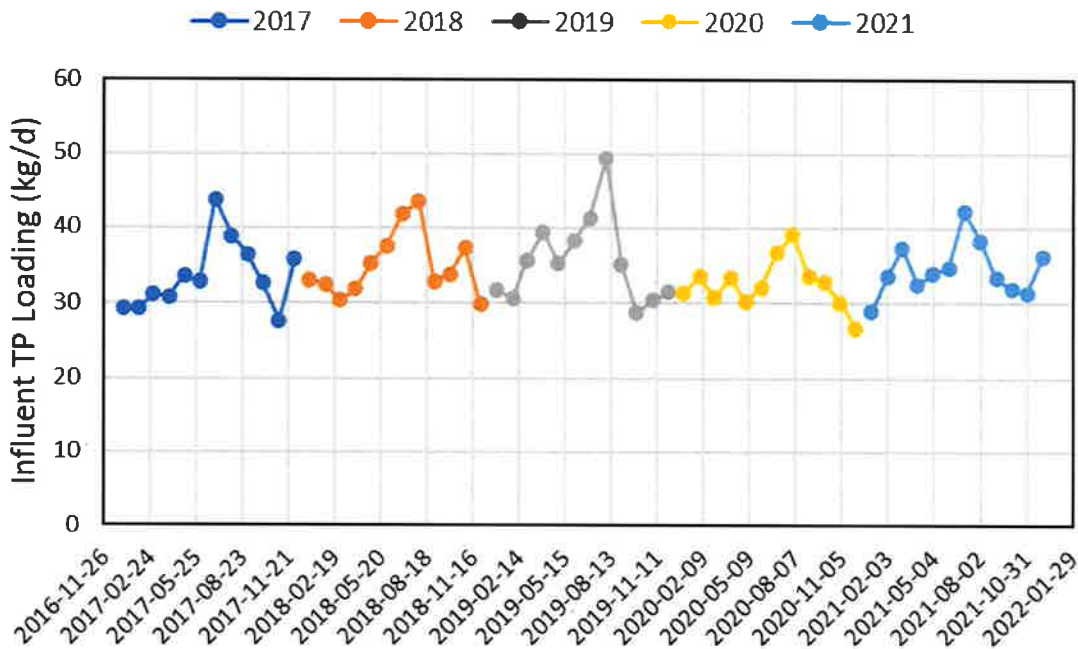


Figure 2-6: Influent TP Loading from 2017-2021

2.4 Existing Plant Performance Limits

Currently EPCOR and the Alberta Environment and Parks are in discussion about the future effluent regulations to which the Canmore WWTP must adhere. The current effluent regulations are shown below.

Table 2-3: Current Canmore WWTP Effluent Limits

Parameter	Effluent Limit
cBOD₅	≤ 20 mg/L ⁽¹⁾
TSS	≤ 20 mg/L ⁽¹⁾
TAN	≤ 5 mg/L ⁽¹⁾ (Jul – Sep) ≤ 10 mg/L ⁽¹⁾ (Oct – Jun)
TP	≤ 1.0 mg/L ⁽¹⁾
Faecal Coliform	≤ 200 per 100 mL ⁽²⁾
Notes:	
(1) Monthly arithmetic mean of daily composite samples	
(2) Monthly geometric mean of daily grab samples	

2.5 Effluent Characteristics

The following graphs compare the Canmore WWTP effluent limits (Table 2-1) to the historic average daily effluent data for cBOD₅, TSS, TAN, TP, and fecal coliforms per month for the past 5 years (2017-2021).

The plant is consistently below the 20 mg/L effluent limits for BOD and TSS. Higher effluent TSS concentrations are typically recorded in spring (March-June) of each year, indicating that the plant's process units may be hydraulically strained by high flows during these months.

In 2017, the TAN effluent concentration exceeded the 10 mg TAN/L limit between January and March and exceeded the 5 mg TAN/L limit between July and September. It is important to note that in 2017 several BAFs had to be taken offline for operational maintenance and repair, artificially reducing capacity, and resulting in higher effluent TAN concentrations. Between 2018 to 2021 the plant exceeded the TAN limit of 5 mg TAN/L in summer on two occasions, July and August of 2021, with effluent concentrations of 5.04 and 6.54 mg TAN/L respectively.

The plant has historically achieved adequate TP levels in the effluent. While Figure 2-10 shows a trend of increasing TP levels in the effluent stream from the plant, the concentration of TP has not exceeded the allowable 1 mg/L over the last 5 years.

From Figure 2-16, it can be observed that the Canmore WWTP has approached or past the effluent regulation limit for fecal coliform of 200/100 mL on several occasions throughout the last 5 years. An upgrade to UV disinfection is planned to meet the allowable limit of fecal coliforms in the effluent.

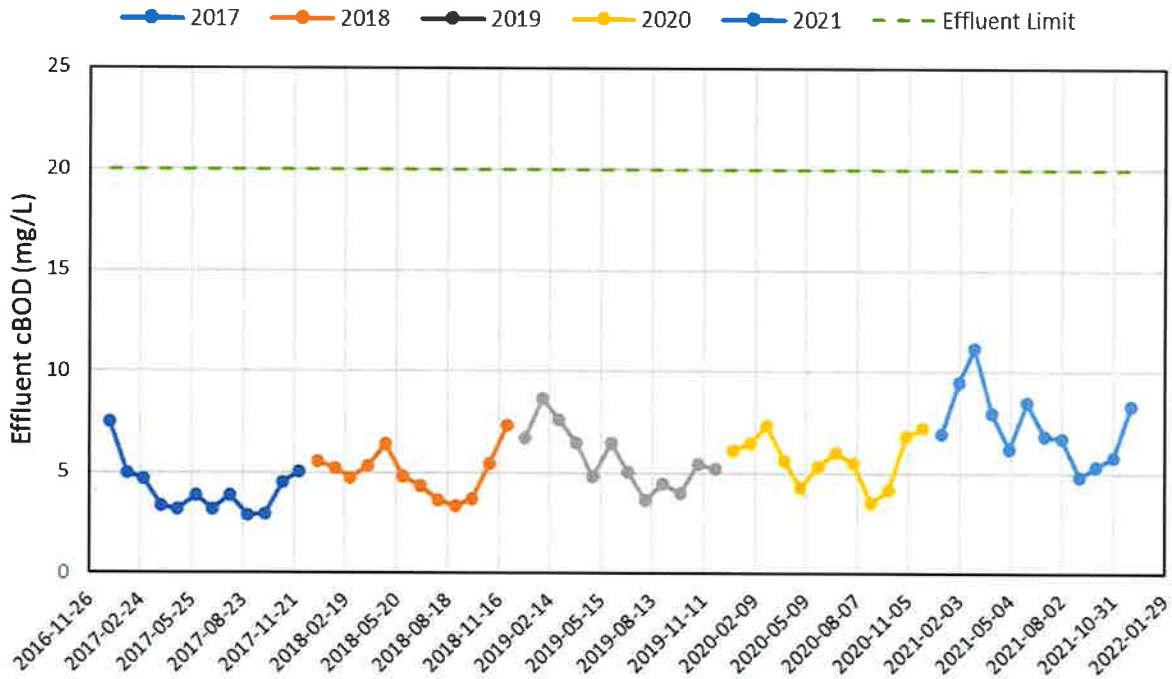


Figure 2-7: Effluent BOD level from 2017 – 2021

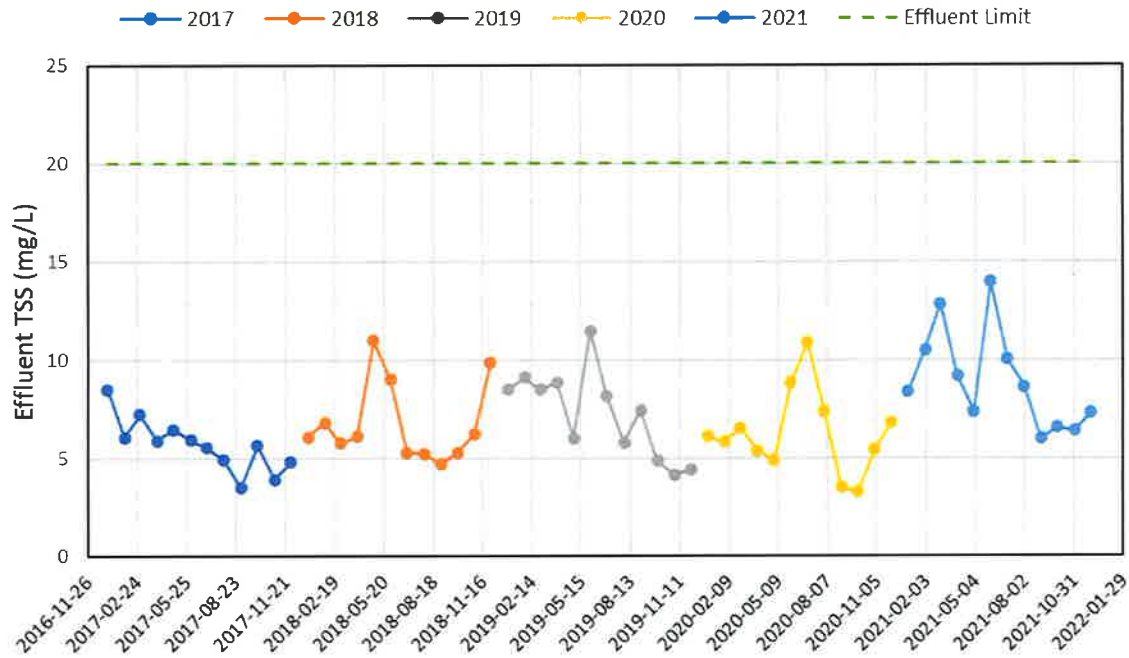


Figure 2-8: Effluent TSS level from 2017 – 2021

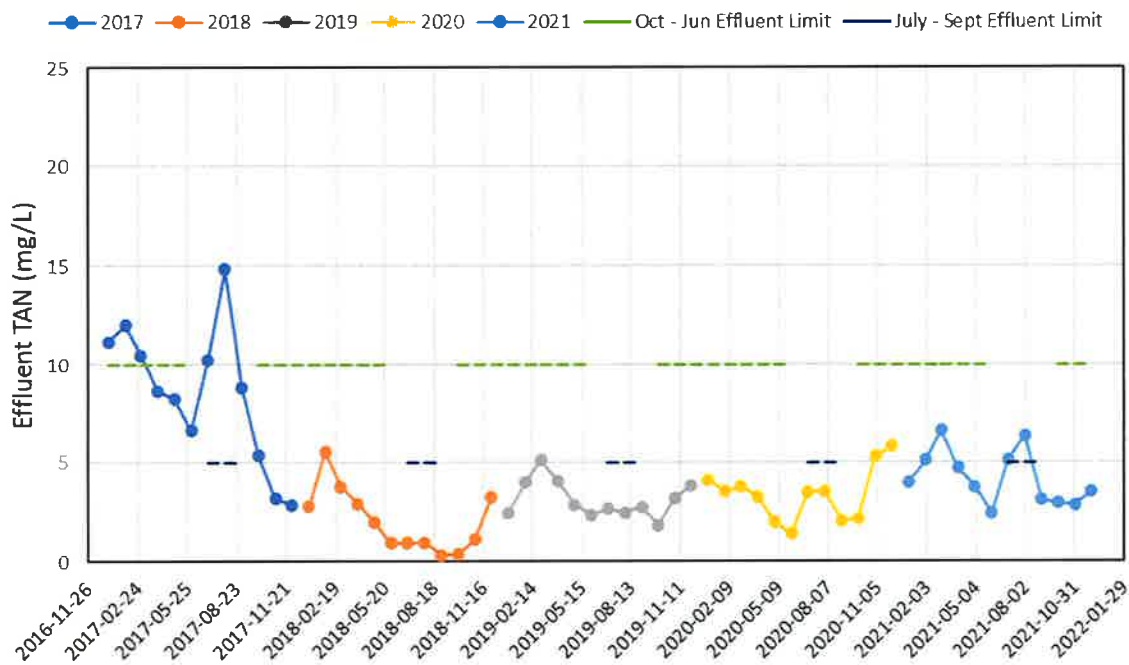


Figure 2-9: Effluent TAN level from 2017 – 2021

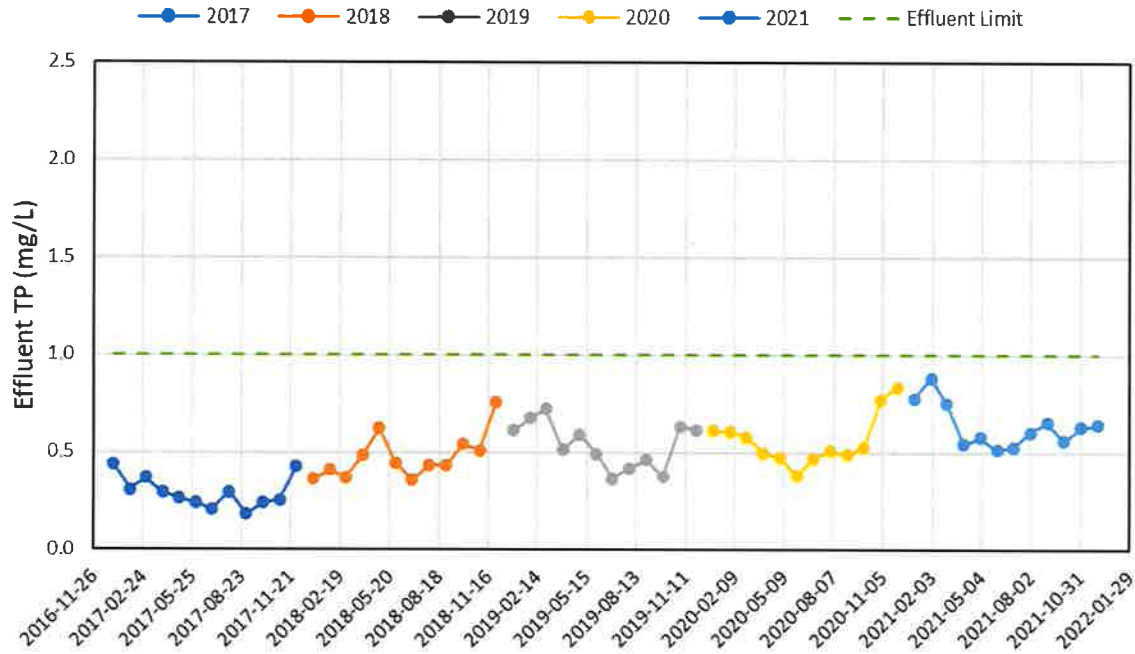


Figure 2-10: Effluent TP level from 2017 – 2021

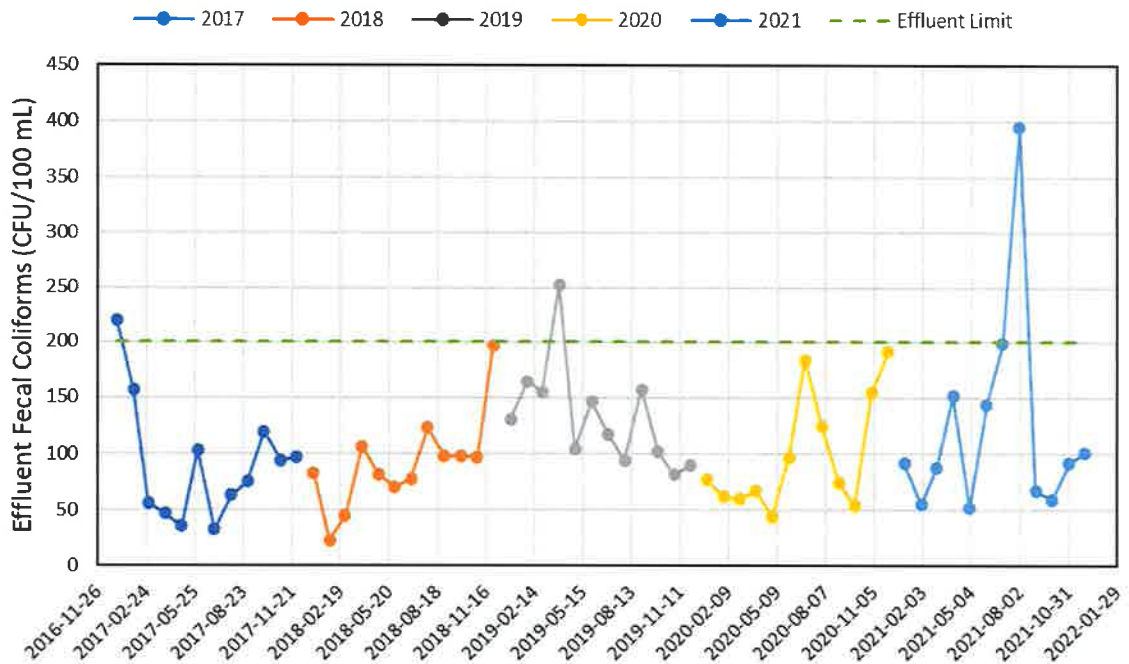


Figure 2-11: Effluent Fecal Coliform level from 2017 – 2021

3 Existing Plant Summary

Table 3-1 outlines the current equipment at the Canmore WWTP along with the rated capacities for each instrument and unit process.

Table 3-1: Canmore WWTP Design Data

Component	Current Available Capacity
Design Population	
Permanent Population	15,990
Non-Permanent Population	3,875
Total	19,865
Influent Characteristics	
Flows	
ADF, ML/d	8.3
MMF, ML/d	16.2
PDF, ML/d	20.9
PHF, ML/d	30.2
Loads	
BOD	
Average, kg/d	1,754
Maximum Month Factor	1.22
TSS	
Average, kg/d	1,574
Maximum Month Factor	1.31
TAN	
Average, kg/d	162

Component	Current Available Capacity
Maximum Month Factor	1.20
TP	
Average, kg/d	34.4
Maximum Month Factor	1.27
Equalization Tank	
Tank Cells	2
Tank Volume (total), m ³	440
Number of Overflow Pumps	2
Capacity per Pump, L/s	17.1
Power per Pump, KW	2.2
Influent Pumping	
Pump 100 C/D	
Number of Pumps	2
Capacity per Pump, L/s	105
Power per Pump, KW	18.7
Pump 100 A/B	
Number of Pumps	2
Capacity per Pump, L/s	190
Power per Pump, KW	37.3
Total Capacity, ML/d	50.9
Total Firm Capacity, ML/d	34.6

Component	Current Available Capacity
Mechanically Cleaned Bar Screens	
Number of Screens	2
Bar Opening, mm	6 (primary) 15 (bypass channel)
Width, mm	1,000
Water Depth, mm	1,050
Capacity per unit, ML/d	34.0
Grit/Scum Removal (Spiral Roll)	
Number of Chambers	1
Number of Sumps per Chamber	4
Volume, m ³	128
Capacity, ML/d	35.0
Alum Addition System	
Number of Pumps	2
Capacity per Pumps, L/min	4.0
Alum Storage, m ³	27.3
Polymer Addition System	
Number of Pumps	2
Capacity per Pumps, L/min	7.8
Primary Clarifiers	
Number	2
Dimensions	

Component	Current Available Capacity
Length, m	33.0
Width, m	6.6
Depth, m	5.0
Surface area per Clarifier, m ²	218
Volume per Clarifier, m ³	1,089
Automatic Curved Arc Screens	
Number of Screens	2
Screen Opening, mm	2.4
Width, mm	1,000
Water depth, mm	1,000
Capacity per Unit, ML/d	46.0
Biological Aerated Filters	
C-side Filters	
Number	5
Cell Dimensions	
Media Depth, m	2.5
Surface Area, m ²	40
Media Volume, m ³	100
N-side Filters	
Number	5
Cell Dimensions	
Media Depth, m	2.5

Component	Current Available Capacity
Surface area, m ²	40
Media Volume, m ³	100
Intermediate Pumps (P-312 A/B)	
Number	2
Capacity per Pump, L/s	128
Size per Pump, kW	9.5
Firm Capacity, ML/d	22.1
Aeration Blower	
Number	10
Capacity per Blower, m ³ /h	440
Size per Blower, kW	18.7
Backwash Pumps (P-310 A/B & P-311)	
Number	3
Capacity per Pump, L/s	111
Size per Pump, kW	12.8
Backwash Waste Pumps (P-313 A/B/C)	
Number	3
Capacity per Pump, L/s	36.1
Size per Pump, kW	7.5
Backwash Blower	
Number	3
Capacity per Blower, m ³ /h	1,400

Component	Current Available Capacity
Size per Blower, kW	45.0
Backwash Waste Tank	
Volume, m ³	460
Intermediate Transfer tank	
Volume, m ³	305
Recirculation Pumping (P-316 A/B)	
Number of Pumps	2
Capacity per Pump, L/s	56
Power per Pump, kW	7.5
Total Capacity, ML/d	9.7
UV Disinfection	
UV Transmissivity, %	65
UV Dosage, mWs/cm ²	22.4
Number of Channels	2
Number of Banks per Channels	1
Number of Lamps per Channels	42
Primary Sludge Pumping (P-134 A/B)	
Number of Pumps	2
Capacity per Pump, L/s	11.4
Grease Pumping (P-127, P-136)	
Number of Pumps	2
Capacity per Pump, L/s	11.4

Component	Current Available Capacity
Aerobic Digesters	
Sludge TS Concentration, %	2.2
Number of Reactors	2
Dimensions	
Diameter, m	14.0
SWD, m	7.5
Volume per Reactor, m ³	1,155
Aerobic Digester Blowers	
Number	2
Capacity per Blower, m ³ /h	2,108
Size per Blower, kW	75
Digested Sludge Pumps (P-610 A/B)	
Number of Pumps	2
Capacity per Pump, L/s	4.1
Size per Pump, kW	3.7
Dissolved Air Flotation (DAF)	
Number	2
Dimensions	
Length, m	3.6
Width, m	2.1
Total Surface Area, m ²	7.7
Thickened sludge, %	2 - 4

Component	Current Available Capacity
Loading Rate Range, m ³ /m ² /h	24 – 48
DAF Pumps (P-511 A/B)	
Number of Pumps	2
Capacity per Pump, L/s	50
Size per Pump, kW	11
Centrifuge	
Number	2
Operation hours per day, hr	8
Operation days per week, d	5
Minimum Solids Capture Efficiency, %	95%
Feed Sludge TS Concentration, %	1.8
Designed Firm Capacity, m ³ /d	100
Flow Capacity per Centrifuge, m ³ /h	29.5
Solid Loading Rate, kg/h	530
Centrifuge Sump Pumps (P-660 A/B)	
Number of Pumps	2
Capacity per Pump, L/s	13.6
Size per Pump, kW	3.7

4 Existing WWTP Capacity Assessment

4.1 Methodology

A capacity assessment aims to evaluate the capacity and performance of each unit process in isolation and in conjunction with the entire treatment train operating as a system. An assessment was conducted in the present report, to determine the capacity of each liquid and solid unit process. The assessment assists in identifying process constraints for further evaluation with operations and planning for upgrades. This capacity assessment in general was based on the current and the future design criteria, historical operational plant data during the study period of 2017 to 2021, equipment data and specifications, and typical design guidelines (MECP Design Guidelines for Sewage Works, 2008; WEF MOP 8, 2009; Metcalfe and Eddy, 2014). The Ontario Ministry of the Environment, Conservation and Parks (MECP) Design Guidelines were used as they recently underwent a comprehensive update for typical treatment performance values and a basis for benchmarking several WWTP unit processes.

4.2 Septage Receiving

The Canmore WWTP receives both wastewater from the sewer system and septage that is trucked to the plant. Historically, the plant receives approximately one truck of septage per day, however this fluctuates throughout the year. The septage that arrives at the plant is deposited upstream of the influent lift station or at the equalization tank. Septage flows and concentrations are quantified by the plant's influent sampler, thus are included in the plants' influent flows and loading values.

If the septage is received upstream of the influent lift station, the wastewater and septage enter the plant in the usual manner and go through all the plant's process units for treatment. If the septage is received at the equalization tank, it must pass through a screen to remove any large objects and flows to the influent well so that it can be pumped through the plant for treatment.

4.3 Equalization Storage

An equalization tank was installed at the Canmore WWTP to offer equalization and surge protection in the event of a power failure. The tank has a volume of 440 m³ and is capable of storing diverted flows from the influent wet well for up to 30 minutes during high flow periods. The equalization tank contains two cells, one larger cell for overflow and surge protection, while the second cell is smaller, and acts as a septage receiving cell.

The overflow cell of the tank has two submersible pumps each with a capacity of 17.1 L/s, that return the overflow wastewater to the influent lift station so that it can be pumped through the plant for treatment.

Due to the anticipated increase in flows over the next 25 years, additional equalization capacity may be required to maintain 30 minutes of storage during high flow periods and mitigate plant bypass events. It's important to note, significant plant upgrades may negate the need for an EQ tank for buffering peak flows.

4.4 Influent Pumping

The influent lift station transfers wastewater from the collection system to the head of the WWTP. There are currently four submersible influent pumps in the influent lift station. Two of the pumps have a capacity

of 105 L/s, while the other two pumps have a capacity of 190 L/s. The firm capacity (one of the larger pumps out of service) of the influent pumps is 34.6 ML/d.

The most recent upgrade to the influent pumps occurred in 2015 when two 105 L/s pumps were replaced with the current 190 L/s pumps. This upgrade ensured that the plant has sufficient influent pumping for the historical peak hourly flows of the plant, which are 30.2 ML/d (see Table 3-1). However, with the expected population increase in the Canmore area, future upgrades may be required to meet the projected peak hourly flows.

4.5 Screening

Screening is an important process of WWTPs as the screens remove large debris that could harm or clog downstream processes. At the Canmore WWTP, currently there are two screens that are used. The primary screen is a 6 mm mechanically cleaned bar screen, while the second screen, located in the bypass channel, has is manual with an opening of 15 mm. The mechanical bar screen has a rated capacity of 34 ML/d which is currently sufficient to meet plant's historical peak hourly flows.

As only the primary screen is typically in service, the Canmore WWTP will likely have insufficient screening capacity for the future flows. In future, replacement of the 15 mm bypass screen with a 6 mm mechanically cleaned bar screen may be required to provide sufficient capacity and redundancy.

4.6 Aerated Grit Chamber

From screening, the wastewater then passes into the aerated grit chamber with a rated capacity of 35 ML/d. The historical operating conditions for the grit chamber were reviewed and summarized in Table 4-1. At historical peak hourly flows of 30.2 ML/d, the hydraulic retention time (HRT) in the grit chambers is estimated to reach 6.1 minutes, which is greater than the 2 to 5 minutes recommended range by the Ministry of the Environment, Conservation and Parks (MECP) Design Guidelines (2008). The original design capacity of 35 ML/d results in an HRT of 5.26 min. The longer retention time will not degrade performance, hence the grit chambers are adequate for the existing capacity.

Table 4-1 Historical Operating Conditions of Aerated Grit Chamber (2017-2021)

Parameter	Historical Value	Typical Design Value ¹
Total Grit Chamber Volume	128 m ³	N/A
Rated Capacity	35 ML/d	N/A
Historical PHF	30.19 ML/d	N/A
Historical HRT at PHF	6.11 min	2 – 5 min
Original Design HRT	5.26 min	2 – 5 min

Note: (1) Based on MECP Design Guidelines for Sewage Works (2008).

The grit chamber is also responsible for fat, oil, and grease (FOG) removal at the Canmore WWTP. The grit chamber achieves FOG removal through fine bubble diffusion, a process that attaches air to the FOG and then floats it to the surface so that grease pumps can transfer the FOG to sludge processing.

4.7 Chemical Injection Systems

Alum is currently added to the wastewater prior to the primary clarifiers. The injection of alum to the wastewater provides phosphorus removal, while enhancing the suspended solids removal within the primary clarifiers. Typically, the concentration of alum added to the system is between 20 – 180 mg/L, dependent on influent flow.

The current effluent regulation for phosphorus is 1 mg/L, and while the Canmore WWTP is currently meeting this regulation, if the regulation decreased to 0.5 mg/L, additional alum or a tertiary treatment process may be required to enhance removal rates.

4.8 Primary Clarifiers

The primary clarifiers each have a surface area of 218 m² and treat both the primary wastewater and excess filter backwash that cannot be treated by the dissolved air flotation (DAF) system. The role of these clarifiers is to remove a significant portion of both BOD and TSS from the wastewater through settling. Prior to the addition of side stream treatment for the BAF backwash, the backwash was contributing more than 50% of the solids loading to the primary clarifiers. With the addition of the dissolved air flotation (DAF) for BAF backwash treatment, the solids loading to the primary clarifiers from the filter backwash has decreased, allowing the clarifiers to run at higher overflow rates. The effluent from the DAF can also be re-introduced to the system downstream of the clarifiers, further lessening the load on the clarifiers.

The historical operating conditions of the primary clarifiers between 2017 – 2021 are summarized in Table 4-2. The historical ADF and PDF surface overflow rate (SOR) are nearing the low end of typical MECF design guidelines for primary clarifiers not receiving waste activated sludge (WAS).

Table 4-2 Historical Operating Conditions of Primary Clarifiers (2017-2021)

Parameter	Historical Value	Typical Design Value ¹
Number of Clarifiers	2	N/A
Total Clarifier Surface Area	436 m ²	N/A
Historical Primary Influent ADF ²	11.7 ML/D	N/A
Historical Primary Influent PDF ²	26.1 ML/D	N/A
Historical SOR at ADF	26.9 m ³ /m ² /d	30-40 m ³ /m ² /d
Historical SOR at PDF	59.8 m ³ /m ² /d	60-80 m ³ /m ² /d

Parameter	Historical Value	Typical Design Value ¹
Note:		
(1) Based on MECP Design Guidelines for primary clarifiers not receiving WAS		
(2) Includes BAF Backwash Waste Recycle Flow		

The historical primary clarifier performance was reviewed and is summarized in Table 4-4. The primary clarifiers have produced a primary effluent of relatively good quality, with a BOD₅ and TSS removal rate of approximately 45% and 64%, respectively. In general, the performance of the primary clarifiers is between a conventional primary clarifier with no chemical addition and chemically enhanced primary treatment (CEPT).

Table 4-3 Historical Primary Clarifiers Performance (2017-2021)

Parameter	Average Concentration ¹		Removal Efficiency ¹	Typical Design Value ²
	Influent	Effluent		
BOD ₅	227 mg/L	125 mg/L	45%	<u>Clarifiers with chemical addition:</u> 45% to 85% BOD ₅ removal 60% to 90% TSS removal <u>Clarifiers without chemical addition:</u> 35% to 65% BOD ₅ removal 40% to 70% TSS removal
TSS	201 mg/L	73 mg/L	64%	
Note:				
(1) Based on average historical concentration values of 2017 to 2021.				
(2) Based on MECP Design Guidelines for Sewage Works (2008).				

The existing primary clarifiers are limited by both ADF and PDF SOR, since the estimated values are higher than the historical average and peak flows of the plant (presented previously in Table 4-2). The historic operation of the primary clarifiers suggest that they are operating near the low end of the typical design value for both the SOR at ADF and PDF without co-thickening. This may be due to the influence of the recycle line from the DAF or the composition of the raw sewage that is not allowing the clarifiers to operate as efficiently as they could. To help alleviate some of this stress, another primary clarifier could be added to the WWTP.

The capacity of the primary clarifiers was evaluated based on an ADF SOR of 40 m³/m²/d and a PDF SOR of 80 m³/m²/d (MECP, 2008). The capacity assessment results are summarized in Table 4-3.

Table 4-4 Capacity Assessment for Primary Clarifiers

Parameter	Evaluation criteria ¹	Estimated Capacity
SOR at ADF	40 m ³ /m ² /d	17.4 ML/d
SOR at PDF	80 m ³ /m ² /d	34.9 ML/d
Note:		
(1) Based on MECP Design Guidelines for primary clarifiers not receiving WAS		

The clarifier inlet channel requires an isolation sluice gate valve to provide maintenance. This sluice gate can be installed as part of maintenance works or grouped into a capital upgrade.

4.9 Primary Effluent Screening

Prior to entering the BAFs, primary effluent passes through automatic arc screens, with 2 mm openings. The purpose of these screens is to remove any large objects that have made it through the clarifying process that could harm or negatively affect the biological aerated filters. The capacity of these screens is 46.0 ML/d, while providing 100% redundancy.

4.10 Biologically Activated Filters

Following the primary effluent screens, the wastewater enters the biologically activated filters. The Canmore WWTP has a two stage BAF system comprised of five (5) C – side filters, along with five (5) N – side filters. The C – side filters remove suspended solids and BOD from the water, while the N – side filters remove ammonia – nitrogen from the wastewater. The two-stage system provides reliable treatment for BOD and TSS, while any carryover of carbon inhibits the N stage process for nitrification.

All ten (10) filters are the same within the BAF system; each with a surface area of 40 m² and a media depth of 2.5 metres. The wastewater first enters the C – side filters through the influent channels, where it flows up through the media and then overflows to the effluent channels and is then transferred to the intermediate transfer tank. The wastewater is then pumped to the N – side filters where the process is repeated, and the effluent from the N – side filters flows to the UV reactors for disinfection.

The BAF system is not equipped with an anoxic zone and any requirement to denitrify will require downstream biological processes with carbon addition or the addition of a pre-denitrification reactor.

The primary clarifiers are precipitating phosphorus upstream of the BAF. There must be a residual P content for the biological system in the BAF to function properly. This limits the effluent TP concentration that can be reliably achieved without causing system upsets. In general, the BAF can achieve 0.5 to 0.7

mg P/L for periods, however, sustained operation below 0.5 mg P/L is not practical. It is anticipated increased flows will require the effluent phosphorus concentration to be decreased to maintain a similar loading to the river. Downstream tertiary filtration is likely required to achieve the lower effluent limits irrespective of the BAFs biological capacity.

4.10.1 General Characteristics and Main Equipment

As wastewater is filtered and treated through the BAF system, suspended solids and organic material builds up in the filters. To counteract this, the C – side BAF cells are backwashed every 14 – 24 hours, while the N – side BAF cells are backwashed every 24 – 48 hours. Performing backwashes helps remove built up organic material and helps to maintain optimal filter performance.

Losing filter media during backwashing can be a problem some WWTPs encounter. The Canmore WWTP has a media screen in each BAF cell, reducing the volume of media lost, as losing media decreases BAF performance, thus decreasing effluent quality. The media loss per year is less than 3% due to the media screens.

The equipment that is required for the operation of the BAF include the intermediate well, blowers, a backwash well, backwash blowers, and backwash waste pumps. The following subsections will discuss each of these components.

4.10.2 Design Loading and Overall Performance

The historical operating conditions for the BAF system are summarized in Table 4-10.

Table 4-5 Historical Operating Conditions of the BAF System (2017-2021)

Parameter	Historical Value	Typical Design Value
C-side BAF Filters		
Number of Filters	5	
Surface Area per Filter	40 m ²	
Media Volume Per Filter	100 m ³	
Historical Hydraulic Loading Rate at MinF	2.0 m ³ /m ² /h	2 – 10 m ³ /m ² /h ⁽¹⁾ (Average = 6 m ³ /m ² /h)
Historical Hydraulic Loading Rate at ADF	4.4 m ³ /m ² /h	
Historical BOD₅ Loading Rate at ADF	5.1 kg/m ³	3 – 7 kg/m ³ ⁽²⁾ (Average = 5 kg/m ³)
Historical BOD₅ Loading Rate at MMF	10.7 kg/m ³	
Historical TSS Loading Rate at ADF	2.9 kg/m ³	3 – 7 kg/m ³ ⁽²⁾

Parameter	Historical Value	Typical Design Value
Historical TSS Loading Rate at MMF	7.6 kg/m ³	(Average = 5 kg/m ³)
N-side BAF Filters		
Number of Filters	5	
Surface Area per Filter	40 m ²	
Media Volume Per Filter	100 m ³	N/A
Historical Hydraulic Loading Rate at MinF	2.0 m ³ /m ² /h	2 – 10 m ³ /m ² /h ⁽¹⁾
Historical Hydraulic Loading Rate at ADF	4.4 m ³ /m ² /h	(Average = 6 m ³ /m ² /h)
Historical TKN Loading Rate at ADF	0.8 kg/m ³	0.5 – 2 kg/m ³ ⁽²⁾
Historical TKN Loading Rate at MMF	1.3 kg/m ³	(Average = 1.25 kg/m ³)
Note:		
(1) Based on BAF Operation and Maintenance Manual (Degremont Technologies, 2008)		
(2) Based on Degremont Technologies recommendations (Stantec, 2012)		

The capacity of the BAF system was evaluated based on both the hydraulic loading rate (HLR) and the organic loading rate (OLR). These capacities were evaluated at the average HLR and OLR values recommended by the vendor of the technology, Degremont Technologies, for C- and N-side BAF filters. The results are summarized in Table 4-11.

Table 4-6 Capacity Assessment of BAF Systems

Parameter	Evaluation Criteria ^(1,2)	Estimated Capacity
C-side BAF Filters		
Average HLR	6 m ³ /m ² /h	28.8 ML/d
Average OLR	5 kg/m ³	20.1 ML/d
N-side BAF Filters		
Average HLR	6 m ³ /m ² /h	28.8 ML/d

Parameter	Evaluation Criteria ^(1,2)	Estimated Capacity
Average OLR	1.25 kg/m ³	32.7 ML/d
Note: (1) Based on BAF Operation and Maintenance Manual (Degremont Technologies, 2008) (2) Based on Degremont Technologies recommendations (Stantec, 2012)		

The average estimated HLR capacity of the plant is higher than BAF historical combined influent ADF, 20.9 ML/d (as presented in Table 4-6). As for the OLR capacity, the estimated C-side BAF filters capacity is lower than historical ADF capacity of the BAF, while higher loading capacity for N-side BAF filters is observed. The BAF filters are therefore limited by the C-BAF average organic loading rate, which would gradually affect the overall treatment performance of the BAFs. In fact, with the population rise and the expected increase of organic loadings to the BAF, the C-side BAF would have less available capacity and thus, the untreated organic matter would pass into the N-side BAF. This could result in lower nitrification efficiency of the N-BAF and therefore, producing a higher final effluent TAN concentration.

The operations staff at the Canmore WWTP has also been experiencing issues with the BAFs during the backwash stage of the filters. Periodically during backwashing, media from the BAFs can be propelled into the air and land outside of the BAF units. This is coupled with the aeration of the BAFs being uneven in some of the tanks, leading to possible short circuiting within the BAFs. With media being propelled into the air during backwash, and uneven aeration, it is possible the BAFs are experiencing consolidation and clogging of the media. The BAF O&M manual suggests that a probable cause due to uneven process air distribution with violent local bubbling could be due to a leak in the aeration system. The course of action recommended in the manual is to empty the media from the cell and change any defective parts as required. Several of the C-Side filters were emptied and replaced within the last 5 years and the problem is persisting.

4.10.3 BAF Influent and Effluent

The BAFs is the heart of the process of the Canmore WWTP as they remove large portions of the BOD, TSS, and ammonia – nitrogen that remain in the wastewater after primary clarification. As the BAFs play a critical role in the removal of these wastewater parameters, they are important for the effluent water characteristics and ensuring that the effluent wastewater regulations are met. This section will discuss both the BAF influent and BAF effluent wastewater characteristics.

The wastewater that enters the BAF consists of primary clarified water, water from the backwash waste tank, a portion of the effluent wastewater from the DAF, and a BAF recycle line. The historical BAF combined influent flows and loadings are summarized in Table 4-6.

Table 4-7 Historical BAF Combined Influent Flows and Loadings (2017-2021)

Parameter	Historical Value
Flows (ML/d)	
ADF	20.9
MMF	28.7
PDF	42.5
PHF	46.1
MinF	9.4
Loads (kg/d)	
BOD ₅ Loads	
Average Annual	2,545
Max Month	5,360
TSS Loads	
Average Annual	1,496
Max Month	3,816
TAN Loads	
Average Annual	398
Max Month	663
TKN Loads	
Average Annual	594
Max Month	989

The loadings are calculated based on the flows and the BAF influent concentration measured before C-side BAF filters. Influent TSS and COD concentrations to the BAFs are measured daily, BOD and TP are measured several days a week, while TAN influent concentrations are measured weekly. These influent concentrations, as well as final effluent concentrations and effluent limits are summarized in Table 4-7.

Table 4-8 Historical BAF System Performance (2017-2021)

Parameter	Average Concentration ¹		Removal Efficiency ¹	Effluent Limits ²
	Influent	Effluent		
BOD ₅	125 mg/L	8.2 mg/L	94%	20 mg/L
TSS	73 mg/L	6.9 mg/L	90%	20 mg/L
TP	2.7 mg/L	0.5 mg/L	81%	1 mg/L
TAN	14 mg/L	4.3 mg/L	69%	< 5/< 10 mg/L (Jul – Sept / Oct - Jun)
Note:				
(1) Based on average historical concentration values of 2017 to 2021.				
(2) Canmore WWTP Regulatory Effluent Limits				

Based on this historical performance evaluation, BAF systems have produced a good quality effluent over the last five years. As shown previously in Section 2.5 of this report, BOD₅, TSS, and TAN average concentration effluent levels have increased slightly during the study period.

Total ammonia nitrogen removal is an important characteristic to consider especially at max month loading scenarios, both in the summer and winter. The loading rates between these two seasons illustrate the range in flow and wastewater characteristics that the Canmore WWTP receives. During the summer flows are high, peaking in June, and most parameters have their highest influent loading rate to the plant in August. During the winter (the months of January, February, March, and December) the water is cooler, the flow to the plant is less on average, while the influent concentration typically does not vary too significantly.

To evaluate the BAFs and their effectiveness, the removal rates of TAN through the BAFs at these max month loading scenarios should be investigated. The following tables highlight the average mass of TAN removed from the BAFs, the average water temperature, average effluent TAN that was discharged from the plant during these max month scenarios, along with the actual and reference removal rates.

Table 4-9: Max Month TAN / TKN Removal

	TAN Removal ¹ (kg)	TKN Removal ¹ (kg)	Actual Removal Rate ¹ (TAN) (kg/m ³ /d)	Actual Removal Rate ¹ (TKN) (kg/m ³ /d)	Temperature ¹ (°C)	Reference Removal Rate ¹ (TAN) (kg/m ³ /d)	Reference Removal Rate ¹ (TKN) (kg/m ³ /d)	Effluent TAN ¹ (mg/L)	Effluent TKN ¹ (mg/L)
2017	49.97	74.59	0.10	0.15	15.89	0.14	0.20	14.83	22.13
2018	162.55	242.62	0.33	0.49	15.26	0.46	0.69	0.95	1.42
2019	174.34	260.21	0.35	0.52	14.64	0.52	0.77	2.45	3.65
2020	112.78	168.33	0.23	0.34	9.93	0.47	0.70	5.82	8.69
2021	131.22	195.84	0.26	0.39	15.39	0.37	0.55	6.34	9.46
Average	126.17	188.32	0.25	0.38	14.23	0.39	0.58	6.08	9.07

Note:

- (1) Based on Canmore WWTP data from 2017 to 2021
(2) TAN/TKN assumed to be 0.67

Table 4-10: Winter Max Month TAN / TKN Removal

	TAN Removal ¹ (kg)	TKN Removal ¹ (kg)	Actual Removal Rate ¹ (TAN) (kg/m ³ /d)	Actual Removal Rate ¹ (TKN) (kg/m ³ /d)	Temperature ¹ (°C)	Reference Removal Rate ¹ (TAN) (kg/m ³ /d)	Reference Removal Rate ¹ (TKN) (kg/m ³ /d)	Effluent TAN ¹ (mg/L)	Effluent TKN ¹ (mg/L)
2017	N/A ²	N/A ²	N/A ²	N/A ²	9.24	N/A ²	N/A ²	11.17	16.67
2018	95.68	142.80	0.19	0.29	10.33	0.39	0.58	3.24	4.84
2019	118.05	176.19	0.24	0.35	10.13	0.49	0.73	3.82	5.71
2020	112.78	168.33	0.23	0.34	9.93	0.47	0.70	5.82	8.69
2021	118.06	176.20	0.24	0.35	9.92	0.49	0.74	3.51	5.24
Average	111.14	165.88	0.22	0.33	9.91	0.46	0.69	5.51	8.23

Notes:

(3) Based on Canmore WWTP data from 2017 to 2021

(4) Values were not recorded in historical data for Winter Max Month Loading

From the tables above, the Actual Removal rate was calculated from the mass of TAN removed, divided by the volume of media within the biological aerated filters. The reference removal rates were normalized to 20°C to compare the influence of max month loading and winter loading, the two worst case scenarios for the biological treatment.

The max month loading included the adverse event in 2017, which skewed the removal rates lower. Removing this event and using the more typical operational conditions, the temperature corrected removals were equivalent at 0.46 kg TAN/m³/d or 0.69 kg TKN/m³/d. In both scenarios, the effluent ammonia concentrations were above 3 mg/L indicating the BAF units were operating near their maximum kinetics. Additional data for dissolved oxygen concentration would confirm this, however, for the purpose of operations the observed ammonia removal rate is 0.46 kg TAN/m³/d at 15°C during the worst-case scenario operations.

4.10.4 Intermediate Well

The intermediate well is 305 m³ with three submersible intermediate transfer pumps, two of them sized for 128 L/s and one rated at 111 L/s. The function of these pumps is to transfer C – side BAF effluent to the N – side BAF filter influent via the intermediate tank. These intermediate pumps share a standby unit with the backwash pumps (the one with 111 L/s rated capacity) and are all equipped with VFDs.

The intermediate pumps have a combined firm capacity of 22.1 ML/d. This firm capacity is currently adequate to cope with the average day flow and peak day flows expected at the Canmore WWTP. Depending on the anticipated future flows to the plant, the pumps may need to be replaced such that they have a larger firm capacity to deal with the rise in flow to the plant.

4.10.5 Aeration Blowers

There are ten (10) blowers provide oxygen to the BAF cells. The blowers utilised at the Canmore WWTP are 18.7 kW positive displacement blowers each with a rated capacity of 440 m³/h, providing a total capacity of 4,400 m³/d for the BAF system.

The capacity of the aeration system was assessed based on the total capacity of the blowers and an oxygen transfer efficiency (OTE) of 20%, given by the vender in the Operation and Maintenance Manual (Degremont, 2008). Average BAF influent BOD₅ and TKN concentrations were used to calculate the oxygen demand. Then a historical peak diurnal and month loading factor of 1.1 and 2.1, respectively, were applied to the calculated oxygen demand to obtain the maximum (actual) oxygen transfer required (AOTR). The aeration system capacity assessment is summarized in Table 4-5.

Table 4-11 Capacity Assessment of BAF Systems

Parameter	Estimated Capacity	Description
Oxygen Demand	220 kgO ₂ /h	Systems with nitrification: 1 kg O ₂ /kg BOD ₅ +4.6 kg O ₂ /kg TKN ¹
AOTR	503 kgO ₂ /h	Oxygen demand x Peak Factors

Parameter	Estimated Capacity	Description
SOTR	1,599 kgO ₂ /h	Standard Oxygen Transfer Required
OTE	20% ²	
Air flow required	2,206 m ³ air/h	SOTR x OTE
Note:		
(1) Based on MECP Design Guidelines for Sewage Works (2008).		
(2) Based on BAF Operation and Maintenance Manual (Degremont Technologies, 2008).		

The required air flow estimated is 2,206 m³air/h, while the blower system has a total rated capacity of 4,400 m³/h. The existing blower system therefore has adequate capacity to meet the required oxygen demand.

4.10.6 Backwash Well

The Canmore WWTP backwashes one filter at a time, such that the plant can still operate effectively when backwashing is taking place. Within the intermediate transfer tank, there are three backwash pumps, each rated at 111 L/s. One of the backwash pumps is a standby pump that can aid either the backwash pumps or the intermediate transfer pumps as needed. Along with the pumps, the backwash blowers also aid in removing built up organic material from the BAFs.

4.10.7 Backwash Blowers

The backwash blowers aid the backwash pumps in removing organic material from the BAF cells when needed. There are three blowers, each is 45 kW, and they provide air scour during the BAF backwash cycle.

4.10.8 Backwash Waste Pumps

The water that is used during backwashing goes to the backwash waste tank (460 m³) for holding prior to either side stream treatment, DAF, or re-introduction to the system at the head of the plant. The water is pumped to either the DAF or to headworks via three 36 L/s submersible backwash waste pumps. Two of these pumps are used to pump backwash waste to the DAF unit which have a total rated capacity of 6.2 ML/d. The rated capacity of the P-313 backwash return pump is 3.1 ML/d

4.10.9 BAF Recirculation Pumps

To maintain adequate flow to the BAFs, two 200 m³/hr vertical turbine pumps are installed in a wet well downstream of the UV disinfection channels, which provide a hydraulic loading rate of 4 m/hr via a recycle line to the filters. These pumps are designed to operate at variable speeds, and can provide flows between 75 m³/hr to 400 m³/hr.

4.10.10 Treated Effluent Measurement

A 600 mm wide fiberglass Parshall flume is utilised to measure BAF effluent flows. The capacity of the flume is 35.0 ML/d. To increase the future capacity of BAF effluent flow monitoring, an additional Parshall flume or alternative sensor (laser) that reduces hydraulic bottlenecks can be considered.

4.11 DAF System

The DAF system utilizes air to remove suspended matter from the surface of treated water. Dissolving air under pressure (whitewater) is introduced to the influent of the DAF tank along with BAF backwash water. The small air bubbles in the whitewater attach to suspended matter and float to the surface of the tank, where skimmers remove the solids. To encourage clustering of solids and promote removal, coagulant is typically added to the influent water. The treated water is then removed as the effluent, while the sludge that is skimmed from the surface is treated further.

Currently at Canmore WWTP, one DAF tank (AquaDAF) with a total surface area of 7.7 m² is in operation. According to the vendor, AquaDAF can treat a high loading rate range of 24 to 48 m³/m²/h (AquaDAF* Brochure, Suez). Based on general experiences with these systems, a lower operational loading rate is anticipated, and with the addition of polymer to the DAF, the historic HLR of 9.4 m³/m²/h (Table 4-12) is within the anticipated range. The historical operating conditions for the DAF tank are summarized in Table 4-12. The operational schedule of DAF was assumed to be 24 hours per day and 7 days per week.

Table 4-12 Historical Operating Conditions of DAF (2017-2021)

Parameter	Historical Value	Typical Design Value ⁽¹⁾
Number of DAF tanks	1	N/A
Total Surface Area	7.7 m ²	N/A
Solid Capture	90% ⁽²⁾	N/A
Historical Annual Average Waste Secondary Sludge (WSS) Feed	1,826 kg/d	N/A
Historical Max Month Waste Secondary Sludge (WSS) Feed	2,221 kg/d	N/A
Historical Average DAF Feed Flow	1.72 ML/D	N/A
Historical Average Solid Loading Rate (SLR)	9.9 kg/m ² /h ⁽³⁾	10 kg/m ² /h
Historical Average Hydraulic Loading Rate (HLR)	9.4 m ³ /m ² /h ⁽⁴⁾	6.3 m ³ /m ² /h

Parameter	Historical Value	Typical Design Value ⁽¹⁾
Note:		
(1) Based on MECP Design Guidelines for Sewage works (2008).		
(2) Based on AquaDAF* Brochure (Suez).		
(3) Based on historical average waste sludge generated in the BAF backwash waste tank (1,826 kg/d).		
(4) Based on historical influent flows to the DAF (1.72 ML/d), recorded by the flow meters F/T 504 and F/T 514.		

The DAF tank has operated at SLR value less than the typical design values recommended by the MECP (2008). Though its historical HLR seems to be higher than MECP recommended typical design value (6.3 m³/m²/h), the original design HLR of AquaDAF* is anticipated to be at least 10 m³/m²/h. Hence, the DAF tank could possibly cope with historical hydraulic loading rates with polymer addition.

The capacity of the DAF tank was evaluated based on the MECP recommended SLR and HLR values and is summarized in Table 4-13.

Table 4-13 Capacity Assessment of DAF Tank

Parameter	Evaluation Criteria ⁽¹⁾	Estimated Capacity
DAF Solid Loading Capacity at <u>Average SLR</u>	10 kg/m ³	1,845 kg/d ⁽²⁾
DAF Hydraulic Loading Capacity at <u>Average HLR</u>	6.3 m ³ /m ² /h	1.15 ML/d
Note:		
(1) Based on MECP Design Guidelines for Sewage works (2008).		
(2) Solid Loading Capacity of the DAF.		

Based on the assessment results, it could be concluded that the solid loading capacity of the DAF tank is almost equal to the historical generated WSS fed to the DAF (1,826 kg/d). As for the hydraulic loading capacity, this unit has reached its capacity when evaluated with the considered MECP values. Stress-testing is recommended to validate the capacity assessment.

4.12 UV Disinfection

The existing ultraviolet (UV) disinfection system is housed in a separate room. There are three hydraulic channels in this room. Two channels are equipped with the banks of Trojan 3000Plus (42 lamps each) installed around the year 2000. The third channel is a bypass channel suitable for the installation of the third UV. Each of the two UV channels has a treatment capacity of 17.5 ML/d at UV transmittance of 65%. The total peak flow capacity of the installed UV system is 35 ML/d which is greater than current plant's rated peak hourly flowrate (30.2 ML/d).

Each of the two UV channels is equipped with a recirculation pump. The recirculation pumps ensure that the channels have enough water for UV lamps submergence.

The existing two ultraviolet reactors have a potential point of failure (i.e. the existing controller is operational but it does not have replacement parts due to its age). The gate valves within the existing UV channels do not allow the level control and require to run the recirculation system during low flow periods.

Additionally, the WWTP will eventually require the third UV reactor to accommodate the future flows.

The existing controller is obsolete. In the event of failure only a custom-built controller can be used for replacement. The new controllers that Trojan currently manufactures are not compatible with the existing UV system. The custom-built controller for replacement of the existing will cost around 100k (which is comparable with the cost of entire new UV bank) and would be a “throw away” cost during future addition of the third UV.

The proposed path forward is to install the new UV with automatic level control gates instead of the two existing UV banks. The new controller will be suitable to run up to three UVs and when the third UV is added in the future, it can be connected to the new controller.

4.13 Outfall

The Bow River is the receiving body of water for the effluent from the Canmore WWTP. The effluent is discharged to the river through a 660 mm outfall. A field inspection is recommended in Spring 2023 during favorable conditions.

4.14 Solids Processing

The main solids produced at the Canmore WWTP are from the clarifiers and the BAF backwash. The clarifiers produce co-thickened primary solids, while the BAF backwash has solids that are from the media that filters the wastewater. The main solids come from the primary clarifiers, however there is some FOG contribution from the aerated grit chambers.

The plant currently has capacity to treat the generated solids, however with an increase in loading to the plant expected with a rise in population, the solid processing of the plant must be evaluated to ensure adequate future capacity.

4.14.1 Primary Sludge Pumping

Primary sludge pumping occurs in two locations at the Canmore WWTP. There are sludge and scum pumps in the primary clarifiers, along with the grease pumps in the grit chamber. All these pumps are rated at 11 L/s, having a firm capacity of 985 m³/d when one pump is out of service. The primary sludge flows were not being recorded historically. The ADF and PDF of the primary sludge leaving the primary clarifier is therefore estimated by conducting a mass balance around the clarifier. The estimated historical and projected sludge flows are summarized in Table 4-14.

Table 4-14 Historical and Projected Primary Sludge Flows and Concentrations

Parameter	Historical values ¹
Primary Sludge Flows	
ADF	55 m ³ /d
PDF	124 m ³ /d
Primary Sludge Loads	
Average	1,382 kg/d
Maximum Day	3,093 kg/d
Average Concentration	25000 mgTSS/L ⁽²⁾
Note:	
(1) Mass Balance estimated values based on historical ADF and PDF of the primary clarifier.	
(2) Based on 2.5% primary sludge concentration assumption.	

The primary sludge pumps have a greater firm capacity than the maximum daily primary sludge produced. These pumps have therefore adequate capacity for the historical condition of the WWTP.

4.14.2 Sludge Holding Tanks

The aerobic digesters at the Canmore WWTP act more as open-air holding tanks rather than digesters. The primary sludge and DAF Sludge are sent to two digesters for stabilization. Each of the digesters have a volume of 1,155 m³. The historical operating conditions of the digesters are summarized in Table 4-15.

Table 4-15 Historical Operating Conditions of Digesters (2017-2021)

Parameter	Historical Value ⁽¹⁾
Number of Digesters	2
Total Volume Available	2,310 m ³

Parameter	Historical Value ⁽¹⁾
Annual Average Sludge Flows to the Digesters	84.9 m ³ /d ⁽¹⁾
Max Month Sludge Flows to the Digesters	86.5 m ³ /d ⁽¹⁾
Annual Average Sludge Mass to the Digesters	3,026 kg/d ⁽²⁾
Max Month Sludge Mass to the Digesters	3,680 kg/d ⁽²⁾
Note:	
(1) Historical combined DAF and primary clarifiers sludge flows.	
(2) Historical DAF sludge loadings + primary sludge loadings (values presented respectively in Table 4-12 and Table 4-14)	

The historical maximum monthly total sludge flow to the digester tanks is approximately 86.5 m³/d which provides 26.7 d of retention. The tanks are aerated to reduce odors and partially digest the solids. The solids are centrifuged and hauled to compost; hence full stabilization is not necessary.

4.14.3 Digested Sludge Pumps

To pump the digested sludge from the open-air holding tanks there are two pumps each with a capacity of 4.1 L/s. These pumps transfer sludge from the open-air holding tanks to the centrifuge such that the centrifuge has sufficient influent flow when it is operated.

4.14.4 Dewatering

The Canmore WWTP currently dewateres using a centrifuge; the capacity of the centrifuge is 27.2 L/s. The centrifuge can receive sludge with up to 4% solids and produce sludge that is between 25% – 35% solids. The centrifuge works by separating the solids from the water through centrifugal forces. Through the introduction of polymer to the influent wastewater, the centrifuge thickens the solids to allow for more efficient and effective solids separation. Centrifuging lowers the overall odor of dewatering as it is an enclosed process, while also maintaining a small footprint. The existing centrifuges operate 8 hours per day for 5 days per week. The historical operating conditions of the centrifuges are summarized in Table 4-16.

Table 4-16 Historical Operating Conditions of Centrifuges (2017-2021)

Parameter	Historical Value
Number of Centrifuges	2
Operation hours per day	8 hrs/5 days

Parameter	Historical Value
Feed Sludge TS Concentration	1.80% ⁽¹⁾
Flow Capacity per Centrifuge	29 m ³ /h ⁽¹⁾
Operational Flow Capacity per centrifuge	7.02 m ³ /h
Max Month Sludge Mass to the Centrifuges	3,680 kg/d ⁽²⁾
Max Month Sludge Flows to the Centrifuges	204 m ³ /d ⁽²⁾
Note:	
<p>(1) Centrifuges Operation and Maintenance Manual</p> <p>(2) Historical DAF sludge loadings + primary sludge loadings (values presented respectively in Table 4-12 and Table 4-14)</p>	

The solid loading rate of the centrifuges is 530 kg/h or 12,720 m³/d (see Table 3-1). These dewatering units thus have sufficient capacity to receive the historical peak sludge loadings (3,680 kg/d) pumped from the digesters.

The cake that is produced from the centrifuge is loaded onto a truck and then shipped to a plant for further composting. Since the centrifuge can significantly enhance the solids content of the sludge, the number of trucks required for transportation is minimal, thus lowering transportation costs and limiting the truck traffic on the roads of the Town of Canmore.

4.14.5 Dewatering pumps

The centrifuge centrate is recycled to the influent well, using two pumps each with a rated capacity of 13.6 L/s.

4.15 Existing Capacity Assessment Summary

The assessed historical capacity of the major plant unit processes is shown Figure 4-1. The chart is colour coded based on the capacity limiting condition for each unit process as follows:

- + Unit Processes limited by peak hourly flows are shown in orange.
- + Process limited by primary clarifier average daily flows is shown in purple.
- + Process limited by primary clarifier peak daily flows is shown in green.
- + Processes limited by average day BAF Influent flows/loadings are shown in blue.

Based on the capacity analysis, the plant is already at or near capacity, with the bottleneck currently being the BAF process unit. The BAFs are currently near their capacity to handle the organic loading rate entering the facility.

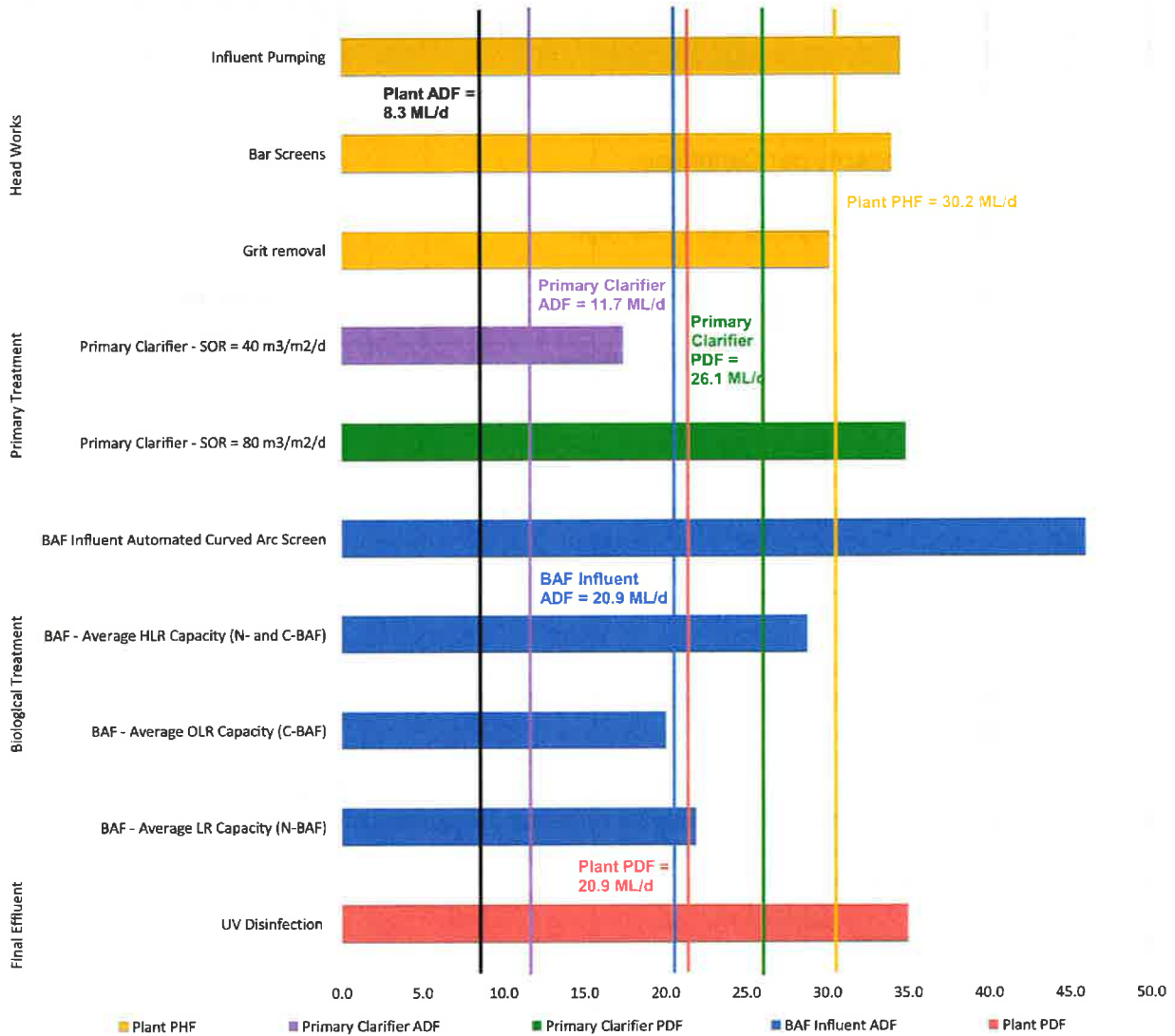


Figure 4-1: Canmore WWTP Process Capacity Assessment Summary

5 Design Basis and Future Projections

5.1 Future Loading Rates

Historic loading rates were used to project the future loading to the WWTP. Where historic rates were above or below the typical range, the future per capita loading rate was adjusted to within the range. Historic loading rates for each of the major wastewater parameters are listed in the following table, along with the assumed per capita loading rate that was considered throughout the future projection calculations.

Table 5-1: Per Capita Loading rates

Constituent Parameter	Average Per Capita Load (g/p/d)	Assumed Future Per Capita Loading (g/p/d)
BOD	88.3	90
TSS	79.2	85
TAN	8.16	8.50
TP	1.73	1.80

5.2 Future Design Basis

The design basis to evaluate the WWTP at 5, 15, and 25 year intervals is shown in Table 5-2. The max month loadings were projected using the historical max month loading factors and applied to the increased loads.

Table 5-2: Future Design Basis

Component	5 Year	15 Year	25 Year
Design Population			
Permanent Population	20,982	25,308	27,758
Non-Permanent Population	5,820	10,462	16,982
Total	26,802	35,770	44,740
Influent Characteristics			
Flows			
ADF, ML/d	11.32	15.22	19.12
MMF, ML/d	22.02	29.61	37.20
PDF, ML/d	28.46	38.26	48.07
PHF, ML/d	41.16	55.35	69.53
Loads			
BOD			

Average, kg/d	2,378	3,185	3,993
Maximum Month, kg/d	2,892	3,873	4,855
TSS			
Average, kg/d	2,163	2,925	3,688
Maximum Month, kg/d	2,846	3,849	4,852
TAN			
Average, kg/d	221.1	297.3	373.6
Maximum Month, kg/d	266.1	357.9	449.7
TP			
Average, kg/d	46.8	63.0	79.1
Maximum Month, kg/d	59.4	79.9	100.4

5.3 Future Projections

From Sections 5.1 and 5.2, a capacity assessment of the Canmore WWTP can be accomplished for the future 5, 15, and 25 year marks.

As shown in Figure 5-1, within 5 years many WWTP unit processes will have insufficient capacity, including influent pumping, screening, primary clarifiers (at PDF), BAF, and UV disinfection.

At the 15-year mark (Figure 5-2), most of the plant will exceed capacity and struggle to provide adequate effluent to the Bow River. The only unit processes that will have capacity at the projected flows will be the grit removal and the arc screens before the BAFs.

The 25-year capacity assessment (Figure 5-3) shows that the only unit process that would have capacity is the grit removal system.

Wastewater Treatment Plant Capacity Upgrade Evaluation and Capital Upgrades

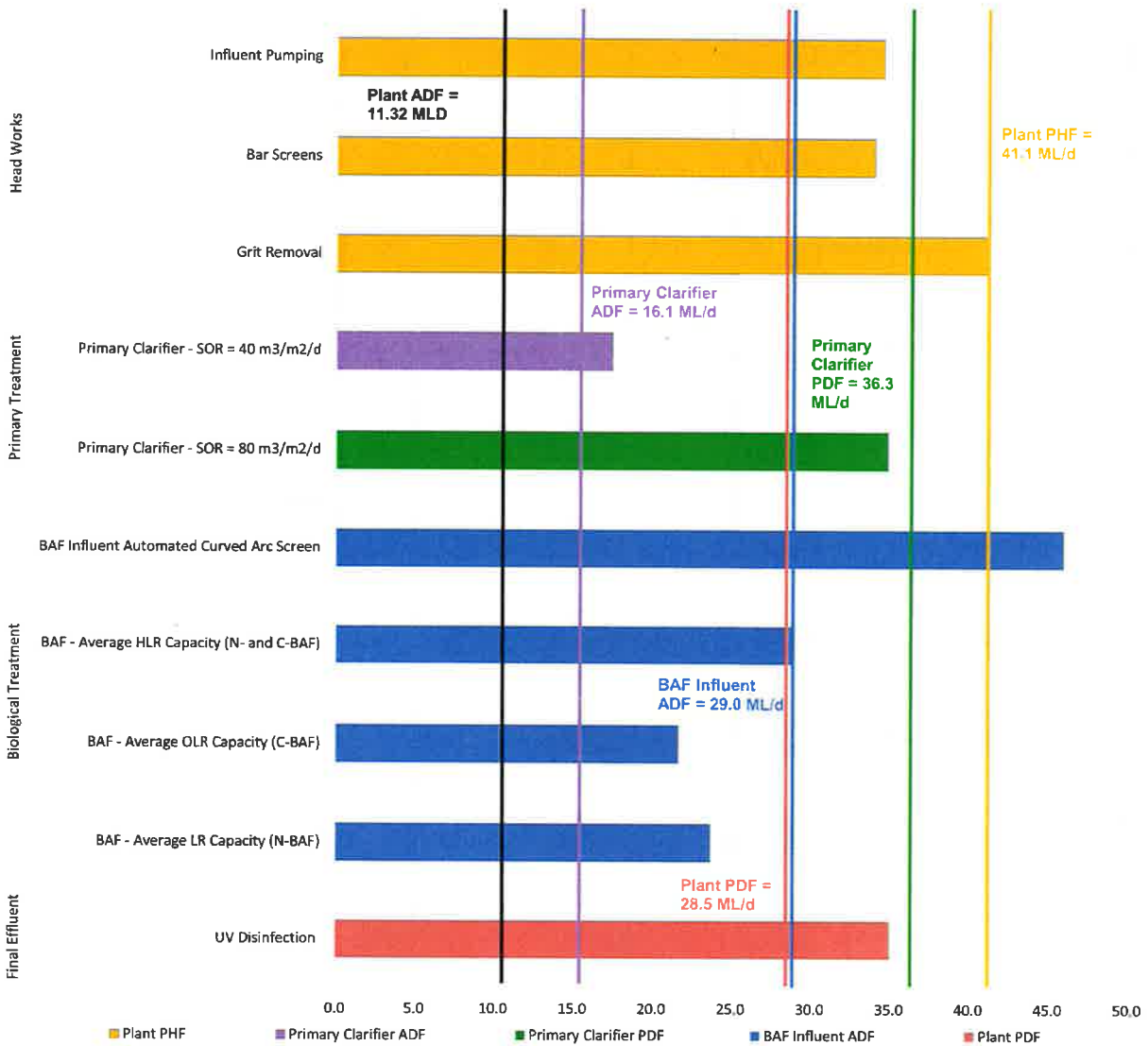


Figure 5-1: 5 Year Canmore WWTP Process Capacity Assessment

Wastewater Treatment Plant Capacity Upgrade Evaluation and
 Capital Upgrades

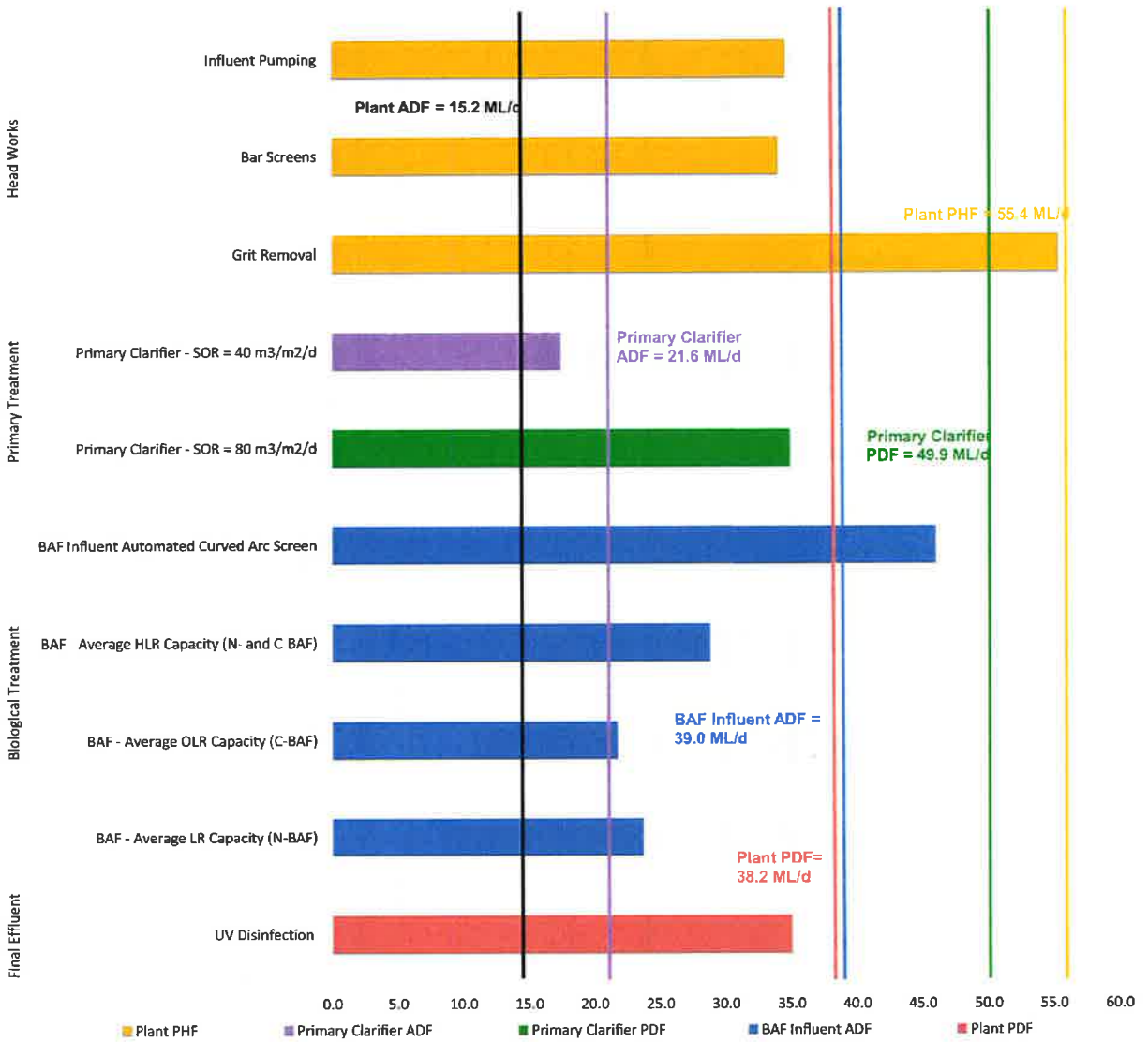


Figure 5-2: 15 Year Canmore WWTP Process Capacity Assessment

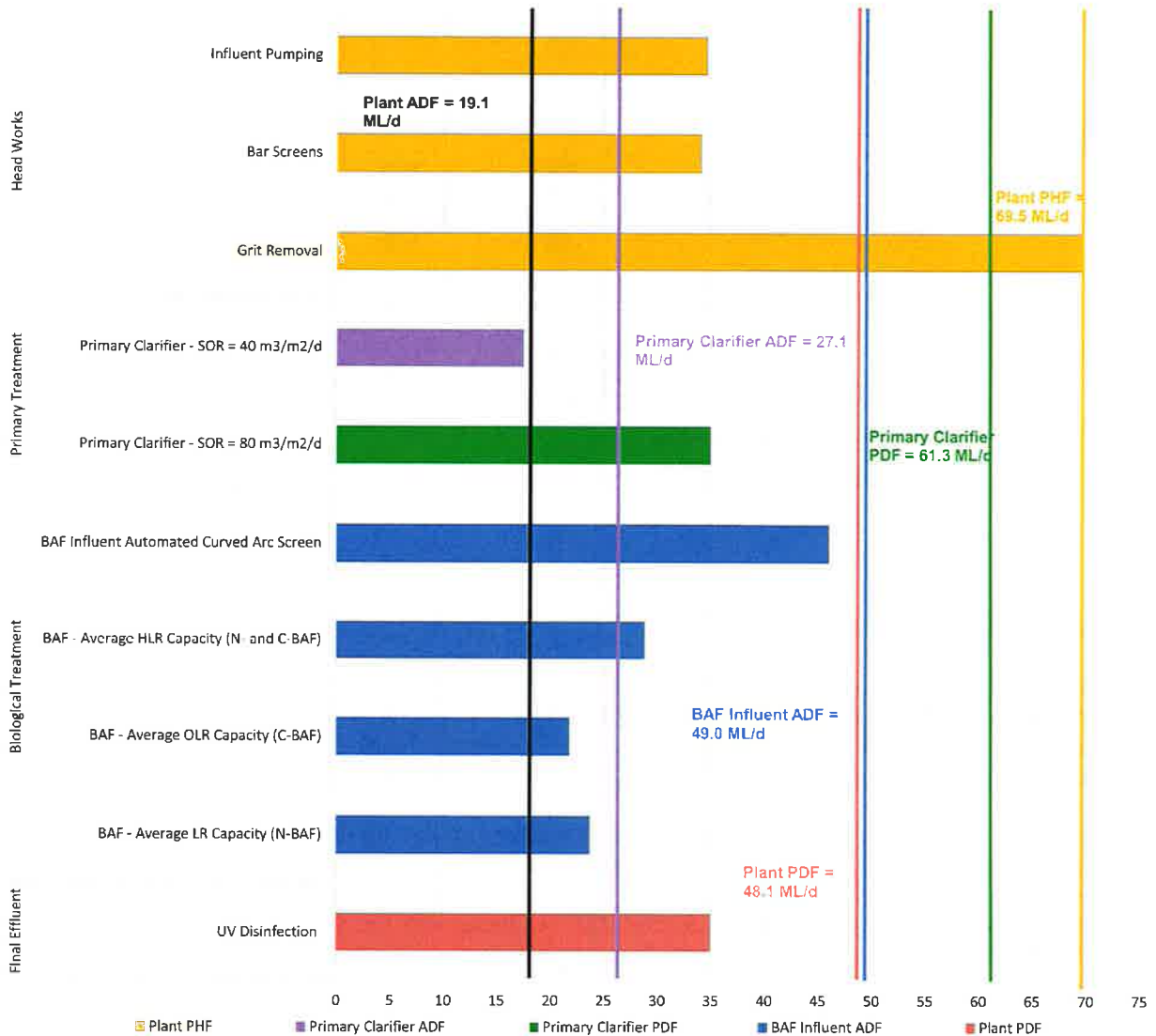


Figure 5-3: 25 Year Canmore WWTP Process Capacity Assessment

6 BioWin Modelling

A Biowin model was developed based on the existing plant process flow, sizing, historical flows (influent and recycle) and loadings. The BioWin model is most appropriate to evaluate the biological processes, which in this case in the BAF system for BOD and TAN removal. The model was partially calibrated using kinetic values from full scale two stage BAF cells on the historical performance during critical periods during the year. To fully calibrate a BioWin model for the plant, extensive sampling over extended periods would be required. This sampling program would require atypical parameters for the plant to identify influent fractionations. EPCOR provided a TKN sample to confirm the TAN/TKN fractionation was within typical ranges for municipal wastewater. The additional excess sampling was not available or required for the purpose of the modelling as a check for the capacity assessment evaluation.

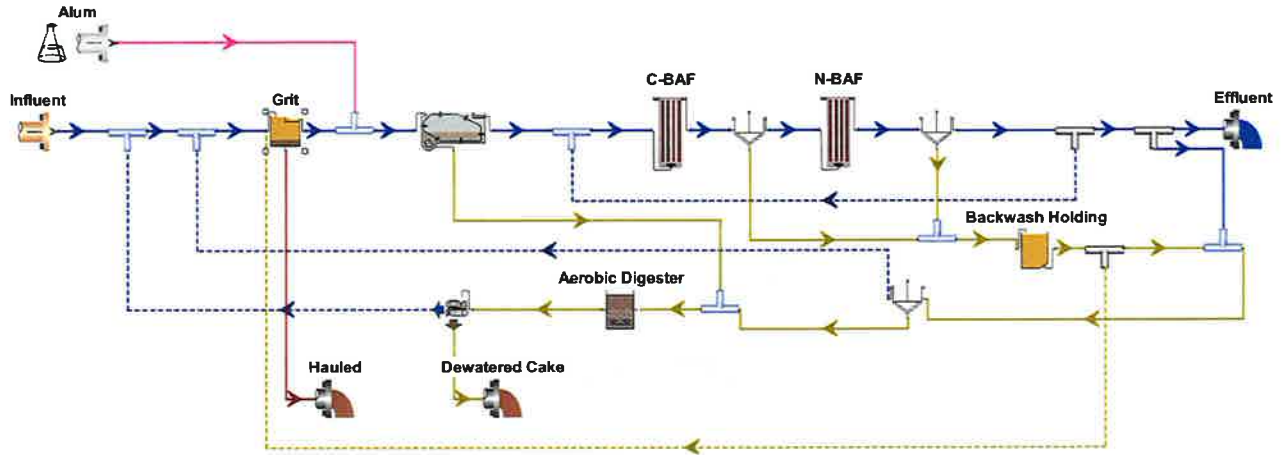


Figure 6-1: Canmore WWTP BioWin Model Process Schematic

6.1 Model Scenario Analysis

The model was calibrated and evaluated on three scenarios, winter, max month loading and max month hydraulic. The scenarios were selected as they represent the most challenging conditions given the influences at the Canmore WWTP from snow melt, tourist seasons and temperature impacts. They also represent the regulatory framework for compliance on a monthly average.

The max month hydraulic loading historically had the same mass loading as the winter scenario and occurs during the same effluent limit period. Hence, the winter case was carried forward for the future projections analysis. In this report, the effluent data presented is the ammonia concentrations. The soluble BOD removal will not be limiting in the BAF systems with the two stages and the particulate material removal is dependent on solids retention capacity/hydraulic capacity of the filters. The effluent ammonia concentrations are the limiting biological component and what is most reliable within the modeling software. Predicted effluent concentrations for all parameters is in Appendix A.

6.1.1 Winter Scenario

The winter months are present challenges for the biological process due to lower temperatures and comparable loadings to the annual average. The flowrates and loadings were pro-rated from the annual average to reflect the actual conditions present during the low temperature period. The model inputs are presented in (Table 6-1).

Table 6-1 Winter Condition

Design Parameter	Historical	5-Year	15-Year	25-Year
ADF, ML/d	6.64	9.06	12.18	15.29

Temperature, °C	8.0	8.0	8.0	8.0
BOD Loading, kg/d	1,754	2,378	3,185	3,993
TSS Loading, kg/d	1,574	2,163	2,925	3,687
TAN Loading, kg/d	162	221	297	374
TP Loading, kg/d	34.4	46.8	63.0	79

The partially calibrated effluent TAN well predicted the winter condition using the historical data. The future projections were applied to the winter condition and outputs plotted in Figure 6-2. It can be observed the effluent is projected to be at the existing limit in the 5-year horizon and exceed in the 15-year horizon. The partially calibrated model does not consider operation optimizations that may be performed (i.e. recirculation adjustment, alkalinity addition, etc.). Adjusting the kinetic rates to the theoretical maximum provides additional capacity in the five (5) year horizon (Figure 6-2). Hence, optimization efforts may gain some additional capacity, however, the trend aligns with the capacity assessment and overall plant being overloaded between the 5 and 10 year horizon.

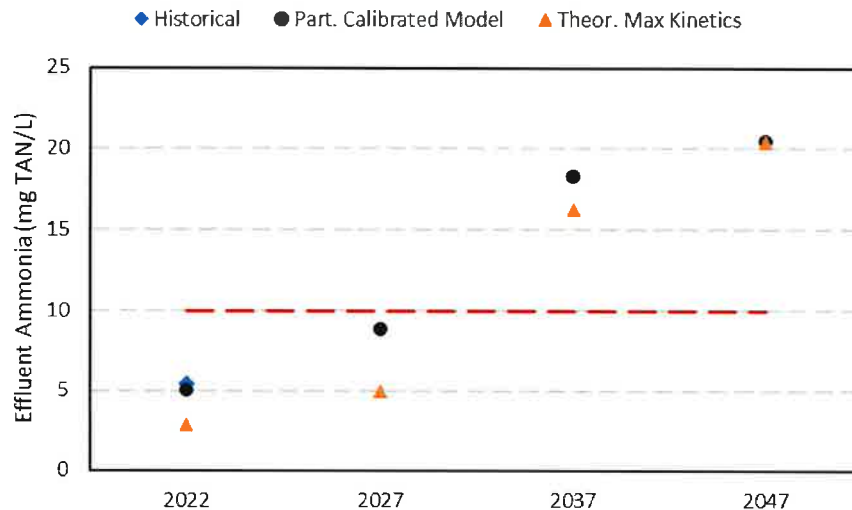


Figure 6-2: Canmore WWTP BioWin Model Winter Performance

6.1.2 Max Month Loading Scenario

The max month loading condition represents the highest mass loading the Canmore WWTP is required to remove. Historically, the max month load occurs in August for most constituents and most notably the TAN Loading. The minimum monthly average temperature observed during the study period in August was 13.2 °C. All flows and loads were pro-rated based on historical information and the model inputs are presented in (Figure 6-2).

Table 6-2 Max Month Loading Condition

Design Parameter	Historical	5-Year	15-Year	25-Year
ADF, ML/d	8.30	11.32	15.22	19.12
Temperature, °C	13.2	13.2	13.2	13.2
BOD Loading, kg/d	2,105	2,892	3,873	4,855
TSS Loading, kg/d	1,888	2,846	3,849	4,852
TAN Loading, kg/d	195	266	358	450
TP Loading, kg/d	42.9	59.4	79.9	100

The partially calibrated effluent TAN well predicted the historical data. The BAF system generally reduces kinetics at lower effluent concentrations, hence it having a slightly lower baseline in the model compared to the historical data is not unexpected. Similar to the winter monthly loading, the existing BAF system is expected to have challenges at the five (5) year horizon with the process predicted to be beyond its capable limits between the five (5) and ten (10) year horizon.

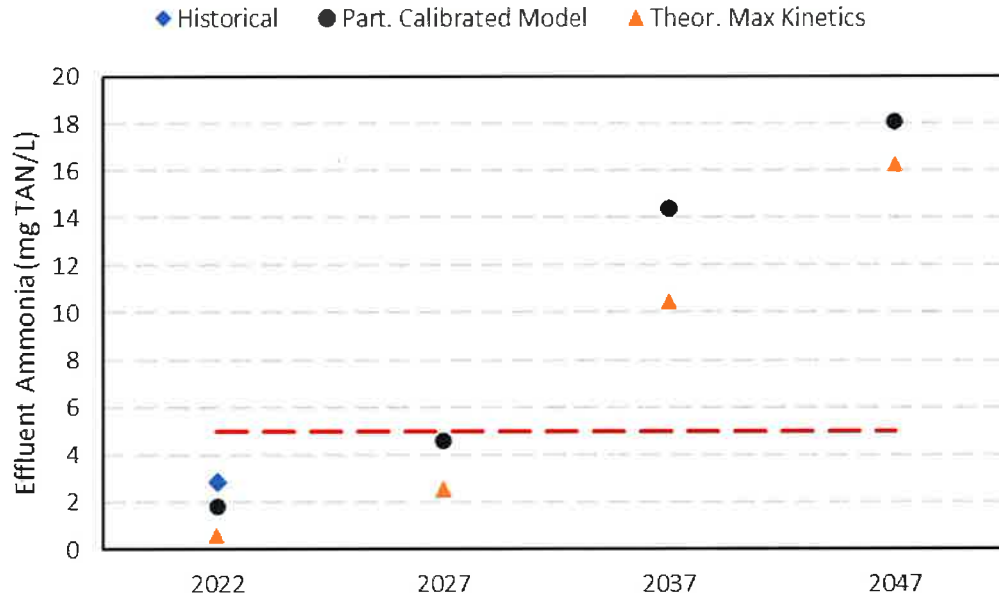


Figure 6-3: Canmore WWTP BioWin Max Month Load Performance

6.1.3 BioWin Model Summary

The BioWin modeling was well aligned with the capacity assessment outlined in Section 4 and 5. The BioWin model provides additional context to predicted effluent concentrations in the future scenarios. The predictions are to be used as a tool for planning as there are several variables that can influence the actual results in the future (i.e. population growth, load variation, plant operations, etc.). In general, the model demonstrates the operations staff are operating the facility well near the capacity limit. It is expected in the five (5) year horizon for the plant to be challenged during the worst case scenarios during the max month load and low temperature conditions.

The Canmore WWTP BAF units are projected to be pushed beyond it's limits even if the facility can operate within the maximum theoretical kinetic rates. This emphasizes the importance of planning and preparing for the large capital upgrade within the ten (10) year horizon, which also coincides with the new license and effluent limits.

7 Summary of Limits and Capacity

7.1 Existing Capacity Summary

The capacity assessment of the Canmore WWTP identified several capacity constraints for the main process units for future flows and loads. The following table illustrates the bottlenecks and challenges as the flows and loads increase with increased development.

Table 7-1 Summary of Key Process Units

Process Unit	Challenges and Recommendations
Raw Sewage Pumping	Increase pump capacity required
Bar Screens	Monitor screenings. Will operate adequately during majority of flow conditions. Bypass events will need to monitor impacts on downstream processes
Grit Removal	Monitor grit carryover. Will operated adequately during majority of flow conditions
C and N-BAF	Nearing Capacity of the filters. Capacity is expected to be challenged at the five (5) year horizon and exceeded between the five (5) and ten (10) year horizon. Optimization and stress testing of system recommended to confirm capacity assessment
UV System	Lifecycle replacement ongoing, will improve reliability from existing capacity assessment

The effluent limits achievable by the plant are limited by the installed process units. A summary of the achievable effluent limits is provided in Table 7-2.

Table 7-2 Effluent Quality Limits of Existing Process Technologies

Constituent	Limit of Installed Technologies
BOD ₅	15 mg/L
TSS	15 mg/L
TAN	5 mg N/L
TN	Assimilation only (no denitrification)
TP	1.0 mg P/L

The plant is lacking the capacity to treat the influent wastewater that it will be subjected to within the next 25 years at existing limits. At the 5-year mark, 2027, the BAFs will be near their limit, along with various other process units within the plant. At the 15 and 25-year mark, 2037 and 2047 respectively, the plant does not have the capacity required to adequately treat the wastewater produced by the Town of Canmore. To cope with the future projected flows and loadings a plant upgrade will likely need to be complete by 2030 to achieve the existing limits.

7.2 Water Quality Based Effluent Limits

Alberta Environment and Parks are finalizing the limits that will be in effect on the new approval that will come into effect in 2031. The draft limits are as follows.

Table 7-3: Future Proposed Canmore WWTP Effluent Limits

Parameter	Effluent Limit
cBOD ₅	≤ 10 mg/L ⁽¹⁾
TSS	≤ 10 mg/L ⁽¹⁾
TAN	≤ 5 mg/L ⁽¹⁾ (Jul – Sep) ≤ 10 mg/L ⁽¹⁾ (Oct – Jun)
TN	15 mg/L ⁽¹⁾
TP	≤ 0.5 mg/L ⁽¹⁾
Faecal Coliform	≤ 200 per 100 mL ⁽²⁾

Parameter	Effluent Limit
Notes: (1) Monthly arithmetic mean of daily composite samples (2) Monthly geometric mean of daily grab samples	

The existing treatment plant is not designed to provide total nitrogen removal and will not be able to reach total phosphorus, BOD and TSS on a consistent basis. Significant upgrades will be required to meet the proposed limits.

Refer to “Wastewater Treatment Plant Technology Evaluation” (April 5, 2023) for the upgrade details.

8 Capital Projects

The projects noted in this section are required as a life cycle replacement or maintenance of the existing WWTP equipment to ensure reliable operation of the plant until the Water Quality Based Effluent Limits required upgrades come online in 2031. These upgrades and probable costs are outlined in Table 8-1.

However, the consolidated summary of upgrades and associated costs required to achieve new EPA effluent limits as well as to maintain the existing WWTP are described in a separate report “Wastewater Treatment Plant Technology Evaluation” (April 5, 2023).

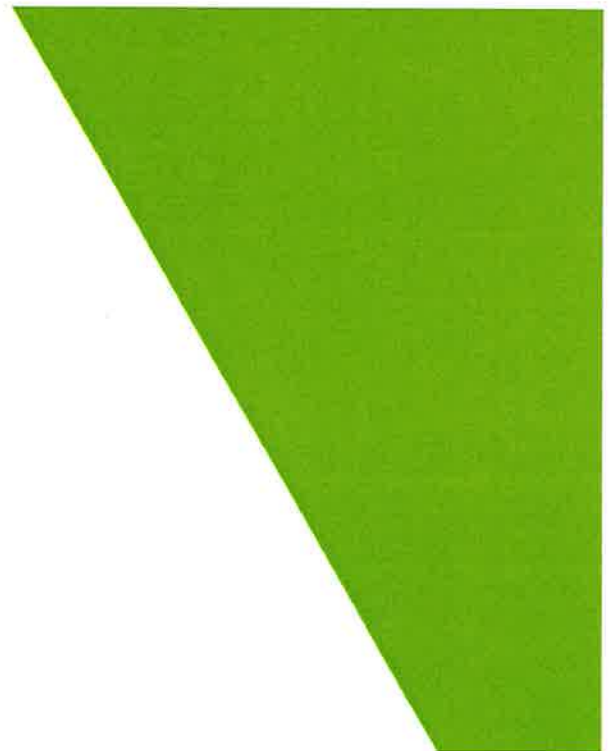
Table 8-1: Capital Projects

Project	Description	Project Justification	Priority	Year Required	Engineering	Construction	Contingency	Probable Cost
Headworks								
Inlet Lift Station Upgrade (Mechanical)	Replacement of existing lower flow pumps and discharge piping	Life Cycle Population Growth	Medium	2027	\$120k	\$800k	\$250k	\$1.17M
Inlet Lift Station Upgrade (Wetwell)	Increase the size of the Inlet LS Wetwell, Provide Actuated valving to EQ tank	Undersized Population Growth	Medium	2027	\$300k	\$2M	\$600k	\$2.9M
Odor Control Unit for EQ Tank, Headworks Bldg	Add odor control building near the Headworks to treat odors from EQ tank, Headworks	Potential Complaints, Regulatory Requirements	Medium	2027	\$300k	\$2M	\$600k	\$2.9M
Septage Receiving Station	Add septage receiving station with flow monitoring and payment system [Odor Control project required before]. Include EQ tank upgrades	Population Growth	Low	2032	\$120k	\$800k	\$250k	\$1.17M

Influent Piping between Inlet LS and Headworks	Piping Replacement, Actuated isolation valves at high point	Life Cycle	High	2027	\$120k	\$800k	\$250k	\$1.17M
Inlet Screen Replacement	Replacement of older inlet screen with smaller mesh, and sludge press unit	Life Cycle	High	2024	\$100k	\$600k	\$200k	\$900k
Grit Separator Replacement	Replace Existing Grit Separator	Life Cycle	Medium	2027	\$70k	\$500k	\$150k	\$720k
Grit Separator Exhaust Fan	Redesign, replace. Existing fan full of grease	Process Improvements	High	2025	\$30k	\$200k	\$60k	\$290k
Headworks Channel Valves	Add sludge gate valve at the Clarifier Distribution Channel Actuation on Clarifier sludge gates and screen inlet gates	Process Improvements	Medium	2027	\$70k	\$350k	\$110k	\$530k
Water Heating System, MUA Replacement	Replace existing boiler, piping, MUAs	Life Cycle Process Improvements	Medium	2025	\$220k	\$1.5M	\$450k	\$2.17M

Scum Removal Piping	Rearrange Scum Removal Piping to pump to digester instead of Headworks	Process Improvements	High	2025	\$70k	\$500k	\$150k	\$720k
Third Clarifier Addition	Add third Clarifier [high flow fluctuations]. North of ex. clarifier	Process Improvements Population Growth	Medium	2027	\$900k	\$7M	\$2.3M	\$10.2M
BAF, DAF								
Intermediate Transfer Pumps Upgrade	Upgrade existing pumps	Life Cycle	Medium	2026	\$150k	\$650k	\$200K	\$1M
UV								
UV 1, 2 upgrade	Replace existing UV 1, 2	Life Cycle	High	2023	\$70k	\$500k	\$130k	700k
UV 3 addition	Add UV3	Population Growth	Medium	2028	\$50k	\$350k	\$100k	500k

The total estimated probable cost is \$27M over the next 10 years. There are several projects that may be consolidated to generate cost efficiencies. It is important to note, with the exception of the BAF transfer pumps project, the specified projects will be utilized past 2031 and will become part of the new facility.





Briefing

DATE OF MEETING: May 16, 2023 **Agenda #:** D-3

TO: Committee of the Whole

SUBJECT: Electric Vehicle Infrastructure: Best Practice Review and Recommendations

SUBMITTED BY: Amy Fournier, Energy and Climate Action Coordinator

PURPOSE: To provide the Committee of the Whole with a summary of the findings and recommendations from the Electric Vehicle Infrastructure: Best Practice Review and Recommendations report.

EXECUTIVE SUMMARY

In the fall of 2022, Administration worked with a consultant to complete an Electric Vehicle Infrastructure Best Practice Review (Review) and provide the Town with a series of recommendations. The review identified strategies to effectively remove barriers to electric vehicle (EV) ownership, with a specific focus on charging infrastructure. This was a capital project approved in the 2022 budget process (CAP 7250). The purpose of the project was to position the Town to better prepare for the rising growth in EV ownership by providing an understanding of the charging infrastructure requirements for a widescale community transition to EVs, and the appropriate roles and levers for municipalities to encourage this transition and remove any barriers.

The key recommendations from the Review include:

1. Updating the Land Use Bylaw (LUB) to require EV charging readiness in new construction.
2. Updating existing Town of Canmore facilities to provide EV parking, to lead by example.
3. Updating the Engineering Design and Construction Guidelines (EDCG) to reflect impact on parking dimensions, and signage for EV charging stalls, including EV-enabled accessible parking stalls.
4. Tracking complaints of Internal Combustion Engine (ICE) vehicles parking in EV charging spaces in public parking lots and updating the Traffic and Road Use Bylaw to allow enforcement, if needed.
5. Creating a program to provide rebates for installing EV charging infrastructure in existing buildings.
6. Identifying optimal locations for publicly accessible chargers to support residents without access to home charging.
7. Maintaining developer engagement through regular consultation to understand concerns regarding EV parking requirements.
8. Maintaining engagement with utilities to ensure there is adequate distribution network capacity for EV charging growth.

BACKGROUND/HISTORY

2018: In December, Council accepted the Climate Action Plan (CAP) (Resolution 269-2018) for planning purposes. The CAP set greenhouse gas (GHG) reduction targets for both the community and Corporation. The CAP included the following actions:

- Support the buildout of EV infrastructure throughout the community.
- Conduct a study to understand how Canmore should prepare for electric vehicles in the community.
- Monitor and assess the applicability of electric vehicles for the Town of Canmore fleet.

2019: In June, the Committee of the Whole was provided an update on the Peaks to Prairies, an initiative started by three Alberta Regional Economic Development Alliances, the City of Calgary and the City of Lethbridge to create a regional electric vehicle charging network for Southern Alberta. Canmore was selected as a host site for one Level 2 charger and one Level 3 (DC fast) charger in Miner's Hall parking lot, at no cost to the Town. ATCO Power is the owner/operator of the stations and is responsible for the costs associated with installing and maintaining the chargers and receives the revenue from EV drivers using the stations.

2020: In October, the Committee of the Whole was provided with a briefing on the results of an Electric Vehicle Fleet Feasibility Study. This study, on a small subset of Town of Canmore fleet vehicles and equipment that were coming due for replacement, analyzed the costs and benefits of transitioning to electric models. Based on the results of that study, the Town received its first administrative electric vehicle in late 2022, with the Municipal Climate Change Action Centre (MCCAC) providing 100% of the costs for the Level 2 charger installation and a \$14,000 rebate for the vehicle. Two more electric vehicles were added to the administrative fleet in 2023. These also received MCCAC rebates.

2022: Council's Strategic Plan (2023-2026) includes the following goals:

- Canmore is a recognized leader in managing human impact on our environment.
- Canmore as a community collaborates to reduce our impact on climate change and prepare for climate adaptation.
- The community is aware of the Town of Canmore's environmental leadership.

DISCUSSION

Project Rationale:

Along with efforts to increase travel by walking, cycling and public transit, EVs are an important component in a strategy to reduce greenhouse gas (GHG) emissions from transportation. EVs also provide the co-benefits of improved local air quality and traffic noise reduction.

In 2022, the Government of Canada set sales targets requiring that at least 20 percent of new vehicles sold in Canada will be zero emission (battery electric) by 2026, at least 60 percent by 2030, and 100 percent by 2035. According to 2022 KPMG poll, 71 per cent of Canadians would consider buying an EV the next time they buy a vehicle.

In consumer surveys, the upfront cost of EVs, battery range, and access to charging are persistent barriers for people contemplating transitioning from an internal combustion engine vehicle to an electric model. Cost and

battery range are mainly in the purview of industry and are improving over time. Access to charging, however, is where governments at all levels have a role.

Access to charging is an essential part of EV ownership, and with EVs expected to be the mainstream passenger vehicle in Canada by the 2030s, there is a need to prepare for this change. While the daily driving distances of many Canmore residents are short enough that they could charge overnight with a regular household outlet (referred to as Level 1 charging), Level 1 charging only equates to about 8 km of range per hour of charge. This is not sufficient for people traveling longer distances (e.g. commuting from Canmore to Calgary). Many EV drivers will require access to a Level 2 charger (requires 240 volt power, similar to a clothes dryer or stove, and can provide up to 40 km of range per hour of charge).

Project Objectives:

The Review aimed to address the following questions and focused mainly on Level 2 charging access for Canmore residents:

1. What are the technical requirements for new residential and commercial construction to be EV “Ready” for Level 2 charging?
2. What are the tools and levers available to Alberta municipalities to require or encourage EV readiness in new construction?
3. How and where should the Town support publicly accessible charging (on both municipal and private land), in order to “fill the gaps” in private charging? (e.g. support EV drivers with no access to at home charging).
4. Are there equity issues the Town should be considering in its approach to EV charging?

Project Results and Recommendations:

The Review highlighted that growth of EVs and EV chargers are fundamentally linked. There is potential for a negative feedback loop where EV adoption is slowed because of concerns there are not enough EV chargers. As a result, fewer chargers are installed because there is not enough demand. Within the context of a time-sensitive need for GHG reduction, EV charger installation must grow prior to market demand to prevent this situation.

The full Review has been included as an attachment and contains more background information and additional recommendations. Key recommendations from the Review are:

Municipal Legislation and Policy

1. Amend the LUB to set minimum requirements for new construction for 100% of parking stalls in new buildings to be “EV Capable”.

Municipalities have the ability to regulate parking stall requirements. As of May 2022, eighteen municipalities in BC, Toronto ON, and Laval QC have modified their Land Use/Zoning bylaws to set requirements for EV charging, with several other municipalities in these provinces actively considering similar action. While both Calgary and Edmonton have completed an in-depth study on home and workplace charging for EVs, as of 2022, no municipality in Alberta has implemented similar changes.

An “EV Capable” stall requires just the infrastructure (conduit, breaker space, distribution panels, etc.) for the future installation of an EV charging station. Building to EV Capable at the time of construction future-proofs buildings to allow for the simple installation of a charging station in the future. EV Capable construction requires the minimum amount of upfront infrastructure installation to remove future cost barriers to EV charger installation.

Multi Unit Residential Buildings (MURB) are one of the most important building types for specific policy and programs to enable EV infrastructure. Research indicates that the cost to retrofit existing MURBs for Level 2 charging is up to four times higher compared to installing charging infrastructure at the time of construction. Beyond the physical retrofit requirements, achieving resident consensus to proceed can be difficult and time-consuming.

2. Update existing Town of Canmore facilities to provide EV parking to lead by example.
3. Update the Engineering Design and Construction Guidelines to reflect impact on parking dimensions, and signage for EV charging stalls, including EV-enabled accessible parking stalls.
4. Begin tracking public EV charging-stall related complaints. If complaints of ICE vehicles parking in EV charging spaces and preventing EVs from charging, start to indicate a significant trend, the Traffic and Road Use Bylaw should be updated to allow enforcement.

Rebates

5. Create a program to provide rebates for Level 2 EV chargers in existing buildings, requiring proof of permit and install by a Master Electrician to ensure chargers are safely installed.

Stakeholder Engagement

6. Identify optimal locations for publicly accessible chargers to support residents without access to home charging.

While adopting requirements for EV readiness in new construction will ensure that future residents can install chargers without the burden of expensive retrofits, this doesn't address existing buildings. People living in apartments, row housing and condominiums without a solution to home-based charging will need the ability to charge an EV away from their home. Additional public Level 2 chargers located in areas where residents tend to spend time can help fill the gap.

7. Maintain developer engagement through regular consultation to understand concerns regarding EV parking requirements.
8. Maintain Utility engagement through regular consultation with Fortis to understand the impact of LUB updates and work to ensure power demand projections provide adequate distribution network capacity for EV charging growth.

Next Steps:

Based on the results and recommendations of this Review, Administration will work to incorporate the recommended changes into the LUB and Engineering Design & Construction Guidelines. This will involve targeted stakeholder engagement with the development community. Administration will bring any proposed LUB amendments to Council later in the year or early next year.

Specific recommendations from this Review will also be considered as part of the development of the Climate Emergency Action Plan, which will be brought to Council for approval in early 2024.

Public Works has put forward capital projects for 2024 to install two Level 2 chargers at both the Canmore Recreation Centre and Elevation Place. All of these will be pay-for-use chargers, with the revenue from EV drivers helping to offset the electricity consumption and installation cost of the chargers. The free artsPlace charger, given to the Town by Sun Country Highways in 2014, will be changed to a pay-for-use charger this year. Administration will continue to look at options for increasing public charging in subsequent capital budgets.

Administration is also exploring using funding from the Sustainability Reserve to offer an EV charger incentive.

FINANCIAL IMPACTS

There are no financial impacts at this time. This report is being provided for information only. The \$15,000 study was funded as a 2022 capital project from the Sustainability Reserve.

STAKEHOLDER ENGAGEMENT

Staff from Planning & Development, Engineering, and Public Works provided input into the Review. Initial conversations have begun with the Bow Valley Builders and Developers Association (BOWDA) representatives regarding this Review and the recommendations.

ATTACHMENTS

- 1) Electric Vehicle Infrastructure: Best Practice Review and Recommendations

AUTHORIZATION

Submitted by:	Amy Fournier Energy and Climate Action Coordinator	Date: <u>March 16, 2023</u>
Approved by:	Caitlin Van Gaal Supervisor, Environment and Sustainability	Date: <u>March 17, 2023</u>
Approved by:	Andreas Comeau Public Works Manager	Date: <u>April 21, 2023</u>
Approved by:	Whitney Smithers General Manager of Municipal Infrastructure	Date: <u>April 27, 2023</u>

Approved by: Sally Caudill
Chief Administrative Officer

Date: May 8, 2023



Electric Vehicle Infrastructure: Best Practice Review and Recommendations

MacLean Consulting
December 2022

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This report has been prepared by MacLean Consulting for the benefit of the Town of Canmore. The preparation of this report was carried out with assistance from Town of Canmore staff. Notwithstanding this support, the views expressed are the personal views of the author.

The information contained herein represent MacLean Consulting's best professional judgment considering the knowledge and information available at the time of preparation. The cost estimates provided as part of the study are subject to change, as such MacLean Consulting does not guarantee the accuracy of such estimates and cannot be held liable for any differences between such estimates and ultimate results.

While every effort has been made to ensure the accuracy of this report, the technologies and legislative considerations described within continue to evolve at a rapid pace and therefore, it cannot be guaranteed that all information is up-to-date. EV charging stations place large loads on the electrical system for long periods of time and there are risks involved if they are not installed correctly. It is imperative that installations are conducted safely and in accordance with all relevant codes and standards.

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Executive Summary

The Town of Canmore's surroundings have fostered an appreciation of nature in its residents that is reflected in its municipal goals. Canmore is committed to being a leader at managing human impact on the environment. This commitment is reflected through all of its municipal plans, but first and foremost through its Climate Action Plan, adopted in 2018.

This plan identifies targets for 20% of vehicles to be electric by 2030, with all neighbourhoods capable of supporting Electric Vehicle (EV) charging, and to have a significant number of fleet vehicles transitioned to either Electric or Hybrid.

Electric vehicle technology is evolving quickly, as is our knowledge of what it will take to transition the world from fossil fuels to electricity in our transportation sector. EV supply is often discussed as the primary barrier to this transition; however, a growing body of research is showing that access to EV charging is just as critical. Without adequate private and public charging available, the EV transition will not grow at the rate necessary to meet Paris Agreement emission reduction targets.

In order to remove charging as a barrier, the number of charging stations must be scaled aggressively, in advance of market demand. In addition to charging points, utility owned electrical infrastructure must be scaled to ensure adequate electrical supply to chargers. To accomplish this expansion all levels of government, including municipalities, must utilize their powers to act in the public's long-term interests.

This study reviews municipal best practices for supporting EV infrastructure in order to highlight what tools are available to the Town of Canmore, and the benefits and drawbacks of these tools, so that it can make an informed decision with respect to EV charging.

The Town of Canmore can take a leading role in supporting the EV transition by implementing the following key actions:

- Amend the Land Use Bylaw to set minimum EV charging requirements for new construction.
- Update existing Town of Canmore facilities to meet the new EV parking requirements.
- Create a program to provide rebates for Level 2 EV charger installation, offering \$600 for home chargers and \$1000 for Multi Unit Residential Dwellings.
- Engage Fortis to ensure power demand projections provide adequate distribution capacity for EV charging growth.

The challenge ahead is daunting, however all the tools necessary are available. By using its powers wisely, and helping the public understand how and why these actions must be taken, the Town of Canmore can demonstrate leadership in Climate Action and do its part to build a more sustainable future.

1. Introduction

The Town of Canmore is proud of its commitment to take meaningful action related to environmental stewardship and climate change, and strives to be a recognized leader in managing human impact on the environment. In 2018 the Town of Canmore adopted its Climate Action Plan, detailing how the municipality will work to reduce harmful emissions that cause climate change within its own operations and the community at large. The overall target is to reduce greenhouse gas (GHG) emissions 30% from 2015 levels by 2030. As part of the plan, Canmore has set targets for 20% of vehicles to be electric, for all neighbourhoods to be capable of supporting Electric Vehicle (EV) charging, and to have a significant number of fleet vehicles transitioned to either Electric or Hybrid¹. In 2019, The Town of Canmore's council declared a State of Climate Emergency, further emphasizing the need for action now.

In order to achieve its goals, the Town of Canmore has identified that it needs to support the buildout of EV charging infrastructure throughout the community. In identifying this, Canmore has joined a growing number of municipalities that see EVs as an important part of reducing community emissions, and EV charging as an important step in facilitating this transition.

While the focus and recommendations of this report are limited to EV charging, it is important to note that EVs are only one part of a much broader and more holistic approach to transportation planning and GHG reduction. The Town of Canmore has established important overarching strategies, including the Integrated Transportation Management Plan, Integrated Parking Management Plan, and 2023 Council Strategic Priorities, which guide the Town's work on transportation as a whole. Any recommendations for EV charging should be integrated with these plans. The lack of discussion of alternative modes in this report is solely due to its defined scope and is not an indication that strategies to enable EV growth should be prioritized over other modes.

¹ 2018 Climate Action plan

2. The Role of EVs in GHG Reduction

Transportation is estimated to account for 25% of GHG emissions nation-wide², with Canmore estimating that transportation emissions are responsible for 40% of community emissions in 2015³. Transitioning from Internal Combustion Engine (ICE) vehicles to EVs is generally acknowledged as one of the effective pathways to reduce transportation emissions, however concerns continue to be raised with this assertion. Criticism centers on the idea that more GHG emissions are created during the construction of an EV than an ICE vehicle and, if the electricity EVs use come from a carbon intensive source, such as coal, EVs will generate more emissions over their lifecycle than an ICE vehicle would. Debate over this issue has led to numerous studies of the lifecycle emissions of EVs to understand if this criticism is true, and under what conditions.

As of 2022, the production of an EV does result in larger construction emissions than a similar sized ICE vehicle, primarily due to the additional activities associated with the mining, refining, and assembling of battery materials. However, the emissions resulting from EV use are less than a comparable ICE vehicle. How much less depends on the amount of GHG emissions produced to generate the electricity that the EV uses.

In 2015, the Union of Concerned Scientists addressed this issue in a report called “Cleaner Cars from Cradle to Grave”. Focused on the United States, it found that even in the region with the most carbon intensive electricity, driving an average EV was equivalent to driving an ICE vehicle with a fuel economy of 29MPG. As of 2020, this had increased to 42MPG⁴, primarily because electrical grids transitioned to lower-emission technology.

In 2017, Simon Fraser University Laboratory for Alternative Energy Conversion performed a similar analysis. In this study, which assumed the Alberta electricity generation mix to include 67% coal, they found that EVs have lower lifetime emissions than ICE vehicles after 50,000 km of use. Alberta’s electricity generation mix as of 2021 has only 20% of power generation coming from coal⁵, with coal to be eliminated completely by 2023. This will result in electricity that emits roughly half the emissions as what was assumed in the study, further lowering the kilometers of use before EVs have a lower overall impact.

In 2021, the International Council on Clean Energy Transportation again studied this issue, this time at a global level. It found that as of 2021, in every region on earth, EV use would result in a total reduction in lifecycle emissions of at least 19%, even in heavily coal-powered regions (India), with both Europe and the United States providing life cycle reductions of greater than 60%⁶. This study also determined that “only battery electric and hydrogen fuel cell electric

² Government of Canada Zero Emission Vehicle Infrastructure Program, <https://www.nrcan.gc.ca/energy-efficiency/transportation-alternative-fuels/zero-emission-vehicle-infrastructure-program/21876>

³ Town of Canmore 2015 Community GHG Inventory

⁴ Reichmuth, David, “What Are the Benefits of Switching from Gasoline-Powered Cars and Trucks to Electric?,” Union of Concerned Scientists, <https://blog.ucsusa.org/dave-reichmuth/what-are-the-benefits-of-switching-from-gasoline-powered-cars-and-trucks-to-electric/>

⁵ Shaffer, Dr. Blake, “Alberta steps closer to ending coal power, faster than many expected. But then comes the hard part,” CBC News Calgary <https://www.cbc.ca/news/canada/calgary/opinion-alberta-end-coal-power-natural-gas-solar-wind-nuclear-1.6300606>

⁶ Bieker, Georg, *A Global Comparison of the life-cycle Greenhouse Gas Emissions of Combustion Engine and Electric Passenger Cars*, International Council on Clean Transportation, 2021

vehicles have the potential to achieve the magnitude of life-cycle GHG emissions reductions needed to meet Paris Agreement Goals”, also concluding that “there is no realistic pathway for deep decarbonization of combustion engine vehicles”.

Concern regarding the effectiveness of EVs has not stood up to detailed analysis; Even the most emission intensive electrical generation still results in lower overall emissions from EVs. As electrical grids, like Alberta’s, continue to decarbonize, the total emission reduction from transitioning to EVs will increase. I

3. Expected Growth in EV and Charger Use

The demand for EV charging infrastructure depends on the expected growth in EV use. Globally, the modern market for EVs started in 2008 with the Tesla Roadster. In the 14 years since, EV use has grown consistently, with the International Energy Agency (IEA) estimating that there were over 10 million electric cars on the road globally as of 2021⁷. It anticipates that number will grow to over 150 million by 2030.

National growth in EV use has followed a similar trend, and use is very likely to continue to grow in the future. A key factor sustaining future growth is Canada’s participation in the Electric Vehicle Initiative, made up of 10 countries, all of which have committed to a goal of achieving a 30% market share for sales of EV vehicles by 2030. To support this, in its 2022 budget, the federal government has committed to a sales mandate ensuring at least 20% of new light-duty vehicle sales will be zero-emission vehicles by 2026, at least 60% by 2030 and 100% by 2035. It has also committed \$1.7 billion over five years to extend the Incentives for Zero-Emission Vehicles (IZEV) Program and \$400 million over five years to fund the deployment of ZEV charging infrastructure in sub-urban and remote communities⁸

At the Provincial level, historic growth trends remain similar. In 2017 there were 377 EVs registered in Alberta. As of 2021 that number had grown to 3,527— a consistent growth of 75%. In estimating future growth, the Alberta Electric System Operator (AESO) in its 20-year long term outlook estimates by 2041 between 195,000 (~23% growth) and 1,960,000 (30% of total vehicle stock) EVs will be registered in Alberta⁹. These numbers can be used to help understand what growth the Town of Canmore can expect.

Historically, the Town of Canmore has adopted EVs at a rate similar to national and provincial levels. In 2016, there was a single EV registered in Canmore— by 2022 there were 65. Though small in numbers, this is consistent growth of 80%. AESO’s conservative growth projections for the future suggest roughly 420 EVs will be registered in Canmore by 2030, with 3,500 by 2040. The aggressive assumption would result in roughly 460 EVs by 2030 and 3,800 EVs by 2040, assuming no overall growth in vehicle use or changes in Canmore’s population. It should be noted that these projections are only for Battery Electric Vehicles (BEVs). While plug-in hybrids (PHEV) are also considered EVs, they are grouped with Hybrid Vehicles in provincial and federal statistics.. Section 5 will discuss the various forms of EVs, what is important to know is that vehicles besides BEVs can also use chargers, further increasing demand. For reference, the Town of Canmore’s currently stated goal of having 20% of all vehicles electric by 2030 would require roughly 2,600 EVs by 2030. As of 2022, 65 BEVs were registered to a Canmore address,

⁷ *Global EV Outlook 2021*, International Energy Agency, 2021

⁸ Government of Canada, “Clean Air and a Strong Economy” in *Federal Budget 2022*

⁹ AESO, Section 3.2.3.2 in *AESO 2021 Long-term Outlook*

0.5% of all vehicles. The current goal of having 20% of all vehicles electric by 2030 is far above even the aggressive adoption estimation, and should be revised to a more achievable target.

Current estimates indicate that in order to maintain high EV adoption rates, 1 public charger is needed for every 10-15 EVs, in addition to home charging stations^{10 11}. Public chargers are chargers that are available to the public for use, and could be on public or private land and publicly or privately owned.

Assuming that 3,700 EVs are registered in Canmore by 2040 (the average of conservative and aggressive estimates), between 247-370 public chargers will be needed. As of 2022, there are 14 public chargers¹². Meeting the estimated future demand would require the equivalent of adding 13 public charging points every year. Meeting the Town of Canmore's current target of having 20% of all vehicles electric by 2030 would require 250 public charging points by 2030, or 30 public charging points added every year.

Growth of EV use and EV chargers is fundamentally linked. The challenge this leads to is the potential for a negative feedback loop where EV adoption is slowed because of concerns there are not enough chargers. As a result, fewer chargers are installed because there is not enough demand. Within the context of time-sensitive goals for GHG reduction, EV charger installation has to grow prior to market demand in order to ensure that this loop does not occur.

4. EV Fundamentals

Before discussing EV charging, it is important to review the current state of EVs. Over the last 10 years, EVs have grown from a luxury/niche technology into a transportation revolution. As with any disruptive technology, there are many alternative approaches explored in early development before the most competitive concepts emerge - EVs are no different. Table 1 summarizes the major types of EVs in various stages of production and planning.

¹⁰ Cage, Fielding, "The Long Road to Electric Cars", Reuters Graphics, <https://www.reuters.com/graphics/AUTOS-ELECTRIC/USA/mopanyqxwva/>

¹¹ Banks, Brian and Jarratt, Emma, "The real story on how many EV chargers Canada actually needs," Electric Autonomy Canada, <https://electricautonomy.ca/2022/07/14/how-many-ev-chargers-does-canada-need/#:~:text=To%20achieve%20the%20recommended%20ratio,million%20public%20chargers%20by%202050.%E2%80%9D>

¹² "Canmore, Alberta EV Charging Stations Info," Chargehub, Accessed December 2022, <https://chargehub.com/en/countries/canada/alberta/canmore.html>

Table 1 – Major EV Types Available and in Development

Type	Description	Charging Required?	Status
Hybrid Electric Vehicle (HEV)	Powered by an internal combustion engine and electric motor(s). Primary energy source is fossil fuels. Energy from driving can be stored in a battery for later use to improve efficiency.	NO	Large scale Production
Plug-in Hybrid Electric Vehicle (PHEV)	Powered by an internal combustion engine and electric motor(s). Energy Source is combination of fossil fuels and electricity from external charging.	YES	Large Scale Production
Battery Electric Vehicle (BEV)	Powered by electric motor(s). Primary fuel source is electricity from external charging.	YES	Large Scale Production
Fuel Cell Electric Vehicle (FCEV)	Powered by a fuel cell and electric motor(s). Primary energy source is hydrogen. Energy from driving can be stored in a battery for later use to improve efficiency.	NO	Limited Production
Plug-in Fuel Cell Electric Vehicle (PFCEV)	Powered by a fuel cell and electric motor(s). Energy Source is combination of hydrogen and electricity from external charging.	YES	Concept

While the future undoubtedly holds further innovation, it is clear that EV charging will be critical.

With so many options it is important to clarify terms. For the remainder of this report, EVs will be defined as vehicles that:

- 1) Use electricity for propulsion, and
- 2) Can use an external source of electricity to charge the vehicle’s batteries.

This includes PHEV, BEV, and PFCEV, but does not include HEV or FCEV. It also does not include e-bikes or e-scooters.

5. Barriers to EV Use

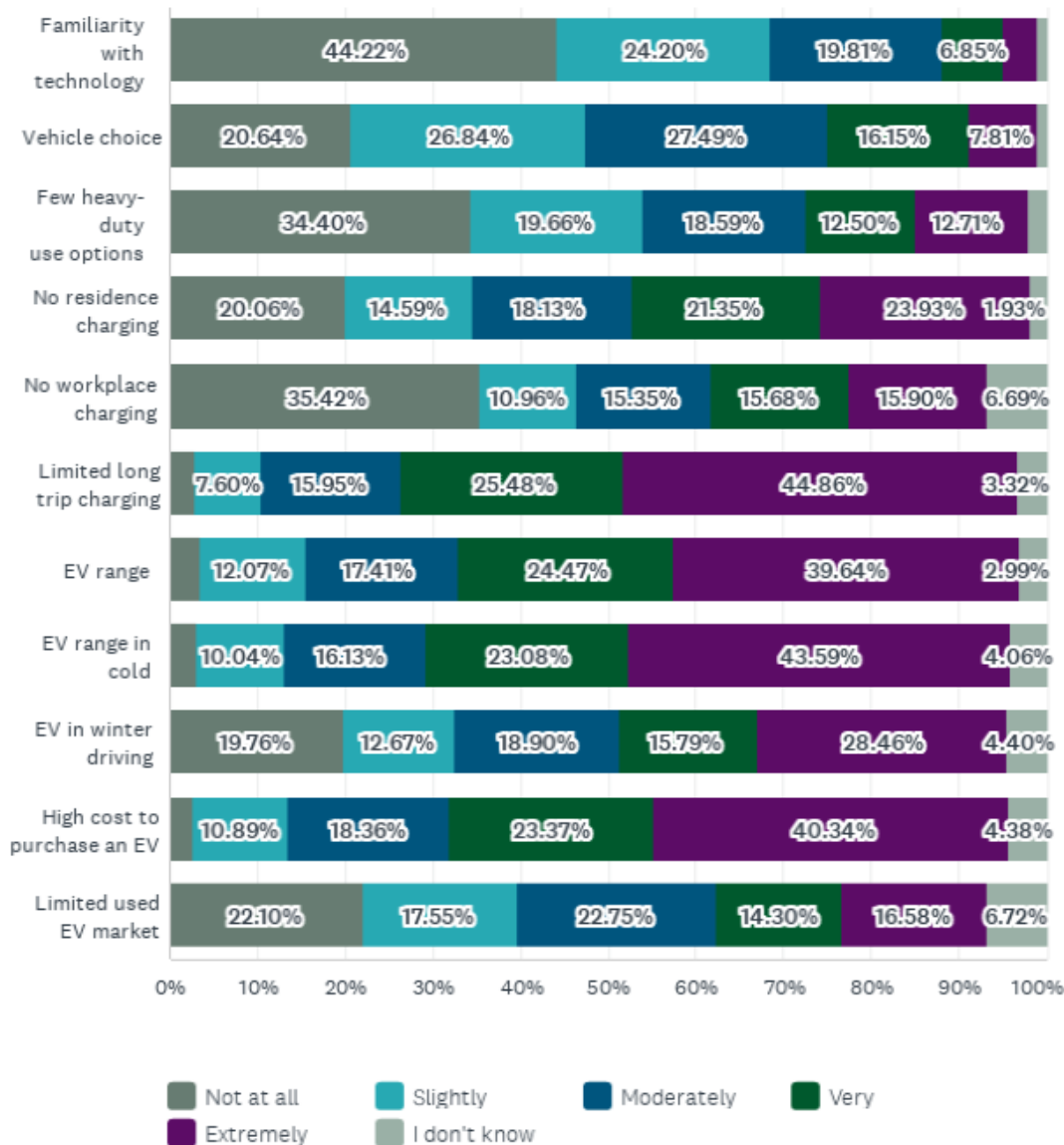
As society looks to accelerate the EV transition, significant research has been conducted into the barriers to EV adoption. These studies consistently suggest the same factors: Lack of knowledge of EVs and EV chargers, limited supply of EVs, high price of EVs, and access to charging.

Concern regarding access to charging stems primarily from lack of charging access at home, perceived lack of public charging, and inconvenient public charging (parking time does not match charging time).

In May 2022, the Community Energy Association (CEA) completed the Regional EV Charging Strategy for a group of Ontario municipalities interested in understanding what the most common and perceived barriers to EV adoption were. CEA surveyed 1,015 individuals who did not own an EV and found that 44% of respondents were extremely or very concerned that they did not have residence charging, while 69% were extremely or very concerned with limited long trip charging (public charging). Similarly, 54% of respondents were extremely or very concerned with EV range, which stems from the perceived lack of public charging infrastructure. These results reinforce that access to charging is an important barrier to adopting EVs which must be addressed to ensure large scale transition.

Figure 1: Barriers to EV Adoption – Regional EV Charging Network Strategy

Question 18: Listed below are some of the most common real and perceived barriers to EV adoption. How concerned would you be about the following when purchasing an EV?

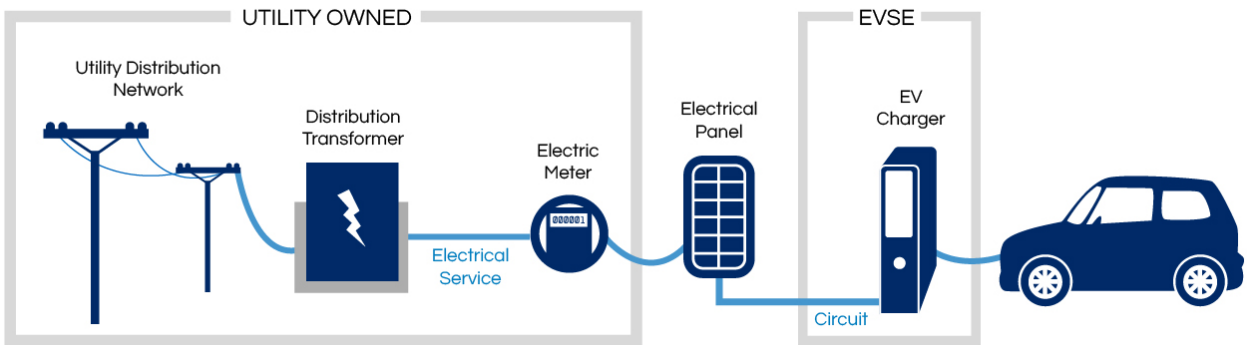


* Source: Regional EV Charging Network Strategy – Clean Air Partnership

6. EV Charging Fundamentals

With EV charging, it is important to be familiar with the fundamentals. First and foremost, EV charging involves more than just a charger. Delivering electricity to an EV requires a chain of infrastructure, flowing from the Utility Distribution Network, to the Distribution Transformer, to the Service Connection, Meter, Electrical Panel, Circuit, and into the EV charger. Each link in this chain needs to be considered as it can impact the total installed cost and performance of the charger.

Figure 2: EV Charging Infrastructure Chain



*Source: Adapted from M.J. Bradley & Associates

6.1. Utility Distribution Network

The Utility Distribution Network is the set of local power lines, powered from a distribution feeder. The Town of Canmore distribution network is owned and operated by Fortis Alberta and the network components have been sized to support historic demand and expected growth. These forecasts are conducted at a local level and include developments that could affect demand such as: historical feeder peaks, committed loads, and known development. The current forecast estimates two of the three feeders supplying the municipal area will have roughly 6% peak electrical carrying capacity remaining by 2030, with the third feeder having approximately 25% remaining. The forecast does not include future EV growth and only accounts for existing chargers¹³.

Given the forecast assumptions, it is likely that a large uptake in EV use will result in capacity issues at the Distribution Network level if upgrades to this infrastructure are not made. The Alberta Utilities Commission will only allow for upgrades to take place when necessary, so the Town of Canmore will have to work closely with Fortis to ensure forecasted energy use accounts for expected EV use, and that upgrades can be justified to avoid capacity constraints.

¹³ Correspondence with Fortis via Town of Canmore staff, Nov 2022

6.2. Distribution Transformers

Distribution Transformers are used to reduce the higher voltage of the distribution network to the lower voltage of the Service Connection. Distribution Transformers can be many sizes, from the cylindrical pole-mount type seen on residential power poles, to larger pad-mounted and vault-mounted units. The number of customers fed by a Distribution Transformer depends on the power demand of connected customers. If planned for in construction, EV charging load can be included in the sizing calculations to determine if another transformer is required, and what size. For large groups of chargers, such as charging hubs, a dedicated transformer is often required. When installing EV chargers—even a single charger in a residential setting—the additional load may be beyond the capacity of the existing Distribution Transformer, requiring the installation of an additional transformer, substantially increasing project cost. It is possible to avoid this in a residential setting by using an Electric Vehicle Energy Management System (EVEMS), but Multi Unit Residential Buildings (MURBs) and charging hubs are likely to require transformer upgrades.

6.3. Service Connection, Panel, Meter, and Circuit

The Service Connection, also known as a service drop or service lateral, is the collection of wires that carry electricity from the Distribution Transformer to the Electrical Panel. These wires are selected from standard sizes based on the anticipated load, described in Amperes or Amps, using the symbol A (units of electrical current). For example, most single-family dwellings would have a Service Connection of 100A, though Fortis will require 200A for homes 2,000ft² or greater.

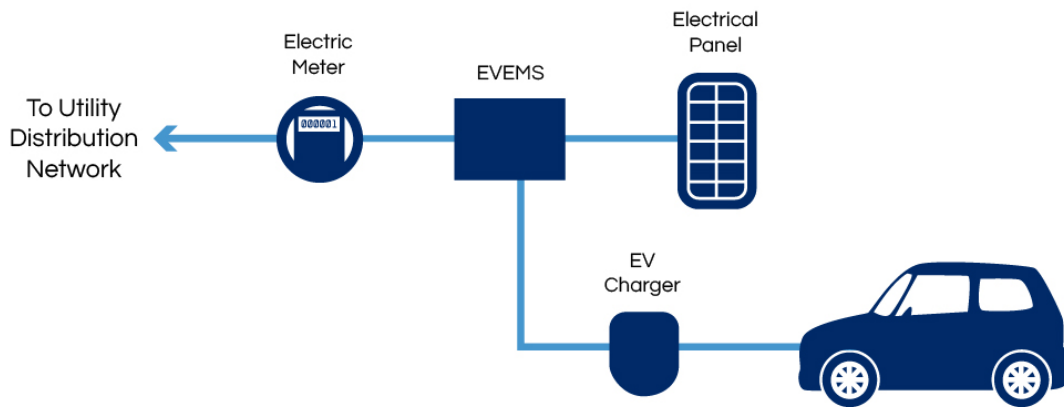
The electrical panel size is similarly selected based on this rating. Panels contain a set number of positions for circuit breakers, each of which is designed to automatically disconnect the attached circuit if an overload is detected. Different EV Charger types have different amp requirements: Level 1 Chargers require a minimum 15 Amp single pole breaker, Level 2 chargers require a minimum 40 Amp double pole breaker and Level 3 chargers require a minimum 400 Amp breaker. As per Section 86 of the Canadian Electrical Code, EV chargers require a dedicated electrical circuit, meaning that no other kind of device can be powered by the wire or breaker that supports a charger in the electrical panel. Though it is possible to utilize EVEMS to share a single circuit to power multiple chargers. Sharing a single circuit can result in a longer charge time than a dedicated circuit, but with Level 2 chargers this can still be adequate for user needs. The rate of charge should be determined by an experienced professional prior to or during the planning phase.

When adding an EV charger to existing construction there are several potential complications. Firstly, the electrical panel may not have enough physical space for additional circuit breakers. Secondly, it may not have sufficient electrical capacity remaining. If physical space is not available, either the panel size will have to be increased, or a sub-panel installed. If there is not enough electrical capacity remaining, the Service Connection and Panel will have to be upgraded.

It may be possible to avoid these upgrades through the use of an EVEMS. EVEMS are installed after the meter, but before the panel, and work by restricting the connected load (EV charger) so that the total load never exceeds available capacity of the Service Connection.

Any of the situations where modifications are required will increase the cost of installation, however rectifying issues in residential installs is typically less expensive and complex than in MURBs, given the relative increase in load compared to capacity.

Figure 3: Location of EVEMS in Infrastructure chain



*Source: Adapted from Delphi Group

6.4. Chargers

Once the supply infrastructure is properly sized and installed it is time to select an EV charger. As EVs have developed, so have EV chargers, with more options becoming available every year. Chargers come in different power levels, different plug types, and with a range of potential features. It is important to be familiar with each of these aspects to know which charger is appropriate, and to understand where EV charging is headed in the near future.

6.4.1. Charger Levels

EV chargers come in three levels: Level 1, Level 2, and Level 3 (also known as Direct Current Fast Charging, or DCFC). Table 2 details the key parameters of each charger type.

Table 2: Charger Level Operational Parameters

	Level 1 (AC)	Level 2 (AC)	DCFC
Typical Output	1.5 kW (120 Volts)	7.2 kW (240 Volts)	50 kW – 350 kW (400 to 800 Volts)
Range Added per Hour (approximate)	8 km	40 km	300+ km
Equipment and installation costs	\$150 - \$1,500 ^a	\$5,000 - \$10,000	\$50,000 - \$200,000
Typical use locations	Some homes, workplaces, public spaces	Homes, workplaces, public spaces	Major corridors, public spaces
Used by	BEV and PHEV	BEV and PHEV	Primarily BEVs

*Source: City of Toronto Electric Vehicle Strategy - 2019

Due to their low power output, Level 1 chargers are the cheapest to purchase and install. These chargers are best used when the EV has low daily use, or will be parked for multiple days in between use. If an EV is outside during extreme cold (below -25C) these chargers may not be able to add any range, as all power will be used to maintain the temperature of the battery. With their ease and flexibility of use, EV owners should experiment meeting their charging needs with Level 1 chargers before investing to install a Level 2 charger.

Level 2 chargers are more expensive to purchase and install, however their higher power output allows an EV to be completely charged overnight, and can continue to add range even in extreme cold. This makes these chargers popular for use at home and in parking lots with multi-hour use, such as business lots or shopping centers.

Level 3 chargers are the most expensive to purchase and install, as their high power demand can require large, dedicated supporting infrastructure. They also have the highest power output however, allowing an EV to be charged within an hour. This makes these chargers popular for use during longer road trips, resulting in installations near desired stopping locations like rest areas, shopping centers, convenience stores, restaurants, and parks or playgrounds.

The primary factor in both charger type and location is driver behaviour and charging availability expectations. The average Alberta vehicle owner drives 42km per day¹⁴. Driving from one end of Canmore to the other, Banff Woods Lodge in Harvie Heights to Stewart Creek Golf & Country Club in the southeast for example, is 11.5km. The distance from Banff to Canmore is 24km. While Canmore-specific data was not available, given these distances, it is likely that the average daily distance driven by residents of Canmore aligns with the provincial average.

Given their cost, Level 1 and 2 chargers are best suited to this driving profile, with Level 1 chargers replenishing this range in approximately 7-10 hours, and a Level 2 charger in approximately 2 hours. As charger accessibility is a concern among EV drivers and the cost is relatively low, Level 2 chargers are the most popular installation, either at home, at work, or at public locations where likely parking time matches expected charging time.


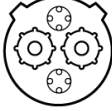
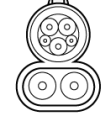

Visitors to Canmore will likely be driving much farther than 50km. Some will use publicly available Level 2 chargers; others will use Level 3. According to ChargeHub.com, of the 14 public EV chargers in Canmore, 7 are Level 2 and 7 are Level 3, demonstrating this split in preference.

6.4.2. Plug Types

Chargers also come with a variety of plug types depending on level and manufacturer, shown in Table 3. Most electric vehicle manufacturers utilize the J1772 for Level 1 & 2, with the North American standard for Level 3 being CCS1 as of 2022. As Tesla was the first-to-market with EVs and chargers they established their own standard for plug type. Tesla vehicles can utilize non-Tesla chargers via an adapter and non-Tesla vehicles can utilize Tesla Destination chargers (Level2) via an adapter, but non-Tesla vehicles cannot use Tesla Superchargers (Level 3).

¹⁴ Natural Resources Canada, "Canadian Vehicle Survey," 2008

Table 3: EV Charger Connection Types

Plug Type	Charger Level	Compatibility	Plug Shape
Port J1772	Level 1 & 2	100% of EVs (with adapter)	
CHAdeMO	DCFC (Legacy)	Pre-2022 Nissan & Mitsubishi	
SAE Combo CCS	DCFC	100% of EVs post 2022 (with adapter)	
Tesla Connector	Level 2 (Destination)	100% of EVs (with adapter)	
	DCFC (Supercharger)	Tesla only	

*Source: adapted from Chargehub - How to Charge Your Electric Car with Charging Stations

6.4.3. Non-Networked and Networked

Non-Networked chargers are simple, powered-only chargers. The most inexpensive, they are unable to track usage info and so cannot provide billing, consumption breakdowns, and other popular features. They are also incapable of sending alerts in case of issues. A physical visit is required to determine if the charging station is working properly.

Networked chargers (“Smart chargers”) are connected to a larger group of chargers operated by a common central management system. Networking allows for tracking energy usage to various users, enabling billing and payment collection, app integration, charge monitoring, reports, scheduling charging times, dynamically varying the charging rate to limit total power draw, charging only when excess solar power is available (if solar panels are integrated), and remotely identifying performance issues requiring maintenance depending on the unit purchased. If a networked charger is desired, consideration must be given to how the charger will be connected to the network. Wired and wireless connections each have their own infrastructure requirements in addition to supplying power.

6.4.4. Closed and Open Networks

Networked chargers can be either be closed or open. Closed networks do not allow chargers to be separate from the manufacturer’s central management system, requiring the charger owner to use only the manufacturers’ network. Tesla chargers currently operate on a closed network.

Open networks allow the physical charger to connect to different central management systems. The intent is to provide flexibility to charger owners, if, for example, their network provider ceases to exist. A charger owner can connect to a different network at any time. This setup is similar to the relationship between cell phones and cell networks. This is accomplished through the Open Charge Point Protocol (OCPP).

6.4.5. Future Developments

Several developments are likely to see wide-scale adoption in the near future. Bi-directional charging is one such development, which comes in three types. Vehicle-to-Grid (V2G), Vehicle-to-Home (V2H), and Vehicle-to-Load (V2L). V2G chargers allow a vehicle to put energy back into the grid. This would allow power companies to use connected EVs as a distributed battery electrical storage system to stabilize the grid, and allow participants to be paid for this service. V2H chargers allow the connected EV to put energy back into an electrical panel, such as during a power outage. V2L EVs can be connected directly to a load, such as an appliance or another EV. All these features require EVs that support bi-directional charging (9 models exist as of 2022). V2G and V2H would also require purpose built bi-directional chargers, which are more expensive than unidirectional chargers. In addition, V2G and V2H would require modifications to the electrical panel to prevent back-feeding to the grid during a power outage and V2G would require the installation of a bi-directional meter. While V2H and V2L are now commercially available, V2G is still considered under development.

In addition to bi-directional charging, wireless charging is another development that will potentially see wide-scale adoption in the near future. In this concept, the plug connection between charger and EV is replaced with two wire coils, one installed on the bottom of the EV, the other in the parking space underneath the vehicle. The transmitting coil is controlled to induce an electromagnetic field which spans the air gap to the receiving coil, which converts the field back into electrical current. As of 2022 these systems have only been deployed in South Korea, however three Chinese automakers are including receiving coils in some of their EV models as of 2023. Even if this technology is widely adopted in North America, it still requires the same electrical infrastructure to power it, so time and money invested in the infrastructure supporting the charger will not be wasted.

7. Safe EV Charger Installation

Unfortunately, Level 2 chargers can be purchased with a 240V plug attached, allowing them to be installed in an existing 240V socket without requiring a permit. This can be an attractive idea for EV owners who would like Level 2 charging at home, but do not want to pay for a dedicated circuit. This approach can be dangerous, as it can lead to serious incidents, including fires, if there are any problems with the wiring.

The most common source of 240V plugs is an electrical dryer or range. Electric dryers can draw up to 5kW, electric ranges up to 6kW. Level 2 chargers can draw over 7kW. Installing in an existing plug assumes that the wiring in the wall, the associated circuit breaker, panel, service connection, and distribution transformer all have adequate capacity for EV charging. It also assumes that the wiring in the wall and circuit have been installed correctly and have not been damaged or degraded over time. At these power levels, mistakes can quickly lead to fires. Level 2 Chargers with plugs are intended for 240V plugs and circuits that have been dedicated to EV charger use. Installing a properly permitted, dedicated circuit, will minimize the risk of an incident.

Another important aspect of proper installation is to notify the local utility. This step is critical to ensuring capacity is available and there are no challenges with local power supply. ENMAX and EPCOR have found that as few as three Level 2 chargers on a typical distribution transformer in a residential setting can result in local system faults and blackouts¹⁵. By notifying the utility, it also ensures that they are aware a charger is in place and can account for this in load forecasting, ensuring that higher level of infrastructure is appropriately upgraded to account for EV demand.

8. Defining EV Charging Readiness

With so many details and types of infrastructure supporting the final charging application, some definitions have been developed to concisely describe the key stages of development.

“EV Capable” means that sufficient electrical capacity is available for future EV charging load. This requires that electrical equipment (e.g. distribution panels) be installed and wall and floor penetrations or conduit, be completed as required to accommodate future EV charging cabling.

“EV Ready” means that in addition to EV capable requirements, parking spaces have an energized electrical outlet capable of supporting EV charging (e.g., 40 A and 240 V) as well as the installation of dedicated/shared branch circuits, breakers, receptacles, and other equipment or controls, such as EVEMS.

“EVSE Installed” means that in addition to EV Ready requirements, an EV charging station has been installed and is operational.

Figure 4: EV Charging Readiness Levels



*Source: Adapted from Go Electric Kamloops: EV Ready Homes

¹⁵ ICF Canada, *Electric Vehicle Home and Workplace Charging Study*, 2020

9. Anticipated Costs

An in-depth study of the cost of EV charging infrastructure in various types of construction was published in April 2022 by the Clean Air Partnership¹⁶. It examined several different combinations of installation types and EV ready extents in 4 different housing types and also compared cost between install in new and existing construction. Installation types and extents included:

- Dedicated circuits on a 40A, 20% EV Ready
- 4-share on 40A, 20% EV Ready
- Dedicated circuits on 40A 100% EV ready
- 3-share on 40A 100% EV Ready
- 4-share on 40A 100% EV Ready
- 10-share on 80A, 100% EV Ready
- 4-share on 40A w/ service Monitoring, 100% EV ready

The findings are summarized in the table below. Costs are on a per charger basis, including infrastructure upgrades. In every category examined the cost to install a similar configuration in existing construction was at least three times the cost to install in new construction, highlighting that the most cost-effective time to install infrastructure is during construction.

Table 4: Estimated EV Charger Installation Unit Costs by Dwelling Types

	New	Existing
High Rise	\$1,609 - \$5,382	\$6,250 - \$20,732
Mid Rise	\$1,508 - \$5,396	\$5,469 - \$19,664
Townhouse	\$2,150 - \$4,847	\$6,616 - \$14,281
Single Family	\$1,750 - \$2,500	N/A

*Source: Adapted from Clean Air Partnerships – EV Ready Requirements for Municipalities

The most important factor in managing cost was the use of EVEMS to share a dedicated EV circuit. This allowed multiple chargers to be serviced by the same dedicated circuit, reducing the number of circuits required, the associated potential peak demand, and the infrastructure costs to install additional circuits and ensure upstream electrical capacity in the panel, service, and Distribution Transformer. While this arrangement does lower the power delivered to each charger, increasing the charging time of connected vehicles, if the longer time can still meet the needs of users, it can be more cost-effective. A study outlining user needs should be conducted prior to installing EV infrastructure to determine if, and how, EVEMS should be used.

Rebates can also reduce the cost of installation, if available. Currently there are no grants applicable to residents of Canmore, however there is a grant from the Municipal Climate Change Action Centre available to municipalities and businesses. The SouthGrow Electric Vehicle Charging Program specifically funds the installation of chargers in public spaces with up to 46% of total costs to a maximum of between \$5,000 and \$75,000 per charger depending on level and power output.

¹⁶ Clean Air Partnership, *EV Ready Requirements for Municipalities*, 2022

9.1. Multi Unit Residential Buildings (MURBs)

In addition to monetary costs, retrofitting MURBS carry an additional time cost associated with joint ownership of land. Properly installing EV chargers and supporting infrastructure in existing MURBs is an expensive and detailed process. This process is unlikely to even begin until a champion who is willing to dedicate the necessary time for the project emerges. Even then, each installation is unique, requiring specialized assistance to properly assess needs and determine the likely cost to address physical and technical challenges. Building consensus to proceed can be difficult and time-consuming if a significant portion of owners do not own EVs and do not consider the installations of chargers as potential benefit to property value. In addition, MURBS likely do not have governance in place to manage billing for EV charging, and also may not have clear ownership of parking stalls or bylaws to manage parking. Modifying condo and strata legislation can be its own challenging and lengthy process. Combined, these factors present significant hurdles for those in existing MURBS to obtain access to EV chargers at home. These challenges underline the significant benefit to anticipating EV charging in new construction of MURBs.

10. Applicable Legislation

The infrastructure supporting EV use is subject to a wide range of legislation from all levels of government. Awareness of the applicable legislation is important to ensure that all laws are respected and that installations follow best practices to ensure public safety and trust. Each section below highlights important legislation and how it relates to EV charging. This should not be considered an exhaustive list. It is anticipated that the number of applicable legislations will continue to grow in number and extent as EV use expands and new technology develops. For this reason, it is important to ensure that legislation is continually reviewed, and to work with experienced EV professionals who stay up-to-date on legislative changes.

10.1. Canadian Electrical Code

The Canadian Electrical Code (CEC) is published by the Canadian Standard Association (CSA) and updated every 3 years. Provinces then adopt the latest edition at their discretion. The current CEC in force in Alberta is CSA C22.1-21 Canadian Electrical Code (25th Edition), which was declared in force on Feb 1, 2022.

The CEC contains several sections that are relevant to EV charging, specifically Section 8 – circuit loading and demand factors, Section 84 – Interconnection of Electric power Production Sources, and Section 86 – Electrical Vehicle Charging Systems.

Together these establish rules to calculate electrical load and demand factors, rules regarding when Electrical Vehicle Energy Management systems (EVEMS) may be used, the requirement for a dedicated circuit for chargers, where chargers can be located, and how they should be labelled.

10.2. Alberta Electrical Utility Code

The Alberta Electrical Utility Code is published by the Safety Codes Council of Alberta. The edition currently in force is Alberta Electrical Utility Code, 5th Edition, 2016, declared in force

on May 1, 2017, however, this will soon be updated as the sixth edition was completed in August 2022. This code is intended “to establish minimum safety standards for the installation and maintenance of electrical utility systems in Alberta”¹⁷. It is most applicable to the infrastructure owned by utility companies, but can influence EV charging when work is conducted at the distribution transformer level, or if construction is located near underground transmission lines.

10.3. Electricity and Gas Inspection Act

The Electricity and Gas Inspection Act (EGIA) is “federal legislation that was created to ensure accuracy in the trade of electricity and gas bought and sold on the basis of measurement”¹⁸. Measurements Canada is the federal agency responsible for its administration.

Measurements Canada is currently developing standards specifically for EV charging. EV chargers that bill on a flat rate, time-based rate, or blended rate (with parking costs) are currently exempt from the EGIA. EV chargers that can measure individual user consumption (kWh) are still subject to EGIA and must be registered as measuring devices with Measurements Canada to ensure there is a responsible party on record should the charger be found to not meet standard or if there are accusations of unfair practices.

10.4. Alberta Utility Commission Act

The Alberta Utility Commission (AUC) Act is intended to “ensure that customers receive safe and reliable service at just and reasonable rates”¹⁹. The AUC does not have any regulations on EVs and EV chargers, though this may change with the introduction of Vehicle-to-Grid chargers. The AUC can impact charging as it has the authority to reject upgrades to utility infrastructure they deem as unnecessary in order to prevent costs being passed on to the rate-payers. While these decisions are rare, this has the potential to lead to capacity restrictions in Distribution Networks if demand increases faster than projected. This should not be an issue if EV growth is factored into demand forecasts.

10.5. Alberta Condominium Property Act

The Alberta Condominium Property Act does not relate to EVs or EV charging directly, however, it does determine the processes which condominiums must follow to amend bylaws. Bylaws amendments must be passed by special resolution, requiring agreement from 75% of those with voting rights. This can represent a significant hurdle to retrofitting EV charging in condos as additional bylaws are often required to establish rules for parking and billing.

10.6. Alberta Safety Codes Act

The Alberta Safety Codes Act is intended to establish “a unifying framework for the administration of ten safety disciplines which each have their own safety codes and standards”²⁰. This Act requires an electrical permit to be issued to install, alter, or add to an

¹⁷ Safety Codes Council, *Alberta Electrical Utility Code*, Sixth Edition, 2022

¹⁸ Measurements Canada, *National Compliance Policy for the Electricity and Gas Inspection Act*, 2004

¹⁹ Alberta Utilities Commission, “How distribution rates are set”, <https://www.auc.ab.ca/distribution-rates/>

²⁰ Province of Alberta, “Safety Codes Act”, <https://open.alberta.ca/publications/s01>, Last Updated November 16, 2022

electrical system. The act also stipulates how organizations can be accredited to supply permits. The Town of Canmore is currently not accredited for electrical permits. Electrical permits are obtained through accredited agencies operating in the area which can be found on the Alberta Safety Code Council website.

10.7. Municipal Bylaws, Policies, Standards, and Schedules

Canmore has several relevant Bylaws and Policies. These include the Land Use Bylaw, Traffic and Road Use bylaw, Parking-in-lieu Policy, Engineering Design and Construction Guidelines, and Fee Schedule.

The Land Use Bylaw currently dictates required parking amounts. While this does not currently include reference to EV, this is the most likely area that changes would occur.

The Traffic and Road Use Bylaw defines what parking infractions can be enforced by the municipality. Similar to the Land Use bylaw, it does not currently reference EV, but could be updated to enforce rules regarding EV spaces.

The Parking-in-lieu policy acts as a stop gap when new development cannot or choose not to meet Land Use Bylaw requirements for parking spaces. This policy allows developers to pay-in-lieu. As a result, any changes to the land use Bylaw for EV parking need to be reflected in this policy.

The Engineering Design and Construction Guidelines ensure consistent development of site elements, including parking. Provisions for EV parking must be reflected in this document, e.g. location of charger relative to parking space, parking spaces are adequately sized given charger location, appropriate signage is defined.

Lastly, the Fee Schedule dictates rates for various services rendered. If the Town of Canmore decides to construct its own public charging infrastructure, the charging rates would be contained in this Schedule.

11. Equity Considerations

Whenever public money is being spent it is important for municipalities to ensure that it is done so in as equitable a way as possible to maintain public trust. With EV charging there are several aspects of equity to be considered: Access to EVs, access to charging, access to parking, and who receives public money.

Equity with regards to **access to EVs** is focused on ensuring residents have equal opportunity to decarbonize their transportation emissions. EVs are currently more expensive than ICE vehicles, creating an inherent inequality in their ownership. Even when EVs reach price parity, owning a private vehicle can be beyond the means of some. This concern can be addressed by supporting other low emission transportation options, such as car share (EVs or conventional ICE vehicles), e-bikes and e-scooters, electrification of public transit, increased public transit options, or the improvement of active transportation facilities.

Equity with regards to **access to charging** is focused on ensuring that all residents have equal access to chargers. This has elements for both public and private charging. For public charging, this means that residents should have to travel roughly equal distances to get to public chargers.

Given the geographical extent of the Town of Canmore, this is not likely to be a concern so long as public chargers are located centrally, and at commonly accessed facilities, such as grocery stores and indoor recreation facilities. Consideration must also be given to persons with accessibility issues, and barrier free parking areas must be included in EV charging requirements. For private charging, equal access means that the cost to install private charging should be the same among dwelling types. The planning barriers and cost per unit to install charging in existing MURBs can be significantly larger than in existing single dwellings, creating an inequality between housing types. As some housing types cannot install private chargers as easily as others in the short term, additional emphasis should be put on public charger availability.

Equity with regard to **access to parking** is focused on ensuring that all residents have equal opportunity to park a private vehicle. The concern with EVs is that if charging spots are EV only, and there are more charging spots than are being utilized by EVs, this favours EV owners. This is challenging to address. As discussed previously, there needs to be enough charging spots available that concerns over charging access does not discourage EV purchase, and in the short term this means that more EV charging stalls will be needed than are likely to be fully utilized. If charging spots are taken up by ICE vehicles or by EVs that are not charging, the overall effect on potential buyers is the same as if charging spots didn't exist, which may require parking spots to be exclusive. In order for EV charging stalls to be exclusive, the Town of Canmore would need to update its Traffic and Road Use Bylaw to allow for enforcement. This should be carefully considered before implementing. Successfully navigating this issue will require community engagement to educate the public on the link between charging availability and EV purchase, and the availability of alternative transportation. It should be noted that this concern does not impact the rate at which parking spots are made EV ready, but does will impact the rate at which EVSE is installed, as the stall is only considered EV parking once a charger is present. This allows for stalls to be made EV ready in advance of charger installation, without creating a parking equity issue.

Equity with regard to **who receives public money** is focused on ensuring only those that require funding to make a change receive it. This is very subjective. Successfully navigating this issue requires community engagement to hear from groups who feel underserved and to educate the public on why the funding is being spent as it is.

12. The Role of Municipalities

Municipalities have significant power to affect public life. Residents expect, however, their municipality will only use that power when it is in the public's best interest, and it will do so equitably and only to the extent necessary. Similarly, municipalities can advocate with other organizations at a level which individuals cannot, however this advocacy must represent the majority of residents' sentiments and support public welfare.

The primary means by which the Town of Canmore can facilitate EV adoption through a charging infrastructure strategy falls into four main categories: Bylaws and Policies, EV Charger Installation Incentives, Public Education, and Utility Engagement.

12.1. Bylaws and Policies

The most powerful tools available to Municipalities are their bylaws and policies.

12.1.1. Land Use Bylaw

The Land Use Bylaw (also called Zoning bylaw by some municipalities) is the strongest tool available to municipalities. Through this bylaw Canmore mandates several aspects of construction, including the amount of parking required by several classes of development. Modifying this bylaw to mandate a certain percentage of parking spaces to be EV Capable, EV Ready, and EVSE Installed will ensure all new development will support EV charging in some capacity.

As of May 2022, eighteen municipalities in BC, Toronto in ON, and Laval in QC have modified their Land Use/Zoning bylaws to set requirements for EV charging, with several other municipalities in these provinces actively considering similar action (Shown in Table 5)^{21 22}. While both Calgary and Edmonton are examining changes as a result of an in-depth study they commissioned on home and workplace charging for Electric Vehicles²³, as of May 2022, no municipality in Alberta has implemented similar changes. This represents an opportunity for the Town of Canmore to take a leading role among municipalities in Alberta, clearly demonstrating its commitment to the climate and environment and encouraging other municipalities to take similar action.

Changes to Land Use Bylaws should support high rates of EV charger installation in MURBs. Not only do MURBs represent a large proportion of Canmore's expected residential growth²⁴, they also carry a much higher cost to retrofit than other dwelling types and experience additional barriers, such as reaching consensus in a joint ownership structure. Mandating a higher percentage of EV Capable units installed at construction—when it is least expensive—helps ensure equal access to EV charging for residents of MURBs.

²¹ Jarrat, Emma and Yakub, Mehanaz, "High-rise headaches: EV charging in Canada's condos, apartments and MURBs a mixed experience", Electric Autonomy Canada, <https://electricautonomy.ca/2022/05/16/ev-charging-canada-murbs/>

²² Clean Air Partnership, *EV Ready Requirements for Municipalities*, 2022

²³ ICF Canada, *Electric Vehicle Home and Workplace Charging Study*, 2020

²⁴ Town of Canmore, *Draft 2022 Utility Master Plan*, CIMA

Changes to the Land use Bylaw (LUB) should also favour EV Capable construction over EVSE Installed. EV Capable construction requires the minimum amount of upfront infrastructure installation to remove future cost barriers to EV Charger installation. This helps ensure cost equity between residents when installing private charging. In addition, with charging technology changing quickly, mandating an EVSE to be installed would commit developers to purchasing a system when it may not be immediately used, and could then become obsolete. While there are many potential future changes in charging technology, the electrical infrastructure supporting the final EVSE will be the same.

Changes to the LUB can also be used to incentivize EV charger install by determining how EV parking will count towards overall parking requirements. While it is far more common to count an EV parking space as a single space, it is possible to define an EV parking space as more than one space, for example an EV space counts as 2 parking spaces with respect to minimum parking requirements.

Table 5: EV Parking Requirements of Various Municipalities Zoning/Land Use Bylaws

Jurisdiction	EV Ready		EVSE Installed	
	Residential	Commercial	Residential	Commercial
City of Burnaby, BC	100%			
City of Coquitlam, BC	1 / dwelling			
City of Nanaimo, BC	100%			
City of Nelson, BC	1 / dwelling	10%		
City of New West, BC	100%			
City of North Van, BC	100%	45%		
City of Port Coquitlam, BC	1 / dwelling, 100% MURBS			
City of Port Moody, BC	100%	20%		
City of Richmond, BC	100%			
City of Surrey, BC	100%	20%		
City of Toronto, ON	100%	25%		
City of Vancouver, BC	100%	45%		
City of Victoria, BC	100%	Varies, ~5%		
District of North Van, BC	100%	~20%		
District of Saanich, BC	100%	Varies, ~5%	0	1-18 min.
District of Squamish, BC	100%			
District of West Van, BC	100%			
Province of Quebec	100% (single family)			
Town of View Royal, BC	100%			
Township of Langley, BC	1 / dwelling			
Ville de Laval, QC	50%			
Under Consideration				
Kamloops, BC	100%			
Maple Ridge, BC	100%	10%		
Mississauga, ON	20%	10%		
St. John's, NL	~10%	~10%		
White Rock, BC	100% (MURBs)			

*Source: Adapted from Clean Air Partnerships – EV Ready Requirements for Municipalities

If Canmore were to update its LUB, there are two important documents which are linked and must be updated accordingly, the Parking Cash-in-Lieu policy, and the Engineering Design and Construction Guidelines. The Cash-in-lieu policy allows developers to construct less parking than required by the LUB, in exchange for a fee of \$40,000 per stall. This money is kept in a parking fund for the future construction of parking facilities. Two decisions need to be made, to what extent EV parking stalls are subject to the Cash-in-lieu policy, and if they are, what value should be charged in lieu of an EV stall. The Engineering Design and Construction Guidelines require updating to ensure that adequate spacing is provided when constructing EV stalls, and that proper signage is provided.

As of the writing of this report, no record of legal challenge to the authority of Municipalities to use their Land Use or Zoning bylaws in this way had been found.

12.1.2. Traffic and Road Use Bylaw

Another tool available to municipalities are their Traffic/Parking bylaws, in Canmore this is the Traffic and Road Use Bylaw. Among its provisions, this bylaw can be used to enforce who can use what parking space. When ICE vehicles park in EV charging spaces it can prevent EVs from charging. The impact is similar if an EV parks in a charging space, but is not using the charger. If the problem is large enough, fear of charging access can discourage residents from purchasing EVs. Canmore can address this by implementing changes that would allow EVs that are charging exclusive use of charging spaces.

Significant care should be taken before implementing such changes to avoid equity issues. If parking is exclusive, and there are more charging spaces than are fully utilized, this would reduce parking available to non-charging vehicles. This would add an additional parking availability challenge on top of Canmore's existing challenges, however it may also aid in moving residents away from using private vehicles, similar to removing parking minimums.

12.1.3. EV Charger Installation Rebate

Installing EV chargers will cost money. Depending on the complexity of the install it can cost a significant amount of money. Municipalities can reduce this barrier by offering rebates for installing EV chargers.

One example of this is the City of Leduc. In May 2022, it began offering an electrical vehicle charger rebate as an extension of its Clean Energy Improvement Program (CEIP). This program is funded by the Federation of Canadian Municipalities and administered by Alberta Municipalities and is focused on single dwellings. In Leduc's program, participants who complete a CEIP project become eligible to apply for an EV charger rebate. The rebate covers 50% of installed costs of a Level 2 charging station up to a max of \$600. Project costs include any electrical upgrades required. Among the requirements for the rebate are proof of electrical permit and installation by a Master Electrician. The charger rebate is administered and funded by the City of Leduc. There are currently eight municipal governments in western Canada offering rebates of some kind: District of Nanaimo, District of Saanich, City of Victoria, Resort Municipality of Whistler, Township of Langley, City of Kamloops, City of North Vancouver, and the City of Leduc. The programs offered in BC are all top-ups to a BC Hydro's CleanBC Go Electric grant program.

Table 6: Municipal Grants for EV Chargers in Western Canada

	Single Family	MURBs	Workplace
District of Nanaimo, BC	\$150		
District of Saanich, BC		\$1,000	
City of Victoria, BC		\$2,000	
Resort Municipality of Whistler, BC	\$150	\$1,000	\$1,000
Township of Langley, BC	\$350	\$1,000	\$1,000
City of Kamloops, BC	\$150	\$1,000	
City of North Vancouver, BC		\$1,000	
City of Leduc, AB	\$600		

*Source: Adapted from Chargehub – Rebates for Home EV Chargers in Canada

Regardless of the form that a public rebate program would take, requiring proof of permit and install by a Master Electrician should be an eligibility requirement to ensure chargers are safely installed and that the utility has been notified.

12.1.4. Public Education

Municipalities can also play a key role in EV charging by increasing public education. It can be time consuming to sort through the mountains of information available online, a task made more difficult by the fast-changing nature of the technology. By offering a convenient location to access accurate information, a municipality can lower the burden of becoming informed. The more knowledge the public has regarding the benefits and considerations of both EVs and EV charging, the more likely they are to participate in the transition.

12.1.5. Utility Engagement

As the owners of critical supporting infrastructure, electrical utilities need to be engaged in any efforts to support an increase in charging infrastructure. Municipalities, as both local government and often a key rate-payer, are well placed to engage with local utilities to understand their needs, inform them of land use policy changes, and advocate for adequate demand forecasts to ensure available power capacity.

13. Recommendations

As discussed, Municipalities have a broad range of powers that can be used to remove barriers to EV charging. Which powers, and to what extent they are used, reflects the will of residents. Within support of the Town of Canmore’s stated goal of being a recognized leader in managing human impact on the environment, MacLean Consulting makes the following recommendations with respect to developing Canmore’s approach to EV charging.

13.1. Municipal Plans

- Ensure alignment between the Integrated Transportation Plan, Parking Management Plan, Climate Action Plan, and EV charging goals and approaches.
- Reassess targets for EV adoption by 2030 in the Climate Action Plan, as it is currently unrealistic given AESO projections of growth.
- Set the following targets for EV use and both public and private charger installations by 2025 and 2030 to ensure adoption is on track and sufficient charging capacity is available and does not discourage EV purchase. If targets are not being met, Canmore should consider its own program to build and operate.

	2025	2030
BEV registered in Canmore	150	450
Private chargers	115	340
Public chargers	32	250

- Report annually on progress against EV adoption and charger install targets.
- Continuously evaluate growth trends and emerging technology to ensure targets reflect a commitment to leadership

13.2. Municipal Legislation and Policy

- Amend the LUB to set minimum EV charging requirements for new construction. An example of the proposed changes is given in Appendix A.
- Update existing Town of Canmore facilities to meet the new EV parking requirements in order to lead by example. Utilize Municipal Climate Change Action Centre rebates to install chargers at publicly owned facilities.
- Update the Parking-in-Lieu Policy to clarify that it does not apply to EV parking. This will require the minimum EV parking requirements are met and cannot be deferred in exchange for payment.
- Update the Engineering Design and Construction Guidelines to address location of chargers, impact on parking dimensions, and signage for EV charging stalls, including EV-enabled Accessible parking stalls (see BC Hydro EV Fast Charging Guidelines, Toronto Zoning bylaw Chapter 200, and Transportation Association of Canada Electric Vehicle Sign package for examples)
- Update the Fee Schedule to include fees for charging at municipally owned public EV chargers.
- Begin tracking EV charging stall related complaints. Should the number of complaints be large enough to warrant a change the Traffic and Road Use Bylaw should be updated to allow enforcement. An example of the proposed changes is given in Appendix B.

13.3. Rebates

- Create a program to provide rebates for Level 2 EV chargers, offering \$600 for home chargers and \$1000 for MURBs (see section 12.1.3). This could be run as an extension of the existing CEIP, or a standalone program. Regardless of form, rebates must require proof of permitted installation by a master electrician.

13.4. Community Engagement

- Maintain community engagement through regular public consultation and survey. Surveys should aim to understand the local concerns of both EV owners and non-owners, with a focus on barriers to adoption, to inform updates to Canmore's approach to EV charging.
- Develop and maintain a website to host information and guides on EVs and EV charging. These resources should specifically provide information on retrofitting MURBs, and requiring a permit as critical to a safe installation.

13.5. Stakeholder Engagement

- Identify optimal locations for publicly accessible chargers to support residents without access to home charging. Criteria for determining optimal locations can be found in ICF's Electric Vehicle Home and Workplace Charging Study Sections 7.2-7.4.
- Engage owners at optimal sites to determine the most effective ownership models to construct charging hubs at these sites.
- Maintain developer engagement through regular consultation to understand concerns regarding EV parking requirements.
- Maintain Utility engagement through regular consultation with Fortis to understand the impact of LUB updates and work to ensure power demand projections provide adequate distribution network capacity for EV charging growth.

Appendix A – Proposed Changes to Land use Bylaw

Additional Definitions

Electric Vehicle or EV – means a vehicle that uses electricity for propulsion, and that can use an external source of electricity to charge the vehicle’s batteries.

Energized EV Outlet – means a connected point in an electrical wiring installation at which sufficient current may be taken to supply Electric Vehicle Supply Equipment.

Electric Vehicle Supply Equipment or EVSE – means a complete assembly consisting of conductors, connectors, devices, apparatus, and fittings installed specifically for the purpose of power transfer and information exchange between a branch electric circuit and an electric vehicle.

Electric Vehicle Energy Management System or EVEMS – means a system that controls the process of connecting, disconnecting, increasing and reducing electric power to electric vehicle supply equipment loads, and which system may be comprised of monitor(s), communications equipment, controller(s), timer(s) and other applicable devices.

EV Capable – means that sufficient electrical capacity is available for future EV charging load. This requires that electrical equipment, e.g., distribution panels, be installed and wall and floor penetrations, or conduit, be completed as required to accommodate future EV charging cabling.

EV Ready – means that in addition to EV capable requirements, parking spaces have an energized electrical outlet capable of supporting EV charging as well as the installation of dedicated/shared branch circuits, breakers, receptacles, and other equipment or controls, such as EVEMS.

EVSE Installed - means that in addition to EV Ready requirements, an EV charging station has been installed and is operational.

Level 2 or Level 2 Charging – means a Level 2 electric vehicle charging level as defined by SAE International’s J1772 standard, and may include variable rate charging that is controlled by an EVEMS.

Additional Clauses (numbered according to Land Use Bylaw Location)

2.7.8 Electric Vehicle Charging Requirements

2.7.8.1 Unless otherwise excepted in this Bylaw, the Electric Vehicle Charging Requirements for parking stalls apply to all residential and non-residential developments. Percentages shall be applied to the totals determined in section 2.7.6 and 2.7.7.

2.7.8.2 Where the calculation of the required number of EV ready and EVSE Installed parking stalls results in a fractional number, the requirements shall be rounded up to the nearest full stall.

2.7.8.3 EV Ready and EVSE Installed requirements cannot be met using the Parking Cash-in-lieu Policy

2.7.8.4 If a development contains more than one use or involves collective parking for more than one building or use, the total number, EV Ready, and EVSE Installed spaces shall be the sum of the various classes of uses calculated separately and any parking spaces that are required for one use shall not be included in the calculations for any other use.

2.7.8.4 Energized outlets provided pursuant to Section 2.7.8 above shall be labeled for the use of electric vehicle charging.

2.7.8.5 No electric vehicle parking will be required to construct a new dwelling unit within an existing building

2.7.8.6 Where one or more accessible parking spaces are required by this bylaw, at least 50% of the accessible parking spaces shall feature Level 2 Charging or higher to the parking space.

Class/Use	Required EV Infrastructure			
	Minimum EV Capable Spaces	Minimum EV Ready Spaces	Minimum EVSE Installed Spaces	Minimum Charging Level
Non-Residential Class A	100%	0%	0%	Level 2
Non-Residential Class B	100%	0%	0%	Level 2
Non-Residential Class C	100%	10%	5%	Level 2
Non-Residential Class D	100%	20%	10%	Level 2
Detached Dwelling	100%	1 / dwelling	0%	Level 2
Accessory Dwelling Unit	100%	1 / dwelling	0%	Level 2
Manufactured Dwelling	100%	1 / dwelling	0%	Level 2
Duplex Dwelling	100%	1 / dwelling	0%	Level 2
Townhouse	100%	1 / dwelling	0%	Level 2
Townhouse, Stacked	100%	1 / dwelling	0%	Level 2
Common Amenity Housing	100%	1 / dwelling	5%	Level 2
Apartment Building	100%	1 / dwelling	10%	Level 2
Live/Work Studio	100%	1 / dwelling	0%	Level 2
Bed and Breakfast	100%	1 / dwelling	0%	Level 2
Home Occupation – Class 2	100%	1 / dwelling	0%	Level 2
Care Facility	100%	100%	5%	Level 2

Appendix B – Potential Changes to Traffic and Road use Bylaw

Additional Definition

Electric Vehicle – means a vehicle that uses electricity for propulsion, and that can use an external source of electricity to charge the vehicle’s batteries.

Additional Clause

No owner or driver shall leave a non-electric vehicle standing in a parking space designated as being for the use of electric vehicles.



Briefing

DATE OF MEETING: May 16, 2023 **Agenda #:** D-4

TO: Committee of the Whole

SUBJECT: Renewable Energy Feasibility Study Results and Next Steps

SUBMITTED BY: Amy Fournier, Energy and Climate Action Coordinator

PURPOSE: To provide the Committee of the Whole with a summary of the Renewable Energy Feasibility Study and the proposed next steps.

EXECUTIVE SUMMARY

From late 2020 to early 2023, a Renewable Energy Feasibility Study (Study) was undertaken to better understand:

- the greenhouse gas (GHG) emission reduction potential of different renewable technologies;
- the technical and financial feasibility of achieving reductions; and
- the Town of Canmore's (Town) ability to undertake or influence the development of different renewable technologies and approaches.

The most cost effective and impactful options identified through the Study will be moved forward for Council consideration in 2024 as part of the Climate Emergency Action Plan, which is being developed in 2023, and/or through a new GHG Emission Reduction Incentive Program funded by the Sustainability Reserve as part of the 2024 operational budget.

More specifically, the next steps for this Study are to:

- Complete grant requirements for Federation of Canadian Municipalities (FCM) funding.
- Consider a Virtual Power Purchase Agreement (VPPA) as part of the Climate Emergency Action Plan.
- Prioritize solar canopies on municipal parking lot(s) and solar rooftop options for the Elk Run Road Maintenance Facility as part of the Climate Emergency Action Plan and capital project requests.
- Evaluate, develop, and deliver a community solar photo voltaic (PV) rooftop incentive program and low-income energy efficiency retrofit program through the Council approved 2024 operational budget funded by the Sustainability Reserve.

BACKGROUND/HISTORY

2018: Council accepted the Climate Action Plan (Resolution 269-2018) for planning purposes. The Plan set greenhouse gas (GHG) reduction targets for both the community and Corporation. Actions in the Plan include considering various forms of renewable energy as well as setting a renewable energy target.

2019: Council accepted the Update to the Climate Action Plan: Priority Actions for 2020 (194-2019) for planning purposes. These priority actions included "Initiating a Renewable Energy Feasibility Study to inform Renewable Energy targets and strategies".

2019: Council declared a State of Climate Emergency (207-2019).

2019: On December 3, as part of the 2020 Capital Budget Amendments, Council approved \$60,000 for Climate Action Plan Initiatives (CAP 7156). Of this budget, \$50,000 was for a Renewable Energy Feasibility Study.

2020: In September, FCM notified Council that the Town of Canmore had been approved for \$42,050 in matching funding. On October 6, Council approved an increase to the budget for Climate Action Plan Initiatives (CAP 7156) from \$60,000 to \$102,050, with the \$42,050 increase to be funded from the FCM's Green Municipal Fund (GMF).

2022: Council's Strategic Plan (2023-2026) includes the following goal "Canmore is a recognized leader in managing human impact on our environment", with intentions that "Canmore as a community collaborates to reduce our impact on climate change and prepare for climate adaptation" and that the "community is aware of the Town of Canmore's environmental leadership".

DISCUSSION

Over half of Canmore's GHG emissions come from the heating and electrical needs of residential, commercial, and institutional buildings. Along with green building and energy efficiency, transitioning to renewable or low carbon energy sources is integral to the Town achieving its 2030 and 2050 GHG reduction targets. The 2018 Climate Action Plan contained a number of actions relating to specific renewable technologies. It also included a recommendation for the Town to consider adopting a formal target for the percentage of energy requirements to come from renewable sources.

To better understand the role of renewable energy in reducing Canmore's GHGs, Administration, with funding support from FCM, undertook the Renewable Energy Feasibility Study between fall 2020 and February 2023. The following details the Study approach and the key findings from each sub-study, as well as a recommendation for setting a renewable energy target.

Renewable Energy Feasibility Study Approach

The approach to the Study was, in part, dictated by the FCM funding requirements which specified that the results had to be sufficiently detailed to guide short-term next steps. This resulted in a process to narrow down promising renewable options into smaller feasibility sub-studies to be undertaken by consultants specializing in the relevant areas. It also limited the scope to what could be assessed to the degree of detail that FCM required, within the available budget.

The Study consisted of the following components:

- A. A backgrounder compiling work on renewable energy to date by the Town, and pre-feasibility assessment to determine which technologies and approaches to undertake more detailed study. A summary of the pre-feasibility assessment is provided in Attachment 1.
- B. Five detailed feasibility sub-studies. These are summarized below and provided in Attachments 2-6.
- C. A Marginal Abatement Cost Curve (MACC) for the different options studied in B. above. MACCs are an effective tool to show how different strategies compare to each other in terms of GHG reduction potential and total lifetime cost per tonne of GHG emissions reduced, integrating both capital costs as well as savings/revenue. The MACC is discussed further in the report, and a more detailed overview is provided in Attachment 7.

*Detailed Feasibility Studies Key Findings:***1. Analysis of options to achieve ‘near net zero’ for the new Fire Station:**

- An air-source heat pump, coupled with a solar photovoltaic rooftop array and energy efficiency measures, was determined to be the most cost-effective strategy to achieve near net zero carbon emissions. These results have already been integrated into the design and construction of the new Fire Station.

2. Virtual Power Purchase Agreement (VPPA) evaluation:

- VPPAs are a longer-term contract with a renewable generator, up to 15 years, in the form of a contract for differences (CFD). A CFD is an arrangement where:
 - A buyer agrees to a “strike price” with the generator for a specific amount of renewable energy and the associated GHG offset/credit.
 - The generator sells the power into the Alberta grid/electricity market.
 - If the price the generator receives from the market is greater than the “strike price”, the generator pays the positive difference to the buyer. Conversely, if the “strike price” is less than the market price, the buyer will pay the generator the difference up to the strike price. This is settled on an ongoing basis.
- Unlike the outright purchase of carbon offsets, VPPAs have revenue potential or can be a hedge against future electricity cost increases. In the Alberta context, they are an important enabling mechanism to increase the amount of renewable electricity in the provincial grid. VPPAs can, however, be a net cost, and it constantly varies over time. While a single VPPA could reduce the Town’s GHGs by up to 60% in the short term, there is significant financial risk. The analysis suggested that a wind VPPA is lower cost and lower risk than solar VPPA, however, this is an ever-evolving landscape with constantly changing prices. The net cost of a VPPA to a buyer is dependant on long-term, but very uncertain, electricity market costs as well as the future of carbon pricing.

3. Solar canopies on a municipal parking lot(s) and solar rooftop options for the Elk Run Road Maintenance Facility:

- Aggregation of electricity load from nearby buildings would allow the Town to maximize the large amount of rooftop space on the Elk Run Road Maintenance Salt Shed, which is the most cost-effective option for additional municipal investment in solar.
- Solar canopies in Canmore, while an efficient use of space, would be about 1.75 times more expensive per watt than large rooftop arrays. A ground-mount system adjacent to Pumphouse 4 was identified as a more affordable alternative to a canopy. Should the Town want to proceed with solar canopies as rooftop space declines, the Canmore Recreation Centre, Public Works Yard, and parking near Elevation Place are the most promising locations.

4. Community solar photo voltaic (PV) rooftop incentive program:

- Within the constraints of available funding through the Sustainability Reserve, a continuous intake municipal incentive program for residents will have minimal impact on increasing solar uptake while the \$5,000 Canada Greener Homes Grant is available.

- The study recommends that the Town continue with the current incentive of \$1,250 for a residential program, ramping it down by 2030. Study results indicate that the Town should continue with the current lottery system, as opposed to a continuous intake without a cap on the number of incentives available.
- A commercial program, also awarded by a lottery, would need to provide higher incentive amounts, potentially based on the size of array (e.g., \$0.20-\$0.30/watt). Currently, there are no federal or provincial programs for the commercial sector, so Town funding could potentially have a meaningful impact on encouraging uptake for large commercial rooftops.

5. Low-income energy efficiency retrofit programming:

- While the original intent for the overall Study was to focus solely on renewable energy, addressing equity was also an important consideration. Low-income residents are often unable to access rebate programs such as the Canada Greener Homes Program and the Town's Solar Incentive, because of the significant upfront costs required. Financing programs, such as the Clean Energy Improvement Program (CEIP), have higher risk for low-income residents. They increase a household's ongoing expenses, which may make the program less accessible to individuals who already struggle to make their monthly bills, and the consequences of defaulting on payments are significant. To integrate equity more meaningfully, it was determined that this detailed feasibility study should focus on targeted energy efficiency for low-income residents, as opposed to renewable energy, as a fundamental and more appropriate first step that provides the co-benefits of increased comfort and cost savings.
- Presently, there is no provincial energy efficiency program and the current federal programs do not fully consider the affordability concerns of lower income individuals. This has created a gap where locally administered programs targeted at low-income and vulnerable populations become more important.
- The most impactful programming for low income and vulnerable populations are deep energy retrofits at no cost to income-qualified participants. These programs are tailored to maximize the reduction of energy consumption within a dwelling, which can have impacts on GHG emissions, affordability, and livability. These programs go beyond typical energy saving kits (e.g. LED light bulbs, low flow shower heads, etc.) and provide participants with deep energy retrofits (e.g. upgraded windows, new insulation, weather stripping, etc.).

Marginal Abatement Cost Curve of Study Results:

To provide a visual summary of the results of all five studies, the options analyzed have been plotted on the below MACC (Figure 1), to show how they compare to each other in terms of cost and GHG reduction potential. The horizontal axis shows the lifetime GHG reduction potential, while the vertical axis shows the marginal abatement cost. Abatement cost is the lifetime cost including savings (Net Present Value), per tonne of GHG emissions reduced. Showing the cost of projects on a per tonne basis makes it easier to compare different options. The options that have a negative marginal abatement cost represent net savings to the Town over the project lifetime. The MACC indicates that five of the twelve options assessed in the detailed feasibility sub-studies would ultimately result in savings. Table 1, below shows the detailed cost and GHG emission data used to create the MACC.

Figure 1: Marginal Abatement Cost Curve of Options Analyzed in the Renewable Energy Feasibility Sub-Studies

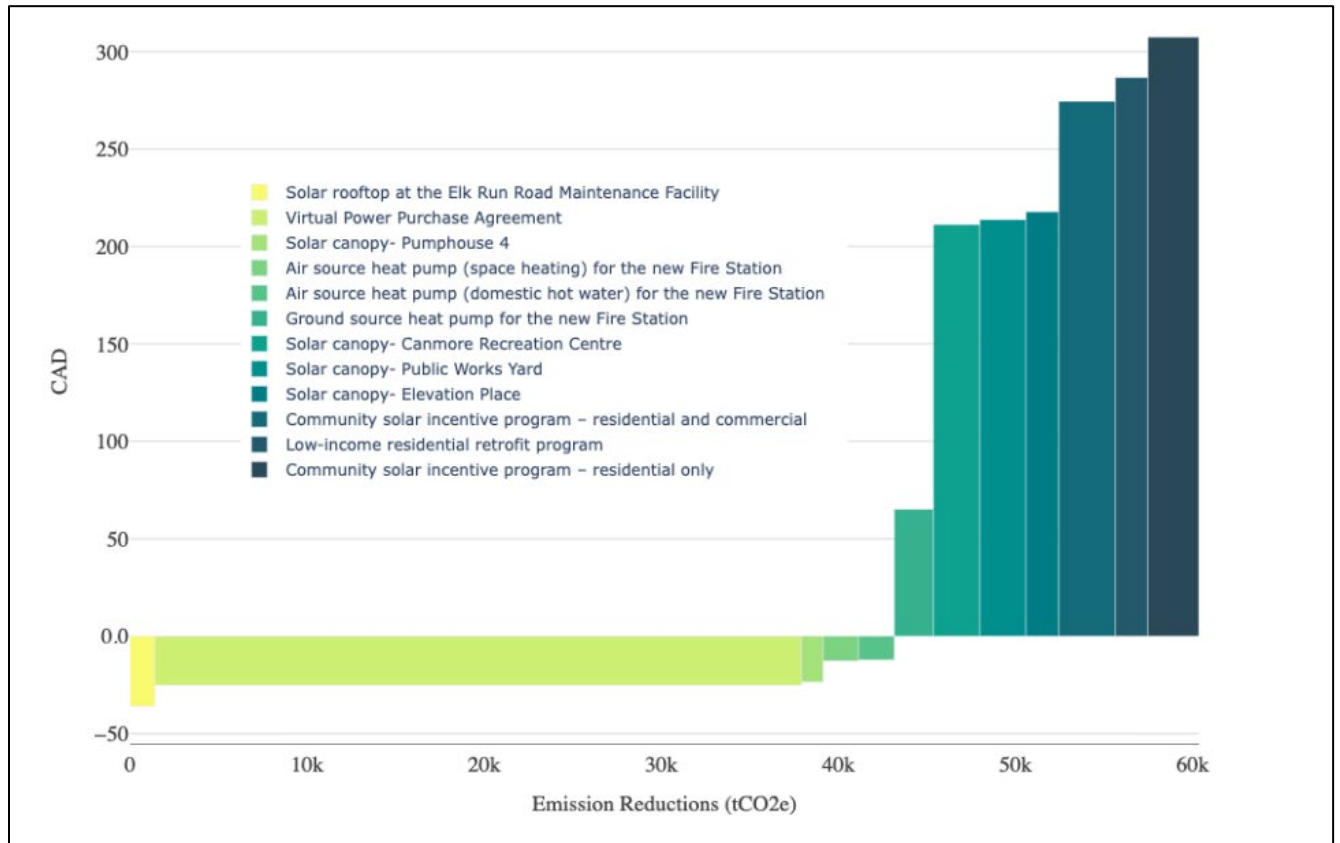


Table 1: Net Present Value, Lifetime GHG Reduction Potential and Abatement Costs of Options Analyzed in the Renewable Energy Feasibility Sub-Studies

Number	Action	Net Present Value (- numbers equal cost savings)	Cumulative GHG reductions (tCO ₂ e)	Abatement Cost (- numbers equal cost savings)
1	Solar rooftop at the Elk Run Road Maintenance Facility	-\$50,300	1,395	-\$36
2a	Solar canopy- Canmore Recreation Centre	\$553,589	2,621	\$211
2b	Solar canopy- Elevation Place	\$402,557	1,848	\$218
2c	Solar canopy- Public Works Yard	\$557,756	2,609	\$214
2d	Solar canopy- Pumphouse 4	-\$28,506	1,209	-\$24
3	Air source heat pump (space heating) for the new Fire Station	-25,367	1,998	-\$13
4	Air source heat pump (domestic hot water) for the new Fire Station	-24,719	2,024	-\$12
5	Ground source heat pump for the new Fire Station	143,921	2,211	\$65
6	Community solar incentive program – residential only	\$884,596	2,877	\$308
7	Community solar incentive program – residential and commercial	\$876,901	3,194	\$275
8	Low-income residential retrofit program	\$526,477	1,836	\$287
9	Virtual Power Purchase Agreement	-\$918,538	36,515	-\$25

The MACC and above table illustrate the following:

Some projects save money: Based on the assumptions used in the analysis, five of the projects result in cost savings for the Town (negative abatement costs). These projects would save money and reduce GHG emissions.

Some benefits are externalized: Most projects which cost money per tonne of emissions reduced generate indirect benefits which do not result in financial returns to the Town. Incentives for low-income retrofits and community solar projects generate energy savings for other actors than the Town. These benefits are not included in the NPV calculation, and as a result the abatement cost per tonne is higher for these actions.

Purchasing green electricity is the most significant action: The VPPA is estimated to reduce 36,515 tonnes of GHG over 20 years, and is projected to save money, although there is uncertainty in the energy costs projections. Note that if the VPPA is implemented, the GHG reduction of other corporate actions is reduced, because the actions will then be displacing green electricity.

Renewable Energy Target:

In addition to assessing the feasibility of different options, the Study was also intended to inform a potential Renewable Energy Target. At the time the CAP was created in 2018, municipalities around the world were committing to 100% Renewable Energy targets for their communities. The CAP recommended the Town consider adopting a formal target. Based on the work undertaken in the Study, Administration is not recommending that the Town proceed with a separate, formal renewable energy target, for the following reasons:

1. Renewable energy should not be decoupled from energy efficiency. Strategies to reduce energy demand should be considered alongside switching to renewable and low carbon sources.
2. The Town has a limited sphere of control and influence. An achievable renewable energy target would be limited to electricity for municipal facilities or a small percentage of community electricity. A renewable target focused only on electricity may distract from strategies to reduce natural gas use, which is also key to GHG reduction. At this time, there is limited ability for the Town to transition existing heating systems from natural gas to renewable sources. Existing options for heating tend to utilize natural gas or electricity more efficiently, such as combined heat and power or ground source heat pumps. These are generally referred to as low carbon technologies, as opposed to renewable.
3. A formal renewable energy target would require additional time and resources to manage and report on progress. As confirmed by the declaration of climate emergency, GHG reduction is the priority for the Town. Renewable energy is a means to achieve GHG reduction. The policies, programs and infrastructure to increase renewable energy can be driven by GHG targets, therefore setting a separate renewable target, and the additional work in managing it, is not necessary. Instead of a broad renewable energy target, sub-targets or performance indicators for specific sectors and energy types can be integrated into the updated Climate Emergency Action Plan.

Next Steps:

Based on the above, Administration will undertake the following:

- **Grant Requirements:** provide the completed Study to FCM and complete the process to receive the \$42,050 in GMF funding.
- **Virtual Power Purchase Agreement (VPPA) evaluation:** a VPPA will be further considered as part of the Climate Emergency Action Plan.
- **Solar canopies on a municipal parking lot(s) and solar rooftop options for the Elk Run Road Maintenance Facility:** the recommendations from this study will be prioritized as part of the Climate Emergency Action Plan and brought forward as a capital project request for Council consideration.
- **Community solar photo voltaic (PV) rooftop incentive program and low-income energy efficiency retrofit programming:** these two incentive programs will be evaluated, developed, and delivered through the Council approved 2024 operational budget for GHG Emission Reduction Incentive Programs funded by the Sustainability Reserve.

Regarding the analysis of options to achieve 'near net zero' for the new Fire Station, the analysis has already been utilized to determine the approach for achieving near net zero emissions for that facility.

FINANCIAL IMPACTS

There are no financial impacts at this time. This report is being provided for information only.

STAKEHOLDER ENGAGEMENT

Town of Canmore internal stakeholders were engaged and helped provide input into various components of the Study. These include staff from Engineering, Finance, Public Works, Community Social Development, and Facilities. External stakeholders include staff from the Town of Banff, ATCO, Fortis, Bow Valley Green Energy, Bow Valley Climate Action and numerous technology providers. Further stakeholder engagement work can be conducted through the development of the updated Climate Emergency Action Plan.

ATTACHMENTS

- 1) Pre-Feasibility Analysis Summary
- 2) Palliser Fire Hall Net Zero Carbon Parametric Analysis Report
- 3) Alberta VPPA Evaluation
- 4) Town of Canmore Solar Project Feasibility Assessment (solar canopies and Elk Run Road Maintenance Facility rooftop)
- 5) Community Solar Program Assessment (solar rooftop incentive)
- 6) Lower-Income Retrofit Programming in the Town of Canmore
- 7) Marginal Abatement Costs for Town of Canmore Renewable Energy Options

AUTHORIZATION

Submitted by:	Amy Fournier Energy and Climate Action Coordinator	Date: <u>March 16, 2023</u>
Approved by:	Caitlin Van Gaal Supervisor of Environment and Sustainability	Date: <u>March 17, 2023</u>
Approved by:	Andreas Comeau Public Works Manager	Date: <u>April 21, 2023</u>
Approved by:	Whitney Smithers General Manager of Municipal Infrastructure	Date: <u>April 27, 2023</u>
Approved by:	Sally Caudill Chief Administrative Officer	Date: <u>May 8, 2023</u>

Town of Canmore Renewable Energy Feasibility Study

Summary of Pre-Feasibility Research and Analysis

From 2020 to 2023, a Renewable Energy Feasibility Study was undertaken to better understand the opportunities and implications of actions in the 2018 Climate Action Plan relating to renewable or 'low carbon' technologies. 'Low carbon' refers to approaches that utilize fossil fuel-based energy but do so more efficiently.

The Study had a \$50,000 capital project budget and \$42,050 in matching funding from the Federation of Canadian Municipalities' (FCM) Green Municipal Fund (GMF). FCM requires that any studies funded through the GMF provide enough information to proceed with a pilot or capital project (or decide not to proceed). To make the most of the available budget and stay within the constraints of the FCM funding, the Renewable Energy Feasibility Study was divided into two phases:

Phase 1: Background Research and Pre-Feasibility Analysis. Phase 1 consisted of a Renewable Energy Backgrounder, with details about the different technologies and summaries of past Town of Canmore investigations, and a Pre-Feasibility Analysis to determine the most promising options to explore in Phase 2.

Decentralised Energy Canada (DEC), a Calgary-based national industry association dedicated to the appropriate development of decentralised energy, supported the Pre-Feasibility Analysis. DEC assessed renewable and low carbon options based on numerous criteria, including the following:

- Cost effectiveness (capital cost, revenue/energy savings, funding/financing mechanisms)
- Greenhouse gas reduction potential
- Community scalability
- Local resource availability
- The ability of the Town of Canmore to implement/private landowner support
- Public perception
- Risks and uncertainties
- Local job creation
- Physical footprint

Phase 2: Detailed Feasibility. Phase 2 consisted of five detailed feasibility studies on different renewable or low carbon options. These options were selected based on the following:

- DEC's Pre-Feasibility Analysis results
- The ability to meet the FCM requirement to provide sufficient detail to guide short term project decisions
- The ability to complete the study within the timeframe and budget
- Equity considerations

The tables below serve as a summary of the pre-feasibility research and analysis completed by DEC and Town staff.

Table 1: Options selected for detailed feasibility study

Technology/approach	Rationale for selecting for detailed feasibility study
Analysis to determine the most effective pathways to achieve near net zero carbon for the new Fire Station	This was a timely opportunity to provide a detailed analysis of options for the Fire Station ahead of its planned construction, with the Town able to immediately apply the results of the feasibility study.
Virtual Power Purchase Agreement (VPPA) or other form of procurement of renewable electricity for the Town's municipal buildings and operations	VPPAs were selected because of the significant GHG reduction potential and a need to better understand the complexity and risk involved. DEC noted that the scalability potential of VPPAs in the community is high. DEC also recommended consideration of Renewable Energy Certificates (RECs), which are part of a VPPA.

Incentive options to accelerate private rooftop solar PV installations	DEC ranked large commercial and residential rooftop solar PV highly in the Pre-Feasibility analysis.
One or more solar canopies on a municipal parking lot(s)	While they didn't rank as highly as rooftop solar PV in the Pre-Feasibility Analysis, DEC noted that community scalability was high for solar canopies, given the number of private parking lots in Canmore. As recommended by DEC, the Elk Run Road Maintenance Facility rooftop was incorporated into the study.
Low income retrofit program (more appropriate to focus primarily on energy efficiency for equity deserving residents)	While the original intent for the overall Study was to focus solely on renewable energy, addressing equity was a consideration. DEC had also recommended a focus on energy efficiency. To integrate equity more meaningfully, it was determined that this detailed feasibility study should focus on targeted energy efficiency for low-income residents, as a more cost effective first step that provides the co-benefits of increased comfort and cost savings.

Table 2: Options for future consideration

While detailed feasibility studies on the below technologies and approaches couldn't be undertaken due to the funding constraints, they are recommended for future consideration.

Technology/approach	Rationale for not including in a detailed Feasibility Study	Recommendation for future consideration
Energy conservation measures and building management and control optimization	Outside of the intended scope of the Renewable Energy Feasibility Study.	The Town should prioritize energy conservation as the easiest and often least expensive solution to reduce energy while maximizing renewable generation. This should be considered ahead of, or in concert with, renewable energy when planning GHG reduction strategies.
Renewable Energy Certificates (RECs)	Additional feasibility study on RECs is not necessary as the process is well understood and the Town has purchased RECs in the past. The VPPA study includes RECs as they are a component. Note that RECs will always represent an ongoing and additional cost and the value of RECs is decreasing as the provincial electricity grid becomes less carbon intense (e.g. it will cost more for a tonne of GHG offset).	RECs are a simple way to reduce GHGs, especially in the short term, and can be a less expensive option to capital projects. These types of offsets will likely be necessary if the Town sets a net zero GHG emissions goal.
Ground or groundwater source heating and cooling (heat pumps)	Buildings in the Spring Creek Mountain Village utilize groundwater source heating and cooling via heat pumps and will continue to do so as the neighbourhood is further built out, due to the leadership of that developer. Elevation Places also uses groundwater source cooling. Ground source heating was included in the analysis for the Fire Station, but not selected due to high upfront capital costs.	Continue to encourage developers to consider ground source or groundwater source heat pumps in new development. Consider a research project via a potential student or partner organization, with a focus on the costs and barriers to ground and

	<p>There were no Town-owned buildings or upcoming projects with interested developers that would be suitable for investigation within the timeframe and requirements of the study.</p>	<p>groundwater source heat pumps for residential and commercial buildings.</p>
In-pipe micro hydro power	<p>A past feasibility study by students from the Southern Alberta Institute of Technology (SAIT) indicated high cost to retrofit existing pressure-reducing valve locations for limited energy production/GHG reduction.</p> <p>This was considered for the new WWTP water connection, however, the flow was too intermittent and pipe too small for this approach to be viable.</p>	<p>Consider in the design phase of new water distribution infrastructure where pressure reducing valves are necessary, ideally with a nearby building to offtake the energy as opposed to direct grid connection, as economics for grid connection are more challenging for small generation projects.</p>
District Energy	<p>Town facilities are not co-located, so a district heating system retrofit servicing multiple municipal facilities is not possible.</p> <p>Without a specific development to focus on, any study on district energy would be too hypothetical and outside of the FCM requirements. A detailed district energy feasibility study would also require more funding than available in this project budget.</p> <p>Note that the degree of GHG reduction for district energy is dependent on the fuel source used, however, a benefit of district energy systems is that they are centralized and can be transitioned to cleaner, renewable sources much easier than individual buildings.</p>	<p>Consider for future Town-owned neighbourhood scale developments, such as the Palliser lands, as installing a district energy system in the early stages of development is more cost effective than a later retrofit.</p> <p>Continue to encourage for larger private developments, especially if there is a source of waste heat or significant 'anchor tenants' with large heating demand.</p> <p>Be open to future partnerships or pilots led by external organizations.</p> <p>Consider an academic research project via a potential student or partner organization.</p>
Biomass heating	<p>Biomass heating was considered in the analysis for the new Net Zero Fire Hall, but an Air Source Heat Pump (coupled with solar PV) was determined to be the most cost-effective option to achieve net zero emissions.</p> <p>Without another Town-owned building to consider for a small system, or potential district energy system to utilize the biomass, any study on biomass would be too hypothetical and outside of the GMF requirements.</p>	<p>Biomass heating could be considered as part of a future Construction, Renovation and Demolition Waste Reduction study/strategy, however, long term fuel supply is critical.</p> <p>Consider an academic research project via a potential student or partner organization.</p>
Combined Heat and Power (CHP) using natural gas	<p>High-level feasibility assessments were completed for both Elevation Place and the Wastewater Treatment Plant (WWTP). At Elevation Place, for the size of CHP unit analyzed, there was little GHG reduction when the 2030 projected carbon intensity of the electricity grid was considered. With carbon pricing increasing, the costs of the</p>	<p>Consider for future Town-owned projects on a case-by-case basis. Investigate feasibility of renewable natural gas or another feedstock (e.g., biomass) during the analysis.</p>

	<p>additional natural gas required represent a financial risk.</p> <p>There is not enough heating load at the WWTP to make the approach worthwhile using natural gas.</p> <p>DEC confirmed that GHG reduction benefits for natural gas-powered systems will diminish to near equivalency towards 2030. Hydrogen (pure or blended) will allow the emissions level from natural gas fired CHP to regain an advantage over the grid, but only gradually in the 2030 to 2050 time frame.</p>	<p>Encourage consideration of CHP for larger developments with high heat loads, such as hotels with pools.</p>
Solar thermal	<p>The Town has solar thermal installations on a few buildings, including a 72 kW system on Elevation Place which offsets a small amount of natural gas for heating the pool. For the amount of roof space required and the economics, solar PV has been a more effective approach for existing buildings in Canmore.</p>	<p>Consider solar thermal for future Town-owned developments at the time of design, including specialized applications such as park space amenity improvement (e.g. outdoor showers at Quarry Lake) or solar wall cladding for low energy, trickle-heated, partially occupied warehouses and storage facilities.</p> <p>Include with any future feasibility considerations of district energy.</p>
Anaerobic digestion at the Wastewater Treatment Facility	<p>There is insufficient budget to study anaerobic digestion to the degree required. Past high-level assessments have indicated there is insufficient material at the WWTP to be economically viable.</p> <p>DEC stated that large capital projects such as anaerobic digestion have trouble meeting a minimum economic scale but should be re-addressed as the population grows.</p>	<p>The wastewater treatment plant accounts for 32% of Town GHGs. The Town cannot meet its GHG targets without a significant energy reduction and/or offsets at the WWTP. Anaerobic digestion should be reconsidered in the future, ahead of significant lifecycle upgrades to the facility and processing equipment and/or as planning for population growth is undertaken. The potential of including food waste as additional feedstock should be included in any future assessment.</p>
Sewer heat recovery	<p>Without another Town-owned building to consider for a small system, or potential district energy system, any study on sewer heat recovery would be too hypothetical and outside of the GMF requirements.</p>	<p>Consider for future Town-owned developments.</p>
Battery Storage	<p>There are no Town-owned buildings or upcoming projects that would be suitable for investigation within the timeframe and requirements of the study.</p> <p>Battery storage has resiliency benefits and energy demand reduction potential but its carbon</p>	<p>This is a rapidly evolving technology that should continue to be considered for future Town-owned developments and/or part of future solar or electric vehicle charging projects.</p>

	reduction potential depends on the associated generation technology.	
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Many of the options and recommendations focus on municipal buildings and operations. While the community accounts for 96% of Canmore’s greenhouse gas emissions, options are limited as the Town of Canmore does not have the legal jurisdiction to require private developers, building owners or landowners to assess or install renewable or low carbon energy systems. Focusing on municipal operations can still, however, help to enable community adoption through demonstration as well as gaining experience and knowledge that can be shared with residents, businesses, and developers.

Table 3. Options not recommended for further consideration at this time

Technology/approach	Rationale for not including in the detailed Feasibility Study or considering further
Energy-from-waste	A 2011 Feasibility Study deemed a local Energy-from-Waste facility not to be economically viable and difficult to site given the natural environment and habitat value of the area.
Run-of-river hydro	This option is assumed to be too expensive and there are no nearby buildings to offtake the electricity. It is anticipated there would be regulatory and permitting challenges, as well as community opposition to the visual impact to the natural river environment.
Purchase of imported renewable natural gas	Renewable natural gas (RNG) is not economical at this time, and there is a limited market in Alberta. The majority of RNG produced in Alberta is sold in BC.
Large scale wind	Due to the visual impact, difficulty co-locating with buildings to offtake energy, high land costs and impact on the natural environment, large wind turbines in Canmore are not recommended. A less capital and resource intensive strategy would be to procure wind power from elsewhere in Alberta.
Hydrogen	The most promising approach for hydrogen, at this time, appears to be blending with natural gas within the existing distribution system. While municipalities would benefit from the reduced carbon intensity of natural gas, similar to GHG reduction resulting from moving away from coal fired generation on the electricity grid, hydrogen blending with natural gas is in the purview of utilities and the Province.
Ground mount distributed generation solar, aggregated rooftop solar (direct import to grid)	The Accelerating the Impact of Renewable Energy (AIRE) project analysed the relative feasibility of large, ground mount distributed solar installations (e.g. direct to grid solar farms) in different areas of Canmore. The Biosphere Institute studied the feasibility of a network of rooftop solar systems tied directly into the grid in their Community Solar project. Both of these projects found that the economics for generating electricity to import to the grid are poor for smaller installations. The AIRE study confirmed that the space required to make a ground mount distributed generation solar system economical, makes it non-viable in Canmore, due to high land costs and competing needs and values for available space (e.g. wildlife habitat, carbon sequestration, aesthetics, recreation, etc.), private landowner support required. A less capital and resource intensive strategy would be to procure electricity from a solar farm elsewhere in Alberta.

Palliser Fire Hall

Net Zero Carbon Parametric Analysis Report



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Executive Summary

Introduction, Scope, & Problem Definition

The Town of Canmore would like to design a building with no net greenhouse gas emissions. To assist in this process, Integral Group was engaged by MTA Architecture to present the impact of 6 building components, or 64 design alternatives, and their performance with respect to: Energy Use Intensity (EUI), Carbon Emissions, Additional Capital Cost, Utility & Maintenance Cost, and Net Present Value over a time period of 20 years.

First, the definition of net zero carbon was clarified as:

- Zero net carbon emissions, encompassing the facility's emissions from both energy use and generation, over a period of one year.
- Since all buildings consume energy, this net carbon objective would be achieved by offsetting any emissions generated with on-site solar PV panels.

Next, the team recognized that Alberta's electricity grid emissions intensity is forecasted by AESO to reduce from 0.86 to 0.324 over the next 10 years. This reduction in electricity emissions makes it more difficult for a project to meet the project's definition of net zero. To encompass this change in our decision making, the scope was refined to evaluate the building's performance compared to 2030 emission rates. The electricity grid GHG intensity reduction makes it more difficult for the Palliser Fire Hall to meet net zero carbon emissions in 2030, compared to 2020. Correspondingly, every scenario that meets 2030 emission targets will also meet 2020 emission targets.

Finally, Integral Group reviewed the architectural rooftop schematic to determine the amount of available rooftop space for solar PV panels. It was established the maximum roof coverage that would be feasible for the design is approximately 50%. There is a possibility of adding additional panels on south-facing walls, above parking space, above rooftop mechanical equipment, or elsewhere on the property. These were not evaluated in this assessment.



Executive Summary

Analysis, Recommendations, and Next Steps

Next, Integral Group began the energy analysis.

First, the design from the October 26th Design Development documents, known as the 'base case', was modelled to determine the energy use and carbon performance. The base case modelled emissions are 139 tCO₂eq per year in 2020 and 58 tCO₂eq per year in 2030. The base case would require 55% PV roof coverage, or a generation of 190,000 kWh per annum of carbon-free electricity, to meet the project's net zero carbon definition of net zero carbon for 2030. If only 2020 emission rates were considered, the base case would achieve net zero carbon with 50% PV roof coverage.

Next, a sensitivity analysis was conducted to determine which components would be selected as part of the 64 design alternatives. This evaluated the relative impact of 15 building components, including heating and cooling systems, fuel types, heat recovery effectiveness, solar thermal air heating, heating and cooling setpoint temperatures, glazing type and orientation, wall / roof / door thermal transmittance, and air Infiltration from building envelope and bay door operation frequency.

From this sensitivity analysis, 7 parameters, or 128 design alternatives were evaluated. The parametric analysis yielded **128 design alternatives that meet the net zero carbon problem definition**. To be zero carbon, these designs would require between 46% and 62% roof coverage with PV panels. This equates to an annual electricity generation requirement between 158,000 kWh and 213,000 kWh, respectively.

An alternative for consideration was presented, where the following parameters differ from the base case design: a heat pump hot water tank, target of lighting power 50% below NECB 2017 levels, and double pane windows. This design would require 53% roof coverage to meet the project's zero carbon project definition. This design is also **net zero energy**, where the annual building consumption is less than the expected annual energy generation from solar panels. With this option, the mechanical system can be retrofitted to be zero carbon once the Alberta grid is fully decarbonized.

Since many design combinations are capable of meeting the zero carbon project requirements, it is recommended the Town of Canmore review the cost per tonne of carbon saved values for each parameter to make an informed decision on their investment.



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1. Recommendation

Part 2 – Project Understanding, Problem Definition, Analysis, and Results

2. Project Understanding & Net Zero Definition
3. Solar PV Rooftop Generation Potential
4. Base Case Specifications (October 26th Design Development specifications)
5. Base Case Performance (October 26th Design Development specifications)
6. Decision Support Tools
7. Results
8. Next Steps

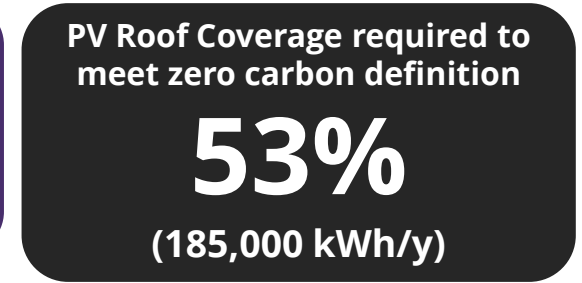
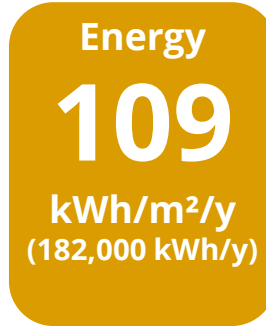


1. Recommendation – Alternative for Consideration

The following solution represents Integral Group’s recommended solution. This alternative has a low 20-year net present value and would require 53% PV roof coverage to have net zero carbon emissions for 2030.

This option was selected for the following:

- It requires close to 50% PV roof coverage, so would not be encumbered to seek additional space for PV panels.
- The air source heat pump has a backup natural gas boiler, so the building can fuel switch as the grid’s GHG emission intensity decreases over time.
- This design is also **net zero energy**, where the annual building consumption is less than the proposed solar generation. With this option, the mechanical system can be retrofitted to be zero carbon once the Alberta grid is fully decarbonized.



Parametric Item	Selection	Same as Base Case (Oct 26 th Design Development?)
Roof	R-50	Same
Windows	Double Pane	Different
Additional Windows	Yes	Different
Radiant Heating	Yes	Same
Heating System Type	Air-Source Heat Pump	Same
Hot Water Heating	Heat Pump Domestic Hot Water Heater	Different
Lighting Power Density	50% below NECB 2017	Different

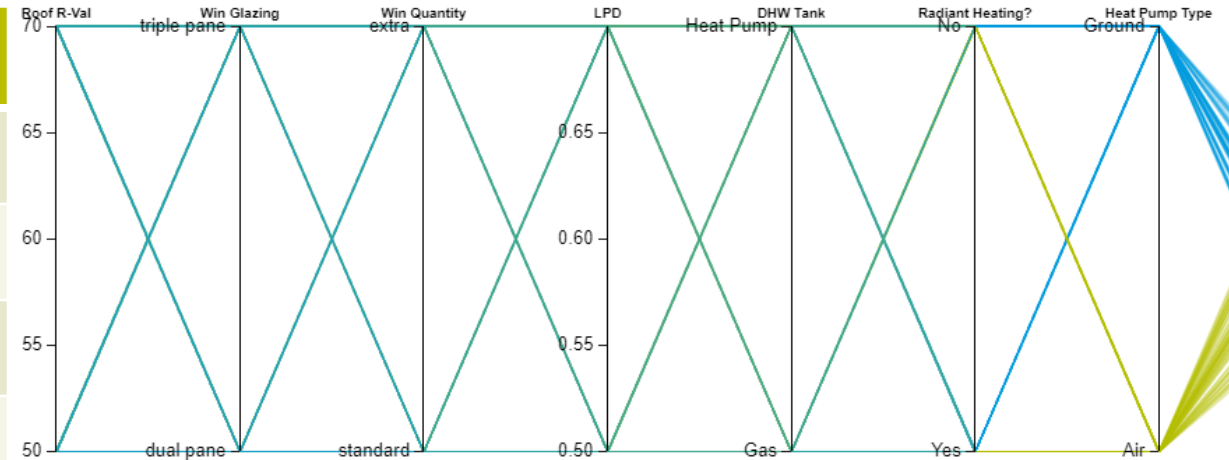


1. Alternatives Considered

This section of the report presents the recommended alternative for consideration. This is presented at the beginning of the report for convenience. The project understanding, problem definition, problem analysis, and analysis results are outlined in the following sections of this report.

The final decision tool used to make a decision was the parametric analysis, where every possible combination between parameters is simulated. The purpose of this analysis is to show the interaction between different building components. The selected components of the parametric analysis are listed below. There are a total of 7 different building components. These components were evaluated by simulating all 128 possible combinations between these components. Each parameter is discussed and a recommendation is presented on the following pages.

Parameter Description	Base Case (Oct. 26th Design Development)	Additional Option Considered
Two roof insulation options	R-50	R-70
Two window options	Triple Pane Windows	Double Pane Windows
Adding additional windows	Standard	“extra” (additional windows)
Heat Supply	Radiant Floor Heating	Fan Coil Units
Heat Pump Type	Air Source Heat Pump	Ground Source Heat Pump
Domestic Hot Water Heater	Natural Gas	Heat Pump
Lighting Power	30% Better than NECB 2017	50% better than NECB 2017



Legend:
█ Integral Group Recommendation



1. Recommendation for each parametric component

The table below indicates Integral Group's recommendation for each parametric component. The \$/tCO₂ saved metric compares the projected 20-year GHG emissions saved to the 20-year Net Present Value.

Parametric Item	Selection
Roof Insulation	Increasing the roof insulation to R-70 decreases the PV coverage requirements by less than 1% and costs \$720/tCO ₂ saved. It is recommended the roof stay at R-50 specification, as this is not the most cost effective measure to achieve GHG emissions reduction.
Windows	The cost to upgrade from double pane to triple pane windows increases PV coverage requirements by 1% and costs \$910/tCO ₂ saved. These cost savings are not as high as other alternatives. Correspondingly, it is recommended double pane windows are used. Windows have thermal comfort and indoor environmental quality impacts on the building and it is recommended these also be considered by the designers before this change is implemented.
Additional Windows	This was seen as negligible on the PV panelling requirements when trying to achieve net zero. Additional windows may be added as a design feature and to offer more natural light.
Radiant Heating	We recommend a radiant heating system is used. A radiant heating system has a cost of \$320/tCO ₂ saved compared to using fan coils for space heating distribution, and reduces PV coverage requirements by approximately 3%. This is the lowest incremental cost per tonne of carbon saved.
Heating System Type	The difference from an ASHP to the GSHP is \$1,800/tCO ₂ saved and does not constitute a significant enough savings to justify the cost of going from an ASHP to GSHP to achieve net zero.
Hot Water Heating	We recommend going with a Heat Pump Domestic Hot Water system. This decreases PV coverage requirements by 1% and has a cost of \$460/tCO ₂ saved. This is the second most economical measure to implement for carbon reduction. Implementing a hot water tank also follows an electrification strategy, which allows the design to take advantage of future decarbonization of the Alberta electricity grid.
Lighting Power Density	We recommend targeting a reduction in lighting power since this decreases the rooftop PV required by 1% and does not have a significant cost increase.
Solar PV	Solar PV has a cost of \$50/tCO ₂ saved.



2. Project Understanding

- Town of Canmore would like to design a net zero building
- Integral Group was engaged to assist in selecting and evaluating a variety of design alternatives, and present how these different design options perform with respect to carbon Emissions, measured as tCO₂eq/yr.
- The outputs of the parametric analysis also considered:
 - Energy Use Intensity (EUI) kWh/m²/yr
 - Capital Cost \$
 - Operating Cost \$
 - Total cost over 20 year lifetime \$
- To assist in selecting an optimal solution, Integral Group adopted the following metric to compare CO₂ savings with cost:
 - Cost per tonne CO₂ saved \$ NPV (20 years) / GHG Emissions (20 years)



2. Net-Zero Carbon Definition

Net Zero Project Definition

- A net zero carbon building was defined to mean a building that produces no net carbon emissions **based on 2030 emissions.**

This may be achieved by:

- **Offsetting on-site emissions with on-site generation**
OR
- Purchasing emission-free electricity

Every scenario that meets the net zero carbon definition in 2030 is also net zero carbon in 2020. This is explained on the next page.

This option was selected for analysis

Constraints:

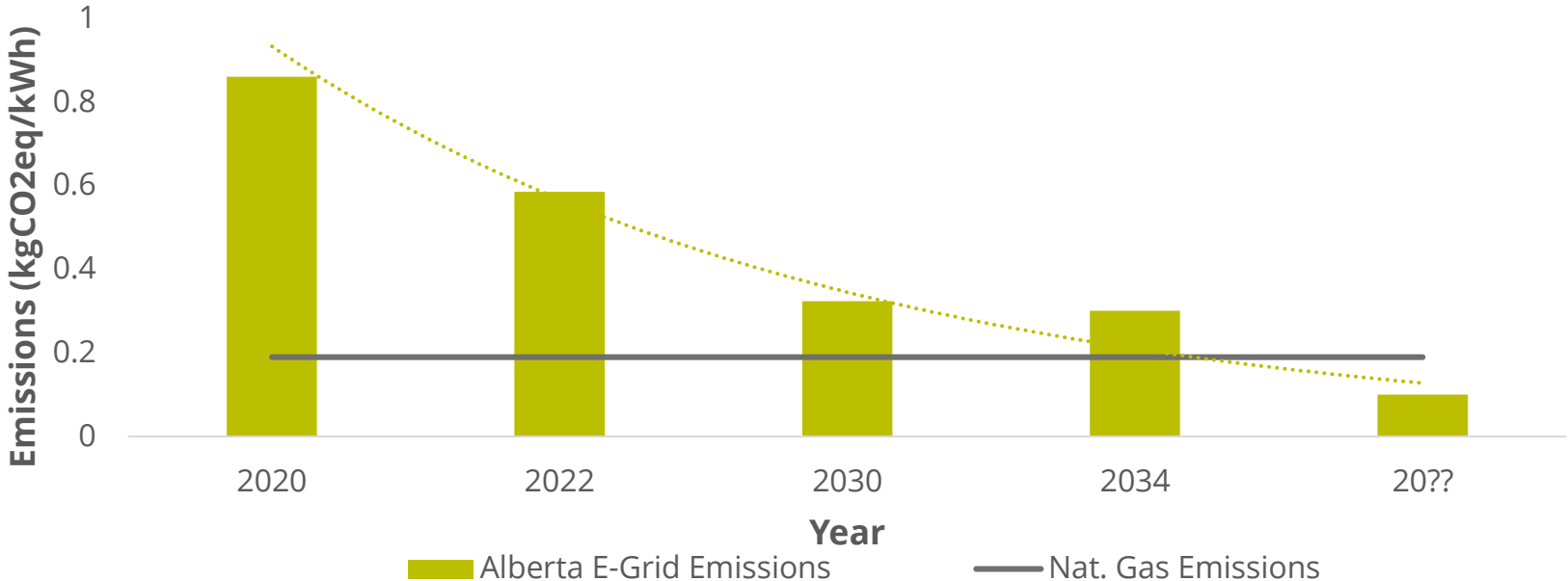
- Amount of rooftop space available for solar PV panels



2. Net-Zero Carbon Definition – GHG Emission Rate

- AESO anticipates the GHG emission intensity of Alberta’s electricity grid **will reduce over time***, as shown in the figures below.
- This reduction makes it more difficult for the Palliser Fire Hall to meet net zero carbon emissions in the future, compared to today.
- This occurs because the project’s net zero strategy is to use on-site electricity generation to offset carbon emissions from Alberta’s electricity grid. Since this strategy **relies on offsetting carbon emissions from Alberta’s electricity grid, a dirtier Alberta grid makes it easier to achieve net zero carbon.**
- Due to this trend, **2030 GHG emission intensities were selected as the basis of comparison.** This is consistent with the Town of Canmore’s Climate Action Plan of reducing carbon emissions by of 30% below 2015 levels by 2030. **Every scenario that meets 2030 emission targets will also meet 2020 emission targets.**
- This emission rate difference may be avoided by adopting a strategy of 100% electrification for the building.

Year	Alberta E-Grid Emissions (kgCO2eq/kWh)
2020	0.860
2022	0.585
2024	0.385
2030	0.324
2034	0.301
2039	0.300



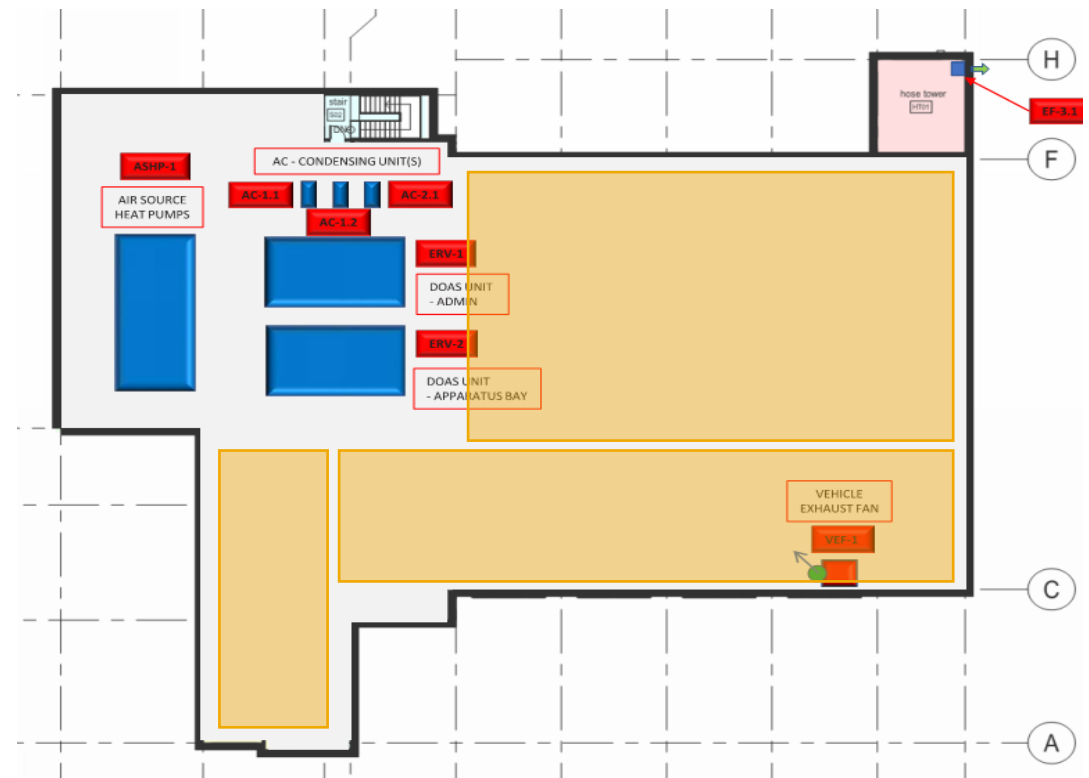
*Based on AESO 2019 Outlook and RETScreen Expert Emissions Analysis
<https://www.aeso.ca/assets/Uploads/AESO-2019-LTO-updated-10-17-19.pdf>

3. Solar PV Rooftop Generation

Next, the rooftop solar generation potential was evaluated to determine the amount of available rooftop space for solar PV panels. The orange shading below indicates the amount of space that is available for a solar PV array. **This shading represents 50% of the building's roof coverage.** With this coverage, the array would be able to produce 172,500 kWh/yr or 103 kWh per square meter of the building's total floor area per year.

Compared to 2030 GHG Emission rates, this represents an emissions offset of 54 tCO₂e per year.

Additional panels may be added above parking space, over the rooftop mechanical systems, along south-facing walls, or elsewhere on the property, if additional generation is required to meet the net zero target. The total area of these spaces is represented by the orange shaded area. This figure illustrates that area available for on-site generation would not present a design constraint.



4. Base Case Design Specifications

Below is a list of building specifications per the October 26th Design Development. This is referred to as the 'base case'. Architectural components are based on the 2020-08-27 schematic design report, while mechanical specifications are based on the DD report, dated 2020-11-13.

Building Envelope		Mechanical - Admin	
Walls	R-27	Ventilation System	Energy Recovery Ventilator
Roof	R-50	Heating / Cooling	Radiant Floor Heating with Fan Coil Units
Slab	R-20	Setpoints	22°C Heating, 24°C Cooling
Windows	Triple Pane Windows		
O/H Doors	High Performance Doors	Mechanical - App. Bay	
Air Infiltration	0.25L/s/m² of gross exterior wall area under natural building pressure.	Ventilation System	Energy Recovery Ventilator
		Heating / Cooling	Radiant Floor Heating
		Setpoint	15°C
Electrical		Mechanical - Plant	
Lighting	30% below NECB 2017	Heating / Cooling	Air Source Heat Pump
		Domestic Hot Water	Natural Gas HW Tank



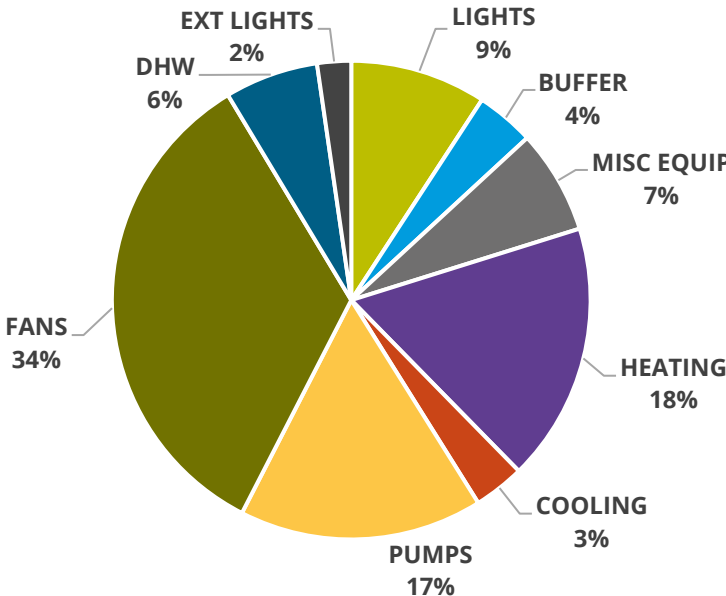
5. Base Case Performance

The modelled GHG emissions of the October 26th Design Development specifications were 58 tCO₂eq per year. This is greater than the 50% rooftop coverage scenario presented previously, which offset only 54 tCO₂eq per year.

This design would require 55% rooftop coverage, or an annual carbon-free electricity generation of 190,000 kWh/year for this design to meet the net zero carbon project definition.



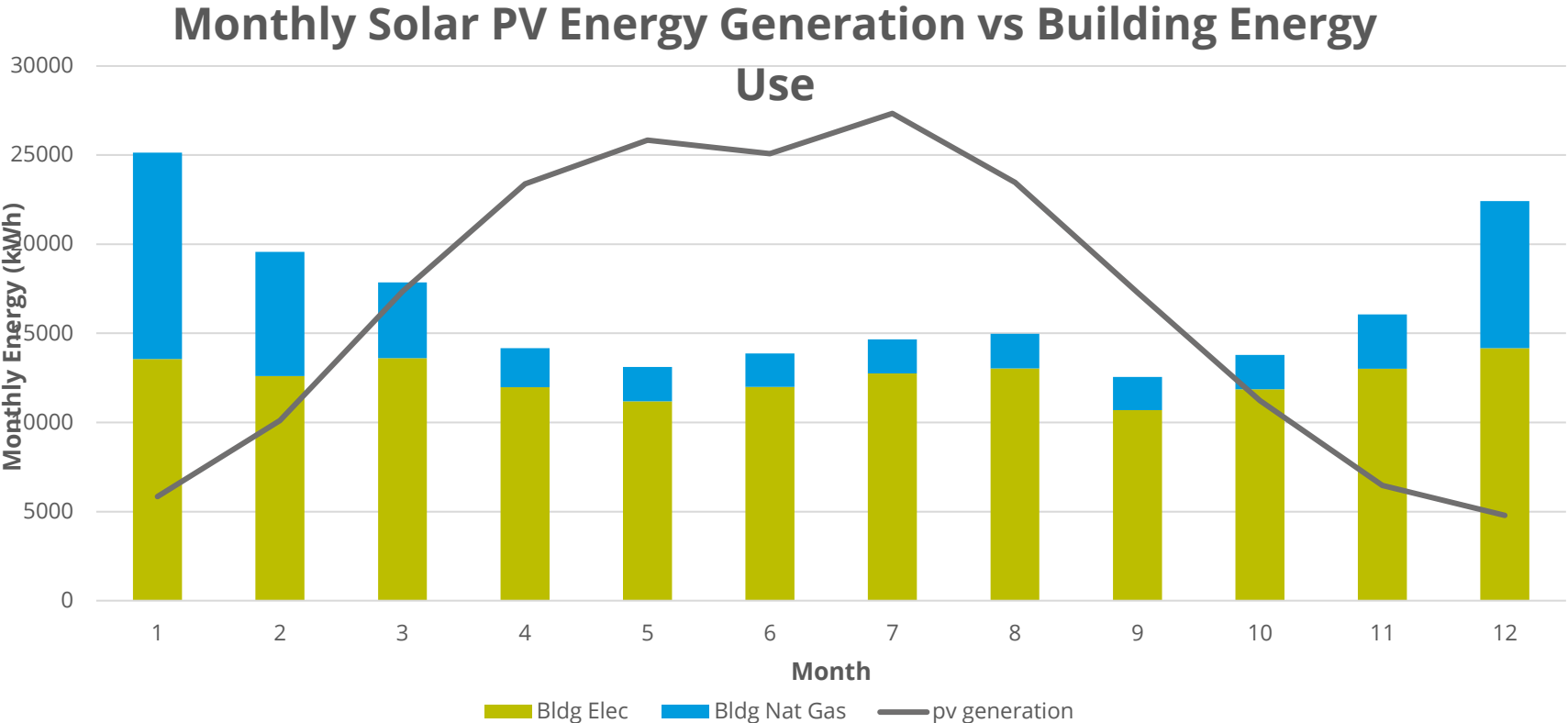
Carbon Use by Function



5. Base Case Performance

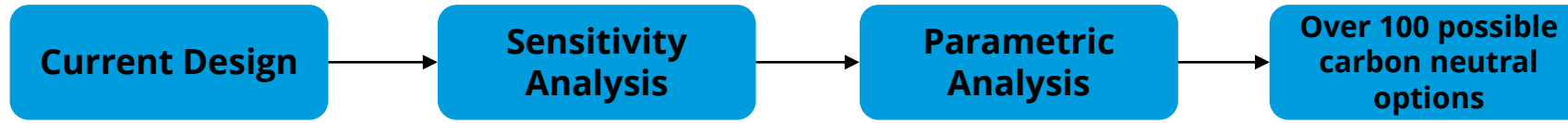
The figure below presents the monthly breakdown of building energy use and PV solar generation with **50% rooftop coverage for the current design**. The design has a carbon surplus in 2030 of 4 tonnes, which means it would not meet the net zero requirements. The design has a net carbon deficit in 2020 of 4 tCO₂eq, which means it would be considered net zero for that year.

	2030	2020
Carbon Offset from 50% PV Generation	54	143
Carbon Emissions from Building Operation	58	139
Carbon Balance	+4	-4



6. Decision Support Tools – Energy Modelling

A sensitivity analysis was completed for the design components listed below. This served in determining components to be included in the parametric analysis.



Sensitivity Analysis – Parameters Considered

- Heating & Cooling Systems, Fuel Types
- Heat Recovery Effectiveness
- SolarWall Air Heating
- Setpoint Temperatures
- Glazing size, orientation, and performance
- Wall, Roof, and Door thermal transmittance
- Air Infiltration from building envelope and door operation



In a sensitivity analysis, individual parameters are adjusted one at a time. The purpose is to show the relative impact of each item.

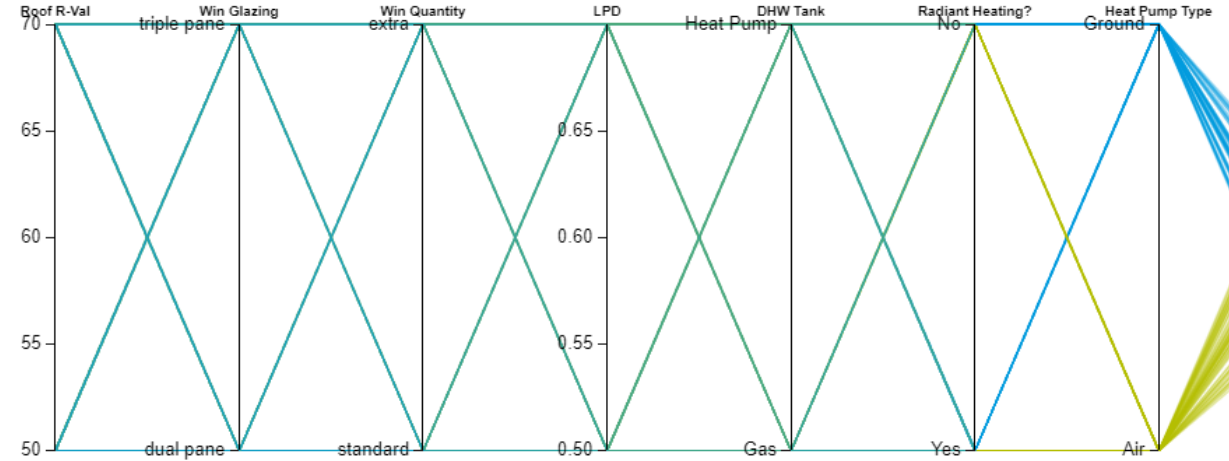


6. Decision Support Tools – Energy Modelling

The selected components of the parametric analysis are listed below. There are a total of 7 different building components. These components were evaluated by simulating all 128 possible combinations between these components.

Parametric Analysis – Parameters Considered

Parameter Description	Parametric Input
Two roof insulation options	R-50 / R-70)
Two window options	Double Pane Windows / Triple Pane Windows
Adding additional windows	Standard vs “extra”
Heat Supply	Radiant Floor Heating vs. Fan Coil Units
Heat Pump Type	Air Source Heat Pump vs. Ground Source Heat Pump
Domestic Hot Water Heater	Natural Gas vs. Heat Pump
Lighting Power	30% Better than NECB 2017 vs. 50% better than NECB 2017



In a parametric analysis, every possible combination is simulated. The purpose of this analysis is to show the interaction between different building components



6. Decision Support Tools – Cost Summary

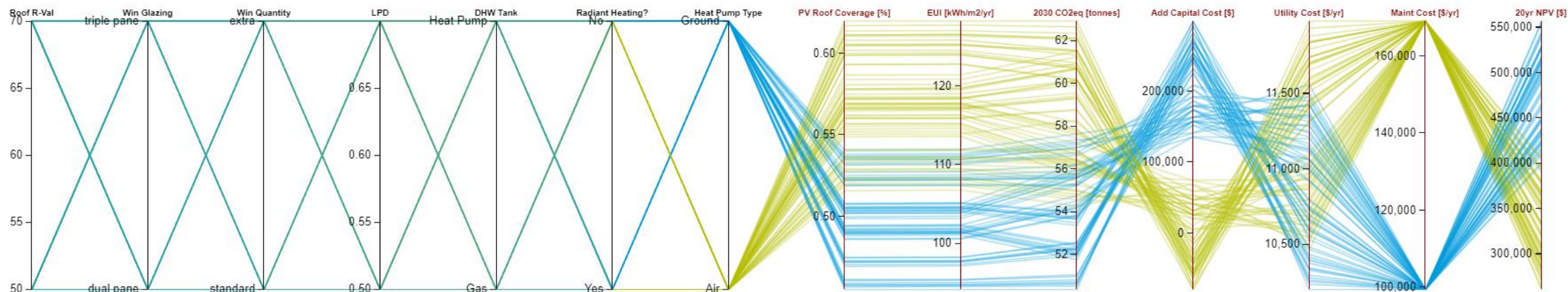
The design alternatives were evaluated against the 20 year net present value, calculated based on an interest rate of 3%. The net present value considers the utility cost, maintenance cost, and additional capital cost required.

Item	Utility Cost (from energy model)	Maintenance Cost (from supplier)	Additional Capital Cost (from Class B Cost Est.)
Roof	This is the annual cost of electricity and natural gas output from the energy model results. Unit Rates: Elec = \$0.0678 /kWh Gas = \$5 /GJ	None considered	\$44/m ³ of insulation +\$17,538 for R-70 Roof
Windows			Triple Pane = \$945/m ² Double Pane = \$700/m ² +\$23,467 for TP windows
Additional Windows (alternate design provided by MTA)			+\$20,600 (Same unit rates as above)
Radiant Heating			FCU cost = \$3,583/unit Radiant Heating = \$132,264 +\$103,600 for radiant heating
Heating System Type		ASHP: 15 year replacement time; \$350/month in maint. GSHP: 25 year replacement time; \$200/month in maint.	+\$250,000 for field; +\$76,711 replacement fee for ASHP and GSHP
Hot Water Heating		None considered	Heat Pump HWT = \$20,000 Nat Gas HWT = \$5,000
Lighting Power		None considered	No cost change
Solar PV Panels		None considered	\$1,600 / kW

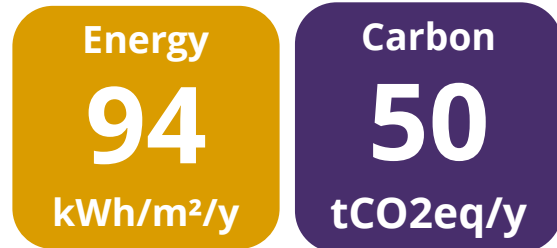


7. Results - 128 Carbon Neutral Options

All 128 of the parametric design alternatives evaluated have the potential to be net zero carbon, depending on the total electricity generated on site. The minimum and maximum carbon emissions alternatives are presented below.

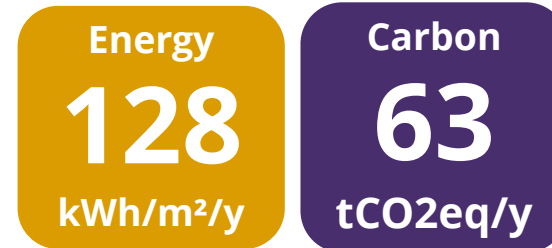


Least On-Site Generation Req'd



Required PV roof coverage to be net zero carbon definition
46%

Most On-Site Generation Req'd



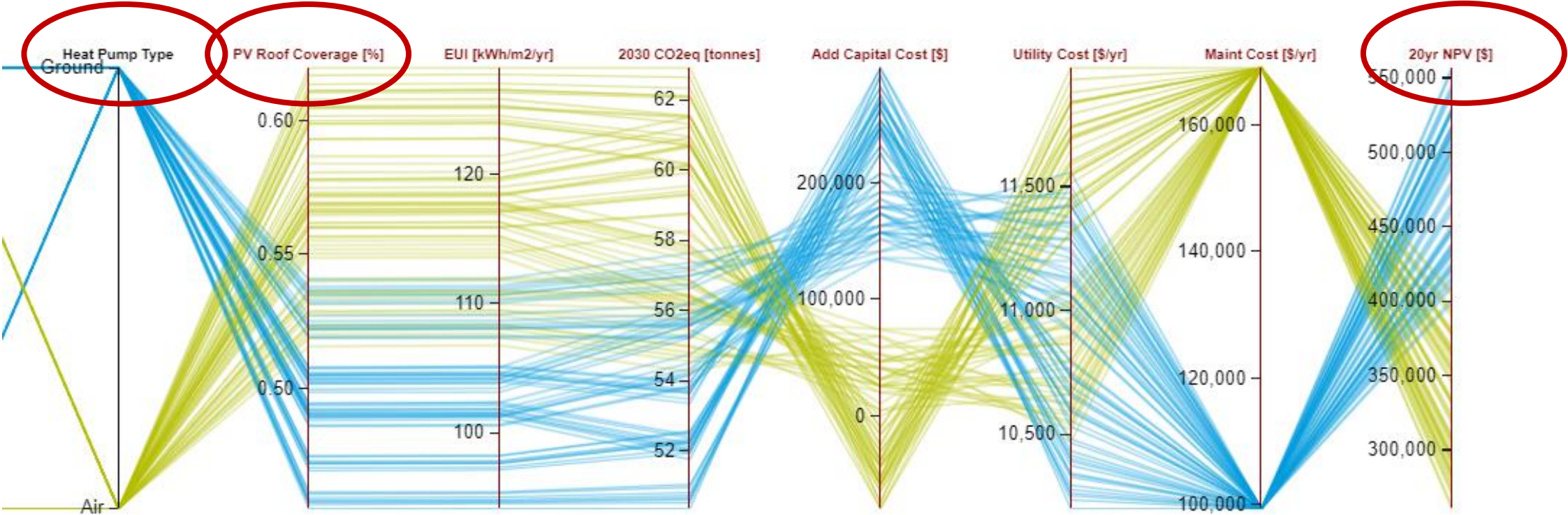
Required PV roof coverage to be net zero carbon definition
62%



7. Results - Heat Pump Type, PV Roof Coverage, and 20 Year NPV

GSHP = Blue / ASHP = Yellow

- The graph below illustrates the rooftop area required for each scenario to be carbon neutral.
- Supplemental information provided in the accompanying emo outlines the economic comparison of the cost to save 1 tonne of GHG emissions.



8. Next Steps

The amount of space for solar PV generation on site is critical to meeting the net zero project description. There are a few important considerations that must be evaluated:

- **Consider Roof Warranty** – Roof warranties are permitted through Alberta Roof Contractors Association (ARCA). ARCA has adopted standards for roof-mounted PV equipment, which are consistent with CSA standards, and permit a maximum of 50% of the roof area be covered. CSA allows for greater than 50% roof coverage if designed by a structural engineer, however this is not explicitly stated by ARCA. We recommend coordination with warranty providers if roof coverage greater than 50% is targeted. This information was accessed from the following Infrastructure Alberta report: <https://www.alberta.ca/assets/documents/tr/tr-solarpvguide.pdf>
- **Consider Utility Provider** – Consultation with utility may be required to determine for the utility to accept the anticipated power that will be generated on site.
- **Refine Rooftop Design** – The rooftop design will dictate the maximum permissible space available for solar PV panels.



03 December 2020



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www.integralgroup.com

Ref: 110126 Palliser Fire Hall

Dear Michael,

Re: Supplementary Information for Parametric Analysis

The information presented in the following pages of this document are intended to supplement the information in the Palliser Fire Hall Parametric Analysis Report, issued December 2020. It presents:

- Detailed scenarios from the parametric analysis
- the cost per tonne of CO2 saved of parametric components
- answers to questions received during the presentation, and
- summarizes the findings of the sensitivity analysis.

Please do not hesitate to contact me if there are further questions or requests.

Sincerely,

Jonathan Brinias
P.Eng, M.Eng., CPHD, EA+MURB
Energy Analyst
On behalf of Integral Group



1. Detailed Data from Parametric Analysis

The chart below outlines a series of minimum NPV alternatives for scenarios that require less than 55% PV roof coverage to meet net zero requirements. All scenarios indicated use an **air-source heat pump**.

Roof R-Val	Win Glazing	Win Quantity	Heat Pump Type	Lighting Power (% of NECB 2017)	DHW Tank	Radiant Heating?	PV Roof Coverage [%]	EUI [kWh/m2/yr]	2030 CO2eq [tonnes]	Additional Capital Cost [\$]	Utility Cost [\$ /yr]	Maint Cost [\$ /yr]	20yr NPV [\$]
50	dual pane	standard	Air	0.7	Gas	Yes	0.55	113.9	58.3	\$0	\$10,967	\$168,967	\$332,121
50	dual pane	standard	Air	0.7	Heat Pump	Yes	0.54	112	56.9	\$10,895	\$11,104	\$168,967	\$345,066
50	dual pane	extra	Air	0.7	Heat Pump	Yes	0.54	111.8	56.8	\$31,346	\$11,082	\$168,967	\$365,179
50	triple pane	standard	Air	0.7	Heat Pump	Yes	0.54	111	56.5	\$32,215	\$11,041	\$168,967	\$365,446
50	triple pane	extra	Air	0.7	Heat Pump	Yes	0.53	110.5	56.2	\$59,355	\$11,002	\$168,967	\$392,007
70	dual pane	standard	Air	0.7	Heat Pump	Yes	0.54	111	56.4	\$26,211	\$11,029	\$168,967	\$359,254
70	dual pane	extra	Air	0.7	Heat Pump	Yes	0.54	110.8	56.3	\$46,737	\$11,010	\$168,967	\$379,501
70	triple pane	standard	Air	0.7	Heat Pump	Yes	0.53	110	56	\$47,682	\$10,973	\$168,967	\$379,902

The chart below outlines a series of minimum NPV alternatives that meet net zero requirements. All scenarios indicated use a **ground-source heat pump**.

Roof R-Val	Win Glazing	Win Quantity	Heat Pump Type	Lighting Power (% of NECB 2017)	DHW Tank	Radiant Heating?	PV Roof Coverage [%]	EUI [kWh/m2/yr]	2030 CO2eq [tonnes]	Additional Capital Cost [\$]	Utility Cost [\$ /yr]	Maint Cost [\$ /yr]	20yr NPV [\$]
50	dual pane	standard	Ground	0.7	Gas	Yes	0.51	105.2	54	\$231,245	\$10,661	\$99,475	\$489,333
50	dual pane	standard	Ground	0.7	Heat Pump	Yes	0.48	98.3	52.6	\$231,595	\$10,799	\$99,475	\$491,734
50	dual pane	standard	Ground	0.7	Heat Pump	No	0.51	104.6	56	\$141,365	\$11,500	\$99,475	\$411,923
50	triple pane	standard	Ground	0.7	Gas	No	0.54	110.7	57	\$163,050	\$11,288	\$99,475	\$430,467
50	triple pane	standard	Ground	0.7	Heat Pump	No	0.5	103.9	55.6	\$163,438	\$11,427	\$99,475	\$432,913
50	triple pane	extra	Ground	0.7	Gas	No	0.54	111	57.1	\$191,809	\$11,314	\$99,475	\$459,607
50	triple pane	extra	Ground	0.7	Heat Pump	No	0.5	104.2	55.7	\$192,197	\$11,452	\$99,475	\$462,053
50	triple pane	extra	Ground	0.7	Heat Pump	Yes	0.47	98	52.2	\$282,051	\$10,732	\$99,474	\$541,193

2. Cost Per Tonne of CO2 Saved

There are two main outputs from the analysis: net present value and building operating carbon emissions. In order to make an economic decision, a comparison between carbon and cost is required. The cost per tonne CO₂ saved (\$/tCO₂eq.) for each component analyzed in the parametric analysis is indicated in the figure below.

As indicated in the chart, upgrading from R-50 insulation to R-70 insulation would cost \$720/tCO₂eq saved. Similarly, using triple pane windows costs \$910/tCO₂eq saved compared to double pane windows. Selecting a radiant heating system over fan coil units has a cost of \$320/tCO₂eq saved. Selecting a ground source heat pump has a cost of \$1,800/tCO₂eq saved. Selecting a domestic hot water heat pump would cost \$460/tCO₂eq saved, compared to selecting a natural gas domestic hot water heater.



Parametric Item Alternative	\$/tCO ₂ eq
Additional Roof Insulation → R-50 to R-70	+720
Windows → Double Pane to Triple Pane	+910
Additional Windows	N/A This is an architectural design decision – metric not relevant
Radiant Heating → FCU heating to radiant heating	+320
Heating System Type → Air Source to Ground Source Heat Pump	+1,800
Hot Water Heating → Gas Hot Water to Air Source Heat Pump HW	+460
Lighting Power	N/A No cost increase for this parameter

3. Questions from Parametric Presentation

3.1 Wood Pellet Heating

A question arose during the presentation regarding the consideration of a wood pellet heating system. This scenario was not included as a parametric option, as it had not been rejected during the sensitivity analysis presented on October 28th, 2020. Five heating systems were considered in this analysis:

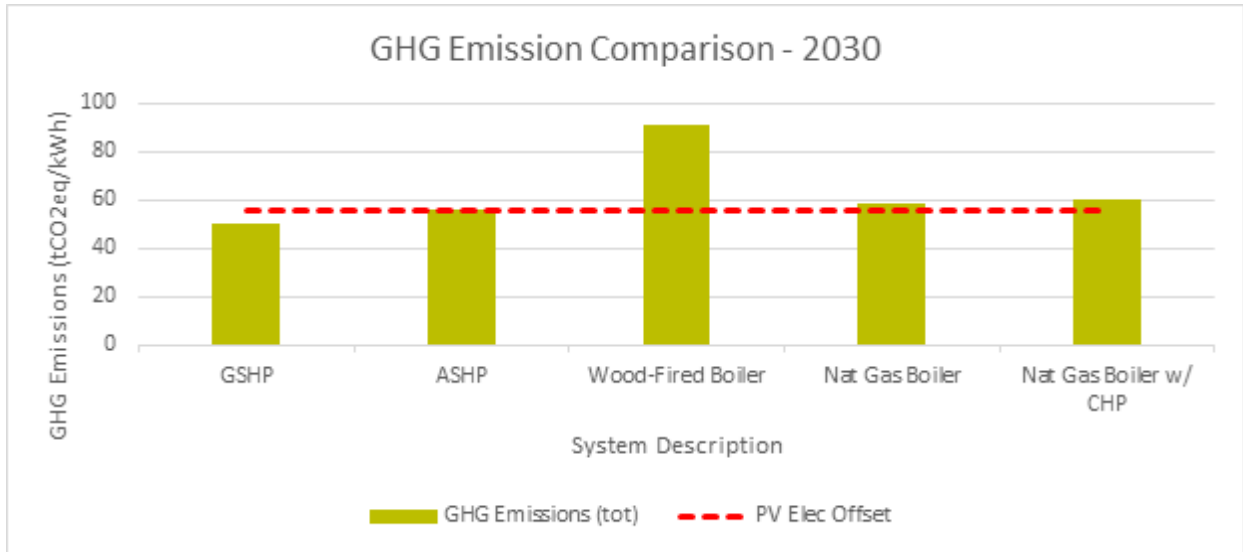
1. Air-source heat pump (ASHP)
2. Ground-source heat pump (GSHP)
3. Wood fired boiler
4. Natural gas boiler
5. Natural gas Combined Heat and Power Plant (CHP)

The snapshot below shows the GHG emissions comparison of the 5 options compared to 50% PV roof coverage. The natural gas boiler, natural gas boiler with CHP, and the wood-fired boiler options were not ideal for meeting the net zero target because they performed worse than the GSHP and ASHP options. Moreover, they would not scale with the change in carbon intensity of the electricity grid. For instance, the ASHP and GSHP options will continue to decrease annual carbon emissions as the electricity grid becomes cleaner, whereas the natural gas and wood options would experience minimal change.

There were also additional obstacles for the wood fired boiler, which included:

1. The potential variability in emissions intensity associated with the wood sourced
2. The potential variability in the quality and availability of wood to be burned

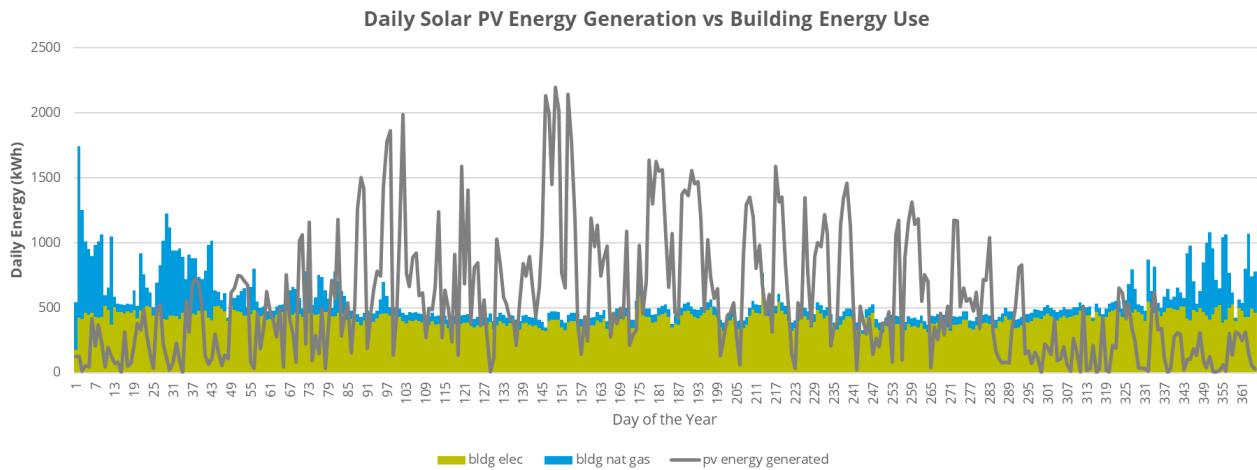




*Based on EnergyStar Portfolio Manager Emission Intensity for Sustainably Sourced Wood

3.2 Energy Generation vs. Building Energy Use

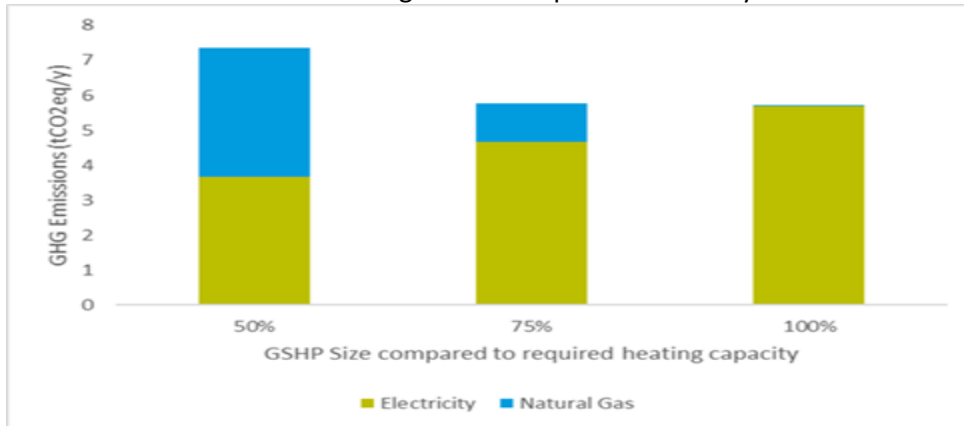
A question arose during the presentation regarding energy generation vs building energy consumption. Below is a monthly breakdown of the solar PV generation (gray), vs electricity use (green) and natural gas use (blue) for the base case model.



3.3 Ground Source Heat Pump (GSHP) Capital Costs and Capacity

Soil conductivity was not considered for the ground source heat pump scenario. As a result, this scenario has a greater amount of variability in the energy and cost outputs. An added capital cost of \$250,000 was applied to the GSHP scenarios. This cost is based on previous projects, though can vary greatly based on local soil conditions.

Below is a chart of the total heating GHG emissions based on the size of the GSHP loop. The GSHP is sized to meet 100% of the heating load in the parametric analysis.

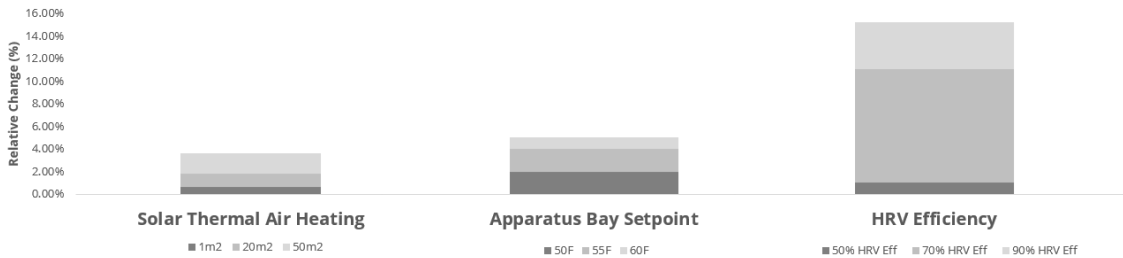


4. Sensitivity Analysis

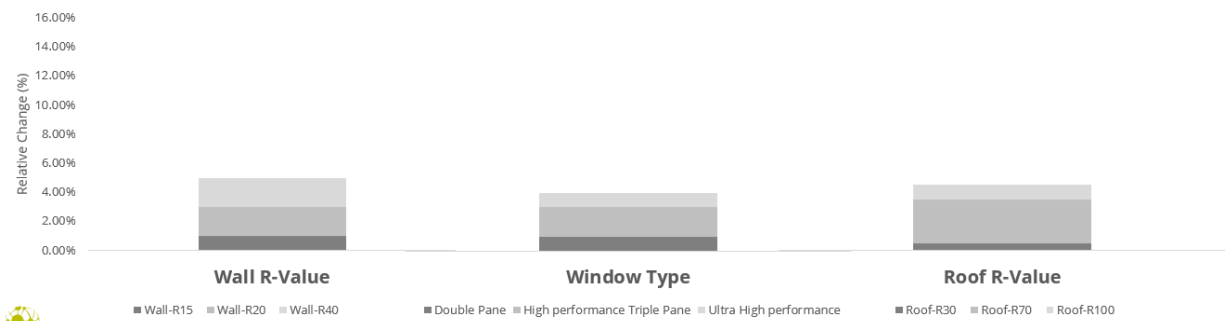
The charts below indicate the results of the sensitivity analysis. The purpose of the sensitivity analysis is to determine how much impact a single parameter can have on the design.

The first series of charts below show the impact that heating delivery systems can have on the design's carbon emissions.

- The first item to note is the large relative impact of HRV efficiency. Given the large relative change of this component, it was determined a high performance HRV be selected. A high performance HRV was already specified in the base case design, so was not considered in the parametric analysis.
- The next item considered was the Apparatus Bay setpoint temperature. Radiant heating systems require a lower setpoint to achieve the same level of thermal comfort among occupants. This phenomenon occurs because thermal comfort is governed by surface temperature as well as air temperature. Due to e relative change, the impact of radiant heating was considered in the parametric analysis.
- Finally, Solar thermal air heating (i.e. SolarWall), had the smallest impact on carbon. Its size is limited to work with HRVs, which already recover large amounts of energy. Solar Thermal Air Heating may also compete with space for PV solar panels. Since the town is already pursuing PV generation as their offset, solar thermal air heating was not considered in the parametric analysis.

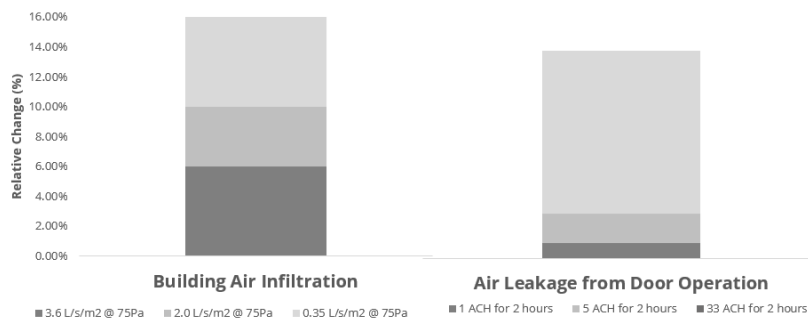


The second series of charts below show the impact that the building envelope has on the design's carbon emissions. Effective thermal transmittances are inversely related to thermal resistances (referred to commonly as R-values). As a result, there are diminishing returns for wall assemblies with high thermal resistances. This 'diminishing return' may be seen when multiple values are plotted and is referred to as an 'inflection point'.



- The first item analyzed was the wall thermal transmittance. The current design value of R-27 was very close to the plotted inflection point. Due to the small relative change, this parameter not be included in the parametric analysis.
- The second item to note is the window type. The window to wall ratio for this design is approximately 2-3% of the gross building exterior area. Due to this small area, the windows are not very sensitive to carbon emissions. Moving from double pane to triple pane windows or adding more windows may have positive cost implications or allow for a more appealing architectural and lighting designs. For these reasons, this parameter was selected for the parametric analysis.
- The final item to note is the roof R-value. The current design at R-50 was not at the inflection point, which was observed to be R-70. The Roof R-value was considered in the parametric analysis to determine if adding more insulation would be beneficial.

The final series of charts below show the impact that building infiltration and airtightness has on the design's carbon emissions. These



- The first item to note is the large impact of building air infiltration. This is a component that is often overlooked in building design, since airtightness testing is not required by Canadian Building Codes. It is also overlooked in some net zero building standards. The infiltration rate currently modelled is 0.9 L/s/m² @ 75Pa, which is calculated from the permissible rate defined in the National Energy Code of Canada For Buildings. This rate, however, does not align with other standards. For instance, US Army Corps of Engineers' (USACE) Standard on Airtightness Testing recommends a value of 2.0 L/s/m² @ 75Pa. When airtightness testing has been required, it has often been observed that buildings without airtightness testing requirements perform worse than the USACE requirement.

Airtightness was not selected for the parametric analysis because airtightness is not a requirement for all net zero standards. Airtightness has a large relative change on carbon and testing is recommended if the town would like to confirm the modelled target is met.

- The second item to note is the large leakage from door operations. Due to the potentially large impacts to building energy use, it is recommended airtight overhead doors are selected with timers.





Alberta VPPA Evaluation

December 2021



Disclaimer

- This report has been prepared by Power Advisory LLC (Power Advisory) for the sole and exclusive purpose of providing market information and insight with respect to a virtual PPA for Canmore and Banff
 - Power Advisory takes no responsibility for the use of the report by third parties
- This report contains opinions, conclusions and estimates made by Power Advisory using its professional judgment and reasonable care
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I. Summary of Findings and Recommendations

High Level Assumptions

- Power Advisory utilized its October 2021 Alberta Forecast as the basis for the analysis
 - The Base Case and Business as Usual Case (Low Case) were the specific scenarios utilized
 - Key assumptions for these scenarios are outlined in this report and are included in an Excel spreadsheet for reference
- Both the wind and solar VPPA's are assumed to be financial contract for differences settled against the hourly Alberta spot market price
 - The size of the VPPA is expected to meet Canmore/Banff's total annual energy requirement (16,260 MWh annual energy purchased)
 - Some hours the wind/solar generator will produce more than the Canmore/Banff load and some hours less
 - In all cases Canmore/Banff will pay a fixed price for the renewable energy
 - Power Advisory did not assume any escalation in the VPPA prices, i.e. the contract price remained flat throughout the term
 - The analysis assumes exactly the right amount of wind or solar generation is contracted, i.e. exactly 1,620 MWh of annual energy are acquired to offset the Canmore/Banff load
- Canmore/Banff may or may not have a separate contract – the analysis would not be materially different

High Level Results

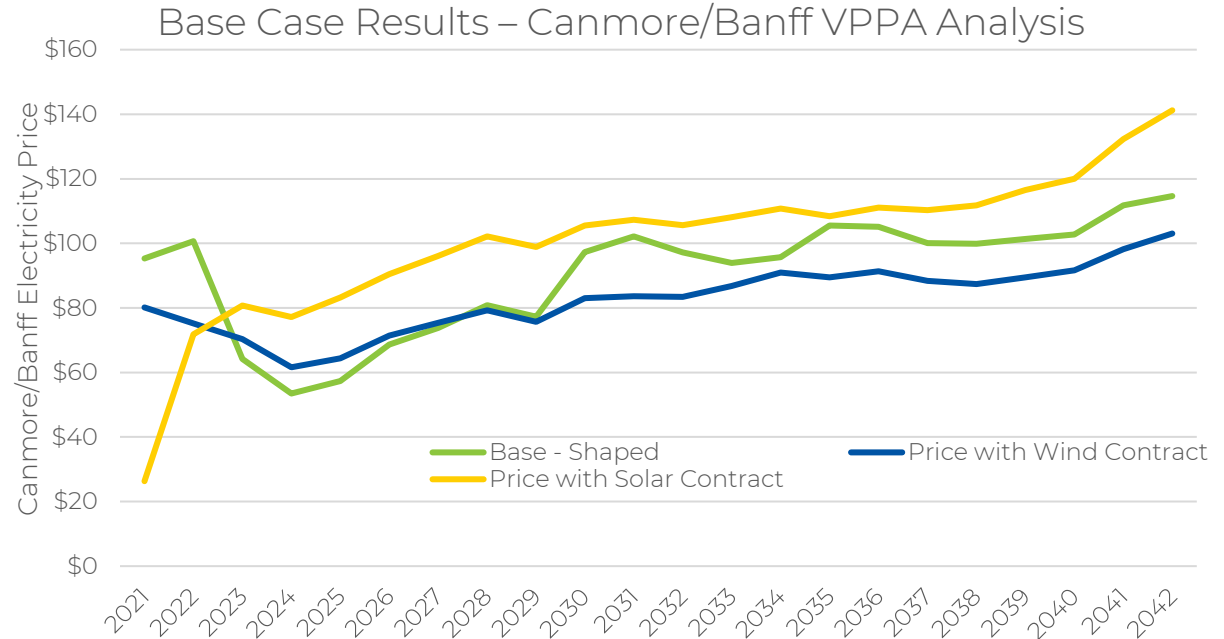
- Wind VPPA is lower cost and lower risk than solar VPPA
 - Near-term risk in the \$20/MWh range (\$350,000 combined cost for Canmore and Banff in REC costs)
 - Longer term upside a function of carbon policy – VPPA is ‘cash positive’ in many years as carbon prices increase
 - In the Base Case there is an expected benefit to the wind PPA
- The lower risk with the wind VPPA is due to the difference in strike prices
 - The wind contract is evaluated based on a strike price of \$48/MWh
 - The solar contract is evaluated based on a strike price of \$71/MWh
- Solar VPPA is expected to cost materially more than the wind VPPA largely because the ‘solar premium’ in the market is expected to dissipate by 2023 with material solar capacity being added to the market
 - Much larger risk and expected costs of \$20/MWh or higher for RECs in the Base Case and \$40/MWh in the Low Case
 - Results in costs of up to \$650,000 for RECs in the low electricity market price scenario
- In essence the ‘timing’ premium of solar production does not last for long enough to overcome the higher strike price associated with the solar VPPA versus the wind VPPA

High Level Results

- Combining wind and solar only makes sense in one potential scenario – over procurement with no retail contract, i.e. electricity is purchased on the spot market
 - If wind and solar are ‘over procured’ with the excess offsets/credits can be used to reduce the VPPA cost
 - Could potentially be done with the original seller who would then sell the attributes to a large Alberta emitter under the TIER regulation
 - Effectively this would lower the price of the renewable energy for Canmore/Banff and the excess energy from diverse resources would provide a hedge for actual consumption
 - This scenario is not examined as it is materially different than but is a potential option if over-procurement is considered
- The key potential risk is that the market for offsets (renewable attributes) is subject to significant political risk and the value of attributes declines unexpectedly
- Canmore and Banff would also have excess energy for sale into the spot market
 - More so than in the case where renewable energy is balanced against total consumption
- The advantage is that future price increases benefit the portfolio – to some extent electricity costs can be hedged for a much longer term than can be done through current retail contracts (typically 5 years or less)

Base Case Results – Wind VPPA is Attractive

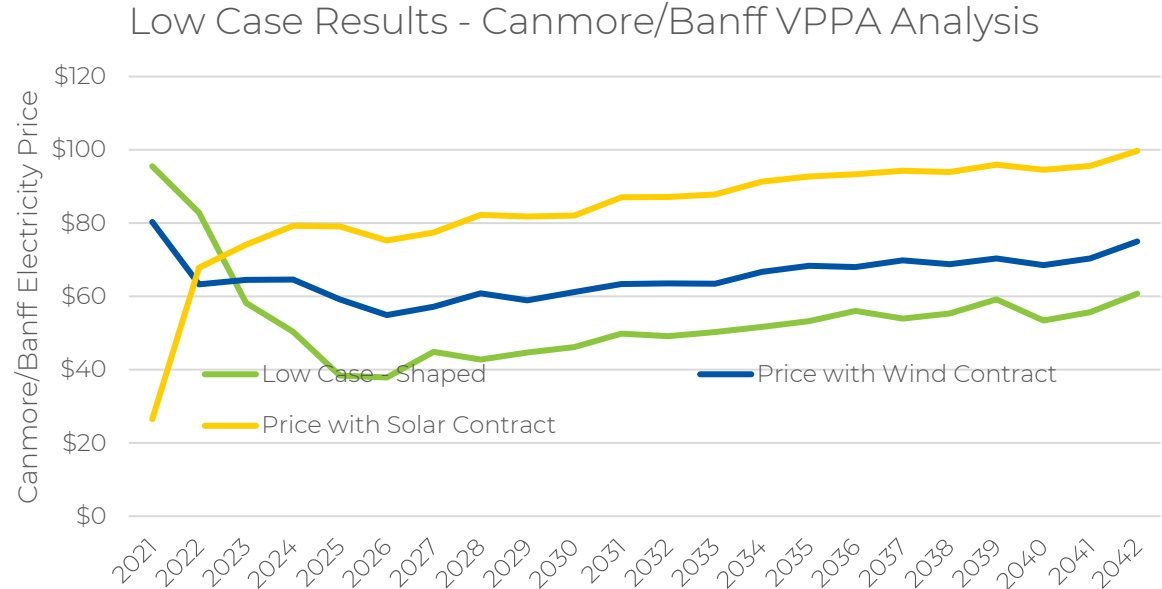
- As the graphic illustrates the expected cost of electricity supply in the Base Case is lower with a wind contract
- The Base Shaped line is the expected cost of electricity based on Power Advisory's forecast shaped to Canmore/Banff's load shape
 - The line is developed from Power Advisory's October 2021 Base Forecast
- Solar is initially attractive but as more solar capacity is added to the system the premium for solar generation timing is driven out of the market and wind becomes the more effective VPPA due to its lower price



- Wind contract strike price \$48/MWh and solar strike price \$71/MWh

Low Case Results – Wind VPPA Less Costly than Solar

- The graphic illustrates the expected cost of electricity supply in the Low Case
 - Price reflects shape of Canmore/Banff load
- Both wind and solar result in higher prices in the Low Case because electricity prices are broadly low resulting in losses within the VPPA
- Annual cost of the wind VPPA is in the \$60 to \$75/MWh range assuming forward prices reflect forecast prices, i.e. the forward contract price is 'fair market value' for Canmore/Banff load

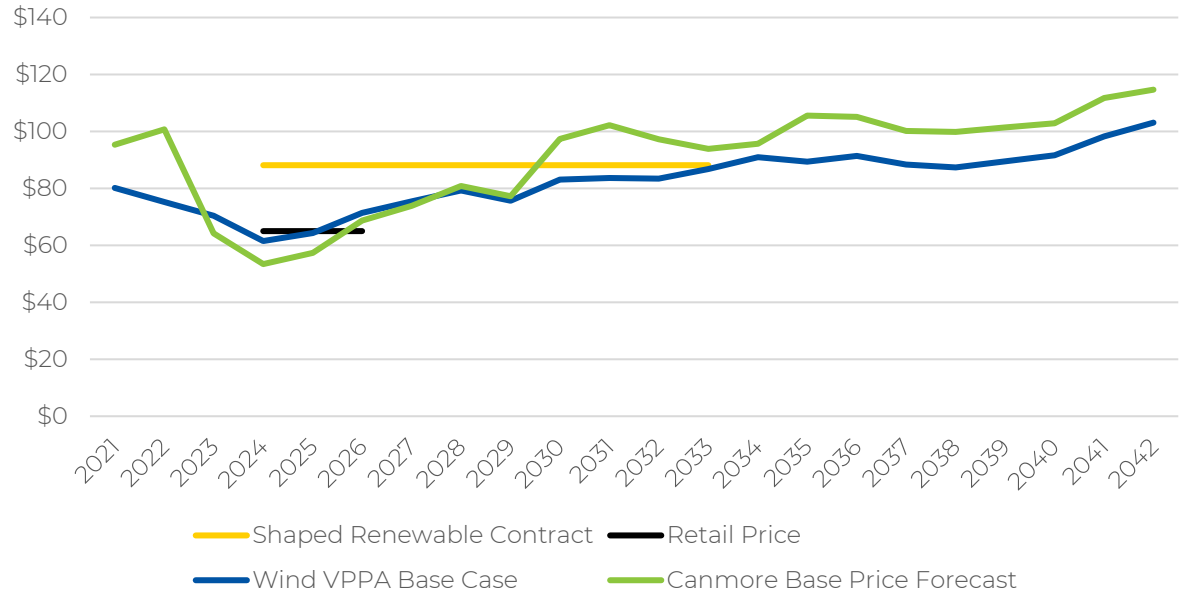


- Wind contract strike price \$48/MWh and solar strike price \$71/MWh

Shaped Renewable Contract Expected to be More Expensive than Wind VPPA

- The shaped renewable contract at \$88.15/MWh is more expensive than the Wind VPPA
 - It creates certainty but at a relatively expensive price
- If electricity prices are above the Base Case the Wind VPPA still generally remains below the shaped renewable contract
- The \$65/MWh retail price for 2024 through 2026 represents a 10% premium over Power Advisory's Base Case estimate for Canmore/Banff load
 - This is likely a reasonable risk premium and reflects similar price expectations to the Power Advisory Base Case

Retail Comparison with Base Case VPPA



- Retail contract based on quote for Canmore load

Potential 'Mixed' Wind and Solar VPPAs

- Given that the Solar VPPA is expected to be materially more expensive than the Wind VPPA Power Advisory did not find any benefit to mixing wind and solar generation
- There is a possible exception that can be explored if the scope of the procurement is changed somewhat
 - If Canmore/Banff over procure renewable energy relative to expected needs they will have renewable attributes that hold value under the Alberta TIER carbon tax system
 - These credits can be monetized (or retained by the seller in return for a lower contract price) in order to lower the expected cost of solar generation
 - With more cost-effective solar generation (or even lower cost wind) lower total costs can be obtained
- In this scenario it may be feasible to purchase both wind and solar such that expected volatility is lowered via the diverse supply portfolio
 - Power Advisory did not examine this scenario in detail but initial analysis suggests it could lower expected costs and/or volatility associated with the VPPPA

Observations

- The Wind VPPA lowers price uncertainty in the long-term
 - If prices tend towards the Low Case the Wind VPPA raises prices as the wind contract will be above market rates
 - If prices tend towards the Base Case or higher the Wind VPPA deliver lower expected costs for Canmore/Banff
- The solar VPPA is only attractive in the near-term when market prices are high and there is not yet much solar capacity in the market
 - The value of solar generation is forecast to fall by 2023 as new solar capacity is brought to market and the 'premium' of solar generation is reduced
 - Power Advisory's estimate is that when solar capacity reaches about 1,000 MW in the market solar generation will no longer receive a premium over the average market price
- The shaped renewable contract at \$88/MWh is higher expected cost than the Wind VPPA in all scenarios
 - In essence the retailer is earning a material margin in return for absorbing the spot market risk inherent in a VPPA

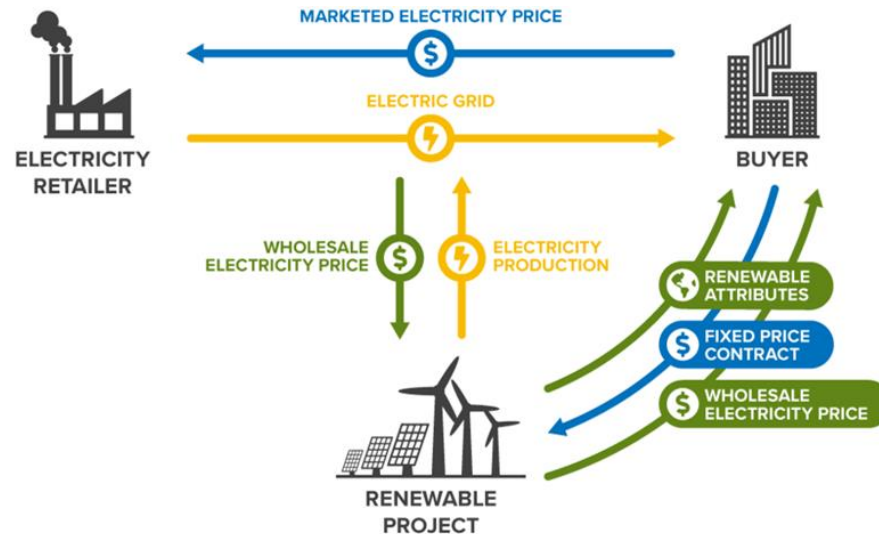
Recommendations

- The Wind VPPA is more attractive than the Solar VPPA at the prices quoted given Canmore/Banff load shapes and if a VPPA is pursued the Wind VPPA should be chosen
 - If carbon prices and future electricity prices are relatively high the Wind VPPA will lower electricity costs
 - If carbon prices and future electricity prices are relatively low the Wind VPPA raises prices by a maximum of \$20/MWh but this is an unlikely scenario as it assumes carbon prices remain at \$50/tonne throughout the forecast horizon
- The \$65/MWh retail price appears reasonable assuming carbon prices increase per federal guidelines. If price stability is important the retail contract lowers price volatility relative to the alternative (but does have slightly higher expected costs than spot market purchases).
 - If carbon prices do not increase beyond \$50/tonne the retail contract is higher than expected market prices in 2024 through 2026.
- The shaped renewable contract at \$88/MWh is only attractive if price stability is a key consideration
- If over-procurement is a potential option Canmore/Banff should get a proposal where the seller retains the excess renewable credits and this lower price can be evaluated relative to the Wind VPPA

II. Overview of VPPAs

VPPA Structure

- Offtake agreements generally involve a long-term contract (8+ years) for renewable energy between a renewable developer and a purchaser
 - Typically the offtake agreement is for energy and renewable attributes (offsets and/or EPCs) although agreements for attributes only have been used to support renewable development in Alberta



VPPA Structure

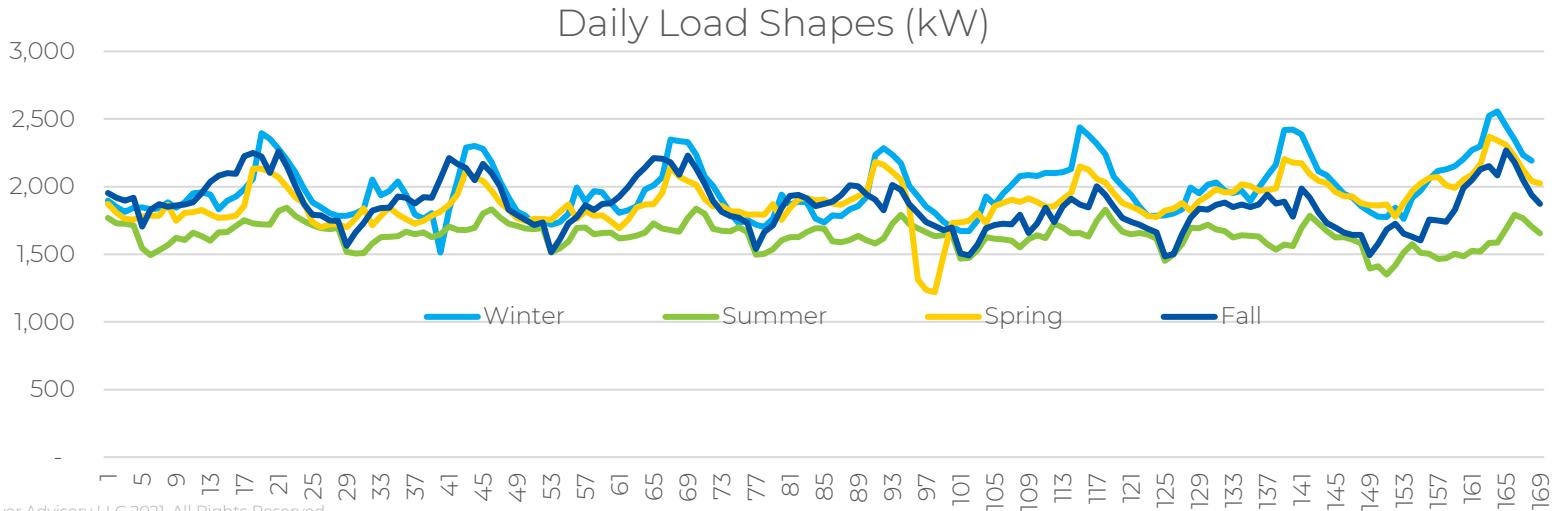
- Most virtual PPAs are in the form of a contract for differences (CFD) in which the buyer pays a fixed price to the generator, sells the power into the spot market, and retires the offset/credit. For Canmore/Banff the municipal load may or may not also be hedged under a fixed price retail contract. The value or cost of the VPPA is negatively correlated with overall electricity prices, i.e. higher electricity prices result in a more valuable (or less costly) VPPA set of cash flows.
- Financial PPAs are essentially a form of a financial hedge under which a fixed price cash flow is exchanged for both a variable priced cash flow and renewable attributes.
- The generator sells the electricity it produces into the wholesale market and the buyer continues to buy the energy from the generator at a fixed price.
 - Actual electricity purchases relative to physical consumption are not addressed in the PPA
 - The renewable energy project and the energy user do not need to be in the same location
- Under the financial PPA, the parties set a “strike price” associated with such agreed portion of the power generated by such renewable energy facility as delivered to the Alberta spot market. This guaranteed fixed price for the power output provides revenue certainty for the life of the PPA provided annual energy production expectations are met.

VPPA Structure Continued

- The renewable energy generator sells the electricity at the available wholesale market price. If this price is greater than the “strike price”, the generator pays the positive difference to the corporate/buyer. Conversely, if the “strike price” is less than the market price, the corporate/buyer will pay the generator the difference up to the strike price.
- Settlement occurs typically on a monthly basis with a form of a contract for difference agreement or a long-term commodity swap transaction under the 2002 ISDA Master Agreement being the most common structure.
- Contracts may be “fixed price, variable volume” which means all output is delivered as it is generated, or “fixed price, fixed volume”, which means that a certain volume or shape is delivered. Under a fixed volume contract the seller is obligated to meet the shape and may end up purchasing spot electricity to cover hourly short positions. Variable volume is generally lower risk for the seller while fixed volume is generally lower risk for the buyer.
 - The analysis in this report assumes fixed price variable volume, i.e. Canmore and Banff take the risk on the timing of the production.

How Would it Settle?

- 16,260 MWh of total load between Canmore and Banff
 - 9,260 MWh in Canmore and 7,000 MWh in Banff
 - Modeling assumes the same load shape in both (Canmore load scaled to reflect total)
- Absent any retail contracts or a VPPA the load would purchase electricity at the Alberta spot market price (or under RRO prices but that is not considered in the analysis)



How would it settle with no VPPA?

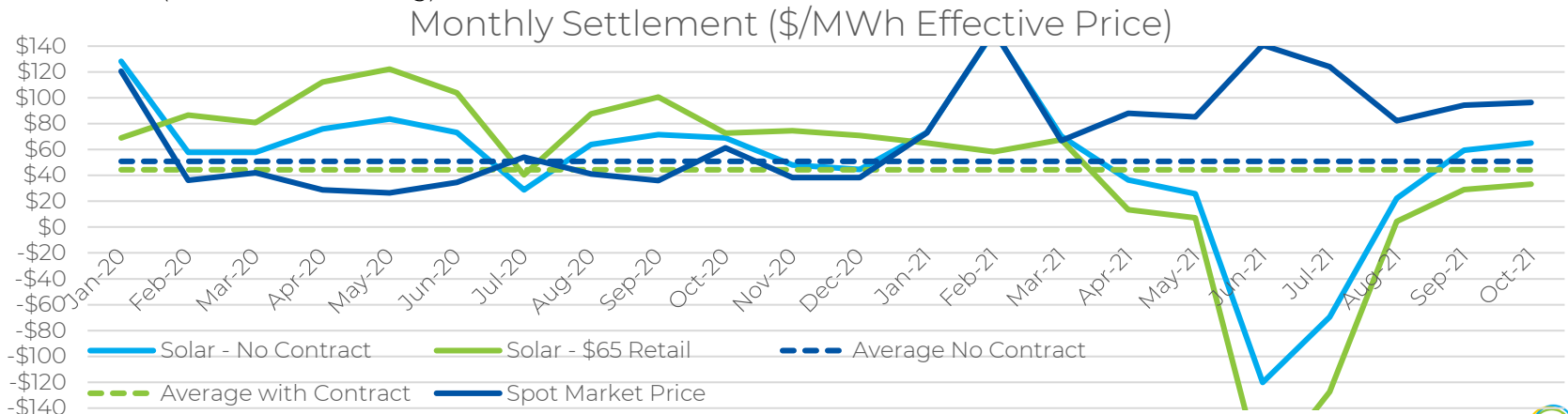
- Graphic illustrates monthly spot purchases of electricity vs a hypothetical retail contract priced at \$65/MWh (noting this was not the contract in place during this period)
 - Canmore/Banff Load line is the estimated cost of Canmore/Banff load shape purchasing spot market electricity and for the period examined the average would have been \$71/MWh due to high prices in 2021 (ranging from \$26/MWh to \$158/MWh monthly – the spot market is very volatile)
- Absent a VPPA Canmore/Banff would pay \$65/MWh for grid power (no environmental attributes) with the retail contract or the monthly spot price (as shown) with a spot market arrangement (RRO monthly 'contract' price not shown but could also be done)

Historical Retail Contract vs Spot Market Purchases



How would it settle with a VPPA?

- Key consideration is whether there is a retail contract in place (solar VPPA shown for illustration)
 - With a retail contract Canmore/Banff pays \$65/MWh for grid power and settles the solar VPPA separately
 - Average price for 2020 through Oct 2021 with a \$65/MWh contract after VPPA settlement was \$45/MWh because the solar VPPA yielded profits in 2021 during high price months (dashed green) noting that settlement is notional only, i.e. netting power costs against VPPA revenues
 - Without a retail contract Canmore/Banff pays spot market prices for electricity and uses the solar VPPA as a hedge
 - With the high prices in 2021 this was also beneficial, but spot market purchases were expensive so the average historical price with this structure would have been \$51/MWh (dashed blue line) on a notional basis once again (after internal netting)



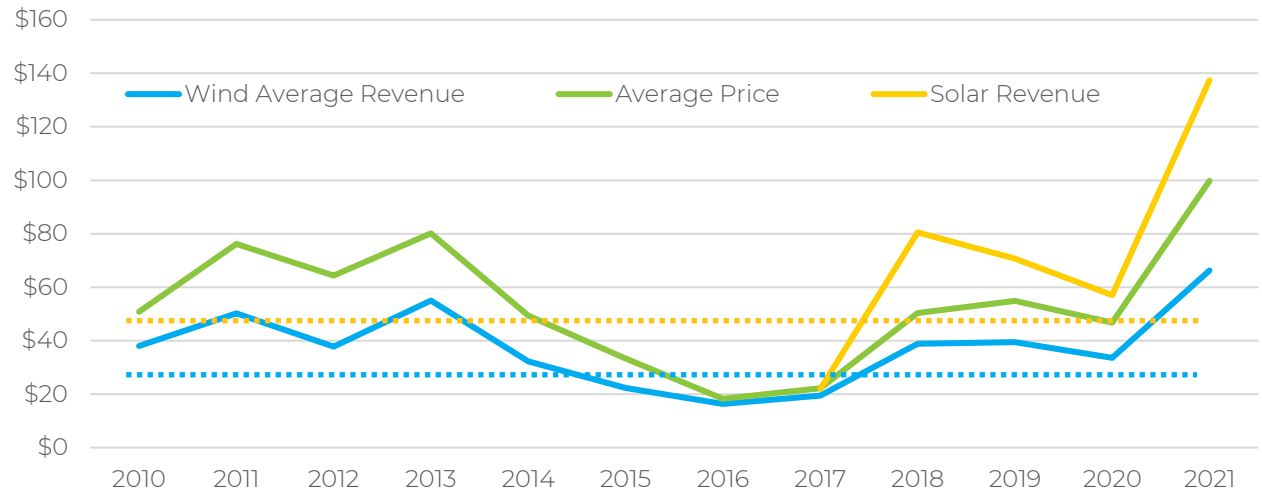
Key Considerations – Settlement with VPPA

- High market prices are generally positive because the settlement of the VPPA is a net benefit with high market prices
 - This is especially true if there is a retail contract in place (shown at \$65/MWh in the historical analysis)
- The opposite is true if there are low market prices – the VPPA becomes more expensive, and the retail contract may be above the spot market price
- There is monthly price volatility as a result of the VPPA
 - In particular it should be noted that winter months have the potential to be more volatile with a wind VPPA and summer months more volatile with a solar VPPA
 - This is because the VPPA is typically sized to annual energy requirements so (for example) a solar VPPA has a relatively large amounts of excess energy to sell in summer – this is the driver of the notional negative prices in June, i.e. the solar VPPA delivered high prices and excess volume relative to actual consumption
 - If load shape is more closely tied to generation shape (by season) this issue is not apparent but Canmore/Banff load is relatively similar across seasons
- A retail contract no longer provides monthly price certainty but does serve to reduce uncertainty
 - If a retail contract is put in place alongside the VPPA the range of annual prices (effective after VPPA settlement) is reduced
 - Whether or not the retail contract is ‘good’ or ‘bad’ depends on whether it is signed at a price above or below the prices that actually occur, i.e. it is not known ahead of time

Renewable Spot Market Revenues Key to VPPA

- Proposed VPPA prices are shown as dashed lines and the gap between the annual price and the strike price would be akin to the VPPA settlement cost or benefit
- Historically wind has received a discount compared to the average spot market price and solar has received a premium due to the timing of production and spot prices when that production occurred
- The difference between the solid and dashed line for each colour represents the notional cost or benefit of the VPPA if it had been in place historically
- Data current through October 2021

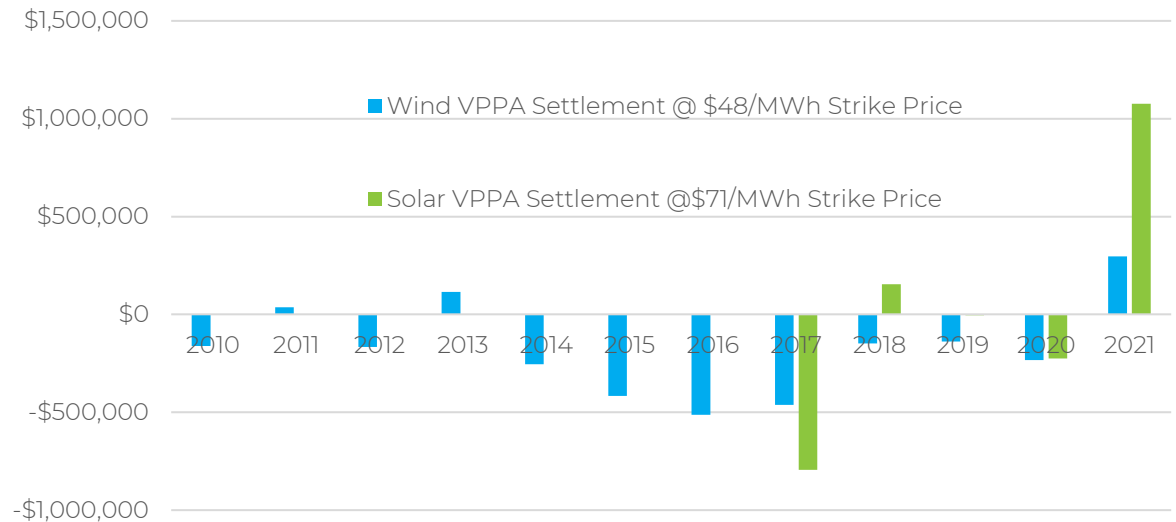
Renewable Average Revenues and Market Price (\$/MWh)



- Solar has seen a premium due to its on-peak production profile combined with limited volume of solar in the market. As more solar is added it will alter the price dynamic and the premium is expected to disappear (akin to wind which receives less than the market price on average due to its timing and the volume of wind in the market)
- Average price is simply the average spot market price for the year (all hour average)

Simulated VPPA Settlement at Historical Prices

- Simulated VPPA settlement based on actual market prices and actual wind and solar generation profiles (average of Alberta wind/solar fleet respectively) against the strike prices noted
- Solar is more attractive than wind historically and VPPA settlement on average would have delivered a positive value of \$41,000 per year
 - Note that historical solar generation settlement occurred when very little solar generation was in the market – as solar is added it lowers expected prices during sunny hours
- Wind generation would have cost \$171,000 per year on average to settle



- On a forecast basis the market is expected to change due to carbon tax and the changing generation fleet, i.e. coal retiring and wind/solar being added to the market
- Graph is based on 16,230 MWh VPPA (Canmore plus Banff total load)

III. Power Advisory Forecast Assumptions

Base Case Overview

- The key driver of the Base Case assumption is that the carbon tax is expected to be increased to \$170/tonne by 2030
 - The carbon tax is assumed to remain flat from 2030 onwards at \$170/tonne
- With carbon taxes at this level both wind and solar are the lowest cost of energy by a large margin
 - For example, the variable cost of a CCGT unit at \$4/GJ natural gas is roughly \$30/MWh plus the carbon plus of about \$60/MWh
 - Whether the carbon tax is reduced via the output based allowance (and renewables credited) or the allowance is lowered and the carbon value is embedded in the energy price is important to market outcomes but does not impact the relative cost advantage for renewables
- The Alternate Base Case illustrates the impact of a high allowance
 - Renewables are more attractive with credits because the effective floor price in the market (for renewables) is equal to the credit value (of nearly \$60/MWh)
 - Although the credit market is not as liquid nor as transparent as the energy market it is potentially more attractive to renewables investment than putting the full carbon value into the energy market price signal
 - The Alternate Base Case does not alter the Base Case in any way other than to change the allowance level to 0.37t/MWh throughout the forecast
 - Energy prices are lower and returns are higher for some generators (renewables and cogeneration) as long as the carbon credit market trades near the carbon tax price

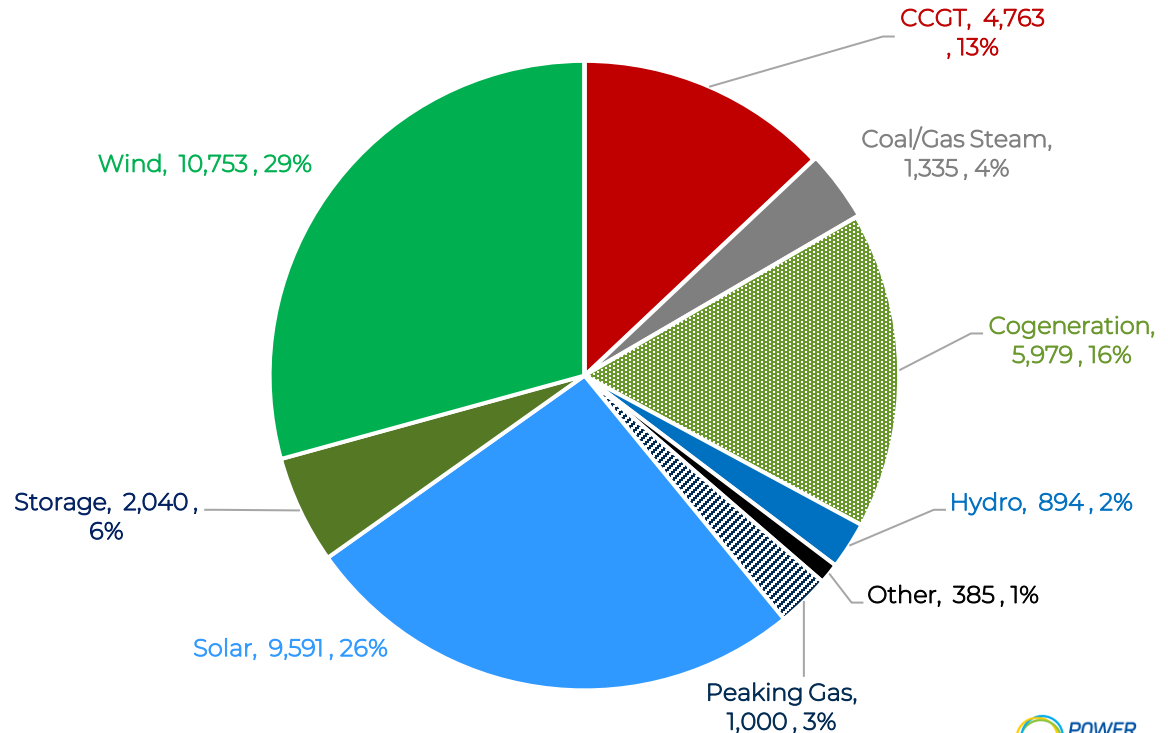
Base Case Overview Continued

- Renewables investment is very high in the Base Case, but is not unreasonable in Power Advisory's view
 - The pace of investment should be considered in the context of other markets transitioning from thermal grids to far more renewable grids
 - For example, ERCOT hit 25% wind and solar (by energy) in 2020 up from about 5% in 2010
 - NEMCO (Australia) is approaching 40% - up from about 10% in 2010
- The Base Case sees about 48% of total energy come from renewables in 2042 (measured relative to Alberta Internal Load (AIL))
 - Wind and solar account for the large majority
 - In 2020 renewables accounted for about 11% of total AIL energy
- In effect the forecast is calling for slower uptake in renewables than has been observed in two similar systems
 - There are material policy drivers in place for the Alberta grid, as was the case in ERCOT in particular

2042 Supply Mix – Base Case

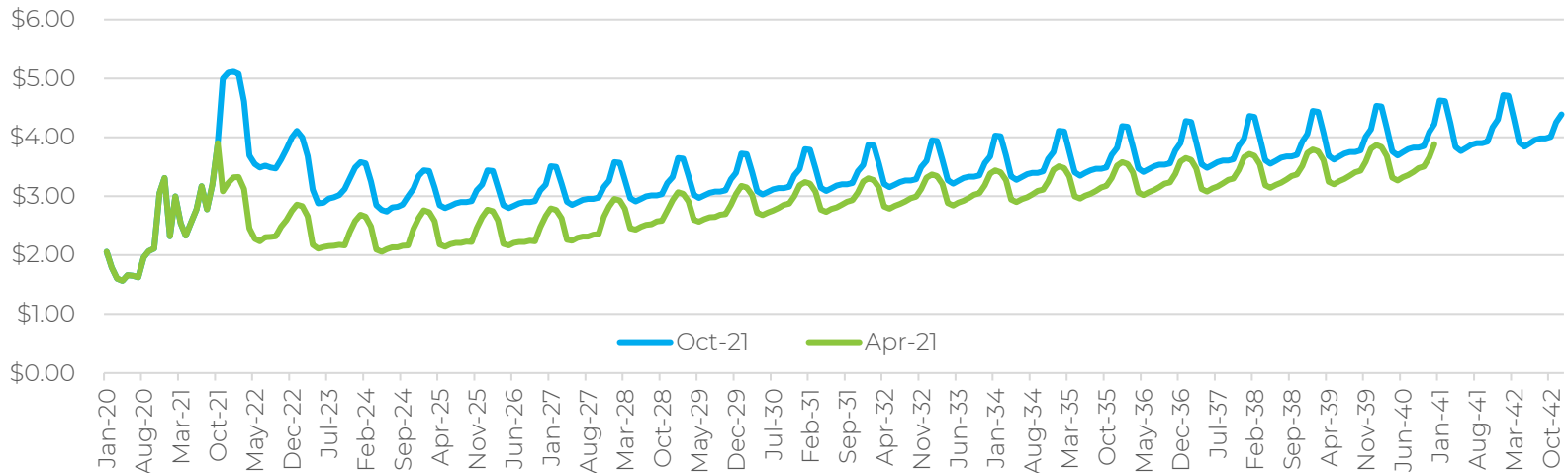
- Total installed capacity is 36,750 MW in 2042
- Wind and solar account about 20,000 MW in total by 2042 in the forecast
- Storage accounts for about 6% of installed capacity and provides capacity and hourly flexibility
- The coal/gas category is natural gas fired capacity at the coal facilities and is assumed to remain online as backstop capacity/energy but produces limited energy
 - Power Advisory assumes this capacity will be allowed to continue to stay in the market but potentially with annual energy limits

2042 Base Case Capacity Mix



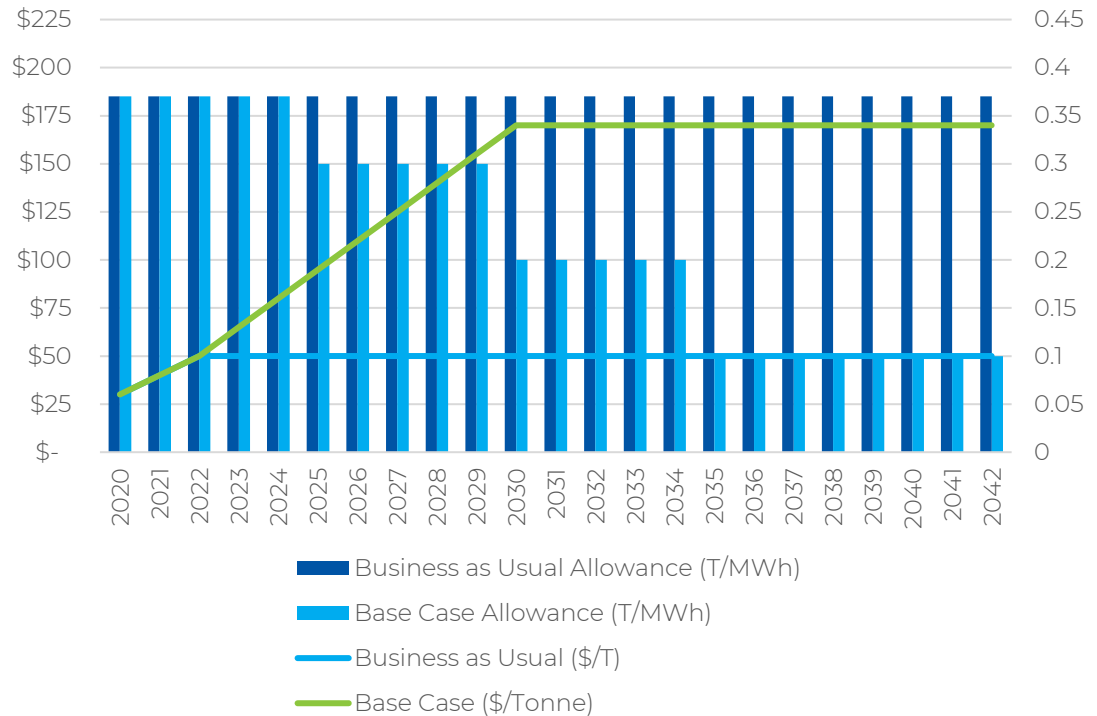
Natural Gas Price Forecast (\$/GJ)

- The price of natural gas is the single most important determinant of electricity prices in a large number of hours as by 2023 the majority of dispatchable capacity is natural gas fired
- Natural gas prices are materially elevated across the entire forecast spectrum relative to the April 2021 forecast
 - The higher natural gas price is particularly pronounced in the front end of the forecast



Carbon Price and Allowance (\$/tonne)

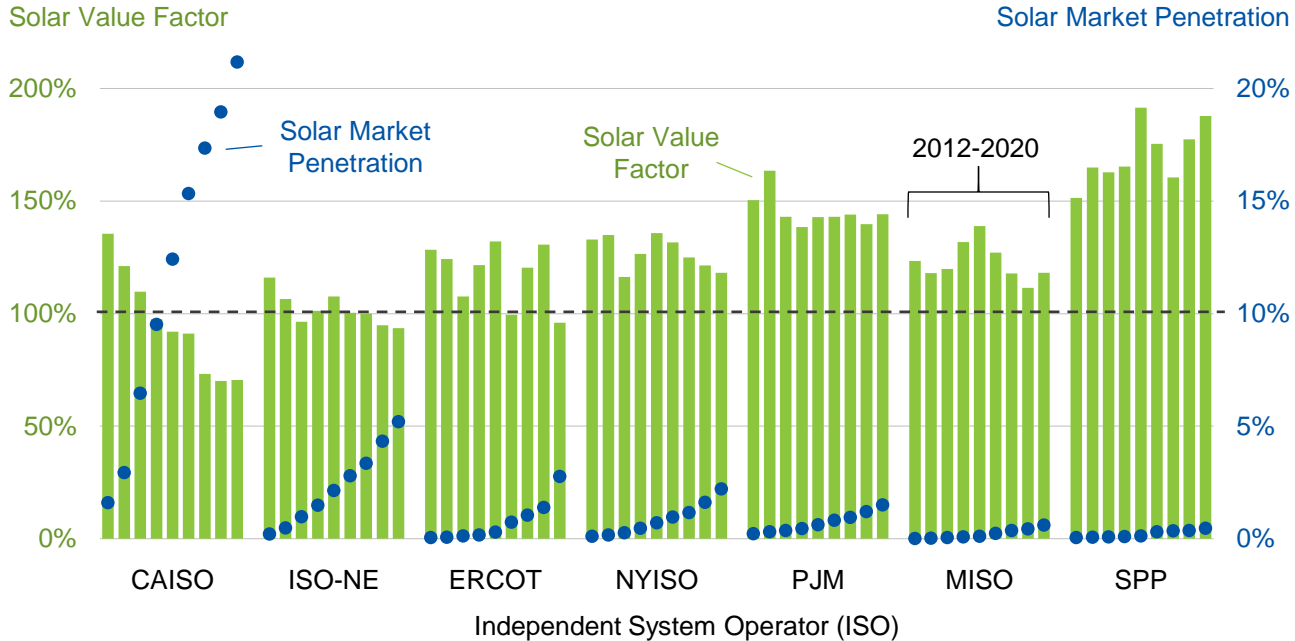
- Both carbon prices (lines) and allowance levels (vertical bars) change with each scenario
 - Higher carbon prices are combined with lower allowance values which is a key driver in price levels across scenarios.
- The Business as Usual scenario assumes the 2022 carbon price and allowance level is maintained indefinitely (0.37t/MWh)
- The Base Case assumed carbon price increases are capped at \$170/tonne and the allowance level declines moderately to 0.1 t/MWh by 2040
- The Net-Zero Pathway assumes carbon prices are capped at \$170/tonne from 2030 onwards but the allowance level declines to 0.1t/MWh by 2035



2021 Renewable PPAs in Alberta

Seller	Buyer	Contract Capacity/Installed Capacity (MW)	Fuel Type	Date Announced	Estimated ISD
BluEarth Renewables	Shell	100 MW/130 MW	Wind	April 8, 2021	2022
Renewable Energy Systems	Bimbo Canada	50 MW/170 MW	Wind and Solar	April 13, 2021	2022
Capital Power	Labatt	51% of the 75 MW project	Solar	April 19, 2021	2022
Greengate Power	Amazon	80 MW (full output)	Solar	April 19, 2021	2023
TransAlta	Pembina Pipelines	100 MW/130 MW	Wind	May 3, 2021	2022
Greengate Power	Amazon	375 MW/465 MW	Solar	June 23, 2021	2022
Cold Lake First Nations and Elemental Energy	Cenovus	150 MW (full output)	Solar	July 22, 2021	2023
Elemental Energy	TC Energy	20 MW/26 MW	Solar	July 2021	Q1 2022
Capital Power	Dow Chemical	25 MW/151 MW	Wind	Sept 15, 2021	Q4 2021
EDP Renewables	TC Energy	297MW (full output)	Wind	Sept 20, 2021	Q4 2023

Solar Premium Expected to Decline

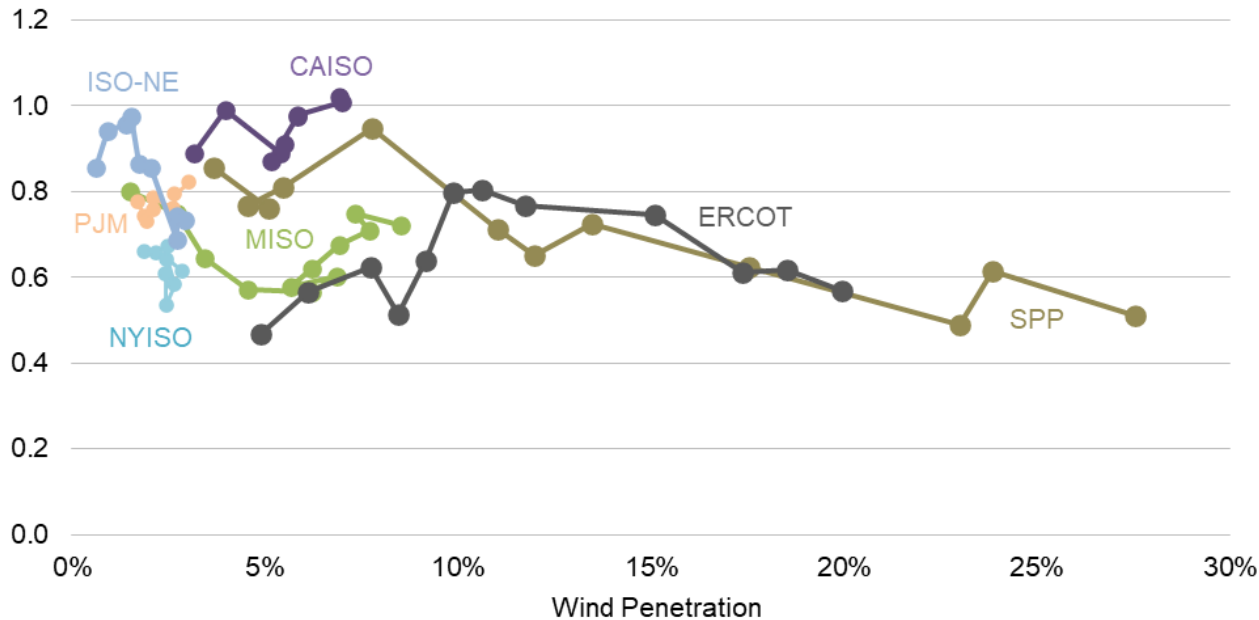


- In general the value of solar falls below the average market price as solar penetration grows
- Examples from California and ISO-NE as solar energy hits about 5% of total energy
- Alberta expected to show an even steeper value decline given the market design (prices driven by scarcity value)
 - More akin to ERCOT where solar fell below parity at 2.8% of energy

• Source: [Utility-Scale Solar | Electricity Markets and Policy Group \(lbl.gov\)](https://www.eia.gov/analysis/studies/utility/utility_scale_solar.php)

Wind Generation Price Discount Expected to be more Stable

Wind Value Factor



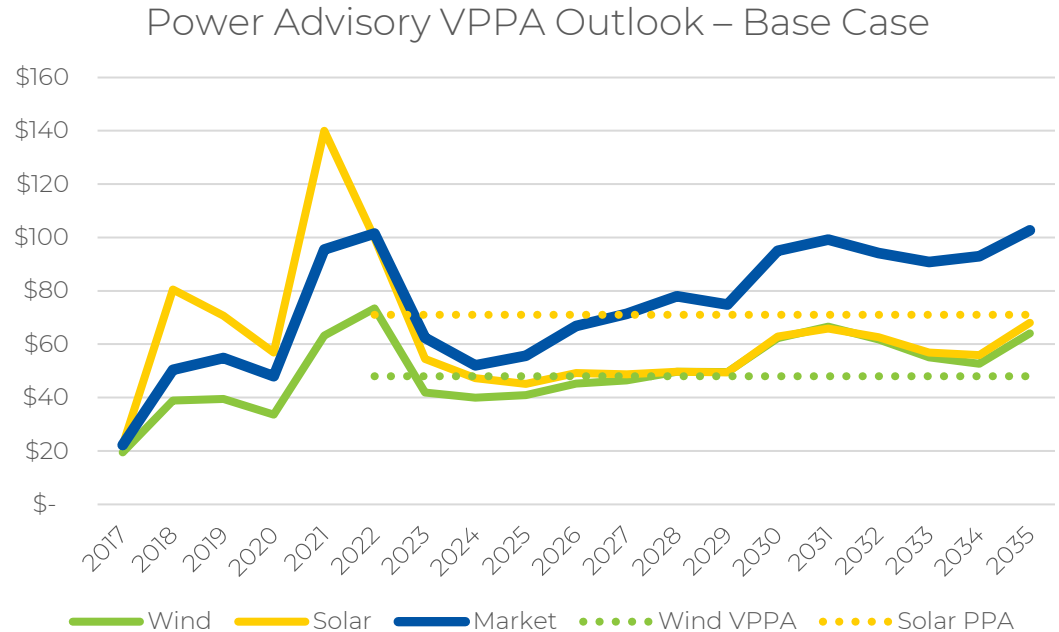
- Alberta's wind realized prices see a discount in the 30% range at present
- As illustrated in other markets with very high wind penetration the reduction in value tends to become less 'steep' at very high penetration rates
 - In effect wind prices in Alberta have relatively less downside than solar prices

Base Case Forecast Results

- Electricity prices are forecast to be quite high in 2021 and 2022 due to a relatively short-market driven by offer strategy at long-lead time generation units (primarily coal or gas fired steam generators)
 - Load has largely recovered from the pandemic and is forecast to be well above 2020 levels for both 2021 and 2022
 - Large amounts of CCGT, cogeneration and renewables are expected to enter the market in the next five years reducing prices to the \$50/MWh level
 - Retirements are likely to be necessary to balance the market beginning in the mid 2020s – Power Advisory expects many of the coal plants will retire by about 2025 due to market conditions
- Longer term prices are kept in the \$60 to \$75/MWh range on average due to carbon prices and declines in the TIER allowance level
 - Renewables projects are added throughout the forecast, but very little natural gas generation is added due to storage additions providing the capacity needed to meet the relatively slow load growth
 - Storage competes with natural gas to meet peaking needs in the latter part of the 2030s
- The spread from the Low Case to the High Case is much higher than previously
 - The rising carbon price assumptions are the key driver of this uncertainty
 - Both the carbon price itself and the choice of TIER allowance level increase uncertainty
- Natural gas generation remains viable in all scenarios but as carbon prices rise the risk increases that returns will be impacted by increased renewables deployment and competition from other capacity resources such as storage

Base Case Forecast Results – Market Prices

- The figure illustrates Power Advisory's forecast of wind and solar received prices over time
- As shown wind and solar received prices tend towards similar values as the amount of solar capacity on the system increases
- Given this forecast dynamic the \$25/MWh premium for a Solar VPPA relative to a Wind VPPA is not attractive in the long term

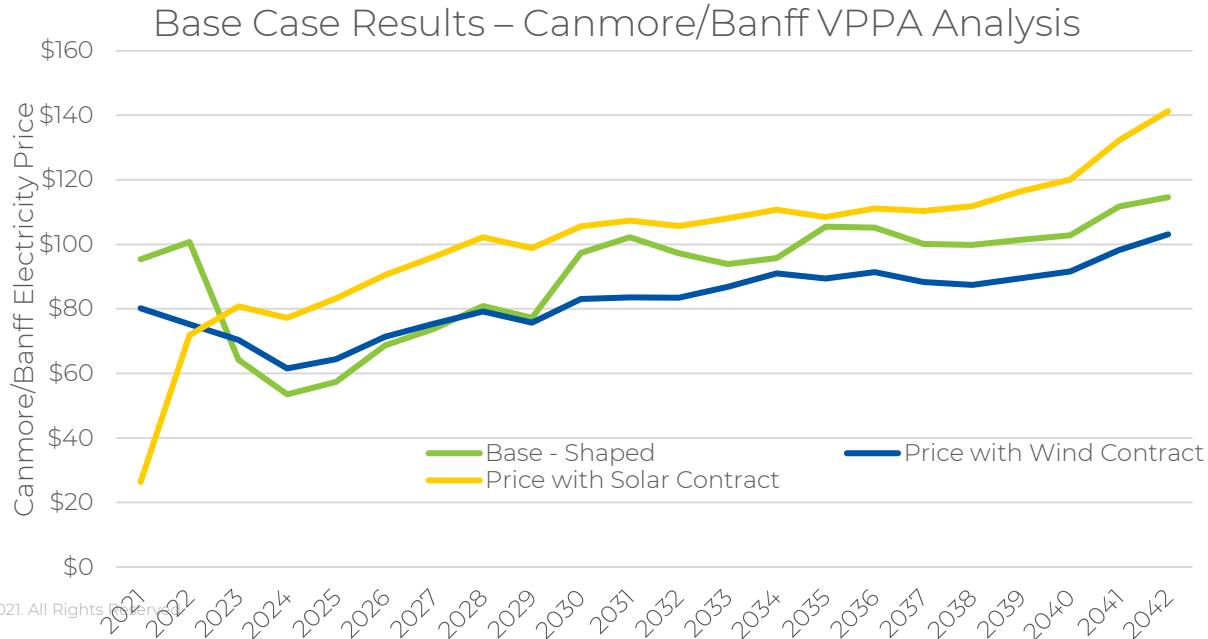


Wind and Solar Assumptions

- Wind generation is based on Power Advisory's profile of wind generation located in southwest Alberta
 - Average capacity factor is modeled at 42%
 - Hourly production is based on historical data from existing windfarms adjusted for modern turbine characteristics (more generation per installed MW)
- Solar generation is based on Power Advisory's profile for solar generation located in southern Alberta
 - Average capacity factor is modeled at 22% (AC capacity factor) with a DC/AC ratio of 1.35
 - Hourly production is based on historical data adjusted for current solar generation panels
 - Power Advisory assumes bifacial panels on single axis trackers for its generic solar capacity production in the model

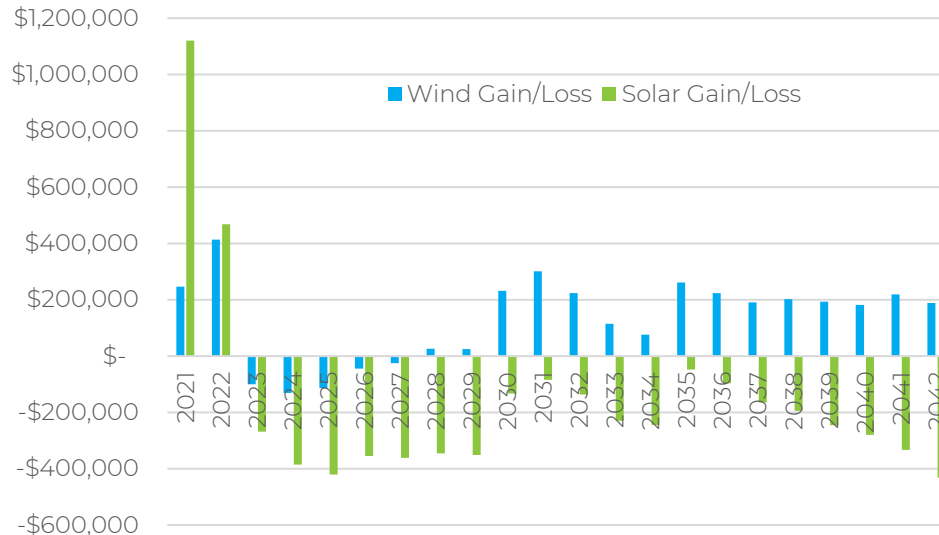
Base Case Results – Canmore/Banff Analysis

- As shown, in the Base Case the Wind VPPA lowers expected electricity costs largely because the rising carbon price makes renewable generation attractive although solar generation at the price quote used in this analysis is less attractive
- Graph is after 'notional' settlement of the VPPA, i.e. if the VPPA has a cost it serves to increase the average price paid for electricity in the graph – the graph on the next slide shows the actual VPPA settlement cost or benefit in \$ terms



Base Case Results – VPPA Settlement

- As shown, in the Base Case the Wind VPPA typically results in a small payment to Canmore/Banff in the latter part of the forecast as the carbon tax reaches \$170/tonne and thermal units face much higher costs in the market (therefore setting high spot market prices)
- The solar PPA results in small annual losses due to its higher strike price and the increase in solar generation that lowers prices during daylight hours



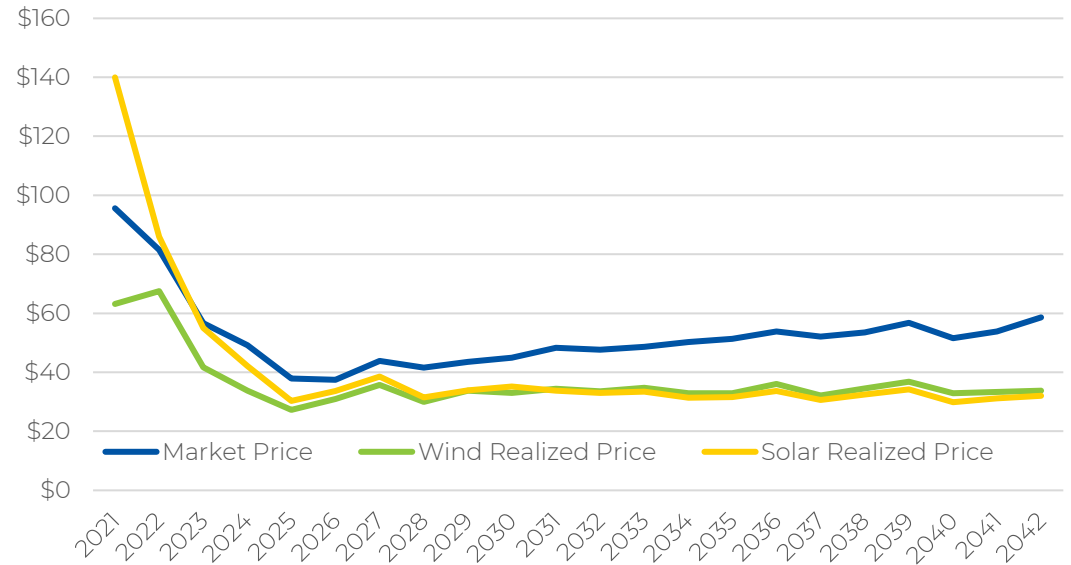
Business as Usual Scenario Overview (Low Case)

- The Business as Usual Scenario freezes carbon prices at \$50/tonne (starting in 2022) and does not put any additional de-carbonization measures in place in the broader economy
- Renewables are added to the generation mix in Alberta, but the pace is much slower and natural gas generation provides much more of the energy than the Base Case and Net Zero Scenarios
- Much less total capacity is added given the higher utilization rate of natural gas fired generation in this scenario
 - About 7,700 MW of wind capacity is on the system by 2042
 - About 5,500 MW of solar capacity is installed by 2042 (inclusive of about 1,500 MW rooftop)
 - Renewable energy reaches roughly 45% of total energy in the market
 - 5,000 MW of CCGT installed capacity is built by 2030 and post 2030 any new CCGT be to replace existing generation (not modeled so 5,000 MW is the peak CCGT capacity in the market)
 - Cogeneration reaches about 6,000 MW of installed capacity

Low Case Forecast Results – Market Prices

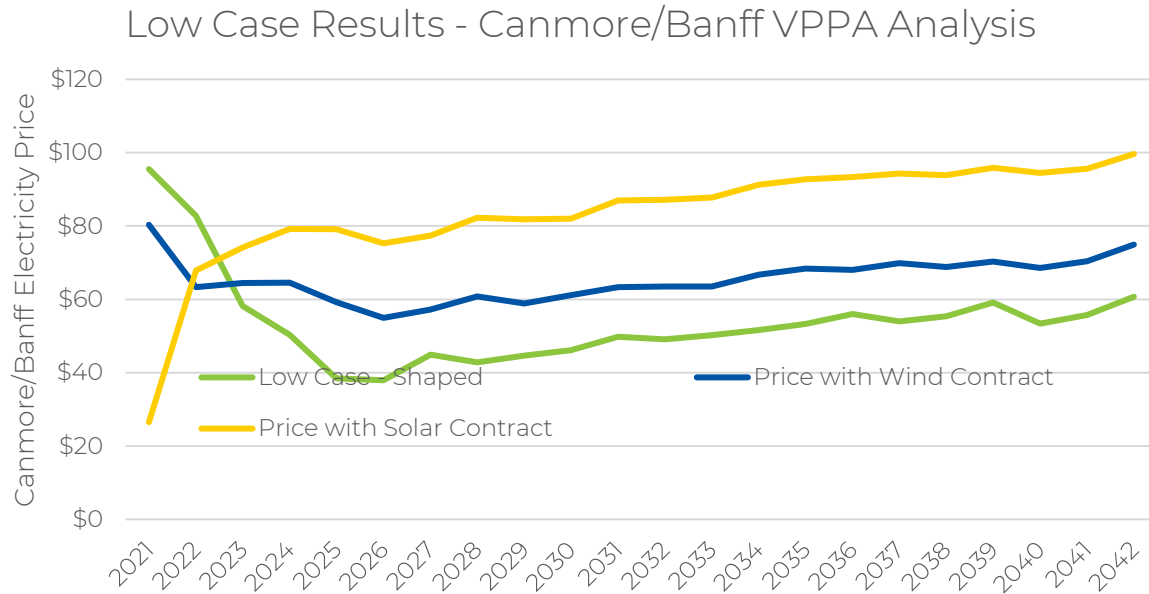
- The figure illustrates Power Advisory's forecast in the Low Case
- As shown wind and solar received prices tend towards similar values as in the Base Case
- In the Low Case renewable generation is not attractive purely based on the electricity price as realized prices are below \$40/MWh
 - Carbon offset value from the TIER carbon tax supports the renewable investment in this scenario as less total renewables are developed due to the reduced carbon tax signal

Power Advisory VPPA Outlook - Low Case



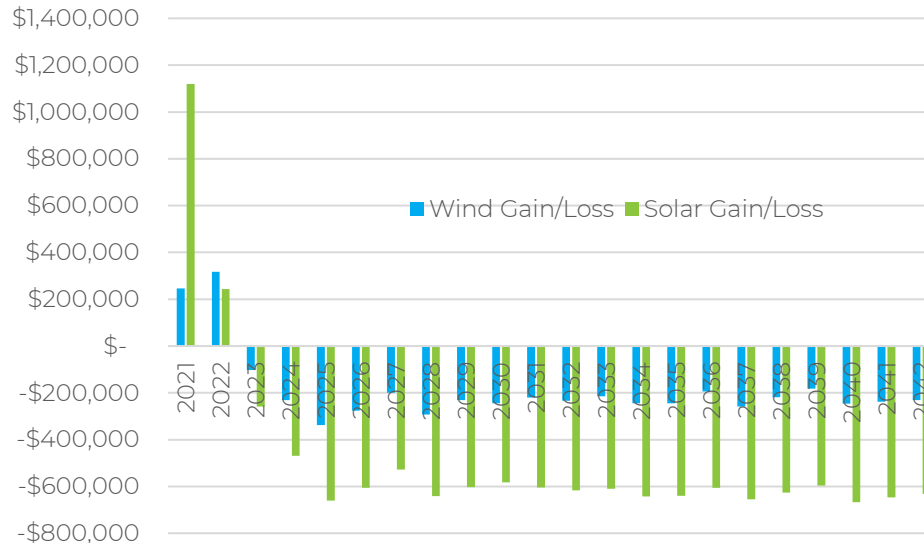
Base Case Results – Canmore/Banff Analysis

- As shown, in the Low Case the Wind VPPA increases expected electricity costs because the overall electricity market price is low but overall electricity costs for Canmore/Banff remain below the Base Case



Low Case Results – VPPA Settlement

- As shown, in the Low Case the Wind VPPA typically results in a cost to Canmore/Banff because the carbon price does not increase beyond \$50/tonne and electricity prices are overall lower as a result
- The solar VPPA has much higher settlement costs due to the higher strike price – nearly triple the annual cost (~\$200,000 annual cost for the wind VPPA on average versus \$550,000 annual cost for the solar VPPA)





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TOWN OF CANMORE SOLAR PROJECT FEASIBILITY ASSESSMENT

PREPARED FOR:



PREPARED BY:



DISCLAIMER:

This feasibility assessment is intended to inform high level discussion and should solely be used to determine whether further investigation of solar development(s) and/or commercial transaction(s) related to solar systems would be appropriate as the Town of Canmore evaluates opportunities to meet its sustainability targets. This assessment is not an offer, a solicitation of an offer or a commitment from SWITCH Power Corporation and/or its affiliates and does not purport to identify or suggest any or all risks (direct and/or indirect), which may be associated with the proposed projects.

ACKNOWLEDGEMENTS:

SWITCH Power and Proactive Planet would like to both acknowledge and thank the Town of Canmore for their interest in solar photovoltaic (PV) and for their commitment to this feasibility assessment. Numerous factors should be evaluated when considering project(s) that require large capital commitments. An independent feasibility study equips your team with the knowledge to make sound investment decisions for the future of your community.

A special thanks to Amy Fournier and the Town of Canmore for choosing to engage a local Alberta contractor to complete this analysis and report.

We would also like to thank Emily Shivak, a CAD student at Lethbridge College for her assistance in the creation of this feasibility study and models.

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LIST OF ACRONYMS

AC	Alternating Current
AEOR	Alberta Carbon Offset Registry
AESO	Alberta Electric System Operator
AUC	Alberta Utilities Commission
BoS	Balance-of-System
CAD	Canadian Dollars
CAPEX	Capital Expenditure
CO ₂	Carbon Dioxide
COR	Certificate of Recognition
CRC	Canmore Recreation Centre
DC	Direct Current
DFO	Distribution Facility Owner
DTS	Demand Transmission Service
EGDF	Electricity Grid Displacement Factor
EPC	Engineering, Procurement and Construction Partner
ESG	Environment, Social and Governance
FortisAB	FortisAlberta Inc
GHG	Greenhouse Gas
GST	Goods and Service Tax
IAM	Incident Angle Modifier
IRR	Internal Rate of Return
kW	Kilowatts
kWh	Kilowatt-hours
LCOE	Levelized Cost of Energy
LOA	Living Out Allowance
MW	Megawatts
MWh	Megawatt Hours
N/A	Not Applicable
NCF	Net Capacity Factor
NPV	Net Present Value
NRTL	Nationally Recognized Testing Laboratories
O&M	Operations and Maintenance
P50	50% Probability Level
Pa	Pascals
RFP	Request for Proposals
RRO	Regulated Rate Option
Solar PV	Solar Photovoltaic
Sq.ft	Square Feet
STC	Standard Testing Conditions
T&D	Transmission and Distribution
TBD	To Be Decided
tCO ₂ e	Tonnes of Carbon Dioxide Equivalent
TIER	Technology Innovation and Emissions Reduction Regulation
V	Volts

1. EXECUTIVE SUMMARY

The Town’s 2004 commitment to The Natural Step *Framework* for a sustainable Canmore demonstrates the community’s long-standing, collective interest in economically, socially, and environmentally responsible decision-making. With an objective of achieving greenhouse gas reduction targets published in its 2018 Climate Action Plan, the Town of Canmore must evaluate opportunities that exist within its borders.

The sites identified by the Town of Canmore were evaluated using standard industry tools to optimize and customize their design to maximize potential project benefits. Any work discussed or suggested within the document must engage qualified personnel and/or teams which have demonstrated record of adherence to the strictest safety standards and current building and electrical codes. By these standards, it is recommended that contractors install pre-engineered products that are tested and stamped.

During the assessment of potential sites consideration was given to:

- Spacing and density opportunities;
- Physical constraints such as setbacks from road allowances;
- Environmental factors such as wildlife, shading and soiling;
- Geological factors;
- Appropriate technology options, and;
- Interconnection constraints and existing infrastructure.

The evaluation of nine sites for the development of Solar suggest there is a strong business case for two sites: the Elk Run Road Maintenance Facility Rooftop and the Pumphouse 4 station. Key project metrics are summarized below in Table 1. See Appendix Section 1 for additional detail on project economics.

Due to higher upfront capital costs, the Canmore Recreation Centre Parking Lot, Elevation Place Future Intercept Lot, and Public Works Yard sites are not likely to perform as competitively as other potential investments. Solar canopies are more capital intensive than rooftop and ground mounted installations, however, they provide an attractive option where land is constrained. In addition to being an efficient use of land, solar canopies provide other benefits such as weather protection for vehicles parked underneath and a highly visible ESG statement.

Table 1: Summary of Evaluated Project Sites

Site Name	Installation Type	Capacity (kW _{DC})	Energy Yield (MWh/year) ¹	CAPEX	Capital Intensity (\$/Watt _{DC})	NPV ²	LCOE ³
Elk Run Road Maintenance Facility Rooftop	Rooftop	348	350.4	\$519,512	\$1.49	\$320,935	\$0.069
Canmore Recreation Centre Parking Lot	Parking Lot Canopy	692	753.2	\$1,816,320	\$2.63	\$28,152	\$0.106
Elevation Place Future Intercept Lot	Parking Lot Canopy	496	526.8	\$1,283,613	\$2.59	\$4,322	\$0.108
Public Works Yard	Parking Lot Canopy	684	743.5	\$1,804,389	\$2.64	\$16,494	\$0.107
Pumphouse 4	Ground Mount	327	344.8	\$538,935	\$1.65	\$294,816	\$0.072
<i>Lift Station 7</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>
<i>Pumphouse 2</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>
<i>Quarry Lake Parking Lot</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>
<i>Millennium Park Parking Lot</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>

Sites that have been deemed to not be viable are indicated with grey shading. Additional information on each site is available in Section 4.

Our recommendation is to continue investigation of options where Canmore can deploy their capital most effectively. This can be accomplished through a competitive RFP process for the engineering, procurement, and construction of the proposed solar developments. Alternatively, the Town of Canmore may consider engaging a power producer to contract for the offtake of the renewable power generation and environmental attributes produced from the proposed solar developments.

¹ Energy Yield is a P50 estimate based on a desktop analysis of the proposed solar PV systems.

² Net Present Value calculated using a 3% discount rate. NPV assumes the monetization of carbon offsets at announced federal carbon prices and are not inclusive of potential brokerage fees.

³ Levelized Cost of Energy (LCOE) is a measure of the average net present cost of electricity generation for a generator over its lifetime. It is used for investment planning and to compare different methods of electricity generation on a consistent basis. It is calculated as the ratio between all the discounted costs over the lifetime of an electricity generating plant divided by a discounted sum of the actual energy amounts delivered. LCOE calculations are not impacted by carbon value assumptions.

2. INTRODUCTION

2.1 Kilowatt (kW) vs Kilowatt-hour (kWh)

The natural starting point for a discussion of energy, in this case electricity, is to begin with an explanation of the units of measurement, as these units may not be well understood.

A kilowatt (kW) is simply 1,000 Watts, which is a measurement of power. To help illustrate, a 1,000-Watt appliance needs 1,000 Watts (1 kW) of power to make it operate. A 10,000-Watt electric water tank, therefore, could also be referred to as a 10kW electric water tank.

In contrast to a watt or a kilowatt, a kilowatt hour (kWh) is a measure of energy. A kilowatt hour denotes how much energy is being used. Please note that a kWh should not be interpreted as the number of kilowatts used per hour. Rather, it is simply a unit of measurement that equals the amount of energy that would be used to keep a 1,000-Watt appliance running for an hour. To further illustrate, a 100-watt light bulb would need to be switched on for 10 hours to accumulate 1 kWh of energy consumption, while a 2,000-watt appliance would use 1 kWh in just half an hour.

In this report we reference kW and kWh extensively. A megawatt (MW) and megawatt hour (MWh) are equivalent to 1,000 kW or 1,000 kWh respectively. To help further contextualize this, the average household in Alberta consumes ~7,200 kWh (7.2 MWh) of electricity per year.⁴

2.2 Alternating Current (AC) vs. Direct Current (DC)

Further to the above, a distinction needs to be made between kW_{DC} (or MW_{DC}) and kW_{AC} (or MW_{AC}). With respect to solar PV, it is common to reference direct current (DC), whereas alternating current (AC) is a much more common and standard unit of measurement for households and businesses. Nearly every home and business are wired for AC, whereas very few (typically off-grid, battery-based systems) are wired for DC. Direct current is more commonly associated with cars, RVs, and boats, all of which have a battery for energy storage.

Alternating current describes the flow of charge that changes direction periodically. Thus, the voltage level also reverses along with the current. AC is used to deliver power to houses, office buildings, etc.

In contrast to AC, rather than oscillating back and forth, DC provides a constant voltage or current. DC is defined as the “unidirectional” flow of current that is, current flows in one direction only.

Solar PV modules generate power in the form of direct current (expressed as DC or dc). As such, solar PV modules are rated in W_{DC} (watts DC) with typical ranges between 280 watts

⁴ [Energy Usage and Production](#). Alberta is Energy, 2022

and 400 watts. A 1 kW_{DC} solar system is therefore comprised of between approximately three and four solar PV modules.

Given that residential and commercial buildings (and the electricity grid) operate in AC, the DC power produced by the PV modules must be converted to AC power within the solar PV system prior to grid integration. This is accomplished by inverters which can be located at the module level (i.e., micro-inverters) or at the system level, as is the case with string combiners. Once the DC power has been run through a DC->AC inverter, the power output is in the form of alternating current (either single or three phase), which can be used by the internal loads or exported back to the grid.

2.3 Solar Irradiance & Energy Yield

The western provinces of Canada have an excellent solar resource, especially when considered on an annual basis. Some of the highest global solar irradiance values (the flux of radiant energy per unit area) in the world can be found in a narrow band extending from southeastern Alberta through southwestern Manitoba. Figure 2.1 below provides a visualization of Canada's overall solar resource potential expressed in kWh/kW/year.⁵ With approximately 1,350kWh/kW/year, the Town of Canmore experiences moderate to high solar irradiance values.

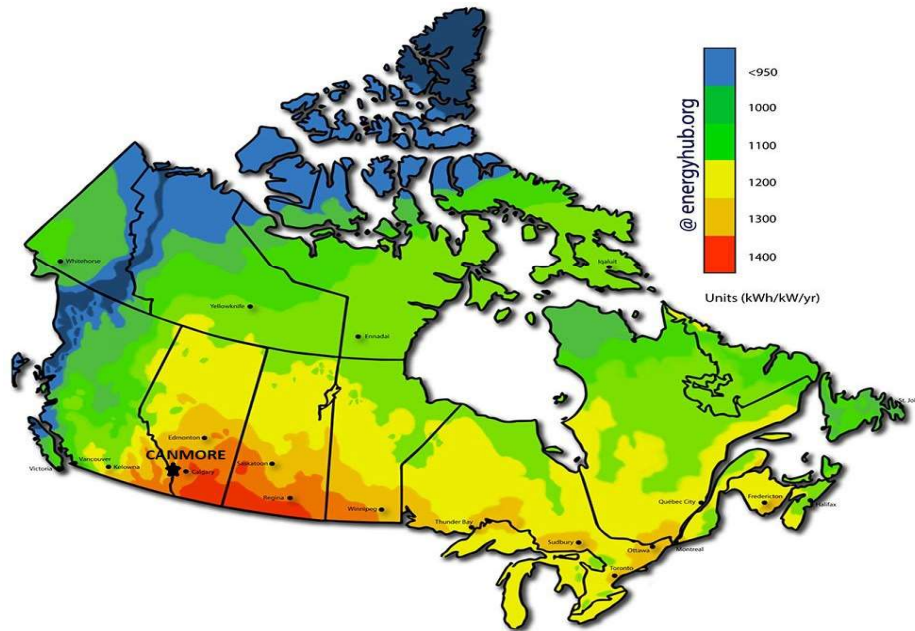


Figure 2.1: Canadian Solar Irradiance Map

While solar irradiance values are an important consideration in siting of solar photovoltaic (PV) systems, annual energy yield proves to be equally important. Energy yield is the amount of energy that is produced from the system and is typically measured in MWh_{AC}. Energy yield

⁵ Urban, R. (2021). [Solar Energy Maps Canada](#). Energy Hub.

is impacted by the number of modules installed, equipment selection, configuration, orientation, and environmental factors including shading and soiling, and can be modelled using advanced solar simulation and design software, such as **HelioScope** or **PVSyst**.

2.4 The Alberta Carbon Offset Market

Generation of electricity through solar PV also results in the generation of valuable carbon offsets, commonly referred to as carbon credits or environmental attributes.⁶ Monetization of these offsets provides an additional revenue stream, increasing project returns and shortening the payback period of the system. Municipalities are often restricted from selling environmental attributes for projects that have been supported by provincial or federal grants. Under the current regulatory regime, municipalities are considered free, and would be wise, to participate in the carbon offset/credit markets.

A carbon credit is a form of environmental commodity that derives its value from a tonne of carbon dioxide (CO₂) or equivalent greenhouse gases (GHG) that is reduced, removed, or captured before entering the air. Credits are generated from projects that either prevent emissions or remove emissions from the atmosphere altogether. You can purchase and apply offsets against your own emissions to work toward Carbon Neutral/Net Zero commitments or comply with government regulations.

In Alberta, carbon offsets are generated through the voluntary registration of a qualifying project with the *Alberta Carbon Offset Registry* (AEOR), which issues, tracks and manages all emission offset projects and the emission offsets they create. The standard unit for all GHG credit registries is, one carbon offset credit (emission offset) represents a one-tonne reduction or sequestration in GHG emissions expressed in CO₂e, resulting from an independently verified project activity.⁷

To generate carbon offsets, the project developer must first submit a project plan to register the project with the AEOR. If approved, the project will commence generating offsets from the date that the project plan is submitted until the end of the *offset crediting term*. The project developer can apply for one of two options for the length of the offset crediting term:⁸

1. An 8-year primary term with a potential 5-year extension
2. A 10-year primary term with no extension period

The market price of an emission offset in Alberta is driven by supply and demand. However, the price of a [Technology Innovation and Emissions Reduction Regulation](#) (TIER) fund credit – currently \$50 per tonne – effectively acts as a price ceiling. There are plans to continue to gradually increase the federal carbon pricing threshold, which acts as a backstop or

⁶ Ward, C. (2022). [Generating solar carbon credits in Alberta](#). Radicle, 2022

⁷ [Alberta Emission Offset Registries](#), CSA Group, 2019

⁸ [Standard for Greenhouse Gas Emission Offset Project Developers 3.0](#), Government of Alberta, Nov 2019

minimum standard for provincial carbon pricing, from its current price to \$170 per tonne in 2030.⁹

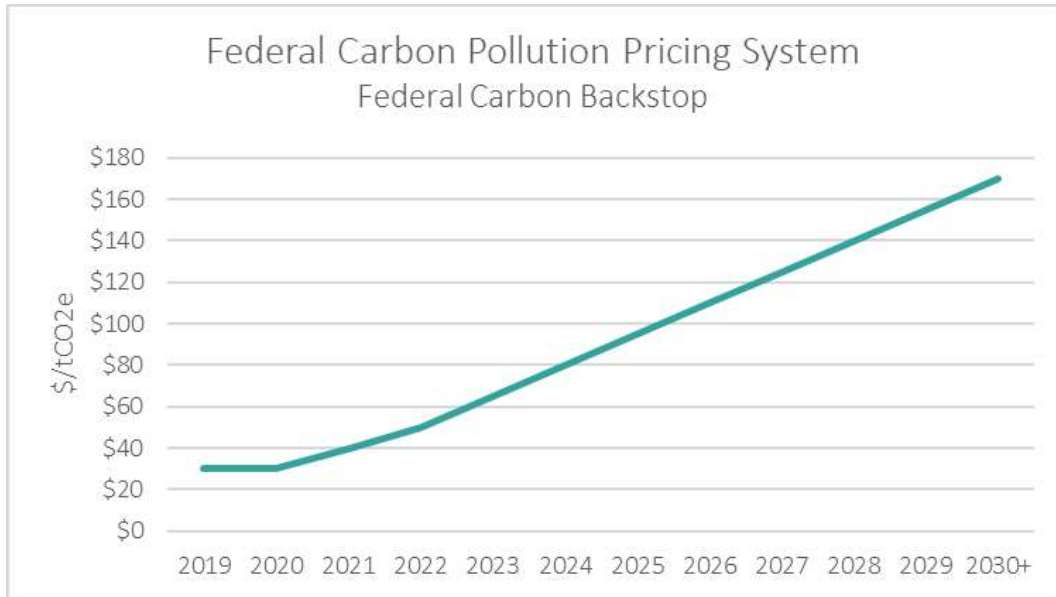


Figure 2.2: Announced Federal Carbon Price

Within the province of Alberta, there are several companies including **Rewatt Power** and **Radicle** that may be contracted to provide credible and trusted access to carbon credit markets and develop your strategy for carbon market participation. Within the context of this report, carbon value has been assessed based on announced federal carbon prices referenced above in Figure 2.2 and do not include brokerage fees, as such they may not be fully representative of market prices.

3. REGULATORY PROCESS & APPLICATIONS

The following section has been provided for informational purposes. Should an RFP be awarded for the development of solar in the Town, the management of micro-generation application process should be included in the scope of work. All cost estimates included in this report include anticipated and applicable costs to complete the Fortis connection process.

In Alberta, a solar PV project can be connected to the electric grid in three different ways:¹⁰

1. **Behind-the-meter:** The energy produced from the small-scale solar panels is directly used by the facility/building, so that less electricity needs to be purchased from the grid. If more electricity is generated than the building needs, the excess is exported

⁹ [A Healthy Environment and a Healthy Economy](#), Government of Canada, December 2020

¹⁰ [Alberta community solar guide: Organizing and owning community solar PV projects](#), The Pembina Institute, 2017.

to the grid. Behind-the-meter systems are typically in the range of a few kW homes, going up to hundreds of kW or even a few MW for large buildings.

2. **Distribution-connected:** Medium-scale systems are connected to the local distribution line, not tied to a single load facility. Electricity produced is fully exported to the distribution system. System size is limited by the size of the distribution substation and can range from a few hundred kW to ~20 MW.
3. **Transmission-connected:** Large-scale utility-scale solar PV projects are connected to a high-voltage transmission system and sell power into the provincial wholesale electricity market.

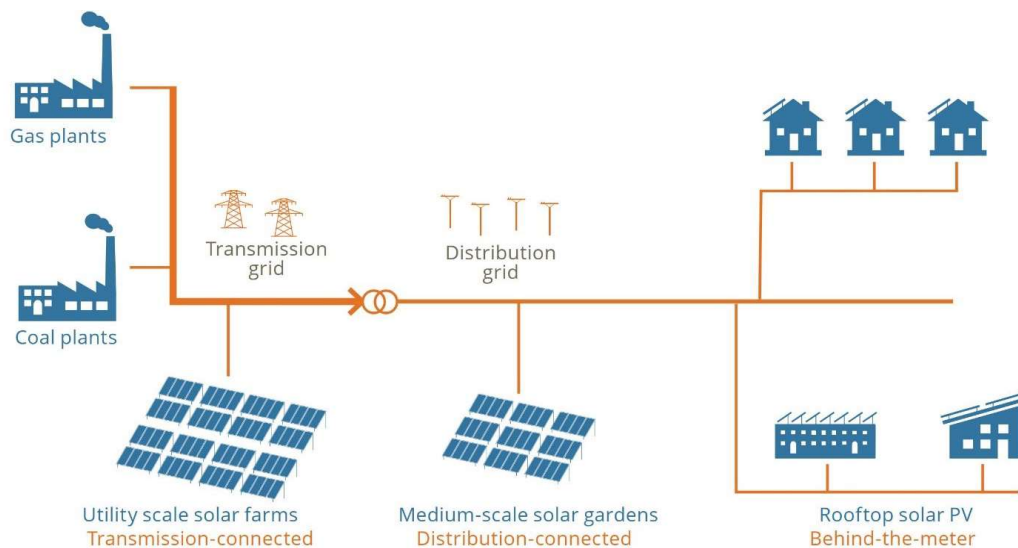


Figure 3.1: Electric Grid Connection Options

This feasibility study assumes that all proposed sites will be connected behind-the-meter as a micro-generator, instead of as a distributed generator to a distribution line. It is assumed that system design, pricing, timelines, and most of what is contained in this technical feasibility study should be useful with respect to either approach.

WHAT IS MICRO-GENERATION?

Alberta's *Micro-generation Regulation* enables electricity consumers to install onsite generation to offset their electricity consumption and permits the sale of excess electricity back onto the Alberta electrical grid.¹¹ In addition, micro-generators are exempt from the standard AUC approval process and are not responsible for the costs of interconnection and metering. FortisAB does not charge for micro-generation applications, any additional Fortis costs specified in this report are included in our turnkey solution estimates.

To be an eligible micro-generation project, the generating unit must:

¹¹ [Micro-generation Regulation](#), Alberta King's Printer, 2018.

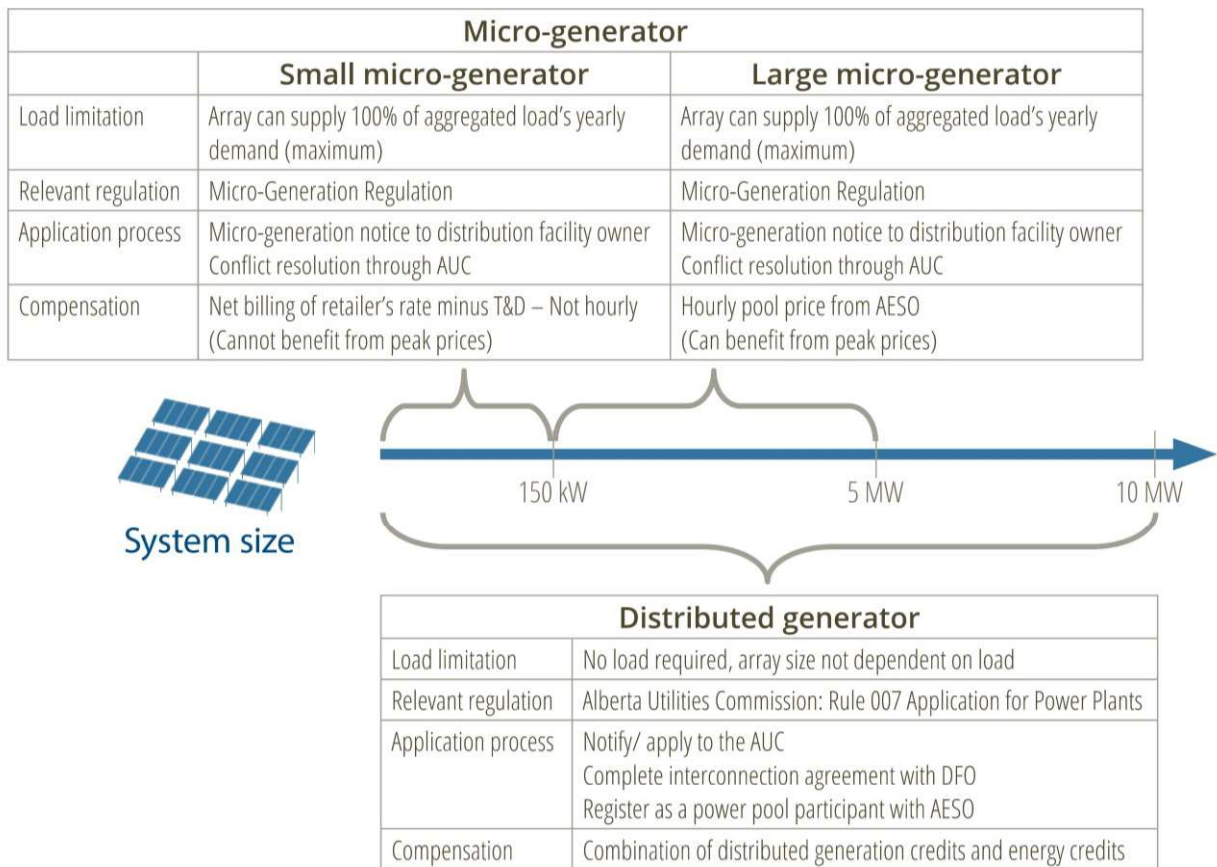
1. exclusively use sources of renewable or alternative energy;
2. be intended to meet all or a portion of a customer's total annual energy consumption;
3. have a total nameplate capacity that does not exceed the lesser of 5MW or the rating of the customer's site; and
4. supplies electricity only to a site that is located on property owned or leased by the customer.

Micro-generation applications are considered to be relatively simple in comparison to other types of generation site applications. It is our experience that micro-generation sites are faster to evolve and are generally easier to seek approval on.

3.1 The Regulatory Context of Connecting Solar PV in Alberta

Figure 3.2 below provides a summary of the regulatory framework for connecting solar generation as either a small micro-generator, large micro-generator, or as a distributed generator to Alberta's electricity grid.

Figure 3.2: Summary of Micro-generation & Distributed Generation Frameworks



3.2 The Micro-generation Application Process

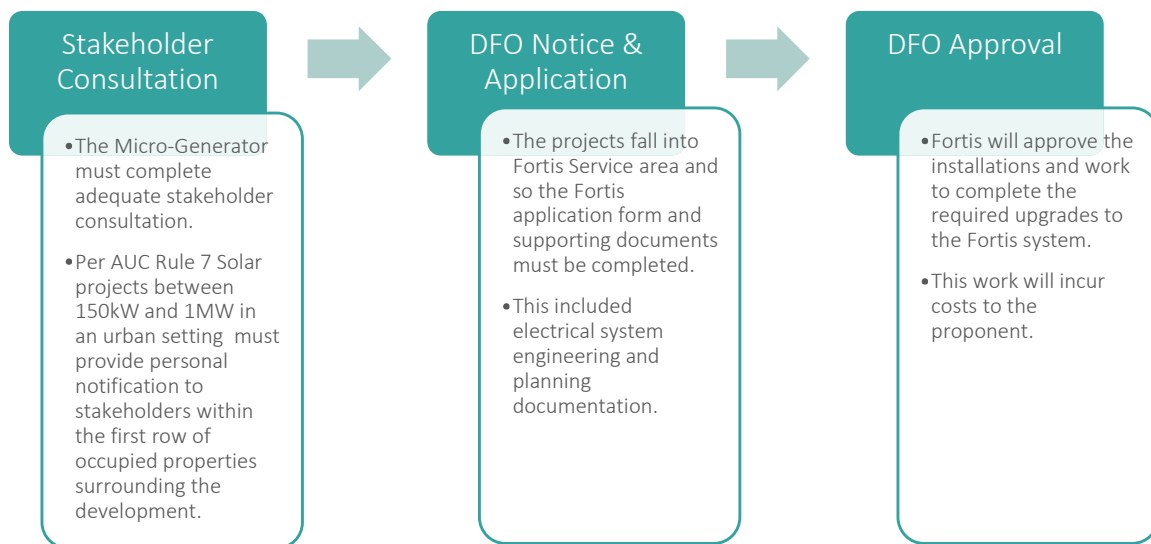
All Town of Canmore sites fall under the Micro-generation process. This process is for projects where electricity production using renewable or alternate energy resources on a small scale to meet a metered load's own energy needs (up to 5MW).

Load from multiple sites may be aggregated in order to oversize the generation relative to the needs of the individual host site, however, aggregated loads must meet the following conditions:

- They must be owned by the same customer;
- They are customers of the same retail energy company, and;
- They are located along the same distribution line.

Micro-generators must follow the rules outlined by the Alberta Utilities Commission (AUC)'s *Rule 024 - Rules Respecting Micro-Generation*.¹² The micro-generation application process is summarized below in Figure 3.3:

Figure 3.3: The Micro-Generation Application Process



Aggregation of sites is done through the energy retailer who, after receiving the meter reads from the DFO (Fortis Alberta), does the accounting on their end. So long as onsite infrastructure and the proposed solar inverters are equally rated, or the inverter output rating is less than the kVA of the transformer (e.g. 150 kW_{AC} inverter connected to a 150kVA transformer) there are no costs or additional requirements.

¹² [Rules Respecting Micro-Generation](#). Alberta Utilities Commission. 2019.

4. PRELIMINARY SITE EVALUATIONS

SWITCH Power has partnered with Proactive Planet to conduct a preliminary evaluation of site viability and constructability. Proactive Planet has installed more than 500 systems in Western Canada, with a number of these systems being actively monitored. Using this data to help inform our projections for the subject property, Proactive Planet has conducted modelling utilizing various other data sources for each solar site within the town of Canmore. This is an excellent source of relative value and an excellent starting point for a solar PV system designed to meet the needs of this community in the short, medium, and longer (e.g., 30+ years) term.

Table 2 below contains a list of Canmore sites that have been evaluated. Sites 1 through 5 are recommended as economic projects while sites 6 through 9 have been excluded for a variety of reasons as outlined in the following evaluation summaries. Each site has been reviewed for system type, electrical load, solar system design considerations and energy yield.

Table 2: List of Evaluated Sites

#	Site Name	Site Address	Installation Type	Recommended Capacity
Site 1	Elk Run Road Maintenance Facility Rooftop	103 Elk Run Boulevard	Rooftop	348 KW _{DC}
Site 2	Canmore Recreation Centre Parking Lot	1900 8th Avenue	Parking Lot Canopy	692 KW _{DC}
Site 3	Elevation Place Future Intercept Lot	700 Railway Avenue	Parking Lot Canopy	496 KW _{DC}
Site 4	Public Works Yard	100 Glacier Drive	Parking Lot Canopy	684 KW _{DC}
Site 5	Pumphouse 4	241 Benchlands Terrace	Ground Mount	327 KW _{DC}
Site 6	<i>Lift Station 7</i>	<i>1251 Palliser Trail</i>	<i>N/A</i>	<i>N/A</i>
Site 7	<i>Pumphouse 2</i>	<i>159 Park Lane Road</i>	<i>N/A</i>	<i>N/A</i>
Site 8	<i>Quarry Lake Parking Lot</i>	<i>N/A</i>	<i>N/A</i>	<i>N/A</i>
Site 9	<i>Millennium Park Parking Lot</i>	<i>5th Avenue</i>	<i>N/A</i>	<i>N/A</i>

Because the solar resource is intermittent, so too is the power produced from a solar PV system. The expected values and spread for natural data like weather, is not necessarily normally distributed or even unimodal. For this reason, it is convention to describe our level of confidence that a certain level of power production will be met, in order to minimize the risk in managing a system. Within the context of this report, all generation estimates are considered to be “P50” estimates, which infers a 50 percent confidence level that actual generation will meet or exceed the estimated value. Once detailed analysis and design are

undertaken the confidence level of generation estimates would improve and move towards P90.

A number of variables are used to estimate production of a solar PV system, ranging from the specifications of components, system configuration and environmental factors. To deliver accurate production estimates, system losses have been calculated for each site to account for various factors that impact energy production of each unique system design. See Section 5.3 for additional information and description of the sources of system losses.

4.1 Elk Run Road Maintenance Facility Rooftop

SITE DESCRIPTION

The Elk Run Road Maintenance Facility is situated in a general industrial district within the town boundaries of Canmore, Alberta located at 103 Elk Run Boulevard. The main industrial building on the property has a large, open rooftop with high solar exposure. The preliminary design for this site has been plotted to maximize the potential of this rooftop. It is estimated that the proposed system, comprised of 2 arrays of 9,225 sq.ft each, will cover approximately 75% of the rooftop area.

In 2018, this site's annual consumption was 63 MWh. Due to its low electricity demand this building has not previously been considered for a rooftop solar installation. However, with multiple town-owned facilities nearby there is significant potential to aggregate the load. Possible aggregation options include any building west of Elk Run Blvd and east of Spring Creek that are on the same feeder. Specifically, we recommend aggregating the following loads:

Table 3: Recommended Aggregate Sites

Site Name	Estimated Annual Consumption
Canyon Booster Station	71,681 kWh
Lift Station #7	66,348 kWh
Lift Station #6	25,978 kWh
Lift Station #5	19,581 kWh
Pedestrian Underpass	2,534 kWh
Boulder Maintenance Facility	9,837 kWh
North Side Street Lights	TBD

Table 4: Electrical Feeder Hosting Capacity – Elk Run Road Maintenance Facility

Hosting Capacity (kW)	4,547 kW
Feeder	118S-488LW
Date Updated	2022-04-14
Phase	XYZ

PRELIMINARY DESIGN & LAYOUT



Figure 4.1: Preliminary Module layout - Elk Run Road Maintenance Facility Rooftop

Table 5: Preliminary Equipment List – Elk Run Road Maintenance Facility Rooftop

Component	Model	Installed Capacity
Solar PV Modules	Jinko 460-Watt Mono-crystalline Modules	756 units x 460 watts/module = 347.76kW _{DC}
Inverters	Canadian Solar 125kW 600V Inverters	2 x 125kW 600V Inverters = 231.84kW _{AC}
Racking	HB Solar International Inc. Skyrack Racking System	N/A

Table 6: Capital Cost Breakdown – Elk Run Road Maintenance Facility Rooftop

Item	Est. Capital Cost	\$/Watt _{DC}	% of Total
Solar Panels	\$186,921	\$0.54	36%
Racking	\$53,978	\$0.16	10%
Inverters	\$16,411	\$0.05	3%
Other (Engineering, Service Upgrade, Labour, LOA, Permits, Inspections, 150kW & over switch, equipment rentals, travel, hotels, meals, and freight)	\$262,201	\$0.75	50%
Total	\$519,512	\$1.49	100%

ENERGY YIELD

Using the solar PV system which has been identified above in Table 6, it is possible to estimate the solar PV production for the proposed system. Proactive Planet estimates the annual production from this system at ~1,007.7 kWh/kWp/year. The result is an estimated production of 350.4 MWh of energy produced in year 1.

Array soiling losses consist of losses due to snow accumulation in the winter and dust in the summer. These losses were estimated as follows:

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
45%	45%	35%	10%	2%	2%	2%	2%	2%	15%	25%	35%

Figure 4.2: Soiling Losses – Elk Run Road Maintenance Facility Rooftop

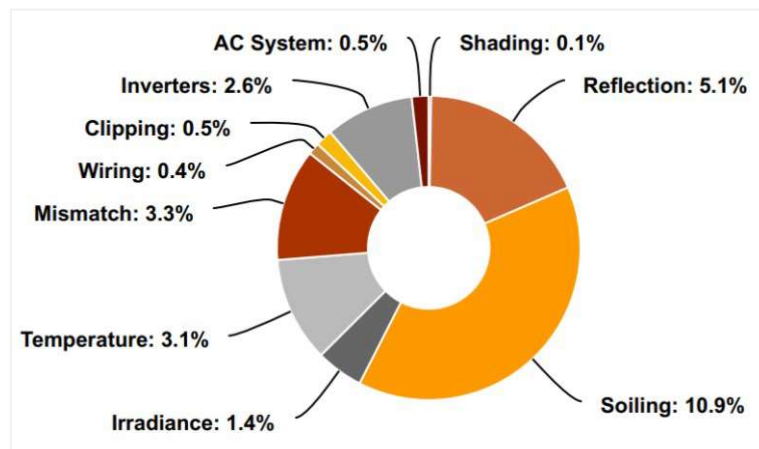


Figure 4.3: System Loss Diagram – Elk Run Road Maintenance Facility Rooftop

Given the above, Proactive Planet is able to produce a monthly generation estimate (see Figure 4.4) and an hourly generation estimate. The hourly data is important for the economic analysis given that energy exported will be settled by the AESO at the hourly wholesale pool price.

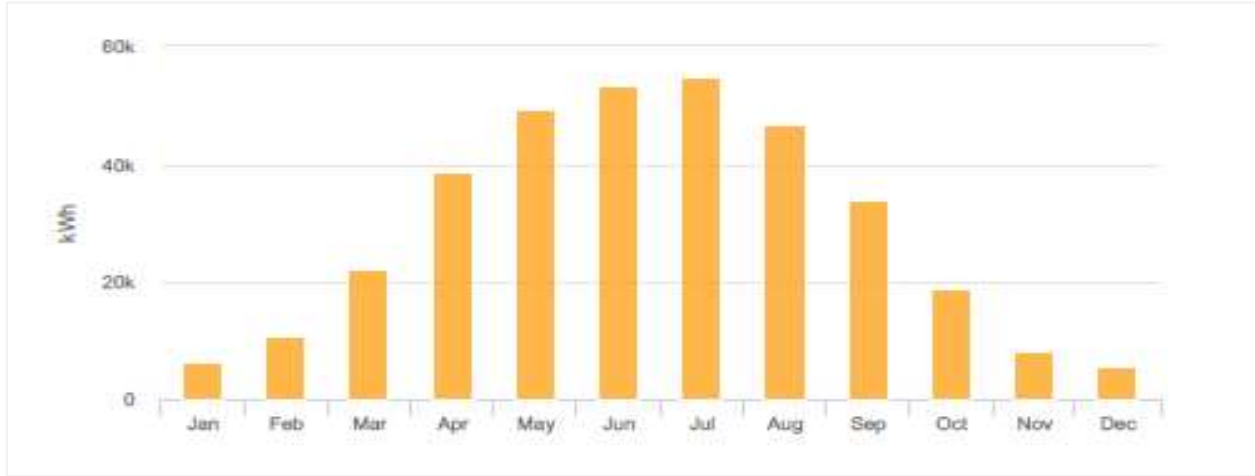


Figure 4.4: Elk Run Road Maintenance Facility Rooftop – Generation Profile

FINANCIALS

The estimated price is based on system component prices as of September 1, 2022, and the estimated construction costs in Canmore, Alberta, inclusive of permitting (e.g., Building, Development, and Electrical Permits necessary). Thus, the turnkey cost to construct this system is estimated as follows:

Table 7: Estimated System Costs – Elk Run Road Maintenance Facility Rooftop

Item	Estimated Cost	\$/Watt _{DC}
Estimated Capital Cost	\$519,511.65 + GST	\$1.49
Estimated O&M Cost (Year 1)	\$3,478 + GST	\$0.01

With these estimated system costs, it is estimated that the Elk Run Road Maintenance Facility rooftop system will yield an LCOE of ~\$0.0691/kWh with an estimated NPV of \$320,935 over an expected project life of 25 years.¹³ See Appendix Section 1 for more information.

¹³ NPV calculation assumes the monetization of environmental attributes as carbon offset revenue, valued at announced Federal Carbon Prices and does not include brokerage fees. LCOE calculation does not consider carbon value.

4.2 Canmore Recreation Centre Parking Lot

SITE DESCRIPTION

The Canmore Recreation Centre (CRC) is located at 1900 8th Avenue in Canmore, Alberta. The parking lot of the CRC building has good solar exposure, so this site is being assessed for a solar PV canopy. The property neighbours the Canadian Rockies Public High School and a transition, industrial district, so opposition due to aesthetics is less likely than other locations. PV canopy projects include the foundation, the canopy structure and the components of the PV system, modules & inverters.

The CRC building and ice rink refrigeration plant are high consumers of electricity, consuming 854 MWh and 1,021 MWh in 2018, respectively. A 400.5 kW solar PV rooftop array was installed on the building in 2021, which is estimated to supply ~20% of the building's annual consumption, potentially supplying up to 27% in the future.

Some potential concerns arise from the usage of the parking lot, as it is well-used with taller vehicles (food trucks, camper vans, team buses, etc.) often occupying the parking lot. Reconfiguring of the canopy may be needed to accommodate for this, as well as snow loading.

PILE TYPE

The carport structures require a robust foundation to support the canopy framework and PV modules, as well as additional loading from wind or snow. The pile design is finalized by the EPC during detailed design and depends on structure loading information, frost depth, ground conditions, size, and costing information.

For the purposes of this report, it is assumed helical piles would be used and that the piles would be drilled. It is recommended that contractors first perform torque testing to determine the best base, sometimes as deep as 30 feet, dependent on soil conditions. Frost heaving is mitigated by sleeving the piles if necessary.

CANOPY INSTALLATION

Once the piles are installed, the installation of the canopy structures can be completed using zoom booms and lifts. First the post beams are lifted and bolted onto the pile. Then the remainder of the canopy structure is then lifted into position and bolted together.

WATER MANAGEMENT & DRAINAGE

Water management is performed through the installation of gutters along the bottom edge of the solar canopies to allow water and snow to drain off slowly. The carports will be 100% sealed and come with snow stops, which help reduce the risk of ice forming and falling from the structures. Heat tracing can also be included if necessary.

It is recommended that a civil engineer be hired to prepare a detailed drainage plan for this site, ensuring proper water runoff and drainage. The fee for this study is usually around \$5,000.

PRELIMINARY DESIGN & LAYOUT



Figure 4.5: Preliminary Module Layout - Canmore Recreation Centre Parking Lot

Table 8: Preliminary Equipment List – Canmore Recreation Centre Parking Lot

Component	Model	Installed Capacity
Solar PV Modules	Jinko 540-Watt Mono-crystalline Modules	1,281 units x 540 watts/module = 691.74kW _{DC}
Inverters	Canadian Solar 125kW 600V Inverters	4 x 125kW 600V Inverters = 461.16kW _{AC}
Racking	Sun Action Trackers Solar Canopy	N/A

Table 9: Capital Cost Breakdown – Canmore Recreation Centre Parking Lot

Item	Est. Capital Cost	\$/Watt _{DC}	% of Total
Solar Panels	\$389,104	\$0.56	21%
Carports & 52 Helical Piles	\$958,588	\$1.39	53%
Inverters	\$30,161	\$0.04	2%
<i>Other (Engineering, Service Upgrade, Labour, LOA, Permits, Inspections, 150kW & over switch, equipment rentals, travel, hotels, meals, and freight)</i>	\$438,468	\$0.63	24%
Total	\$1,816,320	\$2.63	100%

ENERGY YIELD

Using the solar PV system which has been identified above in Table 8, it is possible to estimate the solar PV production for the proposed system. Proactive Planet estimates the annual production from this system at ~1,088.9 kWh/kWp/year. The result is an estimated production of 753.2 MWh of energy produced in year 1.

Array soiling losses consist of losses due to snow accumulation in the winter and dust in the summer. These losses were estimated as follows:

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
45%	45%	35%	10%	2%	2%	2%	2%	2%	15%	25%	35%

Figure 4.6: Soiling Losses - Canmore Recreation Centre Parking Lot

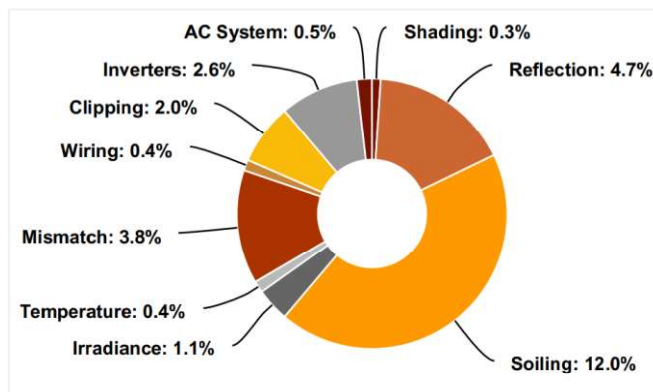


Figure 4.7: System Loss Diagram - Canmore Recreation Centre Parking Lot

Given the above, Proactive Planet is able to produce a monthly generation estimate (see Figure 4.8) and an hourly generation estimate. The hourly data is important for the economic analysis given that energy exported will be settled by the AESO at the hourly wholesale pool price.

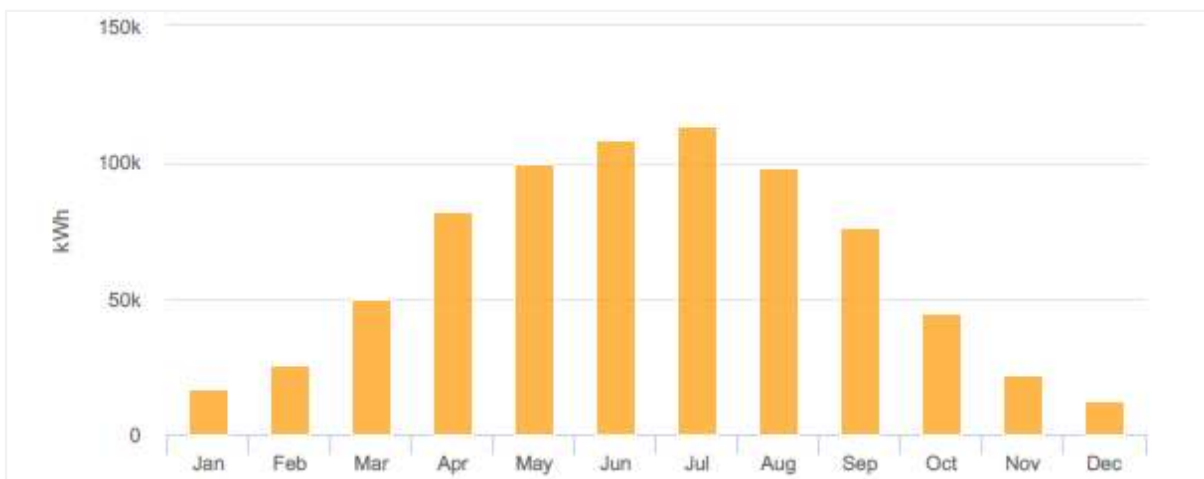


Figure 4.8: Canmore Recreation Centre Parking Lot – Generation Profile

FINANCIALS

The estimated price is based on system component prices as of September 1, 2022, and the estimated construction costs in Canmore, Alberta, inclusive of permitting (e.g., Building, Development, and Electrical Permits necessary). Thus, the turnkey cost to construct this system is estimated as follows:

Table 10: Estimated System Costs – Canmore Recreation Centre Parking Lot

Item	Cost	\$/Watt _{DC}
Estimated Capital Cost	\$1,816,320.25 + GST	\$2.63
Estimated O&M Cost (Year 1)	\$6,917 + GST	\$0.01

With these estimated system costs, it is estimated that the Canmore Recreation Centre Parking Lot system will yield an LCOE of ~\$0.106/kWh with an estimated NPV of \$28,152 over an expected project life of 25 years.¹⁴ See Appendix Section 1 for more information.

4.3 Elevation Place Future Intercept Lot

SITE DESCRIPTION

The solar PV site will be located at the Elevation Place in Canmore, Alberta, at 700 Railway Avenue. The site is being assessed for a solar PV canopy over the future intercept lot, as well as over a portion of the existing paved parking lot of Elevation Place. Since the intercept lot has yet to be constructed, it is assumed that costs for the installation of the canopy will be lower than in existing lots. The proposed system includes 5 carport structures of 116x15 feet (5,220 sq.ft) each. Each canopy accommodates 28-30 parking spaces.

In 2018, Elevation Place’s annual consumption was 1,585 MWh. However, since then a 373kW solar PV array was installed so current grid consumption will be lower.

PILE TYPE

The carport structure requires a robust foundation to support the canopy framework and PV modules, as well as additional loading from wind or snow. The pile design is finalized by the EPC during detailed design and depends on structure loading information, frost depth, ground conditions, size, and costing information.

For the purposes of this report, it is assumed helical piles would be used and that the piles would be drilled. It is recommended that contractors first perform torque test to determine

¹⁴ NPV calculation assumes the monetization of environmental attributes as carbon offsets, valued at announced Federal Carbon Prices and does not include brokerage fees. LCOE calculation does not consider carbon value.

the best base, sometimes as deep as 30 feet, dependent on soil conditions. Frost heaving is mitigated by sleeving the piles if necessary.

CANOPY INSTALLATION

Once the piles are installed, the installation of the canopy structures can be completed using zoom booms and lifts. First the post beams are lifted and bolted onto the pile. Then the remainder of the canopy structure is then lifted into position and bolted together.

WATER MANAGEMENT & DRAINAGE

Water management is performed through the installation of gutters along the bottom edge of the solar canopies to allow water and snow to drain off slowly. The carports will be 100% sealed and come with snow stops, which help reduce the risk of ice forming and falling from the structures. Heat tracing can also be included if necessary.

It is recommended that a civil engineer be hired to prepare a detailed drainage plan for this site, ensuring proper water run off and drainage. The fee for this study is usually around \$5,000.

PRELIMINARY DESIGN & LAYOUT



Figure 4.9: Preliminary Module Layout - Elevation Place Future Intercept Lot

Table 11: Preliminary Equipment List – Elevation Place Future Intercept Lot

Component	Model	Installed Capacity
Solar PV Modules	Jinko 540-Watt Mono-crystalline Modules	918 units x 540 watts/module = 495.72kW _{DC}
Inverters	Canadian Solar 125kW 600V Inverters	3 x 125kW 600V Inverters = 330.48kW _{AC}
Racking	Sun Action Trackers Solar Canopy	N/A

Table 12: Capital Cost Breakdown – Elevation Place Future Intercept Lot

Item	Est. Capital Cost	\$/Watt _{DC}	% of Total
Solar Panels	\$278,843	\$0.56	22%
Carport & Helicals	\$623,875	\$1.26	49%
Inverters	\$23,286	\$0.05	2%
Other (Engineering, Labour, LOA, Permits, Inspections, 150kW & over switch, equipment rentals, travel, hotels, meals, and freight)	\$357,610	\$0.72	28%
Total	\$1,283,613	\$2.59	100%

ENERGY YIELD

Using the solar PV system identified above in Table 11, it is possible to estimate the solar PV production for the proposed system. Proactive Planet estimates the annual production from this system at ~1,062.8 kWh/kWp/year. The result is an estimated production of 526.8 MWh of energy produced in year 1.

Array soiling losses consist of losses due to snow accumulation in the winter and dust in the summer. These losses were estimated as follows:

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
45%	45%	35%	10%	2%	2%	2%	2%	2%	15%	25%	35%

Figure 4.10: Soiling Losses - Elevation Place Future Intercept Lot

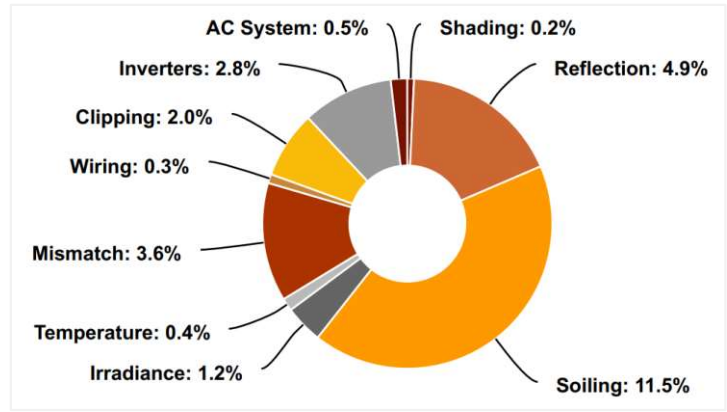


Figure 4.11: System Loss Diagram - Elevation Place Future Intercept Lot

Given the above, Proactive Planet is able to produce a monthly generation estimate (see Figure 4.12 below) and an hourly generation estimate. The hourly data is important for the economic analysis given that energy exported will be settled by the AESO at the hourly wholesale pool price.

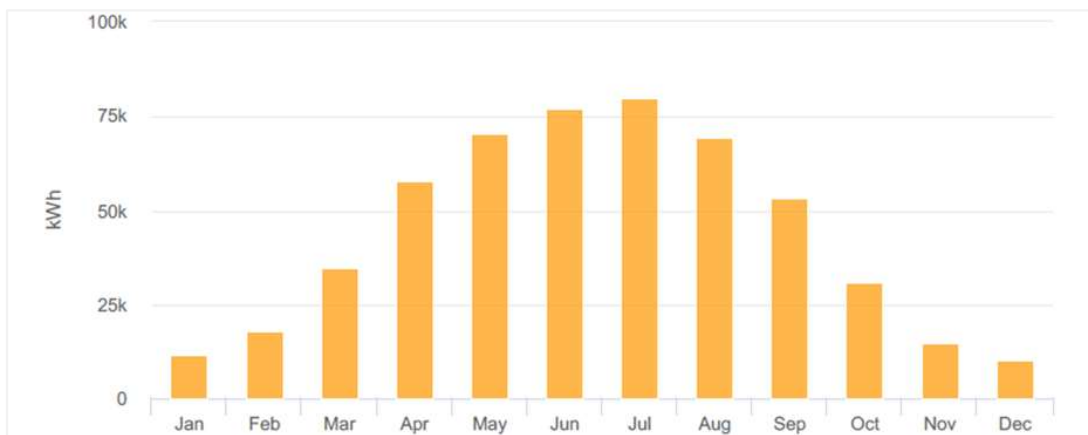


Figure 4.12: Elevation Place Future Intercept Lot – Generation Profile

FINANCIALS

The estimated price is based on system component prices as of September 1, 2022, and the estimated construction costs in Canmore, Alberta, inclusive of permitting (e.g., Building, Development, and Electrical Permits necessary).

Table 13: Estimated System Costs – Elevation Place Future Intercept Lot

Item	Cost	\$/Watt _{DC}
Estimated Capital Cost	\$1,283,613.25 + GST	\$2.59
Estimated O&M Cost (Year 1)	\$4,957 + GST	\$0.01

With these estimated system costs, it is estimated that the Elevation Place Future Intercept Lot system will yield an LCOE of ~\$0.108/kWh with an estimated NPV of \$4,322 over an expected project life of 25 years.¹⁵ See Appendix Section 1 for more information.

4.4 Public Works Yard

SITE DESCRIPTION

The solar PV site will be located at the Public Works Yard in Canmore, Alberta, at 100 Glacier Drive. The site is being assessed for a solar PV canopy over the yard. There are vehicles and equipment within the yard that would benefit from being stored under a canopy. The Public Works building located on the yard consumed 98MWh in 2018.

As it is expected that there will be larger vehicles and equipment maneuvering around the Public Works Yard, the canopy design has been adjusted to accommodate increased height restrictions. The proposed system includes 7 carport structures covering 210 parking spaces with a total coverage area of 35,631sq.ft.

¹⁵ NPV calculation assumes the monetization of environmental attributes as carbon offset revenue, valued at announced Federal Carbon Prices and does not include brokerage fees. LCOE calculation does not consider carbon value.

PRELIMINARY DESIGN & LAYOUT



Figure 4.13: Preliminary Module Layout - Public Works Yard

Table 14: Preliminary Equipment List – Public Works Yard

Component	Model	Installed Capacity
Solar PV Modules	Jinko 540-Watt Mono-crystalline Modules	1,266 units x 540 watts/module = 683.64kW _{DC}
Inverters	Canadian Solar 125kW 600V Inverters	4 x 125kW 600V Inverters = 455.76kW _{AC}
Racking	Sun Action Trackers Solar Canopy	N/A

Table 15: Capital Cost Breakdown – Public Works Yard

Item	Est. Capital Cost	\$/Watt _{DC}	% of Total
Solar Panels	\$384,548	\$0.56	21%
Carport & Helicals	\$937,463	\$1.37	52%
Inverters	\$30,161	\$0.04	2%
Other (Engineering, Labour, LOA, Permits, Inspections, 150kW & over switch, equipment rentals, travel, hotels, meals, and freight)	\$452,218	\$0.66	25%
Total	\$1,804,389	\$2.64	100%

ENERGY YIELD

Using the solar PV system which has been identified above in Table 14, it is possible to estimate the solar PV production for the proposed system. It is estimated that the annual production from this system will be ~1,087.5 kWh/kWp/year. The result is an estimated production of 743.5MWh of energy produced in year 1.

Array soiling losses consist of losses due to snow accumulation in the winter and dust in the summer. These losses were estimated as follows:

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
45%	45%	35%	10%	2%	2%	2%	2%	2%	15%	25%	35%

Figure 4.14: Soiling Losses - Public Works Yard

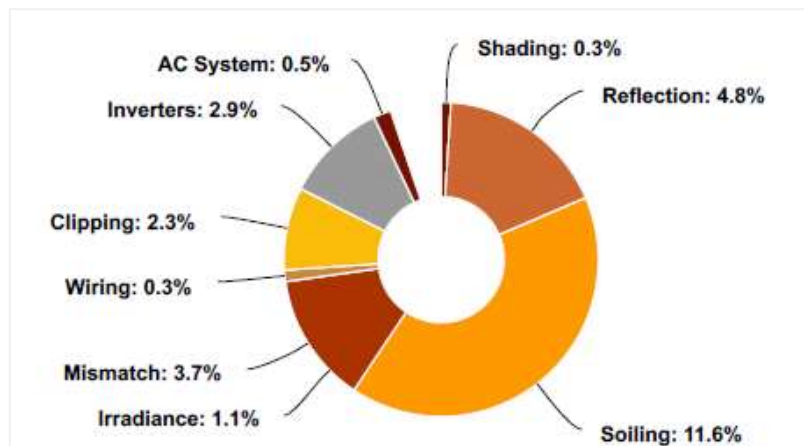


Figure 4.15: System Loss Diagram - Public Works Yard

Given the above, Proactive Planet is able to produce a monthly generation estimate (see Figure 4.16) and an hourly generation estimate. The hourly data is important for the

economic analysis given that energy exported will be settled by the AESO at the hourly wholesale pool price.



Figure 4.16: Public Works Yard – Generation Profile

FINANCIALS

The estimated price is based on system component prices as of September 1, 2022, and the estimated construction costs in Canmore, Alberta, inclusive of permitting (e.g., Building, Development, and Electrical Permits necessary). Thus, the turnkey cost to construct this system is estimated as follows:

Table 16: Estimated System Costs – Public Works Yard

Item	Cost	\$/Watt _{DC}
Estimated Capital Cost	\$1,804,388.75 + GST	\$2.64
Estimated O&M Cost (Year 1)	\$6,836 + GST	\$0.01

With these estimated system costs, it is estimated that the Public Works Yard system will yield an LCOE of ~\$0.107/kWh with an estimated NPV of \$16,494 over an expected project life of 25 years.¹⁶ See Appendix Section 1 for more information.

¹⁶ NPV calculation assumes the monetization of environmental attributes as carbon offset revenue, valued at announced Federal Carbon Prices, and does not include brokerage fees. LCOE calculation does not consider carbon value.

4.5 Pumphouse 4

Pumphouse 4 is located at 241 Benchlands Terrace in Canmore, Alberta. This site is being assessed for a ground mount system. The pumphouse facilities use a significant amount of electricity due to the pumping/lifting process. In 2018, the annual consumption was 70MWh.

The preliminary design for Pumphouse 4 contemplates the use of the PEG racking system by Jurchen Technology.¹⁷ This unique, high-density ground mount substructure has several design features that provide significant project advantages such as minimal foundation and trenching requirements, low profile, and integrated wire management. See Appendix Section 2 and Appendix Section 3 for additional information regarding the PEG System.

¹⁷ <https://www.jurchen-technology.com/products/pv-substructures/peg/>

PRELIMINARY DESIGN & LAYOUT

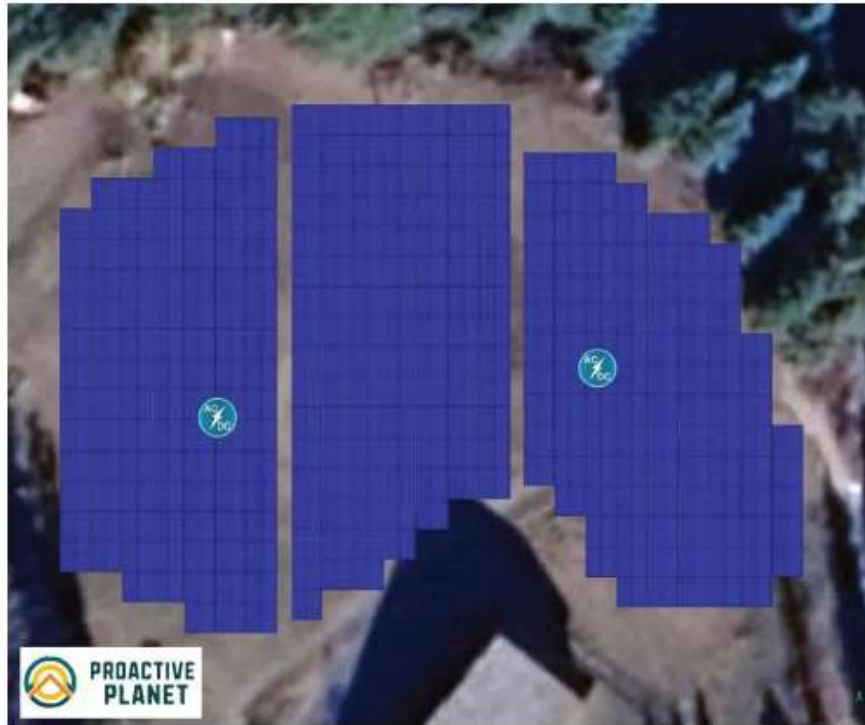


Figure 4.17: Preliminary Module Layout - Pumphouse 4

Table 17: Preliminary Equipment List – Pumphouse 4

System Component	Model	Installed Capacity
Solar PV Modules	Jinko 525-Watt Mono-crystalline Modules	622 units x 525 watts/module = 326.55kW _{DC}
Inverters	Canadian Solar 125kW 600V Inverters	2 x 125kW 600V Inverters = 217.7kW _{AC}
Racking	Jurchen Technology PEG Racking System	N/A

Table 18: Capital Cost Breakdown – Pumphouse 4

Item	Est. Capital Cost	\$/Watt _{DC}	% of Total
Solar Panels	\$175,521	\$0.54	33%
PEG Mounting	\$119,138	\$0.36	22%
Inverters	\$16,411	\$0.05	3%
Other (Engineering, Labour, LOA, Permits, Inspections, 150kW & over switch, service upgrade, equipment rentals, travel, hotels, meals, and freight)	\$227,866	\$0.70	42%
Total	\$538,935	\$1.65	100%

ENERGY YIELD

Using the solar PV system which has been identified above in Table 17, it is possible to estimate the solar PV production for the proposed system. Proactive Planet estimates the annual production from this system at ~1055.8 kWh/kWp/year. The result is an estimated production of 344.8MWh of energy produced in year 1.

Array soiling losses consist of losses due to snow accumulation in the winter and dust in the summer. These losses were estimated as follows:

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
35%	35%	25%	15%	2%	2%	2%	2%	15%	25%	30%	35%

Figure 4.18: Soiling Losses - Pumphouse 4

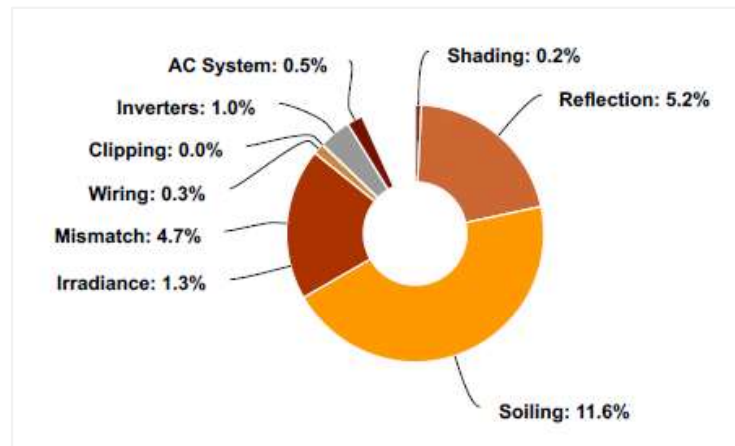


Figure 4.19: System Loss Diagram - Pumphouse 4

Given the above, Proactive Planet is able to produce a monthly generation estimate (see Figure 4.20) and an hourly generation estimate. The hourly data is important for the economic analysis given that energy exported will be settled by the AESO at the hourly wholesale pool price.

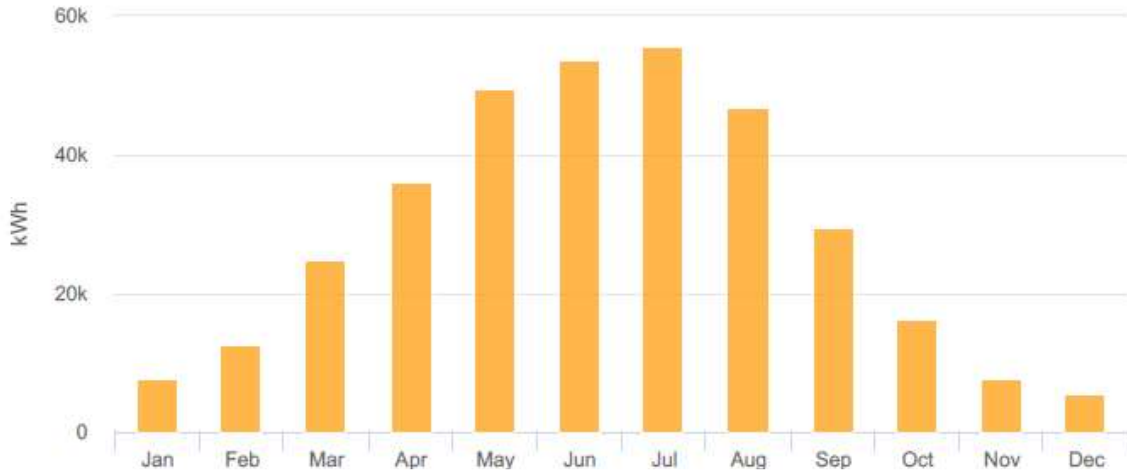


Figure 4.20: Pumphouse 4 – Generation Profile

FINANCIALS

The estimated price is based on system component prices as of September 1, 2022, and the estimated construction costs in Canmore, Alberta, inclusive of permitting (e.g., Building, Development, and Electrical Permits necessary). Thus, the turnkey cost to construct this system is estimated as follows:

Table 19: Estimated System Cost – Pumphouse 4

Item	Cost	\$/Watt _{DC}
Estimated Capital Cost	\$538,935 + GST	\$1.65
Estimated O&M Cost (Year 1)	\$3,266 + GST	\$0.01

With these estimated system costs, it is estimated that the Pumphouse 4 system will yield an LCOE of ~\$0.072/kWh with an estimated NPV of \$294,816 over an expected project life of 25 years.¹⁸ See Appendix Section 1 for more information.

¹⁸ NPV calculation assumes the monetization of environmental attributes as carbon offset revenue, valued at announced Federal Carbon Prices and does not include brokerage fees. LCOE calculation does not consider carbon value.

4.6 Lift Station 7

Lift Station 7 is located at 1251 Palliser Trail in Canmore, Alberta. The building on the property's rooftop is quite small, limiting the opportunity for a rooftop solar PV array. The lot is also limited for size, making the option of a ground mount also difficult. Because of these restrictions, **Lift Station 7 has been removed as a potential solar PV site.**

4.7 Pumphouse 2

Pumphouse 2 is located at 159 Park Lane Road in Canmore, Alberta. This site is limited in buildable area in terms of a ground mount and rooftop array. Because of these restrictions, **Pumphouse 2 has been removed as a potential solar PV site.**

4.8 Quarry Lake Parking Lot

Quarry Lake Park is located off of Spray Lakes Road in Canmore, Alberta. This parking lot was being assessed for potential solar PV canopies. However, after reviewing with Fortis, it was concluded that the Quarry Lake parking lot is not a feasible site due to the lack of power infrastructure nearby. If there is no service on site, it would be necessary to bring in a line, from the south or west, with a 200Amp service and a 150kVA transformer. It is possible that if a larger solar array were to be considered it could be more worthwhile, but until then, the **Quarry Lake parking lot has been removed as a potential solar PV site.**

4.9 Millennium Park Parking Lot

Millennium Park is located at the base of 5th Avenue in Canmore, Alberta. This site was a potential candidate for solar PV carports over the paved lot. However, due to the Millennium Park parking lot being located close to residential, there are potential concerns from the public regarding the canopies. Due to these potential concerns, as well as the smaller buildable area of the site and lack of power infrastructure, the **Millennium Park parking lot has been removed as a potential solar PV site.**

5. TECHNICAL CONSIDERATIONS

5.1 Choosing the Right Solar Design

Multiple design considerations are considered when selecting the appropriate system type. A brief overview of key design features of solar PV installation types is included below in Table 20.¹⁹

Table 20: System Design Considerations

Design Feature	Rooftop	Ground-Mount	Carpport
Installation & Material Cost	Low to mid-range	Low to mid-range, can vary depending on distance from interconnection point and required system foundations	Generally more expensive
Installation Timeframe	Usually the shortest	Medium to long, and can vary depending on system size, permitting requirements and the required system foundations	Medium
Disruption During Installation	Relatively low once the equipment and materials are on the roof	Relatively low	More disruptive if structure is built over a parking lot that will be in use during construction
Additional Features	Single and dual-tilt (to maximize sun exposure) options often available	Tracker systems (to maximize sun exposure) available for some ground-mounted installations	In addition to providing shade and rain/snow protection, integrated security lighting and vehicle charging stations can be added
Visibility	Generally not visible	Varies depending on system placement	Highly visible
Accessibility for Operations & Maintenance	Easy, assuming good roof access	Generally easy	May require specialty equipment due to system height

¹⁹ [Installation Investigation: Choosing the Right Solar Design for your Organization](#), Solar Technologies Inc. 2017.

5.2 Description of Primary System Components

SOLAR PV MODULES

Many factors are considered during panel selection including quality, size and fit for project to meet the required energy output. Final selection and cost are typically subject to availability and supplier pricing.

The modules used in the preliminary design are Jinko 460-Watt, 525-Watt and 540-Watt mono-crystalline modules. Strengthened rated for a snow load of 5,400 Pa and a 2,400 Pa wind load, these modules also have a 12-year product warranty and a 25-year linear power warranty (see

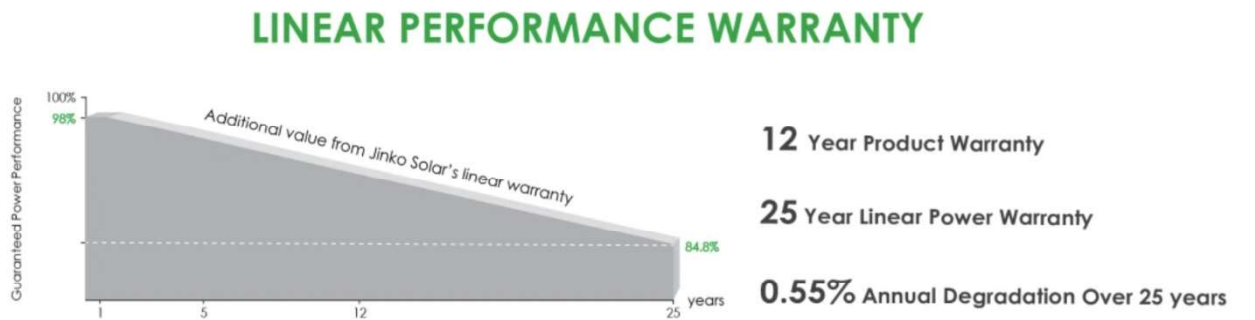


Figure 5.1)



Figure 5.1: Linear Performance Warranty of Jinko PV Modules

SOLAR PV INVERTERS

The Canadian Solar 125kW 600V Inverter is the solar PV inverter used in the preliminary design. Canadian Solar's grid-tied, transformer-less string inverters help to accelerate the use of three-phase string architecture for commercial rooftop and small ground mount applications. An NRTL approved, cost-effective alternative to central inverters, these inverters are modular design building blocks that provide high yield and enable significant

BoS cost savings. They provide up to 99.1% conversion efficiency, a wide operating range of 860-1450 V DC, and maximum energy harvest²⁰.

ROOFTOP RACKING SYSTEM

The HB Skyrack rail-based racking solution by HB Solar International was used in the preliminary design for the Canmore maintenance facility. HB Solar International has earned the reputation as a leading provider of metal roof solutions. The reputation has been built on nearly 10 years of multi-MW portfolios and challenging projects.²¹

PARKING LOT SOLAR CANOPY

The racking for the solar canopies will be provided by Sun Action Trackers. Since 2005, Sun Action Trackers has deployed over 1 GW of solar racking spanning over 8,000 acres (See Appendix Section 2 for more details).

GROUND MOUNT RACKING SYSTEM

The PEG EW System racking by Jurchen Technology (see Figure 5.2) will be used in the Pumphouse 4 preliminary design. Less material and a simple design reduce labor costs and construction times. The PEG substructure is the lightest, most efficient, and most innovative system on the market. The steel rods of the PEG substructure can also be installed with only a hammer drill. Substructures of our competitors are heavier and more expensive. Most of them need concrete foundations and heavy machines²².

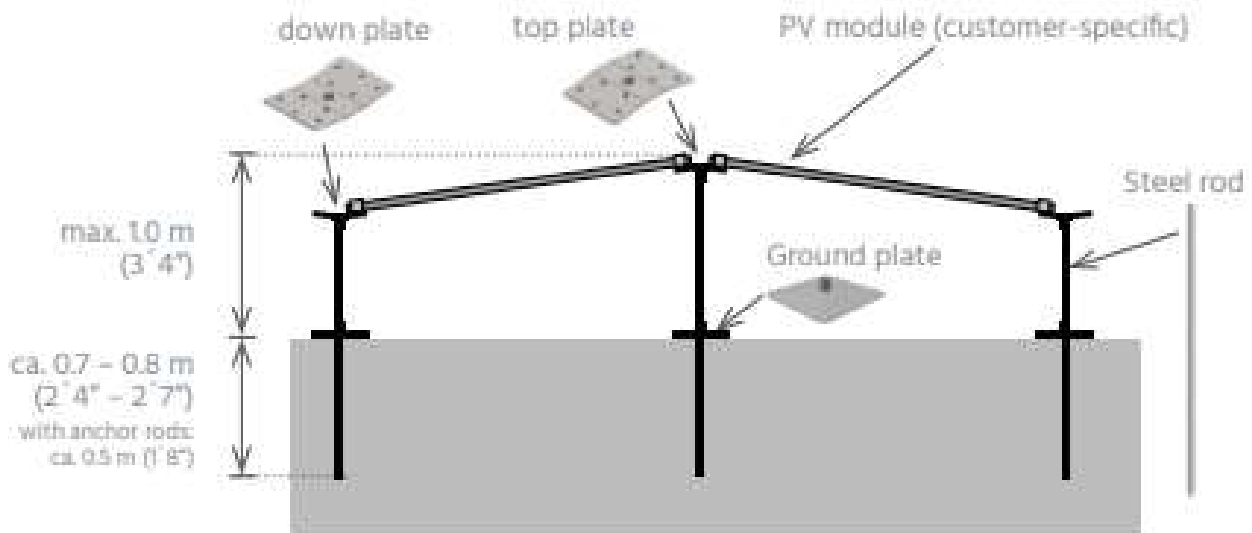


Figure 5.2: PEG EW System Racking System Design

²⁰ [Three phase string inverter 125 kW](#). (2020). Canadian Solar Inc.

²¹ [Skyrack Rail-base Racking Solution](#). (2019). HB International Inc.

²² [PEG revolutionizing PV mounting](#). (2021). Jurchen Technology.

Additional information and recommended project development guidance for the PEG EW system from Jurchen Technology has been included in Appendix Section 3.

5.3 Sources of System Loss

Loss Category	Description
Irradiance	Includes factors that reduce the irradiance that is available to the solar modules. These losses are primarily due to far horizon obstructions, nearby obstruction shading, row-to-row shading, shading losses, and reflective losses.
Temperature	Cell temperature is a critical component of system production, as a module's power production can vary greatly based on its temperature. The relationship between power and cell temperature is defined as the module's thermal coefficient. All coefficients are negative, as higher temperatures lead to lower power production. Note that a module's nameplate power is based on the module being at STC, which is defined as 25 degrees Celsius.
Mismatch	Mismatch losses account for any power lost due to a module being driven off its Maximum Power Point (MPP). Each module has an individual IV curve and therefore has an individual MPP. However, based on the systems electrical constraints (series and parallel connections), the modules will not always operate at their MPP, particularly if there is mismatch between modules on the same string. The difference between the effective power of the array and the sum of the modules maximum power is defined as mismatch loss.
Wiring	Accounts for losses resulting from the resistance of connecting module strings to each other using wire conductors. Each wire in an array has a specific resistance, based on the resistivity of the wire (the resistance per foot), and the distance covered by the wire. The resistance of each string corresponds directly to the wire losses, as well as the voltage drop on the strings. The wire content of each string is calculated based on the exact distances between the modules, combiner boxes, and inverters of the array. In this way, the tool calculates wire losses and voltage drop based on the exact resistance of each home run between each string and its corresponding inverter.
Clipping	An inverter has an operational range of voltage and power that it is designed to work within. However, the array will not always operate within this envelope. In particular, the voltage from the modules can be above or below the inverter's voltage range, or the power from the array can exceed the maximum power that the inverter can deliver. Each of these edge cases will result in a different system behavior such as Over-voltage, Under-voltage and Over-power scenarios.
Inverter	Accounts for efficiency of inverter. The inverter is a device that converts the DC power from the modules to AC power for use on the grid. Inverters run at different efficiencies based on the input voltage and power from the array.

<p>AC Systems</p>	<p>Derates system power to compensate for AC system losses (conductors, transformers, etc.) that is applied to the inverter's AC Output within the loss tree.</p>
<p>Shading</p>	<p>Shading is caused by shadows falling on a solar panel producing power, with current dropping proportional to the reduced irradiance. Shading is a significant problem as shading on just one cell can reduce the power output of an entire string. Shading losses can be minimized through appropriate siting, equipment selection and system design.</p>
<p>Reflection</p>	<p>When sunlight strikes a module from a shallow angle, a portion of the light is reflected by the surface of the module. (A similar phenomenon can be seen when the surface of a pond will reflect the sky above it, even though the water looks clear when viewed straight down toward the surface of the water.) The lower the angle of the sunlight, the greater the reflection is. This reflective loss is technically called the Incident Angle Modifier (IAM). This loss factor will often be adjusted because of new anti-reflective coatings that are used on solar modules.</p>
<p>Soiling</p>	<p>Soiling refers to the accumulation of dust, snow, or other materials on the solar panels, resulting in less irradiance being available for energy production. Soiling losses are a user-defined loss factor, which is defined as a percentage of irradiance each month. The loss is applied to the entire irradiance value, including direct and diffuse irradiance. In areas with significant snow-related losses, these loss assumptions are often bucketed as part of the soiling losses.</p>

6. RISKS & MITIGATIONS

During the initial site visit, risks to the Town of Canmore in executing the project have been identified and addressed as follows:

Event	Potential Effect	Estimated Risk	Impact	Control Strategy	Remarks
Interconnection Capacity constraints on feeder	Capacity limits on the size of the solar asset.	Low	High	Mitigated	Microgen related projects are typically not subjected to interconnection capacity constraints.
Module price volatility	Capex Cost overruns	High	Medium	Transferred	In the scope of the EPC
HSE incident during construction	Shut down or delay in construction	Medium	Low	Mitigated	Require EPC contractor to adhere to proper safety procedures during construction (COR certification is recommended)
Snow melt and ice formation under solar canopies	Creates parking area hazard. Dislodged ice strikes vehicle or person	Low	Medium	Mitigated	Hire civil engineer to prepare detailed drainage plan. Solar canopies are 100% sealed and come with snow stops and gutters.
Poor structural integrity of roof	Damages to the roof	Low	High	Mitigated	Structural assessments of the roof were conducted.

7. FURTHER INVESTIGATIONS

For the rooftop systems, it was determined that no further investigations are required to initiate the development process.

For the carport systems, geotechnical surveys and an assessment of future use may be required to inform detailed design.

For Site 7, being a ground mount installation, additional investigations may be required to initiate the development process, including:

- Validation of buildable area
- Conducting geotechnical evaluations
- Public consultations

8. SUMMARY & RECOMMENDATION

The evaluation of nine sites for the development of Solar creates a strong business case for two sites: the Elk Run Road Maintenance Facility Rooftop and the Pumphouse 4 station.

Due to higher upfront capital costs, the Canmore Recreation Centre Parking Lot, Elevation Place Future Intercept Lot, and Public Works Yard do not perform as competitively as other potential investments evaluated as part of this feasibility assessment. Solar canopies are more capital intensive than rooftop and ground mounted installations, however, they provide an attractive option when land is constrained. In addition to being an efficient use of land, solar canopies also provide other benefits, such as weather protection for vehicles parked underneath and providing a highly visible ESG statement.

As such, our recommendation is to investigate options where Canmore may deploy their capital most effectively. This can be accomplished through a competitive RFP process for the engineering, procurement, and construction of solar development(s) deemed appropriate for your community. Additionally, the Town of Canmore may consider engaging a local power producer to contract for the offtake of the renewable power generation and environmental attributes produced from the solar assets.

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SWITCH
POWER

TOWN OF CANMORE

Community Solar Program Assessment

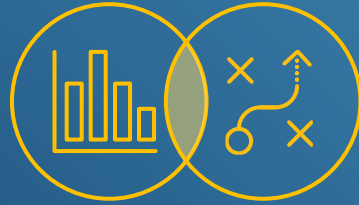
Final Report

February 22nd, 2023





ACCELERATING THE CLEAN ENERGY TRANSITION



ANALYSIS + STRATEGY



BUILDINGS



MOBILITY



INDUSTRY



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18 Years



45+ Dedicated Professionals



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ACCELERATING THE CLEAN ENERGY TRANSITION



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GOVERNMENTS

UTILITIES

CORPORATE + NON-PROFIT

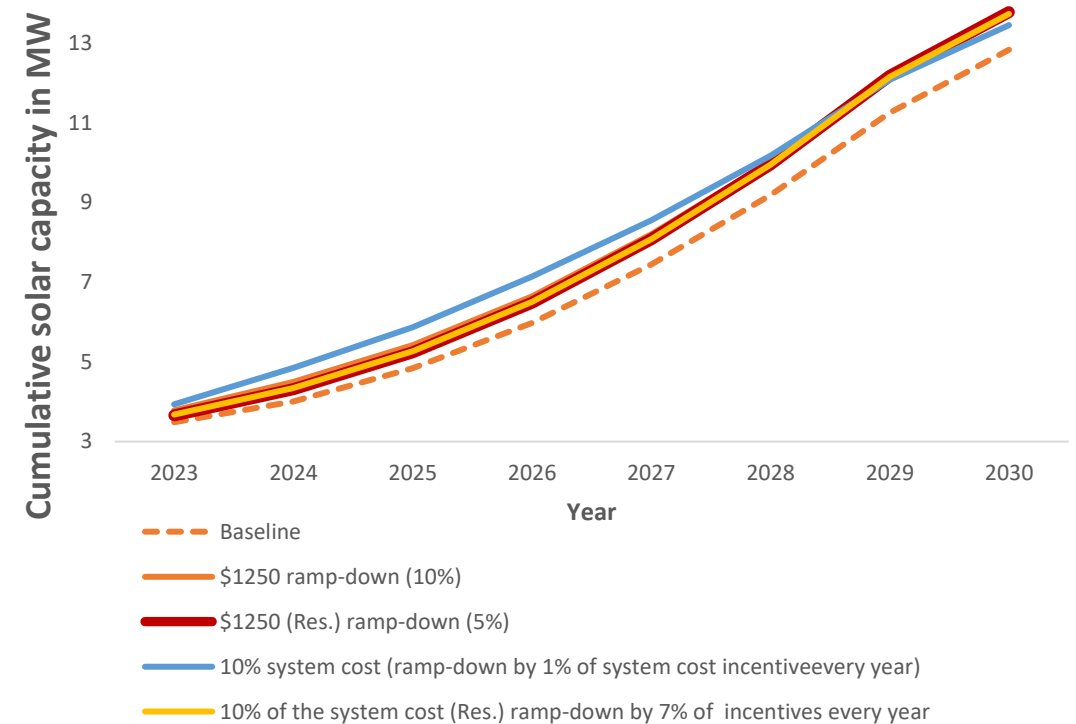
Key Insights

The town of Canmore engaged Dunsky to assess the potential for solar PV in the Town and provide insight into the impact of different incentive programs that the Town can offer to inform future program design.

The study identified that under a Baseline Scenario that includes no action by the Town, 1,229 systems representing 12.8 MW of installed capacity are expected to be deployed by 2030 (up from 161 systems and 3.09 MW by the end of 2022)

- The study also identified several insights to inform Canmore's solar program :
 - **Maintaining the current \$1,250 as is out to 2030 will deplete the program budget by 2027**, so gradually ramping down program incentives over time will be critical.
 - **The program's incentives have a limited impact on advancing commercial solar uptake** given the limited impact of the incentive on the overall economics of large commercial installations.
 - **Gradually ramping down program incentives over time will be critical to maintaining program budget health, maximizing the impact of the program**, and minimizing disruption to the local solar industry,
 - **Program incentives should be adapted in response to the external market, policy, and technology conditions** (e.g., system costs, federal incentives) that could materially impact solar uptake, and result in program under- or over-subscription

Cumulative MW installed in different scenarios



Recommended Program Scenario

Based on our analysis, we recommend:

- Maintaining current incentive **of \$1250 per system**
- Applying incentive to **Residential Segment** to maximize use of program funds
- **Ramping down incentive value annually by 5%** to avoid over-subscription and avoid sudden drops in market demand at the end of the program life
- This scenario **achieves all three guiding principles:**
 - Ensuring the program is delivered with the set budget (~\$130k per year corresponding to ~ \$1M over 2023-2030)
 - Maximizing the impact of the program funds by focusing efforts on the residential system; and
 - Creating sustainable growth and handing off the market to natural demand post the end of the incentive

~ 1400 systems (~14 MW) of total solar deployed in Canmore by 2030

~ 170 systems (~1 MW) of additional solar attributable to Canmore's recommended program

~10% of Canmore's electricity consumption offset by solar by 2030 ^[1]

~120k tonnes of lifetime emission reductions from solar systems supported through the program (installed from 2022-2030)

[1] Recommended program solar generation and Canmore consumption till 2030 is shown in [Appendix B : Solar generation and Canmore consumption](#)

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1. Introduction

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Introduction

Project Context and Scope

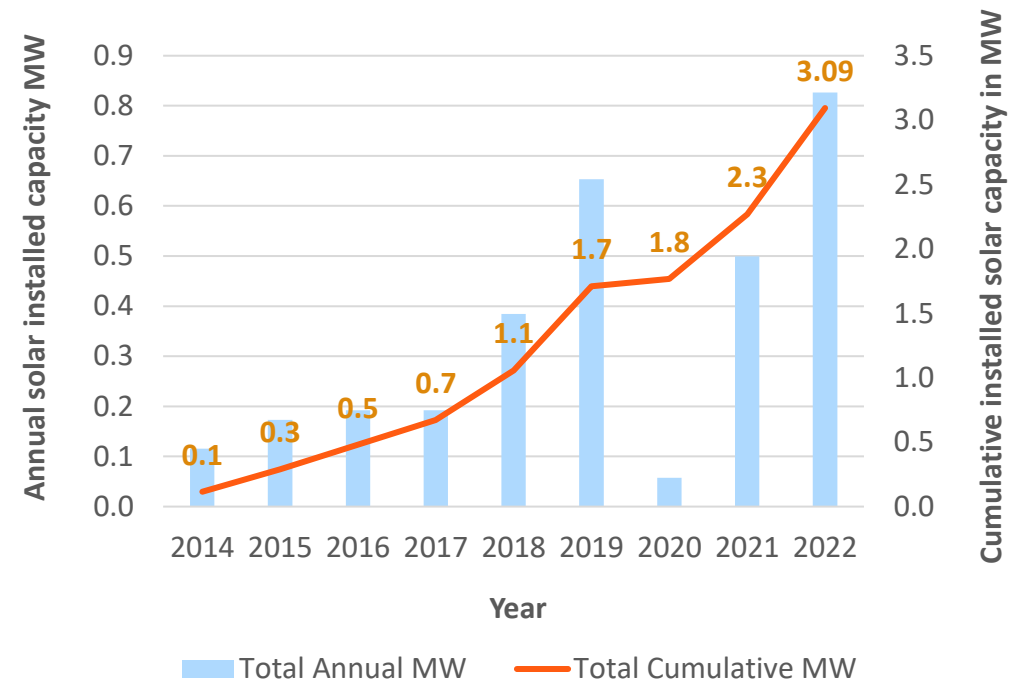
Dunsky Energy + Climate Advisors ('Dunsky') was retained by the Town of Canmore to understand the potential for locally distributed solar and opportunities for the Town to support and accelerate that potential through the development of a community solar program.

The project's scope included:

- **Modelling 3 program scenarios** that reflect varying levels of incentives, and program structures to assess their impact on solar uptake;
- **Determine the ideal program parameters** that will meet the Town's objectives;
- **Assess and quantify the expected impact of the program** on customer economics, solar adoption (# of systems and MW installed), energy savings (GWh), expected program budget (\$), and GHG emission reductions over the program life.

- In Canada, approximately 35% of Canada’s solar generation comes from more consumer-driven distributed sources¹.
- Demand for distributed solar PV systems has increased significantly over the last decade globally, in Canada and in Alberta, driven by declining costs, technology improvements, and climate actions.
- The federal government launched the Canada Greener Homes Initiative, which provides grants of up to \$5,000 for residential solar PV as well as up to \$40,000 in interest-free loans to finance efficiency improvements including solar PV².
- Additionally, the Federal Government has announced intentions to introduce Investment Tax Credits for clean technologies in form of a refundable tax credit equivalent to 30% of the capital cost.
- Other current and past federal and provincial programs have contributed to the growth in solar uptake across the country.

Canmore historic Solar Deployment



The town of Canmore has a total of 161 solar systems (~3.09 MW) installed by the year 2022.

[1] Ganesh Doluweera, Victor Gallardo, Hamid Rahmanifard, Eranda Bartholameuz. 2020. "[Opportunities and Challenges for Distributed Electricity Generation in Canada.](#)" Study No. 187. Calgary, AB: Canadian Energy Research Institute.

[2] <https://natural-resources.canada.ca/energy-efficiency/homes/canada-greener-homes-initiative/24831>

Municipal Solar Programs

In addition to federal/provincial support, a number of municipalities have also introduced programs to incentivize solar deployment within their jurisdictions, including several in Alberta.

Program	Rebate	Eligible Segments	Outcome
Solar Incentive Program, Town of Canmore	\$1250 regardless of the system size (min requirement is 3 kW)	Residential Businesses	Applications open till March 27, 2023.
City of Edmonton Change Homes for Climate PV Incentive	\$0.40/Watt in rebates Rebate stacking is allowed with Canada's Greener Homes Grant program up to a maximum of 100% of the total investment made by the homeowner. Newly constructed homes and residential buildings are also eligible for a City of Edmonton rebate of \$0.30/watt	Residential	The total number of solar program participants was 1212 . The program was fully subscribed & 100% rebate funds committed (665+applications processed only in 2022) ¹
Medicine HAT	\$ 1/ Watt with a maximum of \$6,000 in rebates for solar PV installation	Residential Commercial	Since 2008, awarded rebates worth \$5.25+ million, \$11,225 in sponsorship and awards. In past program rewarded 15 in commercial (Value \$0.6Mn; avg. rebate \$42,472) & 216 in residential (\$0.9 Mn; avg rebate \$5,222). HAT Smart introduced New Home incentive program for rebate up to \$10K. Rebate is based on energy savings %. Funds paid \$3150 (reserved funds 40%).
Town of Banff Solar Photovoltaic Production Incentive	Rebate of \$0.75/Watt for systems between 2 kW and 20 kW in solar PV	Residential Commercial	

+ Tens of other incentive and financing programs offered by municipalities in Canada and the U.S. to support local solar deployment.

[1] <https://homes.changeforclimate.ca/solar-rebate-program/>

Methodology

Approach Overview

Dunsky leverages its Solar Adoption Model (SAM) to forecast the potential for solar in Canmore. The study builds on three key steps:

- **Market characterization:** Segment market into representative group, and for each compile data on key characteristics and inputs, including building stock, electricity consumption, solar system characteristics and other key variables
- **Model calibration:** Using historical inputs, calibrate the model to the Canmore market by benchmarking the model to historical adoption
- **Scenario analysis:** Use the calibrate model to project future market demand for solar under various scenarios

Program Scenario Analysis Approach

Baseline Scenario

No actions taken to accelerate or increase the adoption of solar PV in Canmore. There are no additional/ Canmore program incentives assumed in baseline scenario.



Program Scenario

Additional incentives to accelerate solar adoption based with variations in:

- **Incentive Levels** (e.g. 10% system cost)
- **Eligible Segment** (e.g. Residential, residential and commercial)
- **Incentive Structure** (\$, \$/W; % of system cost)



Sensitivity

Impact of exogenous market, technology and policy factors on the program

Program Scenario Principles

Our team developed and modeled multiple scenarios for incentive program designs for Canmore (described further in the next slide), and short-listed a subset for deeper analysis that meet the following program design principles:



Program Budget: Maintain an average annual program budget of ~\$130k (corresponding to ~ \$1M over 2023-2030)



Maximize impact: Maximize the impact of the program funds in driving incremental solar adoption and GHG reduction over the life of the program



Sustainable demand: Ensure steady and sustainable growth year-on-year, and avoid a market crash after the end of the program

Scenario Description	Total System Installed by 2030	Total MW of Installed Solar by 2030	Total Program Budget 2023-2030 (\$M)	Evaluation	Rationale
Canmore current incentive program	1528	14.8 MW	\$1.7M	REJECTED	Budget exceeds by ~\$0.7 Mn.
Canmore current incentive program limited to residential segment	1479	14.2 MW	\$1.3M	REJECTED	Budget exceeds by ~\$0.3 Mn
Canmore current incentive program ramped down by 20% every year	1276	13.2 MW	\$0.64M	REJECTED	Under-utilization of budget by \$ 0.36 Mn
Canmore current incentive program ramped down by 10% every year	1358	13.7 MW	\$1.0 M	SHORTLISTED	Modest impact within budget
Canmore current incentive program (only for Residential) ramped down by 5% every year	1397	13.8 MW	\$1.0 M	SHORTLISTED	Modest impact within budget
\$0.3/W incentive ramped down by 10% per year	1449	15.5 MW	\$2.5M	REJECTED	Significant impact but with 2.5 times the budget limit
10% of system cost incentives	1461	15.0 MW	\$2.0M	REJECTED	Significant impact but with 2.5 times the budget limit
10% of system cost incentives (moderate ramp down)	1289	13.4 MW	\$1.1M	SHORTLISTED	Modest impact within budget
10% of system cost incentives only for Residential (slow ramp down)	1389	13.7 MW	\$1.0M	SHORTLISTED	Modest impact within budget

Shortlisted Program Scenarios

Following an iterative process of analyzing different scenarios, we shortlisted four scenarios for Canmore's solar program based on the set guiding principles:

- 1. Canmore current \$1250 incentive program ramped down:** \$1,250 for both Residential and Commercial segments ramped -down gradually by 10% per year and ending by 2030
- 2. Canmore current \$1250 incentive program available only for residential segment (ramped down):** \$1,250 for ramped -down gradually by 5% per year and is available only for residential segment
- 3. 10% of system cost incentives (moderate ramp down):** 10% of system cost as incentive for both Residential and Commercial segments; ramped-down gradually by 1% of system cost per year until 2030
- 4. 10% of system cost incentives only for Residential (slow ramp down):** 10% of system cost as an incentive for only the Residential segment; ramped down gradually by 7% every year until 2030

Primer on Solar Program Incentive Structures

Upfront incentives for solar PV systems can be structured in various ways, including

- A fixed incentive per system (e.g. \$1,250 per system);
- A per-Watt incentive based on system size (\$0.25/W); or
- A percentage of system cost (e.g. 10% of cost)

Despite the different structures, the three approaches may result in an incentive of equal monetary value to customers that ultimately has an equal impact on system economics and market uptake. For example, a household that installs a 5 kW solar system for a cost of \$12,500 would receive \$1,250 under all three scenarios highlighted above.

Therefore, the choice of the incentive structure is often largely a program design choice that is applied to maximize program impact, avoid over- or under-subscription, for equity purposes, or to avoid other unintended consequences. For example, some solar programs prescribe their incentives using a combination of these structures (e.g. \$0.5/W up to a maximum of \$5,000) to prevent oversubscription.

Results

Baseline Scenario: No Canmore Incentive

In the baseline scenario, there are **no incentives considered other than federal incentives** for solar installations. However, it considers the impact of all the incentives on solar implementation till the year 2022.

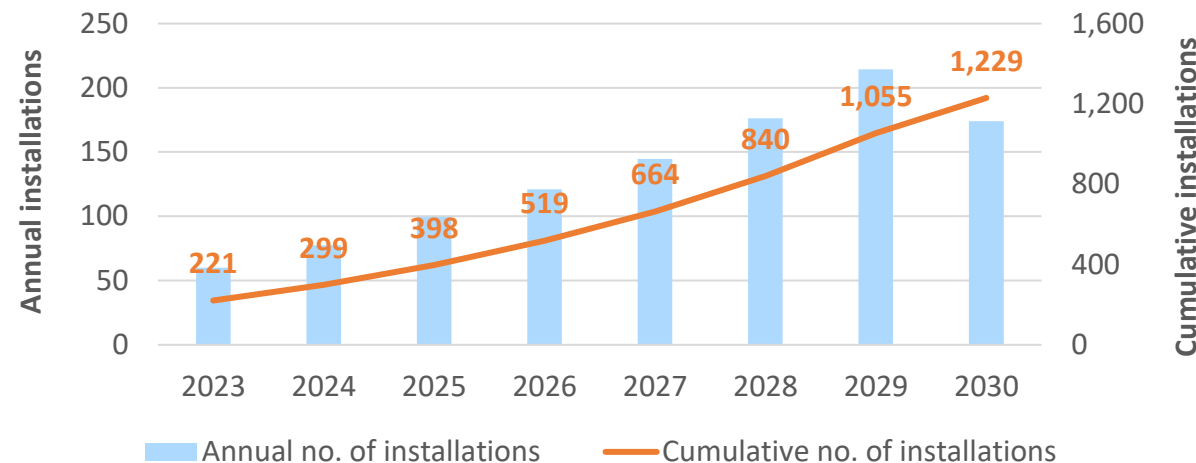
Current implementation in Canmore by 2022 is 161 systems equivalent to 3.09 MW of capacity.

Building on existing implementation, under a baseline scenario (i.e., without any program support from Canmore), **modest market growth continues and by 2030, a total of 1229 solar PV systems (~ 12.8 MW)** are expected to be deployed in Canmore.

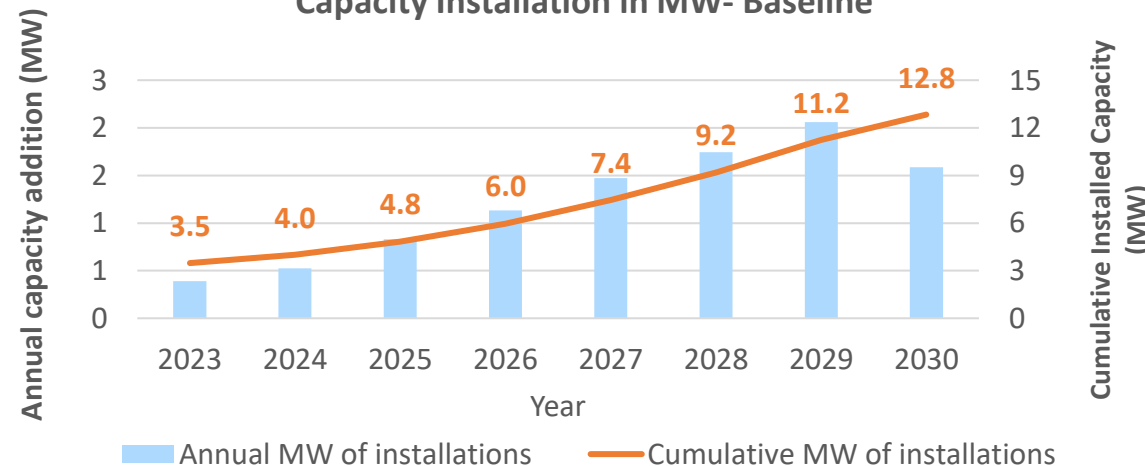
KEY INSIGHT

The market uptake can be enhanced by adding incentives through Canmore program. Thus, different Canmore Program scenarios were analysed.

Number of solar installations- Baseline



Capacity Installation in MW- Baseline

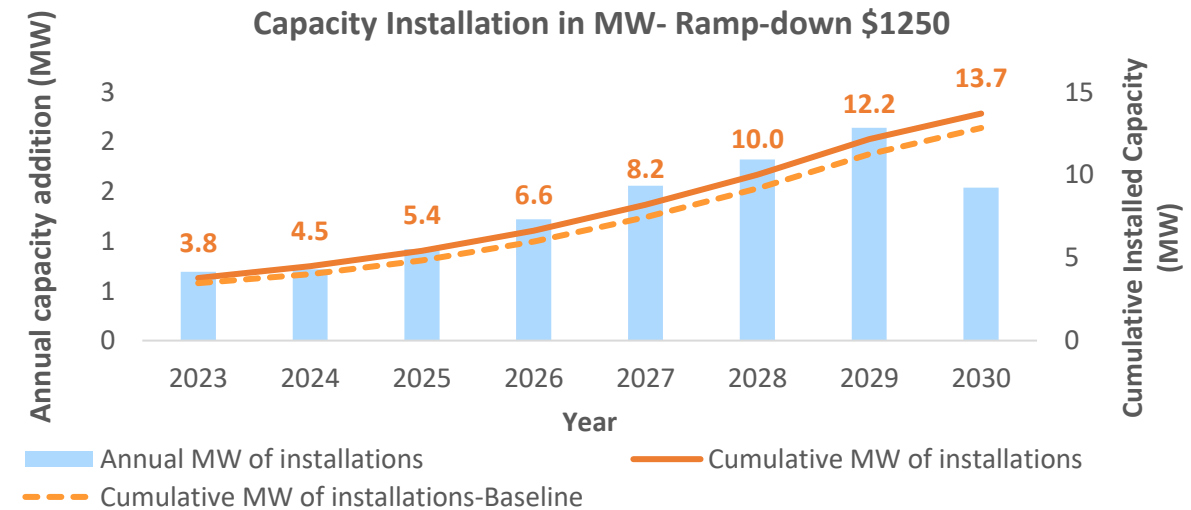
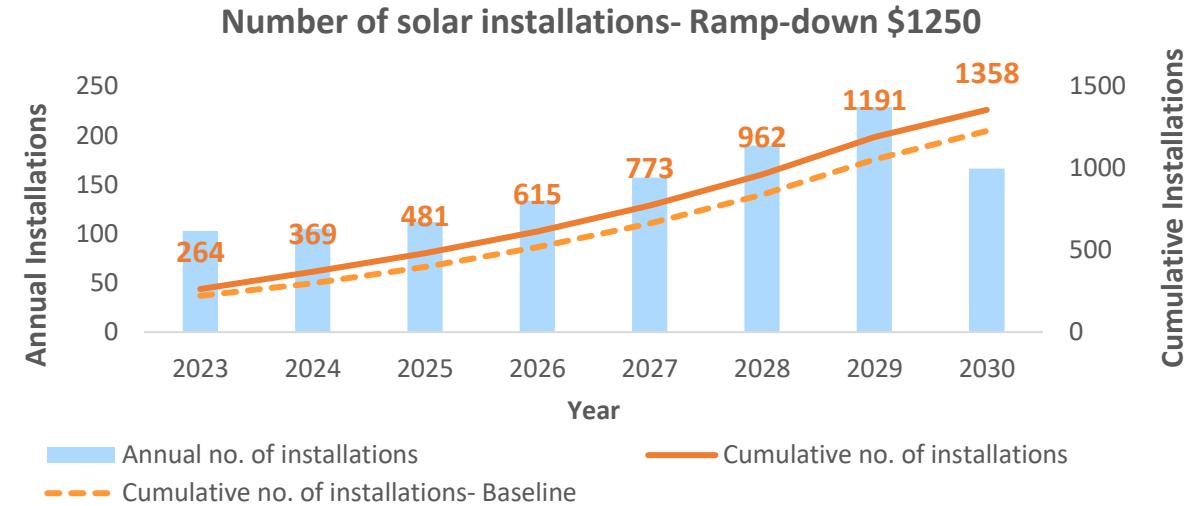


Program Scenario 1: Incentive (\$1250) ramp-down (10%)

- Through an iterative process of ramping down incentives, we **shortlisted a program scenario that includes \$1250 incentive- gradually ramped down by 10% every year till 2030**, that supports a modest market growth in the given budget.
- This scenario results in **1358 installations by 2030** (i.e., additional 129 installations on top of Baseline Scenario) and **13.7 MW solar capacity installed by 2030** (i.e., 0.87 MW of additional solar implementation over baseline).

KEY INSIGHT:

Continuing \$1250 incentives can result in budget over-run. Scenario with ramping down of current incentives will maintain the program budget and have modest impact. However, it will be important to compare the impact with other program scenarios.

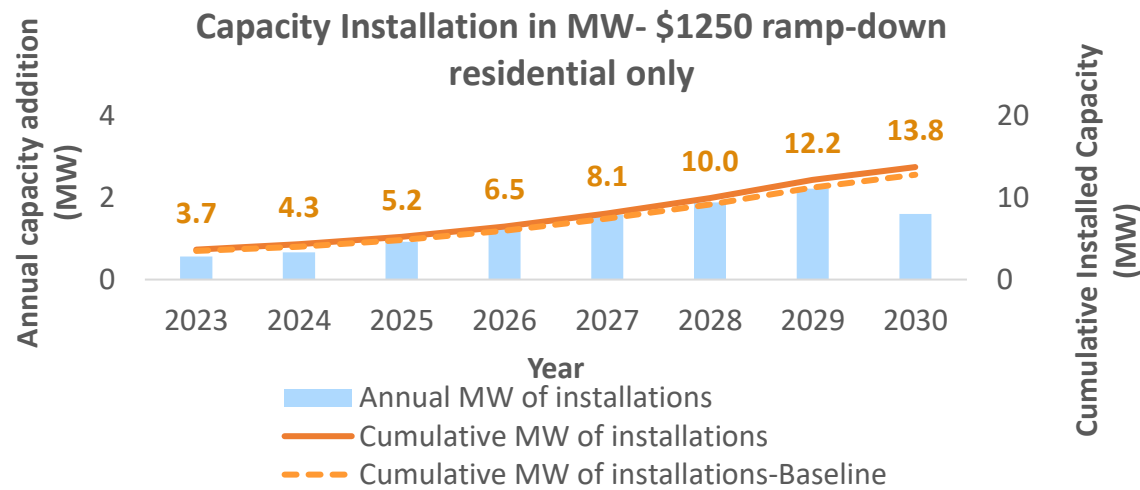
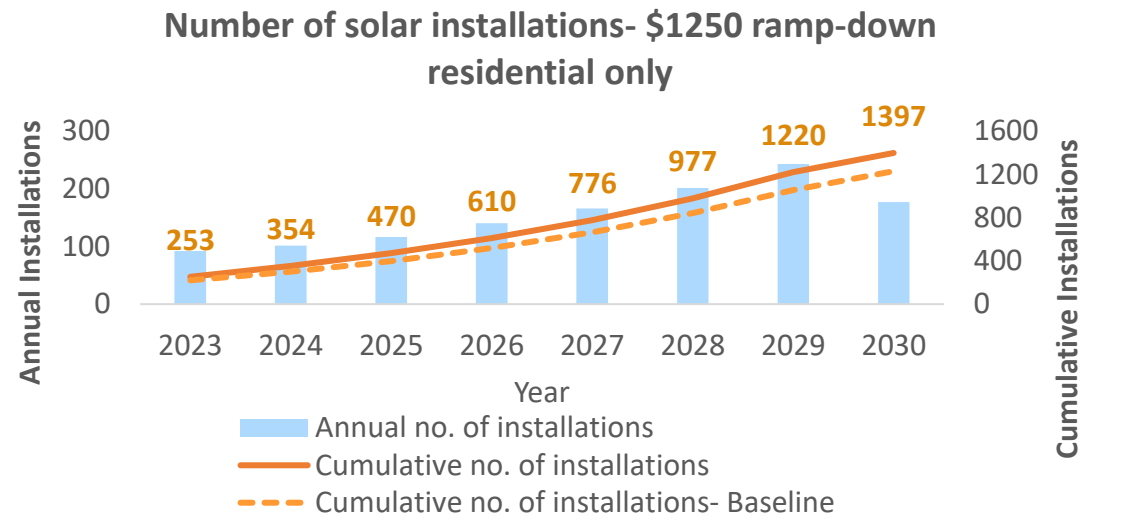


Program Scenario 2: Incentive (\$1250) only for residential segment and ramp-down (5%)

- Leveraging our previous experience, we have seen residential segment can be influenced more by the incentives. So, we analyzed a scenario with Canmore **current incentives (ramped down by 5%) and are limited only for residential segment.**
- Under this scenario, **1397 solar installations (equivalent to 13.8 MW)** are expected to be deployed by 2030.
- This scenario improves the impact by adding 39 more systems and 0.1 MW capacity than the previous scenario.

KEY INSIGHT:

Providing \$1250 incentives can result only to residential segment with a gradual ramp down is expected to result in considerable uptake (more than Canmore’s incentives for both commercial and residential segment).



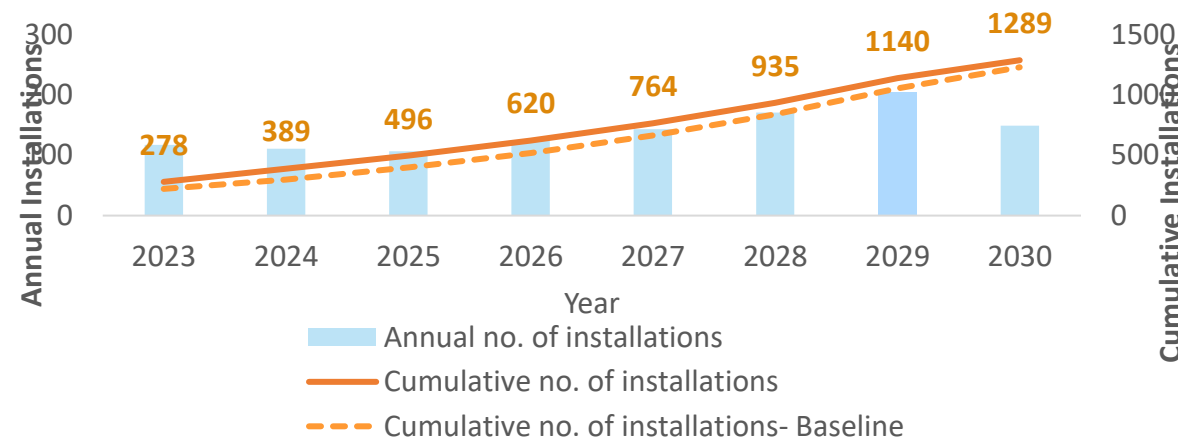
Program Scenario 3: Incentive (10% system cost) ramp-down by 1% of system cost incentive every year

- Another scenario is to assess the impact of **10% system cost incentive- moderately ramped down by 1%** (i.e., incentive will be 10% of system cost in Year 1; 9% of system cost in year 2 and so on).
- This scenario results in **1289 installations by 2030** (i.e., compared to 60 installations on top of the Baseline Scenario) and **0.6 MW of additional solar implementation.**

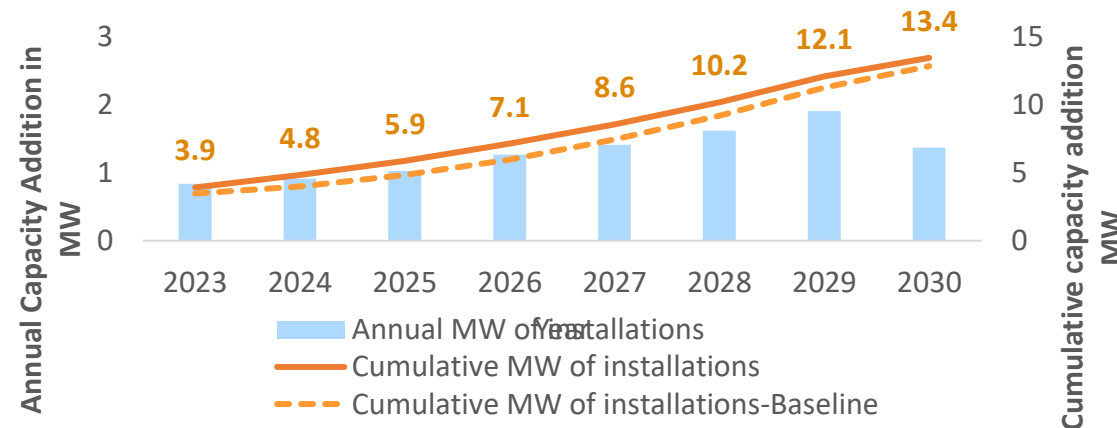
KEY INSIGHT:

The 10% system cost incentives (with a moderate ramp down) includes both residential and commercial segment but has limited impact on the solar uptake compared to the previous program scenarios.

Number of solar installations- 10% system cost



Capacity Installation in MW- 10% of system cost



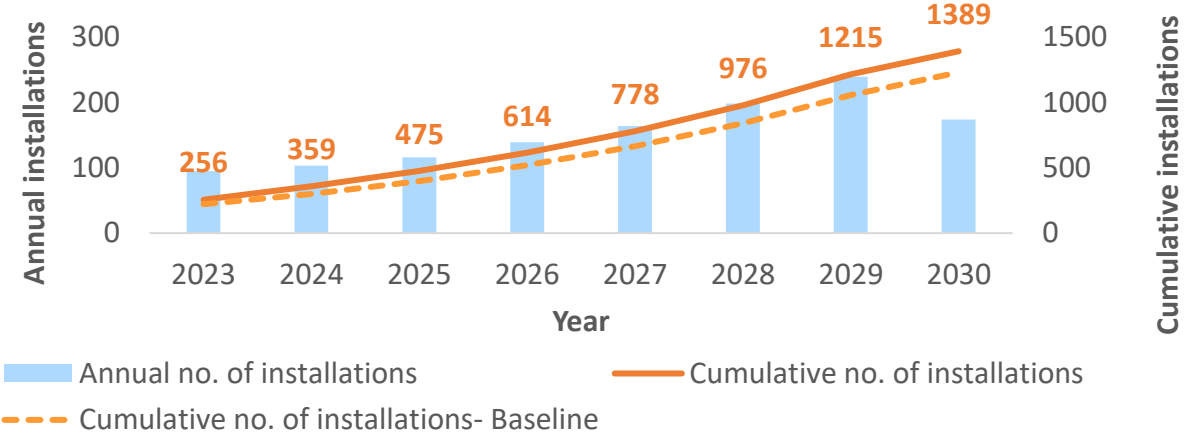
Program Scenario 4: Incentive (10% of the system cost) for residential only; ramp-down by 7% of the incentives every year

- Leveraging our previous experience, we have seen residential segment can be influenced more by the incentives. So, we analyzed a scenario with 10% system cost (ramped down slowly at 7% per year) but is only applicable for residential segment.
- In comparison to the previous scenario (with 1289 systems by 2030), in this case, there is a higher impact in terms of the number of systems (**i.e., 1389 by 2030**). The impact in terms of capacity (**13.7 MW by 2030**) is additional 0.3 MW compared to the previous scenario.

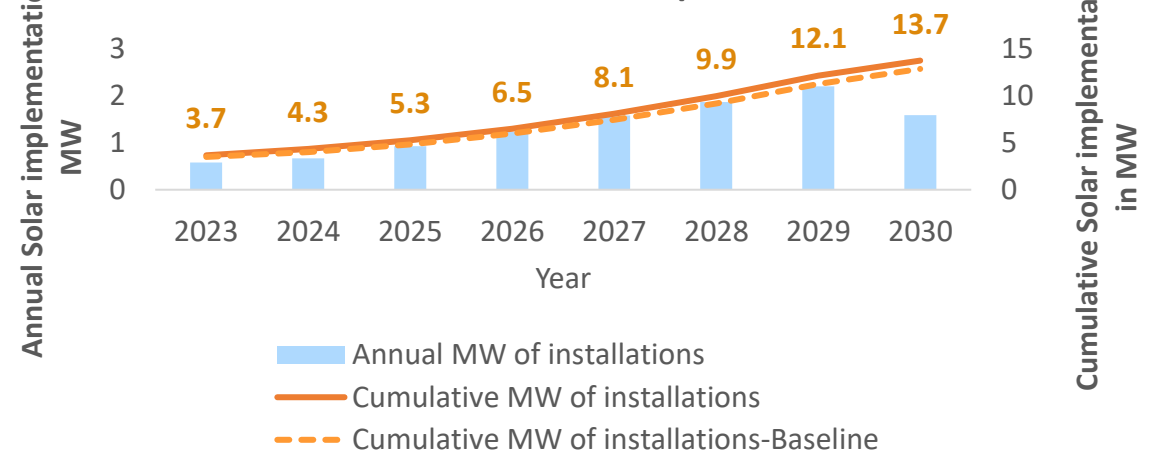
KEY INSIGHT:

The impact of incentives (10% of system cost) for residential segment is considerable compared both residential and commercial segment. However, the impact is marginally lower compared to outcome of program scenario 2 (i.e. incentive (\$1250) only for residential segment and ramp-down (5%)).

Number of solar installations- 10% system cost; only residential; slow ramp-down



Capacity Installation in MW- 10% system cost; only residential; slow ramp-down



Impact of Canmore's Program is highest with \$1250 incentives only for residential segment with gradual ramp down

The table below summarizes the cumulative market capacity under each of the modeled scenarios.

Offering \$1250 for residential segments only with the gradual ramp down to 2030 results in higher cumulative uptake by 2030 than the other modeled program scenarios

RECOMMENDED

Cumulative Market by 2030	Baseline Scenario: Federal incentives only	Program Scenario 1: Incentive (\$1250) ramp-down (10%)	Program Scenario 2: Incentive (\$1250) only for residential segment and ramp-down (5%)	Program Scenario 3: Incentive (10% system cost) ramp-down by 1% of system cost incentive per year	Program Scenario 4: Incentive (10% of system cost) for residential only; ramp-down by 7% of the incentives every year
Total Installed Systems by 2030	1,229 systems	1,358 systems	1,397 systems	1,289 systems	1,389 systems
Total Installed capacity (MW)	12.8 MW	13.7 MW	13.8 MW	13.4 MW	13.7 MW
No. (and MW) of systems added from 2023- 2030	1068 systems (+9.7MW)	1197 systems (+10.6 MW)	1237 systems (+10.7 MW)	1128 systems (+10.4 MW)	1228 systems (+10.6 MW)
Average annual emission reduction (tonnes) from systems added from 2022-2030	2,806	3,061	3,080	2,994	3,067
Lifetime emission reduction (tonnes) from systems added from 2022-2030	106,617	116,309	117,039	113,771	116,554

Lifetime emissions reductions represent reductions from the lifetime energy production of systems installed within the program lifetime (2023-2030)

Impact of Canmore's Program is highest with \$1250 incentives only for residential segment with gradual ramp down

The table below summarizes the estimated impacts attributable to Canmore's intervention.

		RECOMMENDED			
		Program Scenario 1:	Program Scenario 2:	Program Scenario 3:	Program Scenario 4:
		Incentive (\$1250) ramp-down (10%)	Incentive (\$1250) only for residential segment and ramp-down (5%)	Incentive (10% system cost) ramp-down by 1% of system cost incentive per year	Incentive (10% of system cost) for residential only; ramp-down by 7% of the incentives every year
Impact of Canmore's program by 2030	Total Installed Systems	+129 systems	+169 systems	+60 systems	+160 systems
	Total Installed capacity (MW)	+0.87 MW	+0.94 MW	+0.61 MW	+ 0.90 MW
	Average annual emission reduction (tonnes)	255	274	188	262
	Lifetime emission reduction (tonnes)	9,692	10,422	7,155	9,937
Program Abatement cost (\$/tonne)		131	125	179	133

Lifetime emissions reductions represent reductions from the lifetime energy production of systems installed within the program lifetime (2023-2030)

Abatement cost includes only the municipal incentive cost (i.e. budget of \$1 Mn till 2030)

Abatement cost considers the emissions reductions from the additional systems that will be added because of the Canmore program on top of baseline scenario.

Segment-wise impact of the program by 2030

The table below summarizes the estimated impacts of different Program Scenarios in each segment.

		RECOMMENDED				
	Installed by 2022	Baseline Scenario Federal incentives	Program Scenario 1 Incentive (\$1250) ramp-down (10%)	Program Scenario 2 Incentive (\$1250) only for residential segment and ramp-down (5%)	Program Scenario 3 Incentive (10% system cost) ramp-down by 1% of system cost incentive per year	Program Scenario 4 Incentive (10% of system cost) for residential only; ramp-down by 7% of the incentives every year
No. of systems						
Residential	75	899 (+824)	1007 (+932)	1068 (+993)	945 (+870)	1059 (+984)
Small Commercial	70	291 (+221)	311 (+241)	291 (+221)	303 (+233)	291 (+221)
Medium Commercial	16	39 (+23)	39 (+23)	39 (+23)	41 (+25)	39 (+23)
Total	161	1229 (+1068)	1358 (+1197)	1397 (+1236)	1289 (+1128)	1389 (+1228)
System installed capacity MW						
Residential	0.42	5.0 (+4.6)	5.6 (+5.2)	6.0 (+5.5)	5.3 (+4.9)	5.9 (+5.5)
Small Commercial	0.76	3.2 (+2.4)	3.4 (+2.6)	3.2 (+2.4)	3.3 (+2.5)	3.2 (+2.4)
Medium Commercial	1.91	4.6 (+2.7)	4.7 (+2.8)	4.6 (+2.7)	4.9 (+3.0)	4.6 (+2.7)
Total	3.09	12.8 (+9.7)	13.7 (+10.6)	13.8 (+10.7)	13.4 (+10.4)	13.7 (+10.6)

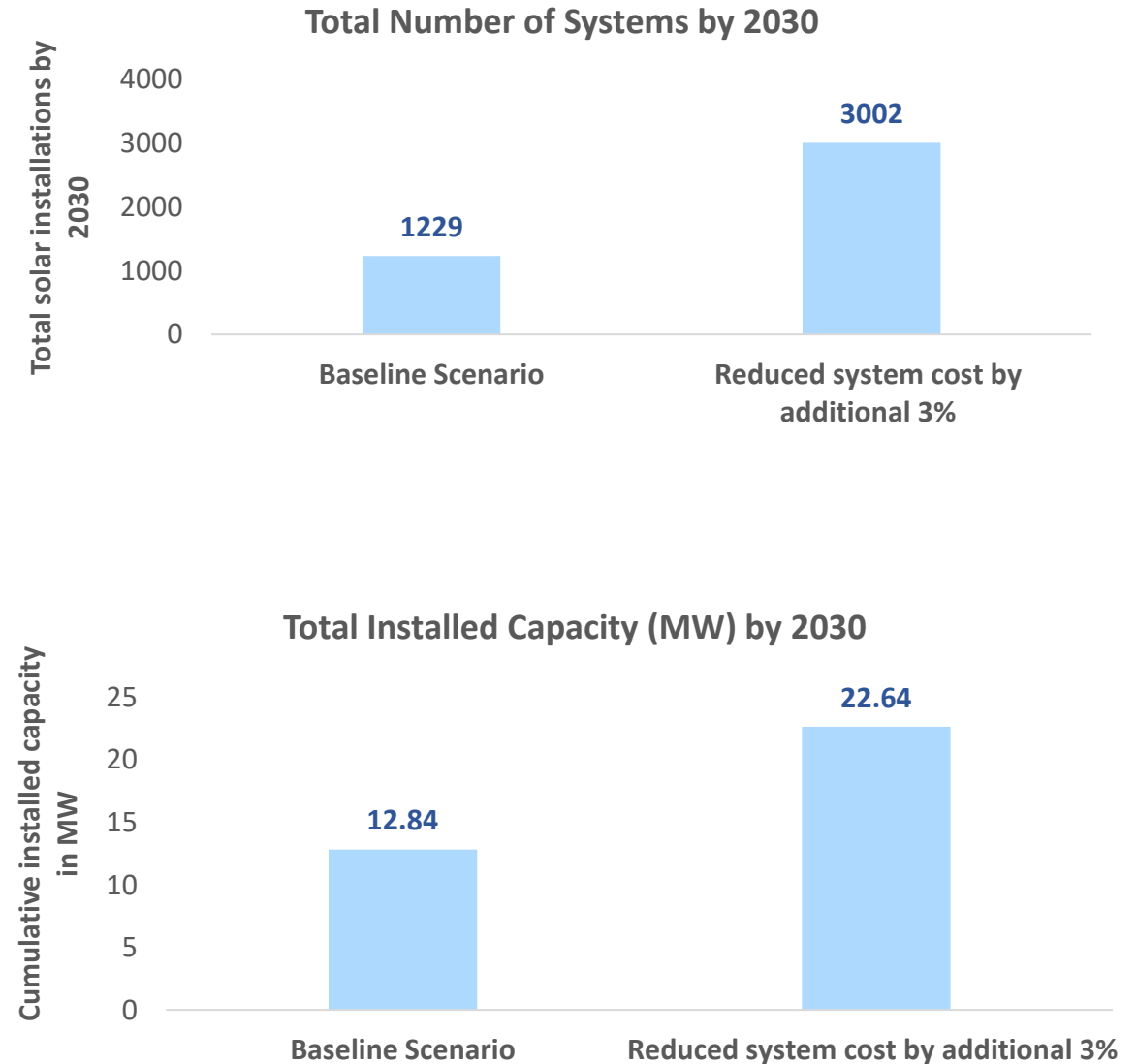
Total impact till 2030
(+additional impact from 2023-2030)

Sensitivity of baseline projections to System Costs

Numerous markets, technology, and policy factors may impact the forecasted solar uptake in Canmore.

- In particular, PV system cost reductions (*whether driven by technology advancements and/or policy support*) are uncertain and expected to have the largest impact on local solar uptake and the impact of any Canmore program.
- For example, under baseline scenario (i.e. in the absence of any Canmore program), higher-than-expected system costs reductions* would **nearly double total deployed solar capacity by 2030 to 22.6 MW**
- Other factors (such as electricity rates in Alberta) will also have an impact on solar uptake, however in this section we focus on the impact of factors that would impact the installed cost

*with additional reduction in system cost by 3%



Key Risk Factors to Program

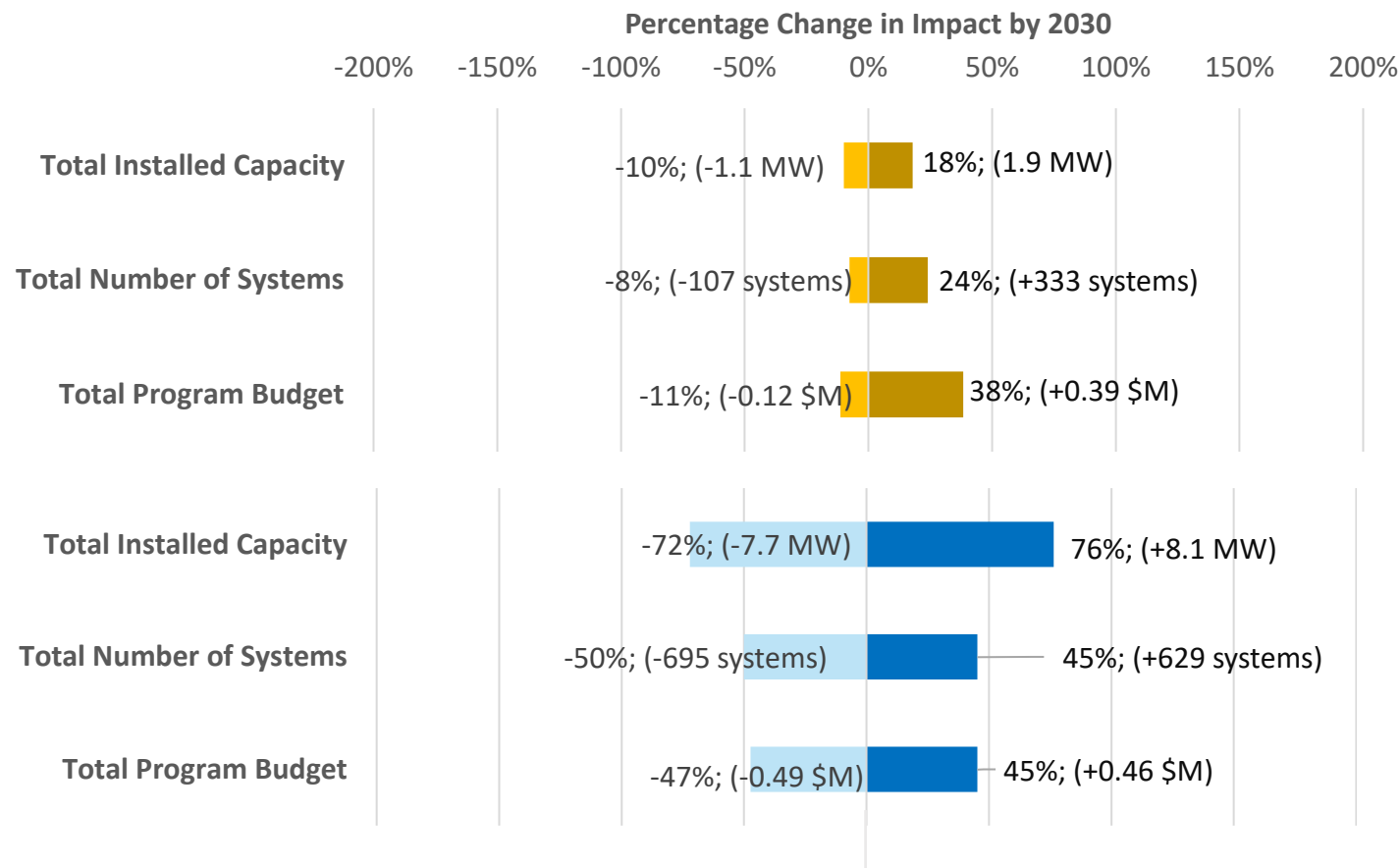
In addition to impacting overall market uptake, these factors could have a significant impact on Canmore's program and result in under- or over-subscription of the program and its budget.

Federal Incentives: Cancellation or expansion of federal incentive programs has a considerable impact on solar uptake

- Withdrawal of federal incentives will reduce the expected capacity by 10%
- However, higher federal incentives will add 18% capacity and result in 40% higher program expenditure

System costs: the rate of solar PV cost decline is subject to global market and technology factors

- Further reduction in system cost can add additional 629 systems and 8 MW by 2030 , and result in additional \$0.46M of program spending
- On the other hand, increase in system cost, can reduce the system uptake by half and result in under-subscription of the program.



Expected Impacts of Proposed Program by 2030
(\$1,250 Incentive for residential with ramp-down)

13.8 MW
1,397 systems
\$1M Program Budget

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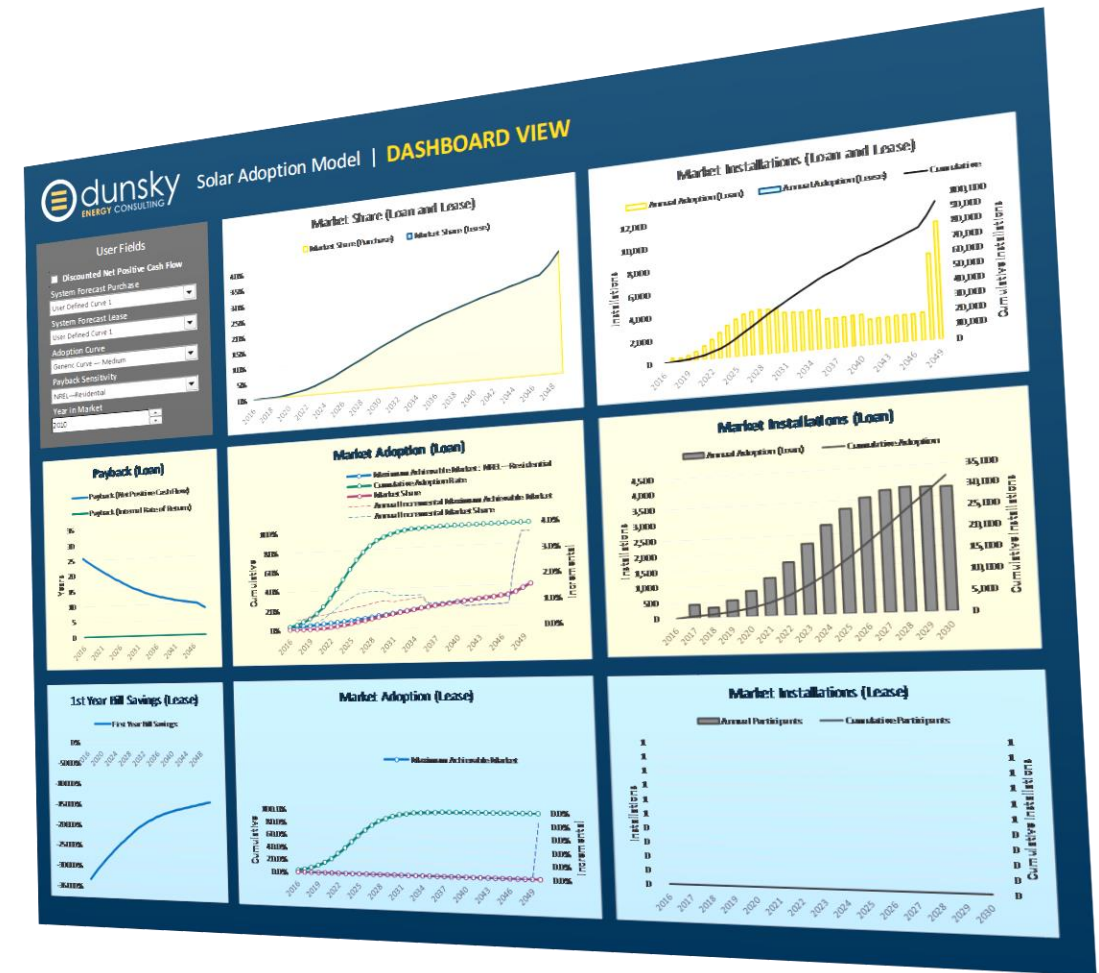
Appendix

Dunsky's Solar Adoption Model

Dunsky's Solar Adoption Model (SAM) is an economic model designed to assess the market potential for distributed generation and storage with consideration for technological, economic, and policy conditions and constraints.

SAM has supported a variety of governments and utilities across the United States and Canada including in Rhode Island, New Hampshire, New York, North Dakota, Alberta, Saskatchewan, Manitoba, Ontario, and New Brunswick to:

- Forecasting the uptake and load impacts of distributed generation in their jurisdictions;
- Assessing the impact of alternative policy and market scenarios; and
- Supporting the design of incentive and financing programs and rate design



Dunsky's Solar Adoption Model

Using jurisdiction-specific inputs, the study leverages **Dunsky's Solar Adoption Model (SAM)** to forecast market demand by sequentially estimating technical potential, customer economics, and achievable market adoption.

Technical Potential

The estimated theoretical maximum deployment potential for solar PV is based on local building stock and solar insolation.

Customer Economics

The expected uptake is driven by customer economics and willingness-to-pay for solar PV.

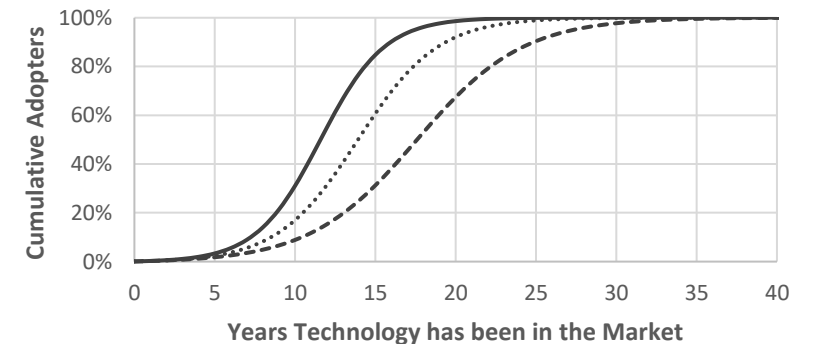
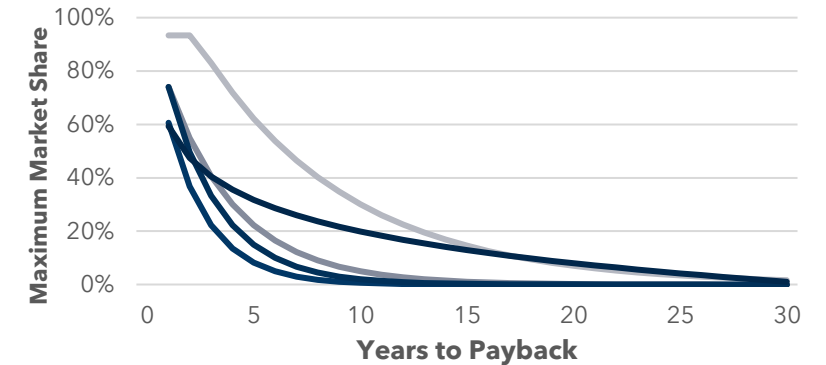
Market Adoption

Apply technology adoption and diffusion theory to estimate the deployment of solar and storage locally as the market matures.

Technical

Customer Economics

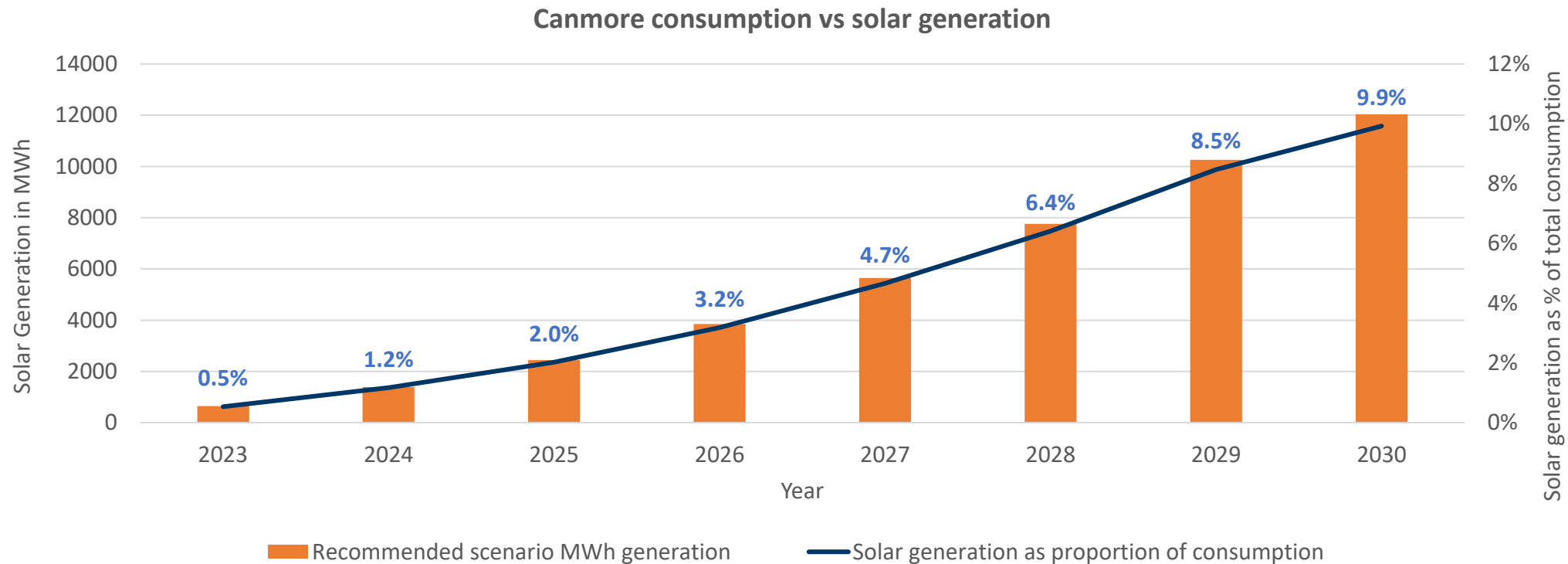
Technology Adoption



Recommended program scenario is expected to generate 10% of the total consumption of Canmore by 2030



By the year 2030, the recommended scenario will result in solar generation of around 12,000 MWh (i.e. ~10% of the Canmore consumption).



Program Scenario Selection

Leveraging our team's expertise in program design and building on the developed guiding principles, we followed an iterative process to arrive at three scenarios for Canmore's solar program.

Dunsky assessed different program scenarios **based on \$/W, flat \$ incentive or incentives linked to system cost**. Some of these are explained below:

1. Canmore current incentive program

- Canmore has an existing program of \$1250 incentive for solar projects.
- To begin with, we assessed the impact of continuing this program. The modelled results indicated with this scenario the budget will overrun by ~\$0.7 Mn.
- Further, sudden pause in incentives after the program budget is depleted (i.e., 2028) will result in a sharp drop in uptake in 2028 and beyond that; potentially harming the local industry

	Baseline Scenario	Canmore current incentive program
Total Installed Systems	1229	1528
Total Installed capacity (MW)	12.8	14.8
Canmore program budget in \$Mn	NA	1.7

2. Canmore current incentive program limited to residential segment

- To assess the impact of the \$1250 incentive scenario within budget, another program scenario was analyzed which was limited only to Residential Segment. However, this scenario also estimated that there will be shortage of budget (by ~\$0.3 Mn).

	Baseline Scenario	Canmore current incentive only for Residential Segment
Total Installed Systems	1229	1479
Total Installed capacity (MW)	12.8	14.2
Canmore program budget in \$Mn	NA	1.3

Program Scenario Selection

3. Canmore current incentive program ramped down by 20% every year

- To further assess the program scenario within the budget and create reasonable impact, we ramped down the existing \$1250 incentive by 20% every year. With a 20% ramp-down, the budget (~\$0.64Mn) is expected to be under utilized and that would limit the impact. Thus, a slower ramp-down in incentives was analyzed.

4. Canmore current incentive program ramped down by 10% every year

- There was a need for a slower ramp-down to assess the program scenario with the available budget and create reasonable impact. So, the current incentive program was ramped down by 10% per year. This scenario is **SHORTLISTED** for further analysis and comparison.

5. Canmore current incentive program (only for Residential) ramped down by 5% every year

- Leveraging our previous experience, we have seen residential segment can be influenced more by the incentives. So, we analyzed a scenario with Canmore current incentives (ramped down by 5%) and are limited only for residential segment. This scenario improves the impact by adding 39 more systems and 0.1 MW capacity than the previous scenario.
- This scenario suggests additional impact within budget and is **SHORTLISTED** for further consideration.

	Baseline Scenario	Canmore current incentive program ramp down by 20%
Total Installed Systems	1229	1276
Total Installed capacity (MW)	12.8	13.2
Canmore program budget in \$Mn	NA	0.64

	Baseline Scenario	Canmore current incentive program ramp down by 10%
Total Installed Systems	1229	1358
Total Installed capacity (MW)	12.8	13.7
Canmore program budget in \$Mn	NA	1.0

	Baseline Scenario	Canmore current incentive (res. only) ramp down by 5%
Total Installed Systems	1229	1397
Total Installed capacity (MW)	12.8	13.8
Canmore program budget in \$Mn	NA	1.0

Program Scenario Selection

6. \$0.3/W incentive ramped down by 10% per year

- We also looked at other incentive programs. Since other programs had incentives from \$0.3/W (ex: the City of Edmonton Change Homes for Climate PV Incentive), we assessed the impact of \$0.3/W on Canmore solar uptake. We ramped down these incentives by 10% per year.
- While there is a significant impact with these incentives (especially on commercial consumers), there is a need for a higher budget (~2.5 times). Because of the budget constraint, we have excluded this from the final list however, more details are attached in Appendix D: Impact of \$0.3/W incentive) for this scenario.

	Baseline Scenario	\$0.3/W incentive ramped down by 10% per year
Total Installed Systems	1229	1449
Total Installed capacity (MW)	12.8	15.5
Canmore program budget in \$Mn	NA	2.5

7. 10% of system cost incentives

- Other program scenarios assessed which were linked to the system cost % of system cost. Considering 0.3\$/W incentives led to budget overshoot, we analyzed the impact of 10% of the system cost as incentives, which is approx. \$0.25/W. Though there was a considerable impact over baseline, the budget required is twice (i.e., \$2 Million).

	Baseline Scenario	10% of system cost incentives
Total Installed Systems	1229	1461
Total Installed capacity (MW)	12.8	15.0
Canmore program budget in \$Mn	NA	2.0

Program Scenario Selection

8. 10% of system cost incentives (moderate ramp down)

- To limit the budget in the previous scenario, we analyzed another program scenario in which the incentives (10% of system cost) are ramped down moderately (by 1 % of the system cost every year; which means incentives are 9% system cost in year 2) to maintain the program budget.
- This scenario is **SHORTLISTED** for further analysis and comparison.

	Baseline Scenario	10% of system cost incentives moderate ramp down
Total Installed Systems	1229	1289
Total Installed capacity (MW)	12.8	13.4
Canmore program budget in \$Mn	NA	1.1

9. 10% of system cost incentives only for Residential (slow ramp down)

- Leveraging our previous experience, we have seen residential segment can be influenced more by the incentives. Thus, to enhance the overall impact of the previous scenario, we 2 proposed changes limit the incentives only for residential consumers and slowly ramp down incentives by 7% every year.
- Thus, within the budget of \$1 Mn, there is a sizeable impact of 169 additional systems over baseline and 0.9 MW capacity. This scenario was **SHORTLISTED** for further assessment.

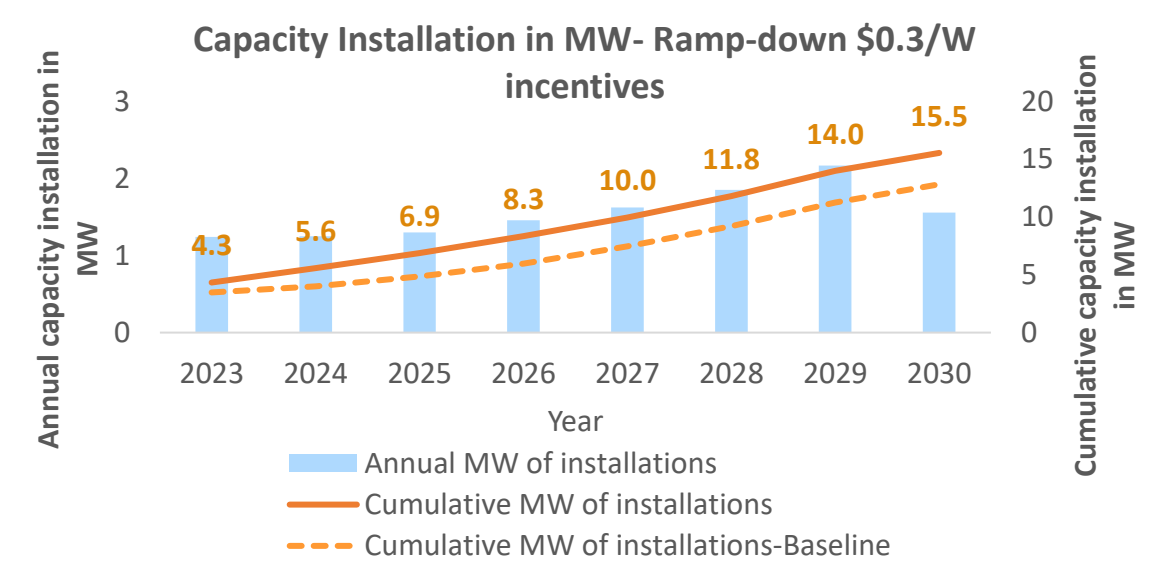
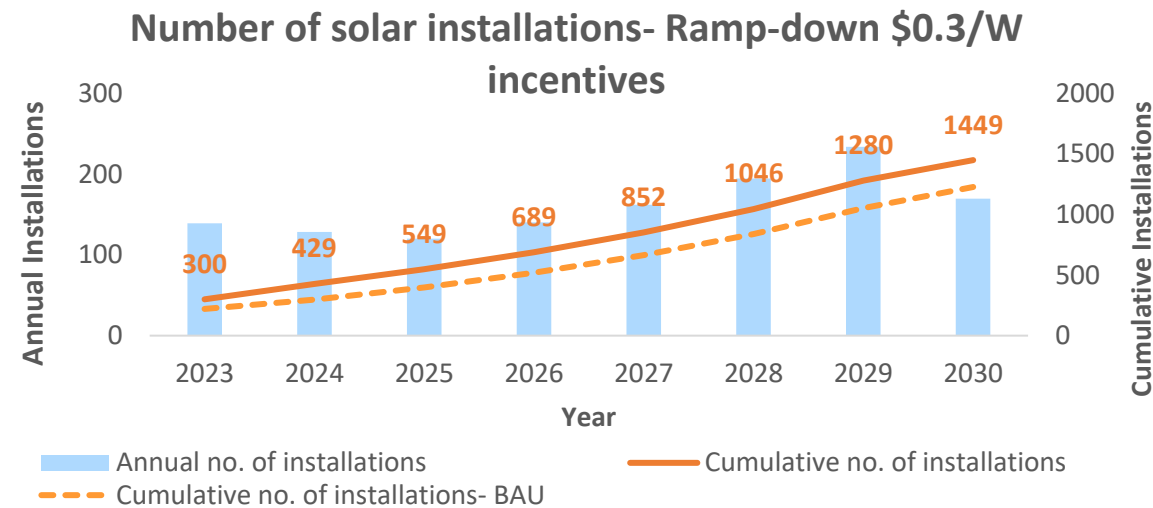
	Baseline Scenario	10% of system cost incentives (only Res.) with slow ramp down
Total Installed Systems	1229	1389
Total Installed capacity (MW)	12.8	13.7
Canmore program budget in \$Mn	NA	1.0

Additional Scenario: Incentive (\$0.3/W) ramp-down

- Leveraging our experience in program design and information from jurisdictional scan, we analyzed \$0.3/W incentive scenario to enhance the overall impact of the program. The proposed incentives were ramped down by 10% every year till 2030.
- The impact seems to be significant with **1449 installations compared to 1229 in baseline scenario (and additional 2.7 MW installations on top of 12.8 MW in baseline scenario)**.
- However, the program budget overshoots by 2.5 times (i.e., approx. \$ 2.5 Mn).

KEY INSIGHT:

The \$0.3/W incentives ramped down at 10% every year has significant impact; but runs over budget of \$ 1 Mn. Thus, it is important to analyse another scenario that is within budget but still offer significant impact. Thus, additional program scenarios were analyzed.



Key inputs and assumptions

Capital costs are based on Dunsky’s internal database and were complemented with values obtained from local installers. Costs are projected post-2022 based on NREL’s Advanced Technology Baseline (ATB) projections.

Solar PV Costs	Residential	Small Commercial	Medium Commercial
Capital Cost (\$/W)	2.67	2.30	2.00
O&M Costs (\$ per Kilowatt per Year)	29.14	25.79	22.43

Electricity Rates	Residential	Small Commercial	Medium Commercial
Energy \$/kWh	0.18	0.11	0.10
Demand \$/kW/month	0.0	20.30	17.57

Segment	Market Size		System Characteristics		
	Technical Potential (MW)	Average System Size (kW)	Capacity Factor (%)	Average kWh/year per System	% Self-supply*
Residential	30.6	5.6	13.02%	6,387	52%
Small Commercial	4.71	10.9	13.02%	12,432	97%
Medium Commercial	10.53	119.4	13.02%	136182	86%

*Self-supply refers to the assumed portion of the energy generated from the solar PV system that is used to meet on-site electricity consumption versus that exported to the grid. The distinction is critical to calculating the economics of solar PV systems in Alberta given the province’s net-billing compensation mechanism. To estimate self-supply, we use data on solar generation and typical customer load profiles to estimate the portion of the generation that is used in-house.

\$2022 real value assumes an average inflation rate of 2% for the duration of the study period.

CAGR for costs: 0.17% Residential, 0.27% Small Commercial; 0.26% Medium Commercial

Incentives in Baseline Scenario

The Baseline scenario assumed that federal incentives are available for both the Residential and Commercial segments;

- Residential incentives \$0.3/W up to \$5000 (ramped down from 2026 by 0.05\$/W per year)
- Commercial Incentives 15% of the system cost (ramped down from 2027 by 0.04\$/W every year)

Residential incentives are based on incentives provided through the federal Greener Homes Program. Due to program participation limitations (e.g., households limited to \$5,000 for all eligible measures), the study assumes only 30% of customers are willing to participate in the Greener Homes Program based on initial reports of program participation.

Commercial incentives are based on a conservative estimate of the 30% generation and storage ITC which is available from the federal government starting on the first day of the 2023.

Baseline Scenario: Incentives (\$/W)

Year	Residential	Small Commercial	Medium Commercial
2023	0.30	0.32	0.28
2024	0.30	0.29	0.26
2025	0.30	0.27	0.23
2026	0.25	0.24	0.21
2027	0.20	0.20	0.17
2028	0.15	0.16	0.13
2029	0.10	0.12	0.09
2030	0.05	0.08	0.05

Program Scenario Total Incentives in \$/W

Total incentives includes federal incentives (in baseline scenario) and incentives from proposed Canmore program.

The tables below summarizes the total incentives in \$/W from year 2023 to 2030 for each segment for all 4 shortlisted scenarios

Program Scenario 1: \$1250 ramp-down			
Year	Residential	Small Commercial	Medium Commercial
2023	0.52	0.43	0.29
2024	0.50	0.40	0.27
2025	0.48	0.36	0.24
2026	0.41	0.33	0.22
2027	0.35	0.28	0.18
2028	0.28	0.23	0.14
2029	0.22	0.18	0.10
2030	0.16	0.14	0.06

Program Scenario 2 \$1250 only for residential segment and ramp-down (5%)			
Year	Residential	Small Commercial	Medium Commercial
2023	0.52	0.32	0.28
2024	0.51	0.29	0.26
2025	0.50	0.27	0.23
2026	0.44	0.24	0.21
2027	0.38	0.20	0.17
2028	0.32	0.16	0.13
2029	0.26	0.12	0.09
2030	0.21	0.08	0.05

Program Scenario 3 10% system cost ramp-down by 1% of system cost incentive every year			
Year	Residential	Small Commercial	Medium Commercial
2023	0.55	0.53	0.46
2024	0.52	0.47	0.41
2025	0.48	0.41	0.36
2026	0.40	0.36	0.31
2027	0.32	0.29	0.25
2028	0.25	0.23	0.19
2029	0.17	0.17	0.13
2030	0.10	0.11	0.08

Program Scenario 4 10% of the system cost for residential only; ramp-down by 7% of the incentives every year			
Year	Residential	Small Commercial	Medium Commercial
2023	0.55	0.32	0.28
2024	0.53	0.29	0.26
2025	0.51	0.27	0.23
2026	0.45	0.24	0.21
2027	0.39	0.20	0.17
2028	0.32	0.16	0.13
2029	0.26	0.12	0.09
2030	0.20	0.08	0.05

Canmore Program Scenarios Incentives in \$/W

The tables below summarize the incentives (\$/W) from proposed Canmore Programs from year 2023 to 2030 for each segment for all 4 shortlisted scenarios

Program Scenario 1: \$1250 ramp-down				Program Scenario 2 \$1250 only for residential segment and ramp-down (5%)				Program Scenario 3 10% system cost ramp-down by 1% of system cost incentive every year				Program Scenario 4 10% of the system cost for residential only; ramp-down by 7% of the incentives every year			
Year	Residential	Small Commercial	Medium Commercial	Year	Residential	Small Commercial	Medium Commercial	Year	Residential	Small Commercial	Medium Commercial	Year	Residential	Small Commercial	Medium Commercial
2023	0.22	0.11	0.01	2023	0.22	-	-	2023	0.25	0.21	0.19	2023	0.25	-	-
2024	0.20	0.10	0.01	2024	0.21	-	-	2024	0.22	0.18	0.15	2024	0.23	-	-
2025	0.18	0.09	0.01	2025	0.20	-	-	2025	0.18	0.14	0.12	2025	0.21	-	-
2026	0.16	0.08	0.01	2026	0.19	-	-	2026	0.15	0.11	0.10	2026	0.20	-	-
2027	0.15	0.08	0.01	2027	0.18	-	-	2027	0.12	0.09	0.08	2027	0.19	-	-
2028	0.13	0.07	0.01	2028	0.17	-	-	2028	0.10	0.06	0.06	2028	0.17	-	-
2029	0.12	0.06	0.01	2029	0.16	-	-	2029	0.07	0.04	0.04	2029	0.16	-	-
2030	0.11	0.05	0.01	2030	0.16	-	-	2030	0.05	0.03	0.02	2030	0.15	-	-

Sensitivity Assumptions

		Low	Base	High
Cost	Residential	ATB projections (CAGR -2%)	ATB projections (CAGR -10%)	ATB projections (CAGR -13%)
	Commercial	ATB projections (CAGR -1%)	ATB projections (CAGR -6%)	ATB projections (CAGR -9%)
Rates	Residential	0.1432 (CAGR -0.81%)	0.1819 (CAGR 0.17%)	0.2135 (CAGR 1.13%)
	Small Commercial	0.0764 (CAGR -0.69%)	0.1145 (CAGR 0.27%)	0.1454 (CAGR 1.21%)
	Medium Commercial	0.0610 (CAGR -0.69%)	0.0970 (CAGR 0.26%)	0.1363 (CAGR 1.21%)
Federal incentives		0	Residential incentives \$0.3/W up to \$5000 Commercial Incentives 15% of the system cost	30% of the system cost

Solar generation in proposed scenarios

The tables below summarize the solar generation (in MWh) from expected solar uptake of Canmore program scenarios. It also represents solar generation as a % of total Canmore consumption.

Scenario	2023	2024	2025	2026	2027	2028	2029	2030
Baseline scenario	444 0.4%	1,042 0.9%	1,986 1.6%	3,270 2.7%	4,933 4.1%	6,899 5.7%	9,214 7.6%	10,976 9.1%
Incentive (\$1250) ramp-down (10%)	789 0.7%	1,603 1.3%	2,644 2.2%	4,024 3.3%	5,781 4.8%	7,831 6.5%	10,234 8.4%	11,938 9.8%
Incentive (\$1250) only for residential segment and ramp-down (5%)	643 0.5%	1,394 1.2%	2,443 2.0%	3,846 3.2%	5,641 4.7%	7,761 6.4%	10,254 8.5%	12,029 9.9%
Incentive (10% system cost) ramp-down by 1% of system cost incentive every year	959 0.8%	1,997 1.7%	3,156 2.6%	4,585 3.8%	6,176 5.1%	7,992 6.6%	10,127 8.4%	11,641 9.6%
Incentive (10% of the system cost) for residential only; ramp-down by 7% of the incentives every year	665 0.6%	1,426 1.2%	2,473 2.0%	3,869 3.2%	5,651 4.7%	7,754 6.4%	10,221 8.4%	11,976 9.9%

Solar generation in MWh from expected solar uptake in each program scenario
 Solar generation as a % of total Canmore consumption

GHG emission reductions (2022-2030)

The tables below summarizes the GHG emission reduction (tonnes) in each scenario. This also represents the GHG emission reduction due to Canmore program (i.e. in addition to baseline scenario)

Scenario	2023	2024	2025	2026	2027	2028	2029	2030
Baseline scenario	222	448	795	1243	1874	2553	3317	3842
Incentive (\$1250) ramp-down (10%)	394	689	1058	1529	2197	2897	3684	4178
	172	241	263	287	322	345	367	337
Incentive (\$1250) only for residential segment and ramp-down (5%)	322	599	977	1462	2143	2872	3692	4210
	100	151	183	219	269	319	375	369
Incentive (10% system cost) ramp-down by 1% of system cost incentive every year	479	859	1262	1742	2347	2957	3646	4074
	257	410	468	500	473	405	329	233
Incentive (10% of the system cost) for residential only; ramp-down by 7% of the incentives every year	332	613	989	1470	2147	2869	3680	4192
	110	165	195	228	273	316	363	350

GHG emission reduction in tonnes from expected solar uptake in each program scenario from 2022-2030
 GHG emission reduction due to Canmore program (in addition to baseline scenario).
 GHG emission reductions will be beyond 2030; till lifetime of solar

Scenario 1 Detailed Output

Scenario 1: Canmore current incentive program

Year	Cumulative system installed	Cumulative installed capacity (MW)	Annual system installed	Annual installed capacity (MW)	Program Budget (\$ Mn)
2022			161	3.09	
2023	267	3.8	106	0.7	0.13
2024	379	4.6	113	0.8	0.14
2025	505	5.6	126	1.0	0.16
2026	657	6.9	152	1.3	0.19
2027	839	8.6	182	1.7	0.23
2028	1061	10.7	222	2.0	0.28
2029	1331	13.1	270	2.4	0.34
2030	1528	14.8	197	1.7	0.25
Total			1528	14.8	1.71

*Total Program Impact is from baseline scenario and Canmore incentive scenario together
Impact of Canmore Program is the Impact of only Canmore incentive scenario (on top of Baseline Scenario)*

Scenario 2 Detailed Output

Scenario 2: Canmore current incentive program limited to residential segment

Year	Cumulative system installed	Cumulative installed capacity (MW)	Annual system installed	Annual installed capacity (MW)	Program Budget (\$ Mn)
2022			161	3.09	
2023	253	3.7	92	0.6	0.10
2024	357	4.3	104	0.7	0.11
2025	479	5.3	122	1.0	0.11
2026	627	6.6	148	1.3	0.14
2027	804	8.2	177	1.7	0.17
2028	1021	10.2	217	2.0	0.22
2029	1286	12.5	265	2.3	0.27
2030	1479	14.2	193	1.7	0.20
Total			1479	14.2	1.32

*Total Program Impact is from baseline scenario and Canmore incentive scenario together
Impact of Canmore Program is the Impact of only Canmore incentive scenario (on top of Baseline Scenario)*

Scenario 3 Detailed Output

Scenario 3: Canmore current incentive program ramped down by 20% every year

Year	Cumulative system installed	Cumulative installed capacity (MW)	Annual system installed	Annual installed capacity (MW)	Program Budget (\$ Mn)
2022			161	3.09	
2023	261	3.8	100	0.7	0.12
2024	360	4.4	99	0.7	0.10
2025	462	5.3	102	0.8	0.08
2026	585	6.4	123	1.1	0.08
2027	730	7.9	145	1.5	0.07
2028	906	9.6	176	1.7	0.07
2029	1120	11.7	214	2.0	0.07
2030	1276	13.2	156	1.5	0.04
Total			1276	13.2	0.64

*Total Program Impact is from baseline scenario and Canmore incentive scenario together
Impact of Canmore Program is the Impact of only Canmore incentive scenario (on top of Baseline Scenario)*

Scenario 4 Detailed Output

Scenario 4: Canmore current incentive program ramped down by 10% every year

Year	Cumulative system installed	Cumulative installed capacity (MW)	Annual system installed	Annual installed capacity (MW)	Program Budget (\$ Mn)
2022			161	3.09	
2023	264	3.8	103	0.7	0.13
2024	369	4.5	105	0.7	0.12
2025	481	5.4	112	0.9	0.11
2026	615	6.6	134	1.2	0.12
2027	773	8.2	157	1.6	0.13
2028	962	10.0	190	1.8	0.14
2029	1191	12.2	229	2.1	0.15
2030	1358	13.7	166	1.5	0.10
Total			1358	13.7	1.00

*Total Program Impact is from baseline scenario and Canmore incentive scenario together
Impact of Canmore Program is the Impact of only Canmore incentive scenario (on top of Baseline Scenario)*

Scenario 5 Detailed Output

Scenario 5: Canmore current incentive program (only for Residential) ramped down by 5% every year

Year	Cumulative system installed	Cumulative installed capacity (MW)	Annual system installed	Annual installed capacity (MW)	Program Budget (\$ Mn)
2022			161	3.09	
2023	253	3.7	92	0.6	0.10
2024	354	4.3	102	0.7	0.10
2025	470	5.2	116	0.9	0.10
2026	610	6.5	140	1.2	0.12
2027	776	8.1	166	1.6	0.13
2028	977	10.0	201	1.9	0.16
2029	1220	12.2	243	2.2	0.18
2030	1397	13.8	177	1.6	0.13
Total			1397	13.8	1.01

*Total Program Impact is from baseline scenario and Canmore incentive scenario together
Impact of Canmore Program is the Impact of only Canmore incentive scenario (on top of Baseline Scenario)*

Scenario 6 Detailed Output

Scenario 6: \$0.3/W incentive ramped down by 10% per year

Year	Cumulative system installed	Cumulative installed capacity (MW)	Annual system installed	Annual installed capacity (MW)	Program Budget (\$ Mn)
2022			161	3.09	
2023	300	4.3	139	1.2	0.37
2024	429	5.6	128	1.2	0.34
2025	549	6.9	120	1.3	0.32
2026	689	8.3	140	1.5	0.32
2027	852	10.0	162	1.6	0.32
2028	1046	11.8	194	1.9	0.33
2029	1280	14.0	234	2.2	0.35
2030	1449	15.5	170	1.6	0.22
Total			1449	15.5	2.56

*Total Program Impact is from baseline scenario and Canmore incentive scenario together
Impact of Canmore Program is the Impact of only Canmore incentive scenario (on top of Baseline Scenario)*

Scenario 7 Detailed Output

Scenario 7: 10% of system cost incentives

Year	Cumulative system installed	Cumulative installed capacity (MW)	Annual system installed	Annual installed capacity (MW)	Program Budget (\$ Mn)
2022			161	3.09	
2023	282	4.0	121	0.9	0.21
2024	402	5.0	120	1.0	0.22
2025	525	6.2	123	1.2	0.23
2026	671	7.7	146	1.5	0.26
2027	840	9.4	169	1.7	0.28
2028	1043	11.2	202	1.9	0.29
2029	1285	13.4	243	2.2	0.31
2030	1461	15.0	176	1.6	0.20
Total			1461	15.0	2.01

*Total Program Impact is from baseline scenario and Canmore incentive scenario together
Impact of Canmore Program is the Impact of only Canmore incentive scenario (on top of Baseline Scenario)*

Scenario 8 Detailed Output

Scenario 8: 10% of system cost incentives (moderate ramp down)

Year	Cumulative system installed	Cumulative installed capacity (MW)	Annual system installed	Annual installed capacity (MW)	Program Budget (\$ Mn)
2022			161	3.09	
2023	278	3.9	117	0.8	0.20
2024	389	4.8	111	0.9	0.18
2025	496	5.9	107	1.0	0.16
2026	620	7.1	125	1.3	0.16
2027	764	8.6	143	1.4	0.14
2028	935	10.2	171	1.6	0.12
2029	1140	12.1	205	1.9	0.11
2030	1289	13.4	149	1.4	0.05
Total			1289	13.4	1.12

*Total Program Impact is from baseline scenario and Canmore incentive scenario together
Impact of Canmore Program is the Impact of only Canmore incentive scenario (on top of Baseline Scenario)*

Scenario 9 Detailed Output

Scenario 9: 10% of system cost incentives only for Residential (slow ramp down)

Year	Cumulative system installed	Cumulative installed capacity (MW)	Annual system installed	Annual installed capacity (MW)	Program Budget (\$ Mn)
2022			161	3.09	
2023	256	3.7	95	0.6	0.12
2024	359	4.3	103	0.7	0.11
2025	475	5.3	116	0.9	0.11
2026	614	6.5	139	1.2	0.12
2027	778	8.1	164	1.6	0.13
2028	976	9.9	198	1.9	0.15
2029	1215	12.1	239	2.2	0.17
2030	1389	13.7	174	1.6	0.12
Total			1389	13.7	1.03

*Total Program Impact is from baseline scenario and Canmore incentive scenario together
Impact of Canmore Program is the Impact of only Canmore incentive scenario (on top of Baseline Scenario)*



LOWER-INCOME RETROFIT PROGRAMMING IN THE TOWN OF CANMORE

FEBRUARY 2023



ACKNOWLEDGEMENT

We respectfully acknowledge that our team members live and work on the unceded and stolen lands of First Nations, Metis and Inuit people.

These Nations include x^mməθkwəyəm (Musqueam), Skwxwú7mesh (Squamish), and Səlilwətaʔ/Selilwitulh (Tseil-Waututh) Nations, Treaty 6 Nations including Cree, Saulteaux, Niisitapi (Blackfoot), Métis, and Nakota Sioux, Treaty 7 Nations including the Siksika, the Piikuni, the Kainai, the Tsuut'ina and the Stoney Nakoda First Nations, Syilx Okanagan; and the Metis people.

The authors are grateful and honoured to work with Indigenous communities across Canada and as settlers on this land, we recognize our own role in reconciliation and that the freedoms we enjoy come at the cost of unimaginable intergenerational trauma and the cultural genocide of Indigenous people.



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BACKGROUND

Accessible energy efficiency for all ensures no one is left behind in the clean energy transition.

Kambo Energy Group, in partnership with Unrooz Solutions, has developed this report on behalf of the Town of Canmore to analyze potential for an income-qualified energy efficiency program for the Town and recommend industry-accepted best practices to ensure households who are struggling to make ends meet can access retrofits which make their homes more sustainable, comfortable, healthy and affordable.

Grants, rebates, and financing programs for residential home retrofits are important tools for achieving our climate goals, reducing greenhouse gas emissions, and cutting household energy costs. While lower income households are often the best candidates for energy efficiency upgrades due to higher bills and more inefficient housing, they face many barriers and risks to participating in these traditional programs and require specifically designed income-qualified programs tailored to their needs.

It is important to note that Alberta is the only province in Canada currently without a provincially operated income-qualified energy efficiency program.¹

This report combines our teams' 10+ years of experience designing and delivering efficiency programming to underprioritized communities with in-depth secondary research about Canmore's unique community. In it we summarize existing programs in the market, analyze Canmore demographics to help inform program design, identify barriers and opportunities for a successful income-qualified program, present potential indicators to measure success, and suggest next steps.

INTRODUCTION

The Town of Canmore highlights three main goals in its 2023–2026 Strategic Plan: livability, environment, and relationships.² In line with these goals, the Town intends to increase affordability, pursue collaboration to reduce emissions and prepare for climate change impacts through adaptation; and develop multi-stakeholder relationships that result in mutually beneficial outcomes. To achieve a more sustainable community, Canmore intends to reduce greenhouse gas (GHG) emissions by 30% below 2015 levels by 2030. The Town's Climate Action Plan calls for 30% of buildings to undertake significant retrofits, and 80% to achieve simple retrofits including weather stripping, high efficiency windows, extra insulation, appliances and lighting.³

The path to a more sustainable future cannot leave anyone behind, so the Town is exploring options for an energy efficiency program for Canmore's lower income residents (an 'income-qualified program'). In an income-qualified program, a lower income household may qualify for higher levels of incentives to implement energy efficiency upgrades.

Energy efficiency programs, when designed specifically to meet the needs of all the people in the community, can be a powerful tool that sits at the nexus of equity, climate change, and economic growth. Here are a few reasons why:

- **Affordability:** Canmore has the highest cost of living in Alberta – even higher than the national average. And costs are going up. As energy costs increase, so will the proportion of individuals who find energy costs unaffordable. It's a vicious cycle: individuals may go without clothing or food in order to pay their utility bills, or, if they fail to pay their utility bills on time they are charged late fees and reconnection fees if power is disconnected. This further impacts energy unaffordability. Reducing a household's energy consumption and therefore their energy bills has a direct impact on livability, the environment, and the relationship Canmore has with its residents.
- **Livability:** Energy efficiency retrofits can improve indoor air quality, safety, affordability, and comfort in the home, resulting in better physical health and psychological wellbeing. In addition, dwellings that have better insulation and tighter air sealings stay more resilient through extreme weather events such as power outages and wildfire smoke.

¹ Efficiency Canada – Efficiency for All Report

² Town of Canmore – 2023–2026 Strategic Plan

³ Town of Canmore – Climate Action Plan



- **Economic Growth:** In recent years, the energy efficiency sector has produced new jobs across Canada in many fields, in particular the trades. Implementing energy efficiency requires qualified and skilled labourers and when those workers are employed locally, it will result in increased wealth generated within the community.
- **Community Relationships:** A program that is designed thoughtfully is done so in partnership with the community. Such a program will enable Canmore to build strong relationships with its residents, local organizations and contractors. This provides a great opportunity to increase trust, further understand residents' needs, and create confidence that the Town cares about the wellbeing of its residents.

To offer the best recommendations for an income-qualified program specific to the Town of Canmore in this report, we share some findings:

- Programs currently available to residents
- Canmore's existing housing conditions and demographics
- Barriers to adoption of programs for lower-income community members
- Recommendations for best practices that can be incorporated into Canmore's income-qualified program to overcome potential barriers to participation
- Indicators that can be used to measure the impact of the program

EXISTING PROGRAMS

At the federal and municipal level, Canmore residents have access to two ability-to-pay energy efficiency programs and one Solar Incentive Program. 'Ability-to-pay' refers to programs where participants are required to pay for the majority of costs of the retrofits themselves. Understandably, lower income households often struggle to take advantage of these programs given the financial requirements.

Many provinces have designed specific income-qualified programs to overcome these barriers. These programs use income indicators to identify participants who qualify for additional financial support. Often this support is in the form of fully subsidized retrofits.

As Alberta is currently the only Province or Territory without a program for lower income households, Canmore's lower income households' only current option is to consider programs that are designed for the 'able to pay' market.

Below is a summary of the programs currently available to the Town's residents:

Canada Greener Homes Grant:

Launched in 2021, this federal program is delivered through Natural Resources Canada and offers eligible participants rebates between \$125 to \$5,000 for eligible home retrofits. Eligible participants include owners of homes that are older than six months who have not yet started renovations. The home must be their primary residence. The program also includes up to \$600 towards pre- and post- retrofit EnerGuide evaluations. Unfortunately, accessing this program is not easy. A plethora of forms and processes are required. Grants are given to homeowners only after the upgrade work is complete. It's important to note that rental properties, new homes, and unoccupied residences are not eligible for the Greener Homes program.⁴

⁴ Natural Resources Canada – Canada Greener Homes Grant

Greener Homes Interest Free Loan:

Greener Homes Grant participants also have access to \$5,000–\$40,000 in interest-free home loans with a repayment term of 10 years. Loan amounts are based on the total cost of eligible upgrades. 15% of the loan is available upfront, and the remainder can be accessed when the work is complete.

Clean Energy Improvement Program (CEIP):

The upcoming Clean Energy Improvement Program (CEIP) provides a low interest financing option for Canmore homeowners to undertake energy efficiency upgrades with repayments through annual property tax bills. The interest rate is 2.7%. In order to qualify, the applicant must be the legal owner of an existing low-rise residential property. Buildings with four stories or more do not qualify for CEIP. The owner must show that they are current on any secured property debt and if they have a mortgage on the property that exceeds the assessed value of the home, they may not qualify for the program.⁵ This program does not include manufactured or mobile homes, which are common in Canmore's more affordable neighbourhoods such as Grotto Mountain Village.

Solar Incentive Program:

Canmore also offers a renewable energy grant through the Solar Incentive Program. The program currently offers up to \$1,250 of incentives, regardless of the size of the system, for a 3kW or larger solar photovoltaic system. Incentives are received only after installation is complete. The homeowner is responsible to select the system and hire a solar installer. The solar incentive program does not require the dwelling to have a prior energy efficiency improvement or energy audit done.

While these programs offer an important piece of the puzzle to support and encourage home retrofits, two critical financial barriers specific to these programs make them out of reach for lower income residents:

- 1. The programs require cash up front** – All of these programs require a household to have the ability to pay contractors for work and equipment before they receive the grants or the majority of the loan amounts. This is a significant barrier for Low to Moderate Income (LMI) households who are often living paycheck to paycheck, and unlikely to be able to outlay a significant amount of cash. Additionally, grant programs typically only cover between 10–20% of the costs of upgrades, leaving the majority of the costs for the homeowner to bear.
- 2. Loans are often not feasible for LMI households** – While programs like the Greener Homes Loan and CEIP offer solutions for residents who are looking for low interest capital to pay for upgrades, loans and increased debt are often not practicable for LMI households who may be servicing additional debts. Equitable loan programs should have consumer protection processes to ensure participants can afford to repay the payments. The Greener Homes Loan requires participants to share financial information to demonstrate participants have the financial capacity to repay the loan. The Canmore CEIP program requires participants to have five years of payment records of their taxes but does not currently include any means testing to ensure participants have the financial ability to repay loans.

Next, we consider housing and liveability in Canmore to offer further context on who an income-qualified program can support.



COMMUNITY DEMOGRAPHICS

An income-qualified energy efficiency program will be most successful if it is centred on the needs of the community it serves. These needs can be better understood by looking at community liveability and diversity. We intend to explore each of these for the Town of Canmore as it relates to energy poverty.

High quality data is the foundation of program design and delivery. While gaps exist in available Canmore data, there is very useful information available that can provide adequate insight as to how to approach income-qualified programming. For Canmore's income-qualified program, information about low-income residents – both renters and owners – will help develop

the program. Where are they living? What is their cost of living? Do they speak English? These are some of the many questions asked. The answers will help to develop the most fulsome program possible.

In this section of the report we present the summary of our findings about the Town's building types, residents' income and shelter spending, and the cultural diversity of its occupants. These findings have helped shape our recommendations.

⁵ Town of Canmore – Clean Energy Improvement Program

Income and Living Wage:

15,990 Albertans are proud to call Canmore their home.⁶ Here is some data about the income levels of residents.

The living wage reflects what people need to earn to cover the actual cost of living in their community. It assumes that each adult is working full time (35 hours/week) and includes more than the basics of food, clothing, and shelter – it also considers unexpected costs, small investments in education, childcare, and participating in the community. A living wage is defined by the Alberta Living Wage Network (ALWN) as earning enough money to be able to cover “basic expenses and participate in the community.”

- The living wage in the Town of Canmore is \$32.75 per hour – the highest in Living Wage Canada’s reported results.⁷
- In Canmore, the living wage of a single parent is \$47.15 per hour.
- In Canmore, the living wage of each parent in a two-parent household for a family of four is \$36.15 per hour.⁸
- For perspective, the average hourly income for individuals in Alberta was \$31.90 for non-unionized employees, and \$31.11 for all of Canada.⁹

Meanwhile, there is a significant income gap between high and lower income households in Canmore.

- Canmore’s median after-tax income in 2020 was \$44,400 for individuals and \$92,000 for a household.¹⁰
- 21% of households have an after-tax income of \$150,000 yearly or more.¹¹
- Canmore households earning below 50% of the Town’s median household income of \$92,000 are considered to be low income by the Low Income Measure definition. There are at least 1,175 Canmore households earning less than \$46,000/yr – 17.3% of all households.
- The Low Income Measure (LIM) (an income below 50% of national median household incomes, after tax), is a relative measure of poverty. 6.5% of adults in Canmore are classified as low income using this measure.¹²

Canmore 2020 After-tax Income for Private Households

Income range	% of households	# of households
Less than \$20,000	3%	210
\$20,000–\$40,000	10.4%	710
\$40,000–\$60,000	13.8%	940
\$60,000–\$80,000	14.9%	1,010
\$80,000–\$100,000	13.6%	925
\$100,000–\$150,000	23.4%	1,590
\$150,000+	21%	1,425

Key Takeaway: A large number of residents of Canmore earn well above the Canadian average income and still struggle to make ends meet due to the high cost of living in the Town. An income-qualified program that uses the standard low income cut offs as qualification for participants will therefore leave a portion of the target market behind. For that reason, the Canmore income-qualified program should consider the living wage as a minimum cut-off for qualification.

⁶ Statistics Canada – Canadian Income Survey, 2020

⁷ Living Wage Canada – Rates

⁸ Alberta Living Wage Network – Alberta Living Wage Report

⁹ Statistics Canada – Table 14–10–0134–01

¹⁰ Statistics Canada – Canadian Income Survey, 2020

¹¹ Statistics Canada – Canadian Income Survey, 2020

¹² Statistics Canada – 2021 Census of Population

Housing Stock:

Canmore is a fast-growing town with a high number of rental and vacation homes. Most homes are single family homes, small apartments and row housing. The majority of the permanently occupied dwellings were built before 1996 and are likely to benefit from energy efficiency upgrades, as each decade has seen significant energy efficiency gains in residential buildings in Alberta.¹³

- 9,173 total private dwellings
- Types
 - Single detached house 2,575
 - Semi-detached house 560
 - Row house 1,340
 - Apartment or flat in a duplex 385
 - Apartment in a building that has fewer than five storeys 1,670
 - Apartment in a building that has five or more storeys 255
- Of Canmore's 6,804 permanently occupied dwellings, 1,830 were built before 1990, and 4,120 were built before 2000.¹⁴ 215 homes are in need of major repairs.¹⁵

Key Takeaway: Based on building age, the majority of housing stock may be good candidates for energy efficiency upgrades. Kambo Energy Group's Home Upgrades Program which is designed to address energy poverty in Alberta includes a requirement that participating homes be built in 1997 or earlier to account for changes in the building code after this time.

Housing Affordability:

Spending 30% or more of one's income before tax on shelter costs (including rent, mortgage payments, property taxes and utilities) is a common frame for measuring housing affordability. Energy bills can contribute to housing affordability challenges. Spending more than 6% of a household's after-tax income on home energy costs is defined as energy poverty. Many households in Canmore are experiencing energy poverty due to high energy bill burdens.

- 1,690 households in Canmore (25%) spend 30% or more of their after-tax income on shelter costs.¹⁶
- 170 renter households in Canmore (9.4%) are spending more than 50% of their after-tax income on shelter costs.¹⁷
- 11% of all households in Canmore are in energy poverty¹⁸ as compared with an average of 16.7% for urban areas across Canada.¹⁹
 - 4.1% are spending more than 10% of their total income after-tax on home energy costs, and 2.2% are spending more than 15%.

Key Takeaway: For the 11% of Canmore's population experiencing energy poverty, reducing energy costs can significantly improve housing affordability.

13 Pembina Institute – Improving Energy Efficiency in Alberta's Buildings

14 Statistics Canada – 2021 Census of Population

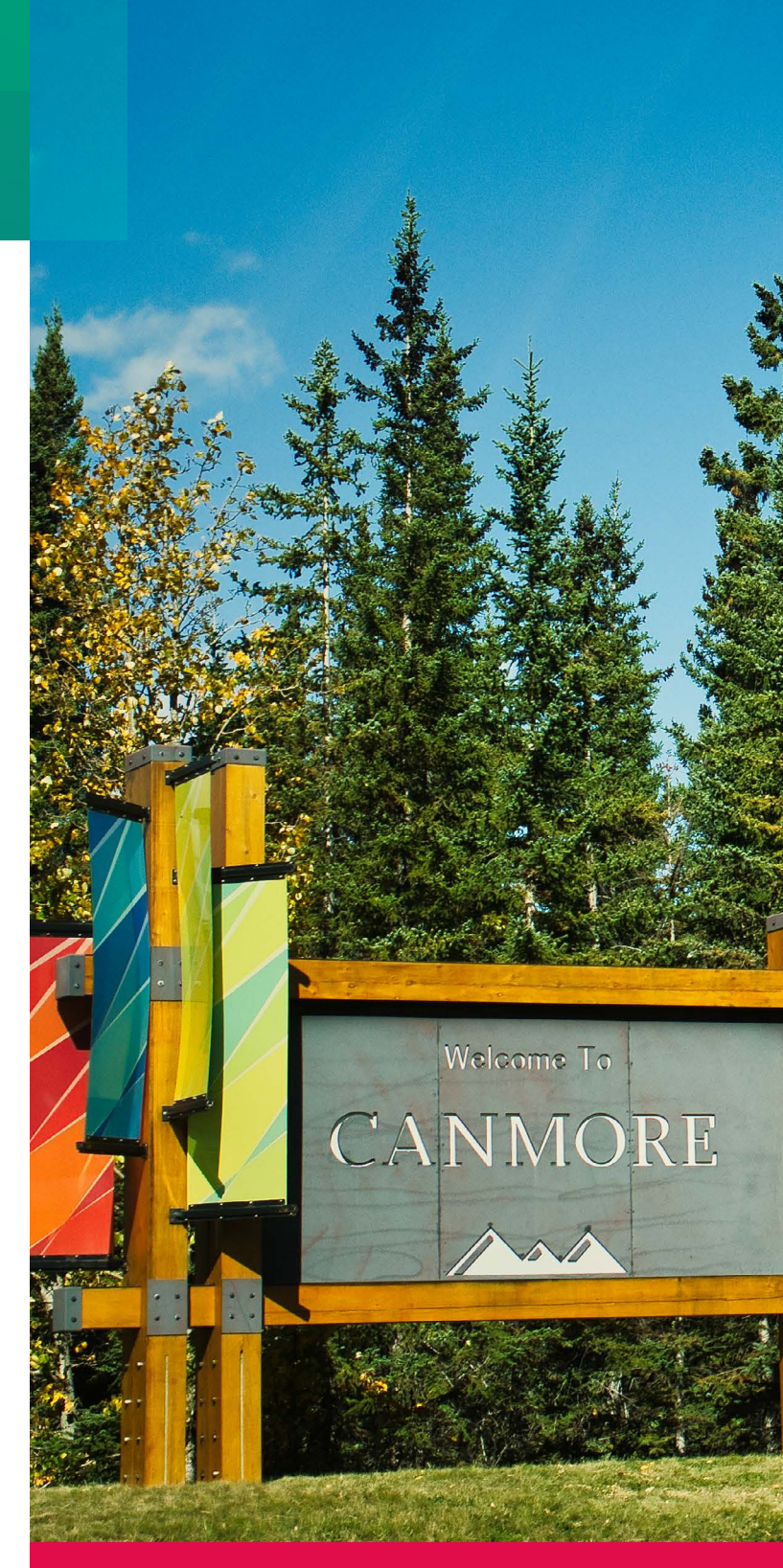
15 Statistics Canada – 2021 Census of Population

16 Statistics Canada – 2021 Census of Population

17 Bow Valley Regional Housing & Canmore Community Housing Corporation – Bow Valley Region Housing Needs Assessment (using 2016 census data)

18 Canadian Urban Sustainability Practitioners – Energy Poverty and Equity Explorer

19 Efficiency Canada – Efficiency for All Report



Home Ownership:

Another unique aspect of Canmore's community demographics is the large number of renter households, and the income differences between homeowners and renters.

- Two-thirds or 6,804 of Canmore's units are permanently occupied, and of those permanently occupied dwellings 2,300 are rented.
- Homeowners across Canada tend to have incomes that are double or more that of renters in the same region²⁰
- Just under 15% of permanent homeowners spend more than 30% of their household income on shelter costs while 30% of renter households spend more than 30% of their income on shelter costs.²¹
- Canmore has the Bow Valley Region's largest median income gap between homeowners and renters (\$120,874 and \$71,162 respectively).²²
- Vacancy rates for rentals across the entire Bow Valley Region are virtually zero, which means there is a lot of competition for renters in the market, resulting in higher rental costs.²³

Income of Homeowners vs Renters in the Bow Valley Region²⁴

Income	# of rental households (% of rental households)	# of owner households (% of owner households)
Less than \$20,000	180 (5.4%)	178 (3.2%)
\$20,000-\$60,000	1,125 (33.8%)	1,021 (18.2%)
\$60,000-\$80,000	645 (19.4%)	607 (10.8%)
\$80,000-\$100,000	495 (14.9%)	578 (10.3%)
More than \$100,000	885 (26.6%)	3,227 (57.5%)

Key Takeaway: Renters are a significant segment of Canmore's population, and are much more likely than homeowners to face affordability challenges with shelter costs.

²⁰ Statistics Canada – Canadian Housing Statistics Program

²¹ Bow Valley Regional Housing & Canmore Community Housing Corporation – Bow Valley Region Housing Needs Assessment

²² Bow Valley Regional Housing & Canmore Community Housing Corporation – Bow Valley Region Housing Needs Assessment

²³ Bow Valley Regional Housing & Canmore Community Housing Corporation – Bow Valley Region Housing Needs Assessment

²⁴ Data is extrapolated from the percentage of total households in Bow Valley Region per income range (p. 14) and number of rental households (p. 58)

Culture and Language:

The Town of Canmore has a diverse population. It is home to 3,265 immigrants, with the majority emigrating from the United Kingdom, the Philippines, and the United States. Many immigrants arrive in Canada speaking a language other than English or French. 2,180 residents of Canmore speak a non-official language as their mother tongue. The most common first languages outside of English and French are Tagalog, Balto-Slavic languages, German and Japanese. 40 residents do not speak English or French at all. 410 residents identify as Indigenous.

Key Takeaway: Canmore's income-qualified program should consider processes, approaches, outreach, and marketing to ensure immigrants have access and can participate.



Conclusion

Canmore's demographics outline the unique context in the community for an income-qualified energy efficiency program. Canmore is an expensive community to call home, and many people are struggling to afford their homes. Due to their age and structure, many dwellings in the community are great candidates for energy efficiency upgrades. Though both renters and homeowners face affordability challenges, renters are more likely to be living in unaffordable housing, and also more likely to earn a lower income. Canmore is also a diverse town – home to several different language and cultural communities. This demographic information will be used to further explore what barriers the Town may face when implementing a program. For each barrier, there is a corresponding opportunity to implement best practices and better serve the community.

BARRIERS TO PARTICIPATION IN CONVENTIONAL PROGRAMS FOR LOWER-INCOME RESIDENTS

Based on our review of Canmore's demographics data combined with our experience in designing income-qualified programs, we have identified multiple barriers that LMI households may face to participating in currently available energy efficiency programs in the region. Uncovering these barriers provides the Town with a better understanding of how some segments of the population may be left behind and not benefit from existing programs.

Barrier 1: Upfront Cost

While many LMI households recognize that energy efficiency upgrades may provide long term financial, health, and other benefits, the upfront cost or increased debt make these upgrades out of reach. Many of these households are living paycheck to paycheck and don't have the capital available to participate. Households that are struggling financially don't always have the privilege of making financial decisions with a long payback window, such as investing in upgrades now for future savings later.

Barrier 2: Language and awareness

More than 2,000 Canmore residents have a diverse cultural background and speak neither English nor French as their mother tongue.

Most efficiency communications and outreach customer supports are available in English only. Even when materials are translated, they often still live within English-only websites, and are frequently translated

word-for-word without considering the cultural context, literacy, learning style and motivations of the community. Studies have shown that without creating conceptually equivalent material, ideas are lost in translation.²⁵

One example of this is the word 'efficient' which is often translated into the Punjabi words 'effective' or 'proficient' – concepts that do not capture the true essence of efficiency. There are words, phrases and concepts in every language that get lost in translation both to and from English, which is why translations must always consider cultural and community context.

An added barrier in some groups is the inability of native speakers to read and write in their native languages. For example for many, Punjabi, Hindi, and Gujarati are languages learned at home and not formally at school. As a result, many in the South Asian communities only speak these languages and are unable to read or write them. This renders many of the translated materials ineffective unless a native speaker with reading skills is available to explain the materials and concepts, notwithstanding the translation issues discussed above.

Consideration and knowledge of suitable cross-culture communications and appropriate supports are important aspects needed to overcome language barriers.

Barrier 3: Complexity and Time

Retrofits are complicated. Any participant, regardless of income, must spend time understanding the often

complicated process of participating in an efficiency program. Participants must navigate a complicated application process, determine which upgrades are most appropriate based on goals of their household, find and receive multiple contractor quotes, select the contractors, ensure the work completed qualifies for the rebate, and then finalise their paperwork with the program.

Lower income households have less free time than higher earning households. Adults in these households may be relying on transit instead of a car, working multiple jobs in shift-type work, picking children up from daycare, etc. For single parent households these tasks become even more of a time burden. Many LMI households simply don't have the time it takes to navigate complicated and intimidating programs that place a high administrative burden on the participant.

Barrier 4: Split Incentives of Renters and Landlords

Nearly one-third of permanently occupied units in Canmore are rented, and there is a significant wealth gap between renters and homeowners. Any program designed for lower income households in Canmore must consider the inclusion of renters. Renters pay their utility costs either as part of their rent or have their own utility account and pay their utility bills directly.

For tenants who pay utilities separately from rent, there is a clear financial incentive to decrease their energy use; however, renters have little incentive to invest in upgrades to a home they don't own. Additionally, landlords are not incentivized to pay for upgrades in this circumstance because they are neither living in the home nor paying the energy costs and therefore will enjoy little benefit from any home upgrades.

Tenants who pay their energy costs as part of their all-inclusive rent will also not see cost savings from changing their energy consumption unless their rent is decreased as a result. In these cases, landlords may be more incentivized to invest in energy efficiency upgrades, however they have little control of how their

tenant interacts with devices such as thermostats and therefore the promise of savings is less certain.

The challenge that all jurisdictions face is that in renter households, neither the tenant nor landlord is sufficiently incentivized to pay for the cost of upgrades, leaving the majority of these homes unaddressed. Fully subsidized low-income upgrade programs can and do include renters – the important aspect of including them is ensuring that rent does not increase and they are not evicted as a result of the upgrades. This requires a strong knowledge of renter protections (which are weak in Alberta) and considering them within program processes and requirements. Fundamentally, this is a risk for any program that includes renter households, and processes should consider and mitigate this risk.

Overall, the complicated incentive structure for retrofitting rental homes is one that jurisdictions across the world are trying to solve.

Barrier 5: Trust

Some barriers are not material, but relational. Successful programs must ensure participants have trust in the program, the processes, and the benefits of the upgrades. In income-qualified programs there can be feelings of shame and embarrassment from receiving financial support. Individuals also have varied, and sometimes negative, experiences with government programs and government associated entities (such as utilities), which discourage people from participating. Some residents do not trust that free programming doesn't come with a catch. Residents may be sceptical that the program will be beneficial to them, or that they will not be sent an unexpected bill at a later date. In short, the success of these programs depends on building trust. When program design and outreach strategies do not incorporate and prioritise creating trust within communities, programs may not reach the people they intend to reach and experience low participation rates.

²⁵ Cha et al., 2007; Fischbacher, Hunt, & Alexander, 2004

BEST PRACTICES IN LOW INCOME EFFICIENCY PROGRAM DESIGN

The intersecting nature of challenges faced by low-income residents means that improvements to redress any single challenge alone may not be sufficient for encouraging participation in an energy efficiency program. Rather, an intersectional approach requires we address challenges together. Below, we present recommendations for offering a transformative program to improve affordability while reducing GHG emissions for lower income households in Canmore.

Offer deep energy retrofits at no cost to income-qualified participants

Eliminating the full cost of the upgrades for LMI households will ensure the program is accessible to those who need it the most and are not served by other programs in the market. Ideally, participation in the program should be at no financial cost to lower income residents.

Additionally, an equity based program should strive to ensure traditionally marginalized groups receive the same benefits as others in society. As discussed, lower income households tend to live in homes that are older and less efficient than the general population, and consequently, their energy bills take up a larger percentage of their income. For this reason, an equity-based efficiency program for lower income households should improve affordability for participants through energy efficiency measures. In other words, a program should reduce energy consumption in the household as much as possible over the budget of the program.

Many efficiency programs delivered by utilities in Canada are designed with a slightly different goal of improving efficiency across all of their lower income

customers. Some of these programs achieve this goal by saving a small amount of energy in many homes through shallow interventions such as Energy Savings Kits (ESK). While ESKs installed in many homes will achieve the utility's goal of reducing energy consumption across the entire customer base, Energy Savings Kits do little to reduce energy consumption or improve the affordability on a household level. The kits themselves result in little savings per household, and more often than not, remain in the box they came in.

Rather than shallow savings from energy kits which do little to improve household affordability, the Canmore program should target deep retrofits tailored to maximising the reduction of consumption within the specific dwelling. Appropriately selected deep energy retrofits can have impacts on greenhouse gas emissions, affordability, and liveability, as well as providing improved health outcomes.

Canmore's program should also ensure that health and safety upgrades tied to energy efficiency upgrades are included as part of the retrofit process. Examples of such upgrades include detecting, remediating and eliminating mould, electrical work, and drywall fixes.

The costs of a lower income efficiency program vary greatly depending on how long a program has been in market, the depth of upgrades offered, the percentage of costs covered for the participant, and the total number of participants supported. This year Kambo and the Alberta Ecotrust Foundation will be launching the Home Upgrades Program in Edmonton and Calgary. Costs of this program are estimated to be between \$13,000-\$16,000 per home and include labour, upgrades, and administration. This program is based on the learnings of a similar program delivered by Kambo in Calgary in 2019. Given the results of that program,

Kambo expects average savings of approximately 497 GJ per home or \$3,079 over the lifetime of the measures on the variable portion of the bill. The Calgary program reduced GHG impact by an average of 10% per home and consumption was reduced by an average of 12%. The impact report of the 2019 program is available here: www.empowermeprogram.com/wp-content/uploads/2019/06/Empower-Me-Impact-Report-1.pdf

Program Qualification should consider realities of the cost of living in Canmore

Careful consideration must be given to designing program qualification criteria that ensures the intended targeted households are included. This is especially important in Canmore where the living wage is significantly higher than the Canadian Low Income Cut Offs (LICO). A program that uses LICO income amounts as a qualification criteria in Canmore will fail to include the majority of households who earn more than LICO but are still struggling given the high cost of living.

Provide a simple one stop shop approach

Strong LMI efficiency programs are designed with processes, requirements, and administration that centres on the customer experience. Canmore's income-qualified program should have low barriers to entry, offer participants multiple options to meet income and other verification requirements, and be as flexible as possible.

A one stop shop designed by and for the participant ensures applicants are supported throughout the program journey, from a straightforward application process to high quality retrofit and quality assurance processes to confirm the intended results are met.

One stop shop best practices include a multilingual community resource which walks participants through the required steps, assists with selecting or directly

hires contractors, and answers any questions the resident may have.

Existing community relationships should be leveraged to promote the program, offer credibility, and ensure accessibility for the intended participants. An example of an existing community partner may be the Canmore Community Housing Corporation or Bow Valley Housing Commission.

The Town of Canmore can also use this opportunity to create a clearinghouse between the various existing programs to ensure that every applicant can be directed to the most appropriate program based on their needs. Applicants who may not be suited for an income-qualified program could be directed to CEIP, Greener Homes, and any other available grants and incentives. The one stop shop should also be aware of other non-energy efficiency grants and services available to income-qualified individuals (such as housing, career, utility bill support) and assist the client with accessing those services. This holistic and multi-problem-solving approach will build trust and relationships within the community.

Develop multilingual and culturally appropriate outreach tactics

Canmore's income-qualified program design should consider marketing, outreach, and communications that include the desired participants based on their language and culture, both in written and spoken form. One successful such program is Kambo's Empower Me – a program specifically designed to include and support immigrants and newcomers to take advantage of energy efficiency and home upgrade programs that are most appropriate for them. This peer-based and community-focused program hires from within the communities it serves to ensure culturally appropriate language and outreach strategies are used. Since 2012, this award-winning program has supported more than 60,000 immigrants and newcomers across Alberta and BC in all socioeconomic statuses to participate in energy efficiency and home upgrade programs.



Include renters in the program, address split incentives, and reduce risk of displacement

Given the large proportion of rental households in Canmore and the significant income gap between renters and homeowners, the proposed income-qualified program should be designed to be accessible to both renters and homeowners. Due to the challenges of split incentives between renters and landlords, including renter eligibility, the program design should consider marketing the program to both renters and landlords, and highlight the benefits for both. To ensure the program achieves the goal of improving affordability for lower income households, eligibility criteria should be based on income of the tenants rather than that of landlords.

Program processes and policies should consider the importance of protecting renters and reducing the risk that landlords evict tenants or increase rent as a result of the upgrades.

While these are some key recommendations to address energy efficiency in rental households, it is important to note this is an ongoing conversation in the energy efficiency industry. The American Council for an Energy-Efficient Economy (ACEEE) recently published a report on energy equity for renters (<https://www.aceee.org/energy-equity-for-renters>) and Efficiency Canada is scheduled to release a report on renter-targeted energy efficiency programs in early 2023. In the next section we have provided several examples of existing programs to show how renter households are included in energy efficiency programs across North America.

Back up your program design and delivery with good quality data

There is no such thing as enough data. While delaying program design to collect more data is not recommended, capturing additional data can help with providing the best services to the community. This is especially important in Canmore, given no lower income program has ever been delivered and little information exists on building archetypes, upgrades needed, and costs for a program such as this. Additional details on age and quality of the building stock, household energy costs, opportunities for savings, and income gaps are recommended in the process of developing and delivering an effective program in Canmore. It can also be accomplished through community-engaged research, attaining utility data, working with community partners who may have the information, and more. Companies like [Properate](#) can provide an ongoing community assessment of virtual energy audits for an estimated cost of \$15,000– \$35,000 yearly. Strong community engagement and a data-driven approach will allow the Town to create a program best suited to residents' needs.

A key part of program data collection is assessing both qualitative and quantitative impacts of the program as a way to build a continuous improvement process into the program delivery. In the next section, we have recommended some key indicators for measuring the success of the program based on its identified desired outcomes.

EXAMPLES OF INCOME-QUALIFIED PROGRAMS THAT ADDRESS RENTERS

Program: The Home Upgrades Program – Edmonton and Calgary

Who qualifies: Renter and owner households in energy poverty across Calgary and Edmonton

What's included: Customized no-cost deep energy retrofits designed specifically to reduce energy consumption and improve affordability. The program includes upgrades, education, and employment opportunities for the groups served.

Energy savings targeted: 30% energy consumption savings per household

Funders: A coalition of organizations including ENMAX, the cities of Calgary and Edmonton, the McConnell Foundation, and the Alberta Ecotrust Foundation.

Program: Enbridge Home Winterproofing Program – Ontario

Who Qualifies: Households qualify based on their income (135% of the low income measure, starting at \$36,578 before-tax income for a single person household), or if someone already receives assistance from other government programs including Ontario Works, Allowance for Seniors, Healthy Smiles, and more. Renters are required to have a consent form signed by their landlord to authorize the process, and no other requirements are made of the landlord.

What's included: Free insulation, draft proofing, and a smart thermostat

Energy savings targeted: Efficiency Canada reports 17.2 GJ of annual energy savings per participant reported by Enbridge.

Funder: Enbridge

Program: Winter Warming Incentive – Prince Edward Island

Who qualifies: LMI islanders

What's included: Free air sealing, a programmable thermostat, a low-flow shower head, heating system cleaning and LED light bulbs. While rental properties qualify for the program, landlords must apply for the upgrades and there are no additional commitments to affordability required from landlords. Qualification is determined via the HST/GST credit based on tenant incomes.

Energy savings targeted: Program suggests savings from \$250–\$650 per year in heating costs

Funder: Prince Edward Island

Program: Income Qualified Rental Program – Tacoma

Who qualifies: Rental property owners whose tenants' income is less than 80% of the area's median income

What's included: Loans for energy upgrades. Two options are available: The first is a five-year forgivable loan covering the entire project cost. The loan would be forgiven at a rate of one fifth per year, with the agreement that landlords will maintain affordable rental rates throughout the five year term. The other option is a seven-year zero percent interest loan with a grant.

Energy savings targeted: Not stated

Funder: Tacoma Power

RECOMMENDED INDICATORS

Developing relevant program indicators makes it possible to track that the program is achieving its intended outcomes. Therefore, it is important to identify intended outcomes, ensure that indicators track those outcomes, and that the program captures the necessary data needed to measure its success.

While tracking quantitative metrics is a powerful tool, we must realise they tell only part of the story. It is very important to see and hear the full impact of the program

in a holistic and qualitative way. Therefore, it is always recommended to capture qualitative measures and the stories shared by participants and non-participants. Below are a handful of recommended indicators that can be considered to measure the effectiveness of an income-qualified program at reducing energy burdens in the community.

Indicator	Example	Reasoning
Energy Bill Reduction	Percentage of the consumption portion of the energy bill reduced year over year	This is the most direct measure of whether the program reduced energy consumption and improved affordability
GHG Reductions	GHGs reduced as a result of the home retrofits	Addresses GHG reduction goals of the Town
Subscription Rate	Number of participants in the program as a percentage of the target	Determines if the program is effectively achieving its goal
Completion Rate	Percentage of qualified participants who complete the program as a portion of qualified applicants who apply	Measures the program's success in accessibility and ease of participation
Participant Wellbeing	A qualitative survey given to participants one month and one year after the retrofits are complete	This indicator shows that the program has centred its participants' comfort and wellbeing in the program design
Demographics of Participants in Other Programming	Measure the incomes of individuals participating in existing 'ability-to-pay' retrofit programs	If data shows that lower income residents are not accessing existing programs, it demonstrates that there is an opportunity to more equitably serve all community members through an income-qualified program

NEXT STEPS FOR CANMORE

Currently, no municipality in Canada offers a fully subsidized energy efficiency program for its lower income residents. Like Canmore, many are considering the most appropriate way to tackle this issue. Meanwhile, outside Alberta, lower income households have the option to participate in programs offered by utilities or provincial governments. Municipalities outside of Alberta have the benefit of considering how their approach and strategy can fill gaps and enhance low-income programs already offered by their local utilities or provincial governments. Alberta is the only province, territory, or state without a program, leaving municipalities in this province in a unique situation of how to address this problem themselves.

An energy efficiency program for Canmore's lower income residents will help the Town deliver on its goals of liveability, environment and relationships by making comfortable, energy efficient homes more affordable for those who need it most, reducing community GHGs, and creating respectful and authentic relationships with Town residents.

To most efficiently and effectively deliver its income-qualified program, the authors recommend Canmore takes one of the two options outlined here:

Option 1: A Canmore Specific Program

Design, set-up, and launch a Canmore-specific energy efficiency program for the Town's low income residents. Best practices in this report can be considered alongside the specific needs of Canmore's residents. Of note, a Canmore specific program will require a third party consultant to complete program design, program set up, and program delivery services. Ideally, the consultant's expertise should include:

- Understanding and experience delivering residential energy efficiency programming in Alberta
- Understanding and experience designing and delivering residential lower income energy efficiency programming. For any program design experience, the participation rate, GHG and energy savings impact on a per-home basis should be reviewed by the Town
- Ideally, the program team should reflect the demographics of the community this program will serve

The following elements are highly recommended in program design and delivery:

- Any income-based eligibility criteria should consider living wage as a minimum income amount
- Program application and processes should be easy to navigate and low barrier
- Savings should be maximized on a per home basis and avoid shallow upgrades such as Energy Savings Kits
- The community should be centred in the design and delivery of the program
- Outreach and customer acquisition strategy should consider trust, awareness, and other participation barriers of potential participants
- The program communications approach should consider language and literacy levels of participants and offer practical solutions to address these
- Program should include budget to address health and safety work that needs to be completed in homes prior to energy efficiency upgrades

Option 2: Leverage the Home Upgrades Program to include Town of Canmore residents

Join the coalition of supporters of the upcoming Home Upgrades Program. The Home Upgrades Program is delivered in partnership between Kambo Energy Group and Alberta Ecotrust Foundation. Some key facts about this program:

- The program is based on a successful pilot offered in 2018/2019 by Kambo Energy Group that offered fully subsidized deep energy retrofits to 140 Calgary households experiencing energy poverty.
- The 2023 program will launch in Calgary and Edmonton and is funded by a coalition of partners including the cities of Calgary and Edmonton, ENMAX, and McConnell Foundation.
- Upgrades will be selected to maximize the reduction in energy consumption on a per-home basis over the budget of the program and include air sealing, fenestration, lighting, water saving devices, insulation, and heating system upgrades.
- The program aims to invest an average of between \$12,000–\$15,000 in labour and materials of deep energy retrofits per home.
- The program has also included provisional budget to address 'energy efficiency enabling' upgrades, that is, health, safety and other work that needs to be completed before energy efficiency upgrades can be installed.
- The program is based on the learnings of the 2018 program and expects to reduce energy by 30% on the consumption portion of bills, save households an average of \$1,800 over the lifetime of the measures, and reduce GHGs by more than 3,000 tonnes.
- The program is designed based on the best practices identified in this report and overall experience designing and delivering low-income upgrades programs in Canada over the last 15 years.

- Goals of the program include offering insights and recommendations to funders, Provincial government, utilities, the Federal government and other stakeholders on how a long term sustainable program can be delivered in Alberta.

Given this program has completed program design and program set up activities, an investment by the Town of Canmore would leverage this work and focus funding on expansion of the program to the Town and delivering home upgrades to residents.

Regardless of the option Canmore chooses, an income-qualified energy efficiency program is vitally important for the Town. As mentioned earlier, it will help Canmore deliver on its 2023 Strategic Goals of Liveability, Environment and Relationships. Further, it's the right thing to do. Canmore's beautiful, rugged and clean environment is near and dear to its residents and draws visitors from near and far. Including all residents in a program that will help them conserve energy while living more affordably in this beautiful Town they call home is ethical, forward-thinking, and will leave an enviable legacy.

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BRIEFING

Marginal Abatement Costs for Town of Canmore Renewable Energy Options

March 22, 2023

Disclaimer

Reasonable skill, care and diligence has been exercised to assess the information acquired during the preparation of this analysis, but no guarantees or warranties are made regarding the accuracy or completeness of this information. This document, the information it contains, the information and basis on which it relies, and the associated factors are subject to changes that are beyond the control of the author. The information provided by others is believed to be accurate, but has not been verified.

This analysis includes strategic-level estimates of marginal abatement costs. The intent of this analysis is to help inform the Town and its residents about the abatement costs of actions. It should not be relied upon for other purposes without verification. The authors do not accept responsibility for the use of this analysis for any purpose other than that stated above, and do not accept responsibility to any third party for the use, in whole or in part, of the contents of this document.

This analysis applies to the Town of Canmore and cannot be applied to other jurisdictions without further analysis. Any use by the Town, its sub-consultants, or any third party, or any reliance on or decisions based on this document, are the responsibility of the user or third party.

1. Introduction

1.1 Purpose of this Memo

This memorandum details the methodology and results of calculating a marginal abatement cost curve (MACC) for project options analysed within five different studies completed for the Town of Canmore.

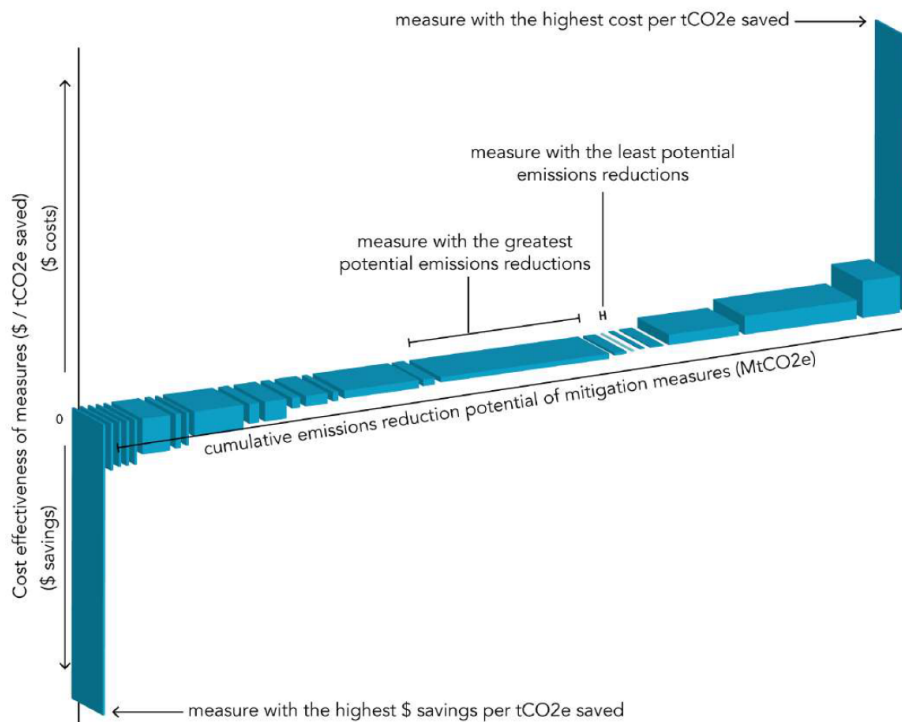
1.2 What is a Marginal Abatement Cost Curve?

In 2007, the consulting firm McKinsey & Company, in collaboration with the Swedish utility Vattenfall, popularised the MACC as a method to illustrate opportunities for global GHG emissions reductions.¹ The marginal abatement cost (MAC) of an action is the cost (or savings) of avoiding a metric ton of GHG emissions, discounted to present dollars.

$$\text{MAC} = \frac{\text{NPV}}{\text{tCO}_2\text{e}}$$

Figure 1. MACC calculation.

A MAC curve (MACC) is composed of the MACs of multiple actions, arranged in order from the lowest-cost abatement opportunities on the left to the highest-cost abatement opportunities on the right.



¹ McKinsey & Company, "Pathways to a Low Carbon Economy: Version 2 of the Global Greenhouse Gas Abatement Cost Curve," accessed March 15, 2022, <https://www.mckinsey.com/~media/McKinsey/Business%20Functions/Sustainability/Our%20Insights/Pathways%20to%20a%20low%20carbon%20economy/Pathways%20to%20a%20low%20carbon%20economy.pdf>.

Figure 2. Illustration of a MACC and the information it conveys.

An example of the MAC curve is shown in Figure 2 above. Items below the line have a negative cost, indicating a positive return. Items above the line have a positive abatement, indicating a net cost. The width of the column indicates the emissions reduction potential of the measure, while the height of the column indicates the amount of cost or savings.

1.3 How MACCs Are Used

MACCs illustrate GHG emissions reduction potential and costs in a single visualisation. From the perspective of policy makers they can address the following questions:

1. Which actions both save money and reduce or avoid the most GHG emissions?
2. What share of the GHG reductions cost money as opposed to saving money?
3. Are there opportunities to combine high cost and high savings actions to achieve greater GHG emissions reductions, while minimising the financial cost?
4. Which actions have a financial profile that is likely to be of interest to the private sector, assuming barriers can be removed or supporting policies introduced?
5. How can governments help reduce the costs of the high cost actions by supporting innovation or by providing subsidies?

2. How the MACC was Calculated

The net present value (NPV) of the flow of capital and operating costs of the action is divided by the GHG reductions resulting from that action over the time horizon of the planning scenario. The process for determining the NPV as well as the accounting principles applied during the process are outlined below.

In this case, the costs and energy impacts of each of the 12 projects was derived from five separate studies completed for the Town of Canmore. The studies used different assumptions for costs and GHG emissions, which introduces inconsistencies into the approach. To mitigate these inconsistencies, variables were recalculated wherever possible. The conventions for the calculation of the MACC are described in the following sections.

2.1 Study Period

The study period is determined by the assumed lifetime of the action, which is assumed to be 25 years for a solar project and 20 years for a building retrofit.

2.2 GHG impact

The GHG impact is calculated by subtracting the scenario containing the action from a reference scenario. The annual stream of change in emissions is summed up over the study period in order to calculate net GHG emissions savings.

In order to ensure consistency of projected emissions factors for the provincial electricity grid, GHG emissions were calculated from energy savings for each of the projects using a consistent projection for the electricity grid.²

2.3 Net Present Value

The NPV of an action is the present value of incremental capital investments, operational expenditures, and revenues over the lifetime of that action.

$$NPV = \sum_{t=1}^n \frac{R_t}{(1+i)^t}$$

The diagram shows the NPV formula with three labels and arrows pointing to specific parts of the equation:

- 'Net cash flow at time t' points to the numerator R_t .
- 'Time of the cash flow' points to the exponent t in the denominator.
- 'Discount rate (time value of money)' points to the variable i in the denominator.

Figure 3. Net-present value calculation.

Three aggregate categories are used to track the financial performance of the low-carbon actions in this analysis:

- Incremental capital expenditures relative to the base case;
- Incremental operation and maintenance expenditures; and
- Incremental revenue generation, as relevant.

For some of the projects, the NPV calculated in the study was used directly. In other cases, the NPV is recalculated to ensure a consistent approach. Appendix 1 provides details on this approach.

The costs and savings analysed were applied from the perspective of the Town. For example, an investment in a heat pump in a Town facility reduces the annual energy costs and therefore improves the NPV. An incentive for community solar on the other hand, does not result in a revenue stream for the Town, as the revenue associated with the solar generation remains with the owner of that installation. In this case, there is no direct financial benefit to the Town, although there may be indirect benefits such as stimulated employment and increased energy security.

A discount rate of 3% was used for calculating the NPV, which is consistent with organisations that have public or social mandates.

2.4 Electricity Emissions Factor

The application of the emissions factor for electricity is challenging because there are different projections which align with different policies. The emissions factor from the Carbon Offsets Emissions Factor Handbook³ was used for the period from 2024-2029. The emissions factor for 2024 was retroactively applied to 2023. The

² AESO (2022) AESO Net-Zero Emissions Pathways Report, <https://www.aeso.ca/assets/Uploads/net-zero/AESO-Net-Zero-Emissions-Pathways-Report.pdf>

³ Government of Alberta (2023). Carbon Offsets Emissions Factor Handbook. Retrieved from: <https://open.alberta.ca/dataset/f2109d83-2153-4481-a8b8-b00178e53999/resource/99973308-0b0f-402e-acea-e1dc339f2e64/download/epa-carbon-offset-emission-factors-handbook-v3-1-2023-01.pdf>

projection from the Net-Zero Emissions Pathways Report was applied to the period from 2030-2040 and from 2040 on, the emissions factor was held constant at 2040 levels.

2.5 Limitations of MACC

1. **Dependencies:** The presentation of the MAC curve implies that the actions are a menu from which individual actions can be selected. In fact, many actions can impact each other. For example, the reduction of GHG emissions resulting from installing a heat pump are reduced if the Town purchases green electricity.
2. **Distributional impacts:** MAC curves do not account for distributional impacts, for example who bears the costs and who derives the benefits of policies and actions.⁴
3. **Timing:** For example, the MAC curve does not describe the sequencing or rate of change. This contributes to other challenges, including inconsistencies in representation and estimation of costs, omission of non-finance costs, and inability to represent system interactions (Kesicki and Ekins, 2012).
4. **Co-benefits:** Many actions deliver a host of benefits related to health, ecology or other externalities. These benefits are not illustrated on a MAC curve, which can only reflect impacts that can be translated into dollar values.

3. Findings for Canmore

3.1 MACC Curve

Figure 4 illustrates the abatement costs of the 12 projects for Canmore.

Some projects save money: A key finding is that based on the assumptions used in the analysis, five of the projects result in cost savings for the Town. In other words there is no downside to implementing the GHG emissions reductions projects on the Town's operations, including the purchase of the VPPA; they are classified as "no-regrets" policies in that they save money and reduce GHG emissions.

Some benefits are externalised: Most projects which cost money per tonne of emissions reduced generate indirect benefits which do not result in financial returns to the Town. Incentives for low-income retrofits and community solar projects generate energy savings and electricity revenues respectively which return to other actors than the Town. These benefits are not included in the NPV calculation, and as a result the abatement cost per tonne is higher for these actions.

Purchasing green energy is the most significant action: The green VPPA generates 36.5 ktCO₂e over 20 years, and is projected to save money, although there is uncertainty in the energy costs projections, a risk which applies equally to any electricity contract, green or otherwise. Note that if the VPPA is implemented, the GHG reduction of other actions on corporate facilities is reduced, because the actions will then be displacing green electricity.

3.2 Summary Results

Table 1 includes the net present value, cumulative GHG emissions reductions and abatement cost for each of the 12 actions. Note that the convention is that positive numbers represent costs (red) while negative numbers (green) represent savings.

⁴ Saujot, M., & Lefèvre, B. (2016). The next generation of urban MACCs. Reassessing the cost-effectiveness of urban mitigation options by integrating a systemic approach and social costs. *Energy Policy*, 92, 124–138.

Table 1: Abatement Costs

Number	Action	Net Present Value (- numbers equal cost savings)	Cumulative GHG reductions (tCO2e)	Abatement Cost (- numbers equal cost savings)
1	Solar rooftop at the Elk Run Road Maintenance Facility	-\$50,300	1,395	-\$36
2a	Solar canopy- Canmore Recreation Centre	\$553,589	2,621	\$211
2b	Solar canopy- Elevation Place	\$402,557	1,848	\$218
2c	Solar canopy- Public Works Yard	\$557,756	2,609	\$214
2d	Solar canopy- Pumphouse 4	-\$28,506	1,209	-\$24
3	Air source heat pump (space heating) for the new Fire Station	-25,367	1,998	-\$13
4	Air source heat pump (domestic hot water) for the new Fire Station	-24,719	2,024	-\$12
5	Ground source heat pump for the new Fire Station	143,921	2,211	\$65
6	Community solar incentive program – residential only	\$884,596	2,877	\$308
7	Community solar incentive program – residential and commercial	\$876,901	3,194	\$275
8	Low-income residential retrofit program	\$526,477	1,836	\$287
9	Virtual Power Purchase Agreement	-\$918,538	36,515	-\$25

¹ The value of carbon offsets has been removed from the net present value calculation for the solar installations.

3.3 Variation

Some of the studies calculated abatement costs for the actions, with results that vary from those presented here. There are three key reasons for that variation, including:

1. **Emissions factors for electricity:** Different projections for emissions factors for Alberta's electricity system were applied in different studies. A higher emissions factor has the impact of decreasing the cost per tonne of emissions reductions, while a lower emissions factor increases the cost per tonne of emissions reductions.
2. **Incremental versus total costs:** In some cases the abatement cost was calculated using a NPV of the total capital and operating costs, where the convention in this analysis is to calculate the NPV of the incremental capital and operating costs relative to a reference case.
3. **Lifetime:** The duration of the project for which the GHG reductions and NPV is calculated varies in the different analyses. The convention in this analysis to calculate the NPV and GHG reductions over the lifetime of the investment.
4. **The sale of carbon offsets:** Carbon offsets were not included in this analysis but were included in some of the studies.

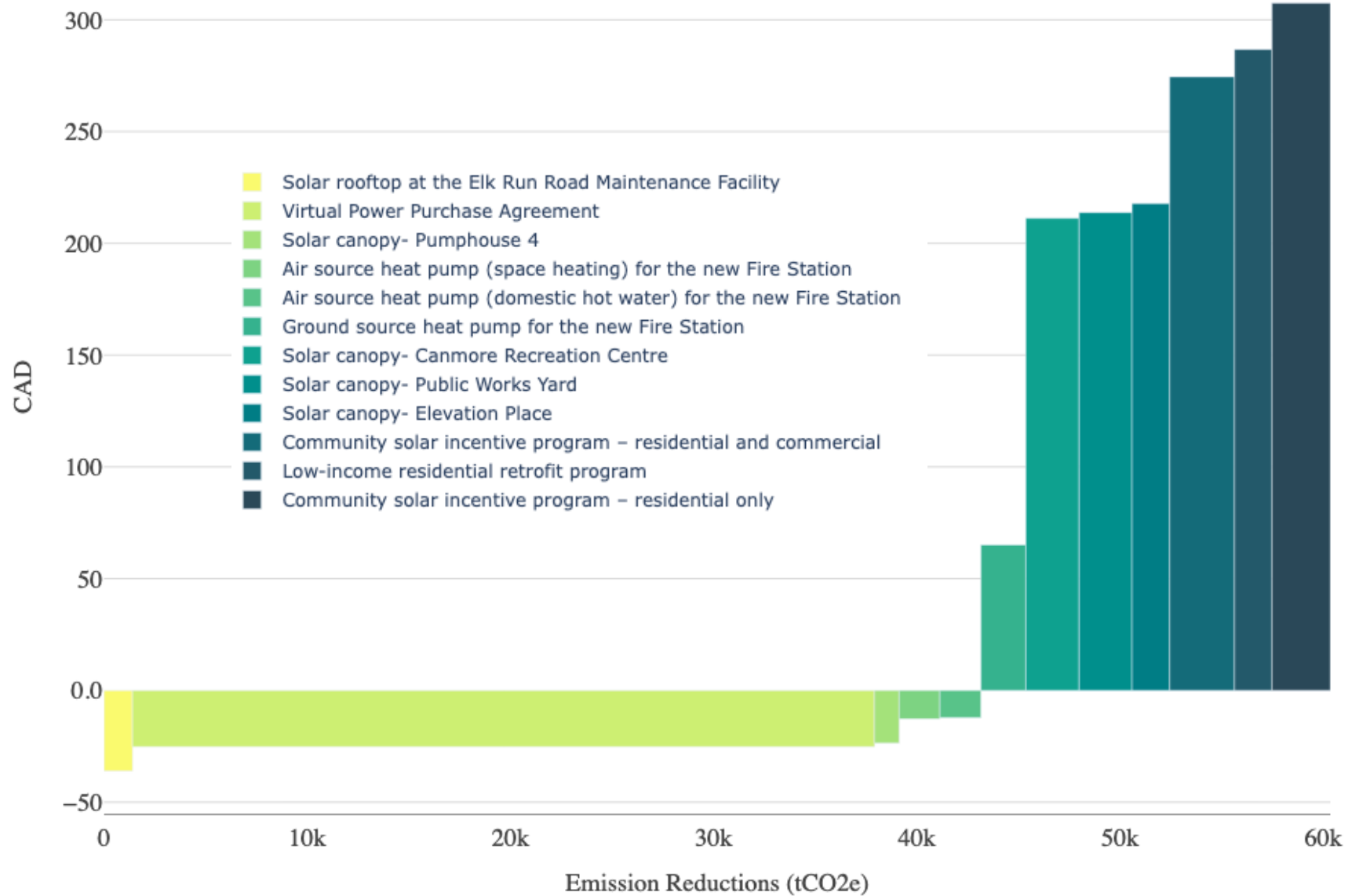


Figure 4. Marginal Abatement Costs for Town of Canmore Renewable Energy Options.⁵

⁵ An interactive version of this chart is available here: https://cityinsight.s3.ca-central-1.amazonaws.com/BF3RjhJSWW3mz796PUkB1y_canmore/canmore_mac.html



Briefing

DATE OF MEETING: May 16, 2023 **Agenda #:** D-5

TO: Committee of the Whole

SUBJECT: Regional Emergency Management Bylaw

SUBMITTED BY: Caitlin Miller, Manager of Protective Services / Director of Emergency Management

PURPOSE: To collect feedback on a draft regional emergency management bylaw before a final draft is presented to Council for approval.

EXECUTIVE SUMMARY

Effective emergency management, including mitigation, preparedness, response, and recovery, continue to be priorities the Councils of the Town of Banff and Town of Canmore as well as the community. Sharing similar hazards and risks, the Town of Banff and Town of Canmore can increase capacity and resilience during a disaster response through formalized plans and governance established by a regional bylaw.

BACKGROUND/HISTORY

In 2019, the Town of Banff and Town of Canmore Councils approved that an Alberta Community Partnership grant application be submitted for a \$170,000 project to create a Regional Emergency Management Coordination Plan. Funds were received in April 2022, but due to the COVID-19 pandemic, the project did not begin until January 2022. Motion 209-2019 that Council approve submission of an application for an ACP grant to fund a shared Emergency Management Coordinator with the Town of Banff. The Response Team Inc. was engaged to fulfill the requirements of the grant. The intent of the project was to create a formalized regional emergency management plan governed by a bylaw, complete a regional hazard identification and risk assessment, run a regional emergency exercise, and increase regional capacity and resiliency in the face of a disaster. Due to delays caused by COVID-19, this project was delayed to January 2022.

An update was provided to both the Town of Banff and Town of Canmore Councils by their respective administration in December 2022 regarding the status of the project.

The Directors of Emergency Management for the Town of Canmore and the Town of Banff hosted a joint-Council workshop on April 25, 2023 to discuss the regional emergency management plan and the need for a regional emergency management bylaw to formalize the governance structure and plan.

The 2023-2026 Council Strategic Plan has several priorities related to increasing preparedness and effectiveness of emergency management within Canmore, including making emergency management communication effective across the community, increasing livability, protecting the environment, and building meaningful relationships.

DISCUSSION

The Town of Banff and Town of Canmore share similar hazards, risk, and vulnerabilities, as well as a long-standing history of sharing human and operational resources where there are reasonable opportunities to do so. Formalizing relationships in a regional emergency management plan helps to ensure that there is greater resident and community protection. It increases capacity of emergency management staff and enhances municipal emergency management plans. By working together to identify regional hazards, risks, and vulnerabilities, administration in both municipalities can be better prepared to mitigate, respond, and recover in the case of a disaster. A regional emergency management plan can lessen confusion around authorities and jurisdiction during a response, as well as the potential for costly duplication of or competition for resources. A regional emergency management plan will enhance cooperation through the establishment of a regional emergency management bylaw. Communities will benefit by increased preparedness, resilience, and effectiveness of response by the municipalities during a complex regional response.

The regional emergency management plan includes a governance structure that applies throughout the preparedness, response, and recovery phases. By establishing a regional emergency management bylaw, Council delegates authority to the regional directors of emergency management and creates a regional emergency advisory committee and regional emergency management agency. The regional directors of emergency management are responsible to the regional advisory committee and for co-chairing the regional emergency management agency. The role of the municipal executives (Mayors, Councils, CAO and Town Manager) is to set the policy direction and mission for emergency management within the region, including:

- Informing of legal or policy restraints and freedoms;
- Setting limitations on delegation of authority to the directors of emergency management;
- Raising political or social concerns;
- Raising environmental concerns; and
- Consideration of costs during a response.

The regional emergency advisory committee will be comprised of the members of each participating municipalities' municipal emergency advisory committees as appointed at the annual organizational meeting and the Chief Administrative Officer and Town Manager. To ensure Canmore and Banff are represented equally on the regional emergency advisory committee, administration will bring forward an amendment to the Emergency Management Bylaw to accompany the Regional Emergency Management Bylaw at an upcoming regular Council meeting to increase the composition of the emergency advisory committee from two members of Council (the Mayor and one Council member) to three members (the Mayor and two Council members).

Activation of the regional emergency management plan may occur when an incident, natural or human-caused, is impacting one or more communities within the Bow Valley that requires a coordinated response to protect life, property, and/or the environment. Regional activation would occur when the resources of the municipalities are either likely to be overwhelmed or responses and resources needed are the same or similar, but it does not automatically mean that a regional activation will occur when the municipalities are facing the same hazard. Examples of when activation of the regional emergency management plan could include (but is not limited to): wildfire impacting both municipalities, transportation corridor disruptions, significant seismic events, severe weather events, flooding, Bow Valley-wide utility outages, and catastrophic dam failure.

A previous example of when a regional response and emergency coordination centre would have been beneficial is the 2013 flood event.

A regional activation of the emergency management plan and coordination centre will not result in a loss of municipal autonomy and activation may occur when a recommendation from the regional directors of emergency management receives approval from the regional emergency advisory committee. Regional resources will be appropriately used throughout to coordinate a response that benefits both municipalities. Though different approaches in response may be taken in each community, there is benefit in regional coordination to provide consistent messaging, information about resources, and provide excellent service to the Bow Valley community. States of Local Emergency will continue to be declared on a municipal basis but may come at the recommendation of one of the Regional Directors of Emergency Management during a regional activation.

Feedback from the Town of Canmore and Town of Banff joint Council workshop regarding the establishment of a regional emergency management bylaw to create a regional emergency management plan was supportive. The attached bylaw is the proposed draft for review ahead of bringing forward the bylaw for approval at upcoming Town of Banff and Town of Canmore Council meetings for a decision.

FINANCIAL IMPACTS

Per the updates to the Town of Banff and Town of Canmore Councils in December 2022, the capacity of the Directors of Emergency Management in each municipality continues to be evaluated. Opportunities for shared resources continue to be explored, including that of a regional emergency management coordinator.

STAKEHOLDER ENGAGEMENT

The MD of Bighorn, the Stoney-Nakoda, and the Kananaskis Improvement District Directors of Emergency Management are aware of this project. As the Town of Banff and Town of Canmore were named on the ACP Grant, the plan is being developed first to provide a governance structure and framework between the two municipalities before exploring the involvement of other stakeholders.

A similar report will be provided to the Town of Banff Finance and Governance Committee for Council feedback and engagement.

ATTACHMENTS

- 1) DRAFT Regional Emergency Management Bylaw
- 2) Regional Emergency Management Governance Structure

AUTHORIZATION

Submitted by: Caitlin Miller
Manager of Protective Services /
Director of Emergency Management Date: April 27, 2023

Approved by: Scott McKay
General Manager of Municipal
Services Date: April 27, 2023

Approved by: Sally Caudill
Chief Administrative Officer Date: May 8, 2023



BYLAW year-number

**A BYLAW OF THE TOWN OF CANMORE, IN THE PROVINCE OF ALBERTA, FOR
THE PURPOSE OF ESTABLISHING A BOW VALLEY REGIONAL EMERGENCY
ADVISORY COMMITTEE AND A BOW VALLEY REGIONAL EMERGENCY
MANAGEMENT AGENCY**

The Council of the Town of Canmore, in the Province of Alberta, duly assembled, enacts as follows:

TITLE

- 1 This bylaw shall be known as the “Bow Valley Regional Emergency Management Bylaw.”

INTERPRETATION

- 2 Words defined in the Act have the same meaning when used in this bylaw.
- 3 In this bylaw:
 - (a) “Act” means the Emergency Management Act, Chapter E-6.8, Revised Statutes of Alberta 2000 as amended,
 - (b) “Agency” means the Bow Valley Regional Emergency Management Agency,
 - (c) “Committee” means the Bow Valley Regional Emergency Advisory Committee, and
 - (d) “Participating Municipality” means the municipalities who have enacted the Bow Valley Regional Emergency Management Bylaw and participate in the Committee and Agency.
- 4 Where a bylaw references a Town staff position, department or committee, the reference is deemed to be to the current name that the staff position, department or committee is known by.

BOW VALLEY REGIONAL EMERGENCY ADVISORY COMMITTEE

- 5 The Bow Valley Regional Emergency Advisory Committee is hereby established.
- 6 The Committee shall
 - a) review the Bow Valley Regional Emergency Management Program and related plans annually, and
 - b) provide guidance and direction to the Agency.
- 7 In addition to the purposes set out in section 6, during an emergency or disaster, the Committee is authorized to activate the regional emergency coordination centre.
- 8 The Committee is comprised of

Bylaw approved by: _____

- a) the members of each Participating Municipality's appointed Municipal Emergency Advisory Committees, and
 - b) The Chief Administrative Officer or designate of each Participating Municipality.
- 9 The Committee shall meet, at a minimum, once per year.
- 10 Committee quorum is at least two members from each Participating Municipality.
- 11 The Committee will conduct its meetings in public, except where authorized by the Municipal Government Act to close a meeting to the public. Meetings shall alternate in location between each Participating Municipality.
- 12 Minutes shall be prepared for every Committee meeting and contain the following:
- a) the date, time and location of the meeting,
 - b) the names of all Committee members present,
 - c) the name of anyone other than a Committee member who participated in the meeting, and
 - d) any motions made at the meeting, along with the results of the vote on the motion.

BOW VALLEY REGIONAL EMERGENCY MANAGEMENT AGENCY

- 13 The Bow Valley Regional Emergency Management Agency is hereby established.
- 14 The Agency is responsible for the administration of the Bow Valley Regional Emergency Management Program.
- 15 The Directors of Emergency Management from each Participating Municipality are hereby appointed as the Regional Directors of Emergency Management.
- 16 The Agency shall, at a minimum, report to the Committee once per year to provide updates on Agency activities and a review of the Bow Valley Regional Emergency Management Plan.

ENACTMENT/TRANSITION

- 17 If any clause in this bylaw is found to be invalid, it shall be severed from the remainder of the bylaw and shall not invalidate the whole bylaw.
- 18 This bylaw comes into force on the date it is passed.

FIRST READING:

SECOND READING:

Bylaw approved by: _____

THIRD READING:

DATE IN FORCE:

Approved on behalf of the Town of Canmore:

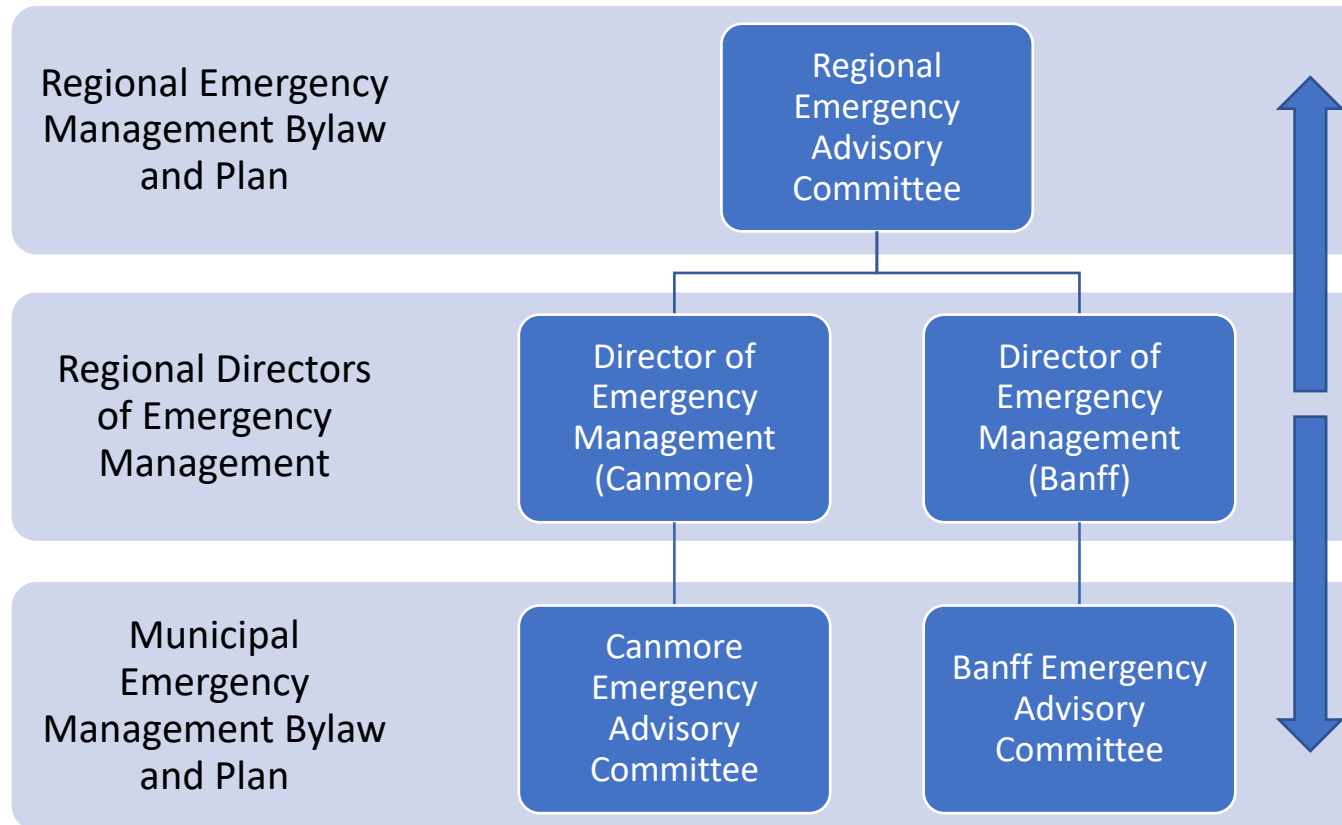
Sean Krausert
Mayor

Date

Cheryl Hyde
Municipal Clerk

Date

Regional governance





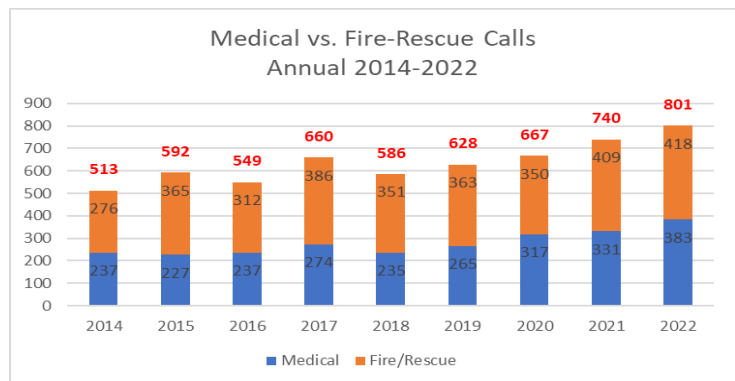
Canmore Fire-Rescue Year-End Review 2022



Canmore Fire-Rescue Year-End Review 2022

Overview

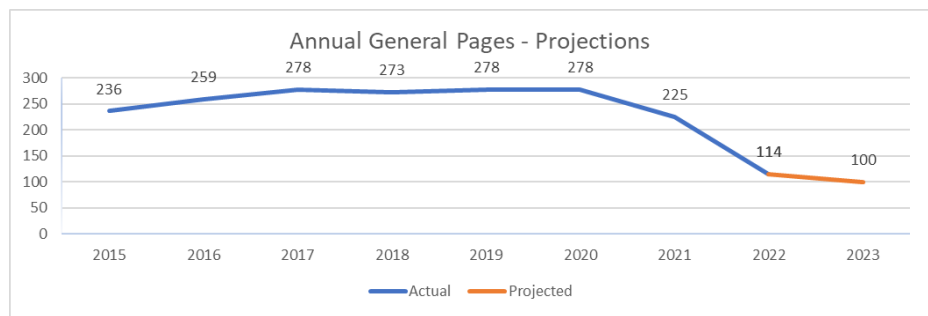
Canmore Fire-Rescue (CFR) received 801 calls for service in 2022. This call volume represents an increase of 8.2% compared to the 2021 call volume of 740 calls. This increase continues the trend from 2021, where volume increased by 10.9% compared to 2020. Medical co-response continue to represent approximately half of the call volume totalling 48% of calls in 2022. Medical co-response calls also increased by 16% from 2021.



Total Call Volume

Staffing Model

Starting on January 1, 2022, Canmore-Fire Rescue began operating with three firefighters on shift, 24 hours a day, for the entire year. The three firefighters on shift comprised two full-time staff and one casual firefighter. With three firefighters staffing a response apparatus 24 hours a day, response times have decreased and reduced the number of general pages. General pages pre-2022 were required to gain the two additional firefighters required for the first engine response to fires and rescues. In 2021 there were 225 general pages; in 2022, there were 114.

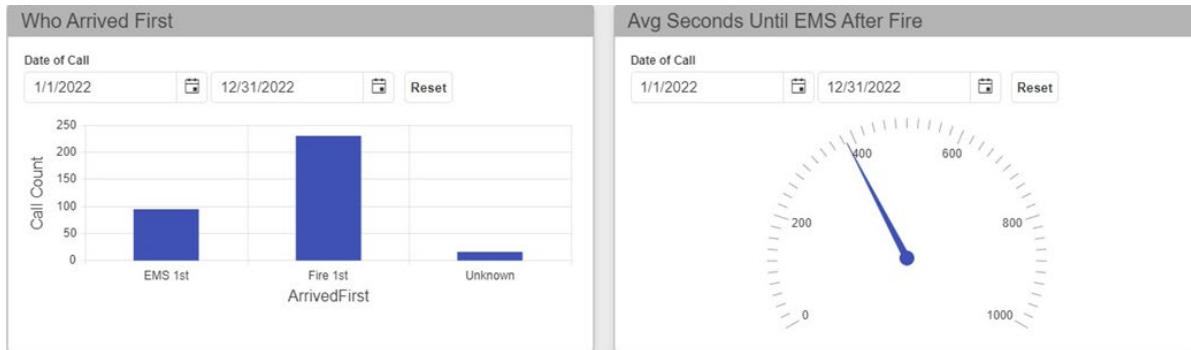


General Pages

Medical Co-Response

Canmore Fire-Rescue (CFR) continues to respond to medical calls that are deemed “serious” by dispatchers. In 2022 CFR arrived on-scene an average of 6.42 minutes before Alberta Health Services Emergency Medical

Services (EMS) staff. CFR arrived first 71% of the time. In conjunction with our medical director, CFR has implemented an Online Medical Control Procedure to mitigate long on-scene times. The procedure provides CFR on-scene staff with direction. Medical direction can advise on when to continue to wait for EMS to arrive, treat and release the patient or when critical to patient outcome, arrange/provide transport to the hospital.



EMS Arrival Times

Training

During the pandemic, weekly training was moved online as opportunities for in-person events were limited. Starting April 2022, in-person training resumed (weekly, daily, and course-based). Wildland firefighting was a focus for 2022; CFR hosted a Wildland Urban Interface course and started regularly cross-training with Alberta Wildfire crews.

Capital Projects

CFR researched specifications for new portable gas detection devices utilized during responses to hazardous materials calls and detected odours. A request for quotations was awarded to Draeger Canada for four detectors that are capable of detecting five different gases. In addition, two specialized detectors for broad-area sampling and volatile organic chemicals were purchased.

A working group was created to define the specifications for a replacement side-by-side vehicle. A request for quotations was awarded to A&E Motorsports for a CanAm Defender side-by-side to enhance our wildland fire fighting and trail rescue capabilities.

CFR has worked closely with facilities and the project manager during the construction of the new Palliser fire hall.

Emergency Management

The Georgetown Field Exercise was successful, and CFR supported the two-day event. This exercise tested CFR deployment of sprinkler lines, integrating into a growing leadership structure, and mock evacuations. Many learnings from the exercise have been incorporated into CFR operations.

The June rainfall event is notable as CFR was deployed to support of monitoring operations that included remote cameras, visual confirmation of steep creeks and the use of drones.



Fire Prevention and Education

Fire Prevention Week returned with the changes in COVID protocols. A pancake breakfast was hosted at the fire hall, and CFR welcomed 600 residents. School visits had CFR interacting with 700 students from Preschool to Grade 5.

Fire Smart assessments continued and are a valuable way for residents to prepare for possible wildfires. Fuel modification and vegetation reduction projects were completed around Quarry Lake.



Councillor Updates

DATE OF MEETING: May 16, 2023

Agenda #: E-1

1. Mayor Krausert

- a) Canmore Community Housing
 - I defer to Councillor Foubert's report.
- b) Tourism Canmore Kananaskis (TCK)
 - TCK continues to operate the Visitor Information Centre during the summer months.
 - The Peaks Academy is launching on May 16th. The Peaks Academy is a training program for frontline personnel to create common awareness of local attractions and resources to better serve visitors.
- c) Rocky Mountain Heritage Foundation
 - Nothing new to report.
- d) Emergency Management Committee
 - Nothing new to report. The next meeting is scheduled for May 17, 2023.
- e) Human Wildlife Co-existence Roundtable
 - Nothing new to report. The next meeting is scheduled for June 2, 2023.
- f) Town of Canmore – MD of Bighorn Inter-Municipal Committee
 - Nothing new to report. The next meeting is scheduled for May 31, 2023.
- g) Canmore Tourism Roundtable
 - Nothing new to report.
- h) Mid-Sized Cities Mayors' Caucus (MCMC)
 - Nothing new to report. The next meeting is scheduled for May 17, 2023.
- i) Advocacy on Behalf of the Town of Canmore
 - On April 26th, I followed up with respect to the application of a new heliport operation wishing to lease land from the province that is situated in the MD of Bighorn adjacent to Canmore. The matter is still under review.
- j) Events
 - On April 19th, I delivered the Mayor's Community Update to the Downtown BIA AGM.
 - On April 22nd, I brought remarks to Bear Day 2023 at the Canmore Nordic Centre.

- On April 24th, the Councils of the Town of Canmore and MD of Bighorn met to socialize and update each other on issues in their respective communities and ask questions about the other.

k) Miscellaneous

- Continued my monthly appearances on Mountain FM with Rob Murray.
- Various media interviews re -.10-yr post flood; summer tourism.
- On April 21st, met to touch base with Mayors DiManno (Banff) and Genung (Cochrane), and we plan to continue to do so every 2-3 months.
- On April 25th, the Councils of Canmore and Banff had a joint Emergency Management Workshop.
- On April 28th – 29th, on a familiarization trip to Sedona, AZ, I participated in multiple meetings with various members of Sedona City Council, Administration, and community members in exploration of the possibility and benefits of developing a sister-city relationship between our two communities. The Sedona Sister-City Association invited me to Sedona to further this discussion, and I confirmed that there are significant similarities between the communities in the issues we face (lack of affordability, escalating housing prices and a housing crisis, staffing difficulties), having a tourism-based economy, similar values (environment, arts, recreation, sustainable tourism), and so much more. The next steps is for 4-5 members of Canmore community to work with a Sedona contingent to determine what a relationship could look like and benefits to each community. This will be a community lead initiative if it is to be successful, which I am helping to facilitate getting going and then will step back. It is not expected to require any financial contribution from either community and no time commitment from either Administration.

2. Councillor Foubert

a) Canmore Community Housing (CCH)

- The sub-committee continues work to find a new executive officer for the organization. The job description is currently being advertised and interviews set up in early June.
- Waitlists for Vital Homes ownership (170) and rental (142) programs continue to increase as rental rates go up throughout the valley. A review of CCH rental rates showed that prices in our inventory range from 28 to 57 per cent below market depending on the unit type, income limit and rental range provided. For example, the average rental rate for a two-bedroom market unit in 2022 was \$2,735 and for Vital Homes it was \$1,551.
- CCH has hired James Kendal to create our social media strategy and presence. Looking forward to being able to share great stories about CCH and Vital Homes soon.
- CCH has been exploring the potential of developing land owned on Stewart Creek Landing.
- CCH is also looking at exploring district energy or geothermal feasibility in the Palliser area to support planning for future projects.

b) Bow Valley Regional Transit

- See Councillor McCallum's update.

- c) Canmore Planning Commission
- The commission approved a 98-unit visitor accommodation development along Bow Valley Trail, which has an area redevelopment plan in place. One unit of employee housing was included and connected to an ancillary retail unit included in the ground floor. As a result of increased energy efficiency for the building's design, variances were granted for max building height, eaveline height, and floor area above eaveline setback,
 - The commission approved a development permit for excavation, stripping and grading at 1 Silvertip Trail. This approval is in advance of a second permit for a nordic spa in that location.
- d) Canmore Museum
- The Canmore Museum Society board is currently looking at recruiting a new executive officer to lead our organization into the next phase of its exciting future as a leader in the cultural landscape of the community.
 - I am excited to confirm that the Indigenous Stories Tipi Program will continue throughout the summer on weekends at the Barracks.
 - The museum board approved awarding the contract for its digital strategic plan development.
- e) Alberta Municipalities Environment and Sustainability Committee
- The committee received a presentation from the Alberta Ecotrust Foundation, the City of Edmonton and Efficiency Canada about the adoption of new building codes by the provincial government. They noted that in BC, Saskatchewan, Quebec and Newfoundland, as well as the city of Whitehorse, local governments may adopt a higher level of compliance with the federal codes.
 - The committee's next meeting is July 14 in Stettler where we will tour local wastewater infrastructure.
- f) Alberta Municipal Climate Leadership Council
- There is now a terms of reference for the council moving forward. Our second meeting saw members work to develop priorities and goals
- g) Miscellaneous
- Was honoured to meet with the consul general of the Philipines Zalday B. Patron for dinner at the local restaurant Kain Tayo to celebrate Filipino Restaurant Month.
 - Spoke as deputy mayor during an announcement of lands being transferred to the municipality from the province for a future affordable housing project. Afterwards, I joined the local Bow Valley Chamber of Commerce, Banff Mayor Corrie Dimanno, Banff and Canmore CAOs, MLA Miranda Rosin and Minister Jeremy Nixon in a discussion about housing our local workforce from a regional perspective.
 - Tuned into a webinar by ABMunis as part of its Future of Municipal Government policy series on Climate Risk Assessment and Adaptation for Municipalities.
 - Attended the Downtown Business Improvement Area annual general meeting.
 - Joined Coun. Marra for a strategic planning session for SAEWA in Brooks on April 21

- Attended a social with MD of Bighorn councillors and administration.
- Tuned into another webinar on Extended Producer Responsibility transition.
- Attended the grand opening at supportive living units development by BVRH.
- Was honoured to attend the SmartStart program graduation celebrations and speak on behalf of council.

3. Councillor Graham

- a) Canmore Community Housing
 - Defer to Councillor Foubert.

- b) Canmore Mountain Arts Foundation
 - Meeting conflict with BIA AGM – meeting minutes yet to be released.

- c) Cultural Advisory Committee
 - April 11th - Civic Centre Interior Mural Project - 12 applicants – Selection Committee to meet on April 17
 - Three Sisters Gallery Update
 - ◇ Climate Matters Exhibit Opening – 25 people at the talk by Lynn Martel – with approximately 60 people attending the opening – very successful
 - ◇ Indigenous Perspectives Exhibit – good submission – one from a curator that has submitted a show for consideration. Would like to ask her to curate the exhibit as it is an Indigenous exhibit, and she is an Indigenous artist and curator.
 - Main Street Installation
 - ◇ No applications at this time – have encouraged committee to reach out to their contacts to drum up interest.
 - Micro Grant Program
 - ◇ Jamie presented the first draft of the Arts and Culture Micro Grant Program to the committee for review and comment.

- d) Wildsmart
 - No meetings.

- e) Miscellaneous
 - Social with MD of Bighorn
 - Attended Land Transfer of Palliser Lands from Province
 - Attended NDP Affordable Housing Announcement
 - Attended BIA AGM

4. Councillor Hilstad

- a) CAO Performance Review Committee
 - Nothing new to report

- b) Heliport Monitoring Committee
 - Alpine Helicopters has submitted their 2022 Annual Report, which the committee will review at our next scheduled meeting on June 12th.

- c) Canmore Planning Commission
 - Canmore Planning Commission approved both Development Permits presented for decision on April 26, 2023.
 - Access the full notice of decision to both on the Towns website:
<https://canmore.ca/cpcmeetings>



Planning & Development Department

Town of Canmore
 902 - 7th Avenue
 Canmore, AB, T1W 3K1

NOTICE OF DECISION

THIS IS NOT A DEVELOPMENT PERMIT

DEVELOPMENT PERMIT No.:	PL20220303
APPLICANT NAME:	MTA Urban Design and Architecture
MUNICIPAL ADDRESS:	1734 Bow Valley Trail
LEGAL ADDRESS:	Block A Plan 6122JK
LAND USE DISTRICT:	Bow Valley Trail – General Commercial District
APPROVED USE(S):	Visitor Accommodation, Retail Sales, Employee Housing
DATE OF DECISION:	April 26, 2023
APPROVED BY:	Canmore Planning Commission
DATE ISSUED:	April 27, 2023

It has been decided that the application be **APPROVED** subject to the conditions noted in the attached **Schedule A – Conditions Of Approval**.



Planning & Development Department

Town of Canmore
 902 - 7th Avenue
 Canmore, AB, T1W 3K1

NOTICE OF DECISION

THIS IS NOT A DEVELOPMENT PERMIT

DEVELOPMENT PERMIT No.:	PL20230005
APPLICANT NAME:	McElhanney
MUNICIPAL ADDRESS:	1 Silvertip Trail
LEGAL ADDRESS:	Lot 1 Block 17 Plan 971 1512
LAND USE DISTRICT:	Silvertip Trail Direct Control District
APPROVED USE(S):	Excavation, Stripping and Grading
DATE OF DECISION:	April 26, 2023
APPROVED BY:	Canmore Planning Commission
DATE ISSUED:	

It has been decided that the application be **APPROVED** subject to the conditions noted in the attached **Schedule A – Conditions Of Approval**.

- d) Enforcement Appeal Review Committee
 - Nothing new to report.
- e) Community Grants Selection Committee
 - Applications for the Community Grants Program are now closed with adjudication taking place in the month of May.
 - For more information visit the Town of Canmore website at: [Town of Canmore - Community Grants](#)

5. Councillor Mah

- a) Bow Valley Waste Management Commission (BVWMC)
 - BVWMC met on April 20th, 2023. At that meeting, we approved the audited financial statements from 2022. Enns and Company were the auditors and confirm that the Commission is on sound financial footing.
- b) Business Improvement Area (BIA)
 - The BIA's AGM was held on Wed April 19th at the Canmore Golf & Curling Club. Compared to prior years, there was an increase in attendance and engagement. Newly appointed board members are:
 - ◊ Dave Stratton (Stratton Jewelers and Bolder Men's Wear)
 - ◊ Jade Ansley (Project A)
 - ◊ Gradey McMahon (Cabeza Grande)
 - Mayor Krausert, despite being under the weather, did a fine presentation regarding the status of the community and fielded questions from the audience.
 - BIA met on May 3rd, 2023 to orient the newly appointed board members. Tori Kendal has elected to stay on as chair of the board.
 - BIA met with administration on May 4th, 2023 to further discuss the Downtown ARP as well as the upcoming U of C Urban Labs study. This study will help the BIA coalesce it's vision of the downtown and ensure they provide meaningful feedback for the Downtown ARP process.
 - BIA's search of a new Executive Director continues. After the first cycle of resumes, they have extended their search until May 22nd for more candidates to apply.
- c) Biosphere Institute of the Bow Valley (BIBV)
 - On April 17th, 2023, BIBV met and approved the 2022 financial statements.
 - Newly appointed board members are:
 - ◊ Audrey Pring
 - ◊ John Paczkowski
 - ◊ Justin Fisch
 - This upcoming Nov 2023, BIBV in conjunction with BOWDA will be running a symposium on Building for Sustainability. The Symposium will target industry, developers and businesses within not just the Bow Valley, but Alberta and BC as well.

- BIBV has also reached out to CCH to consider environmentally friendly methods of heating affordable housing projects such as geoexchange.
- d) Emergency Management Committee
 - I defer to Mayor Krausert's report.
- e) Canmore Community Housing
 - I defer to Councillor Foubert's report.
- f) Miscellaneous
 - None to report.

6. Councillor Marra

- a) Assessment Review Board (ARB)
 - n/a
- b) Bow Valley Waste Management Commission
 - n/a
- c) Canmore Public Library
 - n/a
- d) Subdivision and Development Appeal Board (SDAB)
 - n/a
- e) Inter-Municipal Committee – Town of Canmore and M.D of Bighorn
 - n/a
- f) Southern Alberta Energy from Waste Association (SAEWA)
 - n/a
- g) Bow Valley Regional Housing
 - n/a
- h) Miscellaneous
 - n/a

7. Councillor McCallum

- a) Bow Valley Regional Housing
 - I defer to Councillor Marra's report.
- b) Bow Valley Regional Transit Services Commission
 - **On Friday, April 28th, 2023, Canmore Local 5 experienced its first 1000+ passenger day! What a fantastic milestone!**

- Transit ridership growth remains strong, with a record local route ridership of over 25,000 passengers in March. New service levels were implemented in late March, increasing service hours. Before service level increases, ridership had increased 73% on Route 3 (Regional) ridership year-to-date and a 121% increase on Route 5 (Canmore Local) year-to-date. Roam ridership across all routes is high, with an overall increase of 112% for all routes combined. Ridership increases may moderate as the year progresses, as comparisons going forward will be against higher prior-year ridership, with COVID impacts dissipating as 2022 progresses.
 - The Roam 2022 Audit went smoothly with no issues.
 - The GreenTRIP provincial funding program has ended, with the BVRTSC returning \$1.4 million in pre-funding for projects that did not proceed. The BVRTSC has been able to use approximately \$26 million in provincial grant funding from the GreenTRIP program since 2011, with almost \$25 million of that occurring after 2015. The total project value that has been used to enhance transit in the Bow Valley is approximately \$38.5M dollars.
 - OnIt service is finalized. Service will start on the May long weekend and continue throughout the summer. It might be extended until Thanksgiving, depending on the summer ridership demand. Service will be Thursday evenings, Friday – Sunday full day plus Statutory holidays.
 - Roam is supporting the Homelessness Society of the Bow Valley through a trial where they are purchasing some reduced-rate ten-ride passes to supply their guests who need to move between communities to shelter
- c) Subdivision and Development Appeal Board
- Nothing new to report
- d) Assessment Review Board
- I refreshed my training for the Assessment Review Board. As a result, I am now certified for the next three years.
- e) Alberta Municipalities Safe and Healthy Communities Committee
- Nothing new to report.
- f) Miscellaneous
- On April 25th, I attended the joint Emergency Management Workshop between the Towns of Canmore and Banff.
 - On April 27th, I attended the Grand Opening for the Bow River Lodge Phase 2 DSL wing. It was lovely to see my board colleagues from over the years and meet with the residents.



- On April 28th, I attended the Canmore Smartstart Graduation at Artsplace. It was really inspiring to see these new graduates speak about what they learned and how the program helped them move forward in the entrepreneurship path. It was intimate and fun and even featured some mid-presentation dancing!



Regular Board Meeting
Minutes
Thursday, March 23, 2023, 10:00 a.m.
Bow River Seniors Lodge, Canmore AB

PRESENT: Lisa Rosvold (Chair) and Karen Marra (Vice-Chair)

TELECONFERENCE: Joanna McCallum, Chip Olver, Anita Szuster, and Barb Pelham

ALSO PRESENT: Ian Wilson (CAO), Greg Hutchings (Operations Manager), Jennifer Comighod (Client Services Manager), and Vicki Lockwood (Controller)

REGRETS: Julie Canning

1. CALL TO ORDER

Chairperson L. Rosvold called the meeting to order at 10:23 a.m.

2. ADOPTION OF AGENDA

Motion 23-007: C. Olver to approve the agenda. Carried unanimously.

3. PRESENTATION AND GUESTS

- a. **Kenway Mack Slusarchuk Stewart (KMSS) representatives Scott Reinartz and Jolene Cashin** presented the 2022 Audit Results Report and Combined Financial Statements.
Motion 23-008: K. Marra to take the meeting in camera. Carried unanimously.
Motion 23-009: K. Marra to take the meeting out of the camera. Carried unanimously.
Motion 23-010: J. McCallum to approve the 2022 Audit Results Report to the Board of Directors as presented. Carried unanimously.
Motion 23-011: J. McCallum to approve the audited 2022 Combined Financial Statements as presented. Carried unanimously.
Motion 23-012: C. Olver to approve the transfer of \$2,756.00 from Lodge Operating Surplus to Capital Asset Development and Acquisition Reserve (CADAR). Carried unanimously.

KMSS representatives and Vicki Lockwood left the meeting at 11:19 a.m.

4. APPROVAL OF MINUTES

- a. **Regular Meeting of the Board:**
Motion 23-013: K. Marra to approve the minutes of February 23, 2023, the regular meeting of the board as presented. Carried unanimously.

5. COMMITTEE REPORT

- a. **Community Integration Committee:** verbal update provided and discussed.

6. CAO REPORT

- a. **This is Home Redevelopment:** verbal update provided and discussed.
b. **2023 Supportive Living Programs – Capital and Reserve Budget Development:** report provided and discussed.
c. **2023 Rent Supplement Program Budget:** verbal update provided and discussed.

7. NEW BUSINESS

- a. **2023 Supportive Living Programs – Operating Budget Development:** report provided and discussed.
Motion 23-014: A. Szuster to approve the 2023 Supportive Living Program Operating Budget as presented. Carried unanimously.

8. CORRESPONDENCE AND INFORMATION

- a. **Master Services Agreement with AHS:** report provided and discussed.

- Motion 23-015: K. Marra to accept the report as information. Carried unanimously.*
- b. **Tri-party Agreement with AHS and SEHC:** report provided and discussed.
Motion 23-016: K. Marra to accept the report as information. Carried unanimously.
- c. **March 2023 BVRH Bulletin:** presented and reviewed.
Motion 23-017: C. Olver to accept the report as information. Carried unanimously.
- d. **March 2023 Occupancy and Waitlist Report:** presented and reviewed.
Motion 23-018: C. Olver to accept the report as information. Carried unanimously.

9. **DATE AND LOCATION OF NEXT MEETING(S)**

- a. **April regular meeting to be followed by the Grand Opening of the DSL Wing:**
April 27, 2023, starting at 10:00 a.m. in Bow River Lodge, Canmore.

10. **ADJOURNMENT**

Motion 23-019: B. Pelham that the meeting adjourn at 12:31 p.m. Carried unanimously.



Lisa Rosvold, Chairperson



Ian Wilson, CAO

MINUTES PREPARED BY: Jennifer Comighod, Client Services Manager

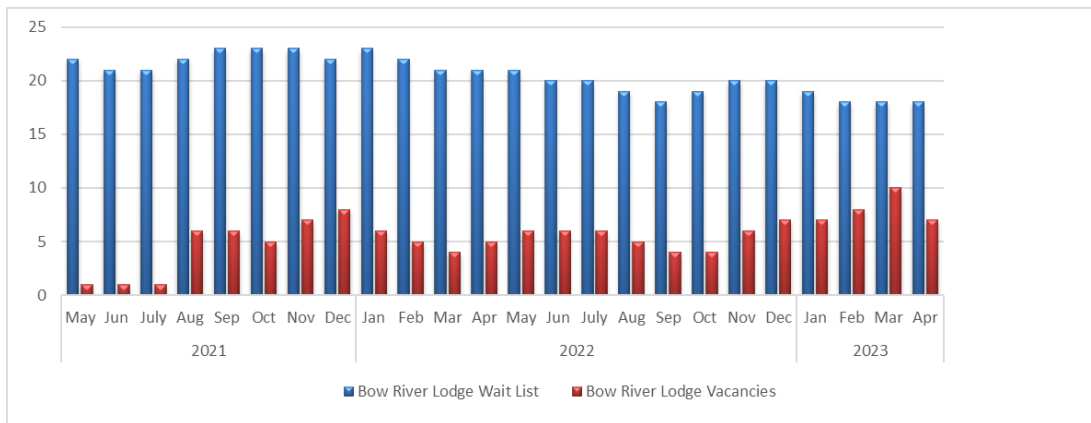
April 2023 Occupancy & Waitlist Report



Bow River Seniors Lodge in Canmore

Occupancy and waitlist as of April 20, 2023:

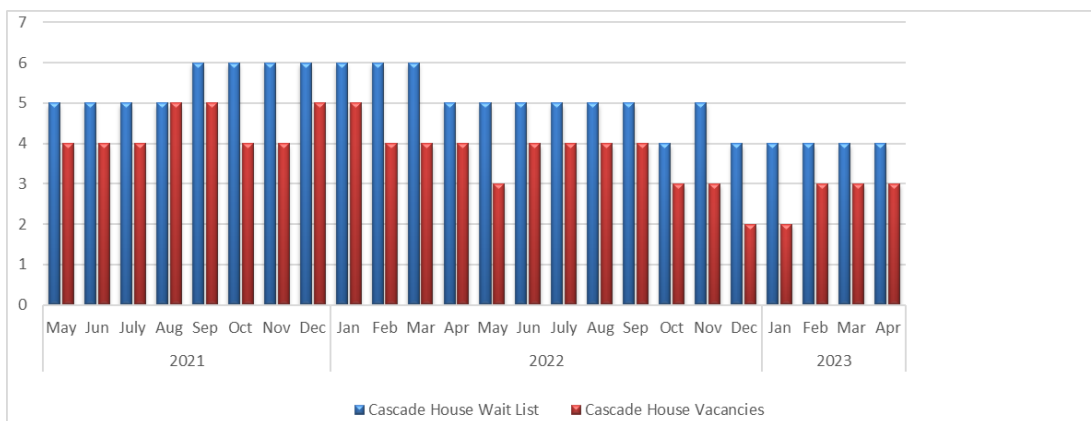
- The lodge has sixty-three residential suites.
- Of those suites, fifty-six are occupied or available for occupancy.
- The other suites are not available for occupancy. They are not captured in the chart below but include the following:
 - Seven are being utilized as offices, storage, breakroom, and amenity spaces.
- 84% of the habitable suites are occupied or awarded pending move-in.
- Eighteen candidate households are wait-listed, and most are not ready to move in.



Cascade House (Seniors Lodge) in Banff

Occupancy and waitlist as of April 20, 2023:

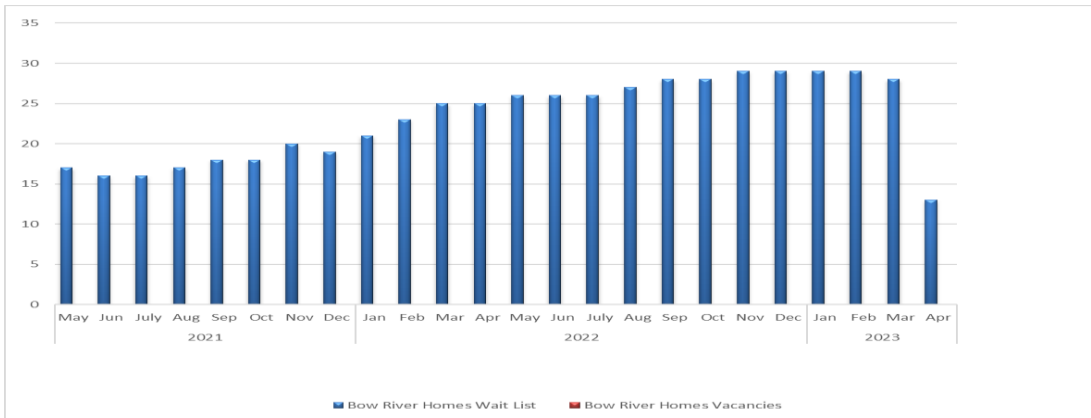
- The lodge has twenty-two residential suites.
- Of those suites, nineteen are occupied or available for occupancy.
- The other suite is not available for occupancy. They are not captured in the chart below but include:
 - Three are being rehabilitated.
- 84% of the habitable suites are occupied or awarded pending move-in.
- Four candidate households are wait-listed, and all of them are not yet ready to move in.



Bow River Homes (Seniors Self-Contained) in Canmore

Occupancy and waitlist as of April 20, 2023:

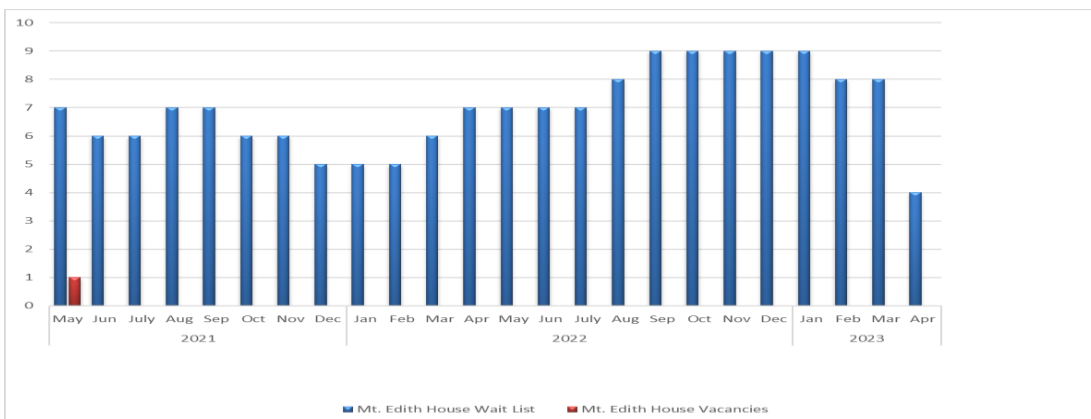
- The project has twenty-eight self-contained residential suites.
- Of those suites, twenty-seven are occupied or available for occupancy.
- The other suite is not available for occupancy. They are not captured in the chart below but include the following:
 - One that is being rehabilitated.
- 100% of the habitable suites are occupied or awarded pending move-in.
- Thirteen candidate households are wait-listed.



Mount Edith House (Seniors Self-Contained) in Banff

Occupancy and waitlist as of April 20, 2023:

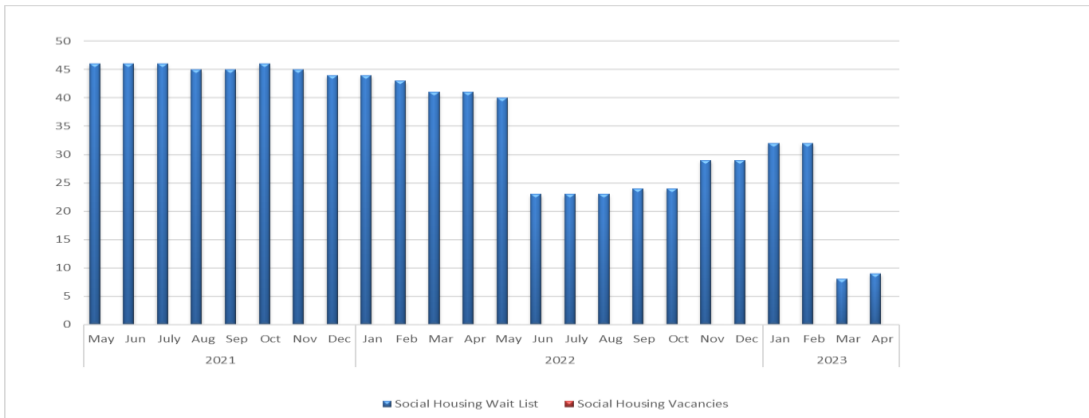
- The building has thirty-four self-contained residential suites.
- Of those suites, thirty-two are occupied or available for occupancy.
- The other suite is not available for occupancy. They are not captured in the chart below but include the following:
 - Two that are being rehabilitated.
- 100% of the habitable suites are occupied or awarded pending move-in.
- Eight candidate households are wait-listed.



Community Housing Projects in Canmore

Occupancy and waitlist as of April 20, 2023:

- The portfolio has fifty-eight individual residential units.
- Of those fifty-eight units, fifty-five are occupied or available for occupancy.
- The other suites are not available for occupancy. They are not captured in the chart below but include the following:
 - Three are being rehabilitated.
- 100% of the habitable suites are occupied.
- Nine candidate households are wait-listed.



Rent Supplement (RS) Programs in the Bow Valley Region.

Occupancy and waitlist as of April 20, 2023:

- A monthly budget of \$32,370.00.
- Providing financial subsidies to sixty-one active client households.
- Two candidate households are wait-listed.
- The monthly subsidy totalled \$31,163.00, averaging \$511.00 per client household.
- Of our active RS client households:
 - 50 live in Canmore
 - 7 live in Banff
 - 2 live in Deadman's Flat
 - 2 live in Exshaw

Monthly Bulletin

April 2023



NEWS, INITIATIVES, AND EVENTS

Spring Garden Party

Our Spring Garden Party returns to Bow River Lodge to celebrate seniors on June 10, 2023! This year marks a return to pre-pandemic partying, so please save the date and join us to recognize our seniors and enjoy fun activities, yummy treats, and a great band. We also hope to allow tours of the first floor of the new wing.

Designated Supportive Living (DSL) Operations

We were proud and excited to continue to welcome DSL residents into the new wing at Bow River Lodge. The program brings public DSL care to the region for the first time and will help keep seniors close to their loved ones and supports in the community for longer. We expect up to 30 former residents of the region who left to access this level of care will return to live at Bow River Lodge!

We thank the Government of Alberta, Alberta Seniors, Community and Social Supports, Alberta Health, Alberta Health Services, and SE Health for helping us bring this facility to Canmore and the Bow Valley region. There will be a Grand Opening in April, so stay tuned for more about that.

2022 Audit

The Board accepted the annual external audit, including the audited 2022 financial statements, in March.

PROGRAM OCCUPANCY RATES

Bow River Lodge	84%
Cascade House	84%
Bow River Homes	100%
Mount Edith House	100%
Community Housing	100%
Rent Supplement	100%

SPECIAL PROJECTS

This is Home (Phase 3+)

We have submitted a draft business case to Alberta Seniors, Community, and Social Supports for our Phase 3+ Projects. These projects, if approved, would refresh much of our Community and Seniors' Independent Housing stock while adding different types and affordability levels of housing to the region in Canmore and perhaps elsewhere. We hope that the GOA will appreciate and be able to approve the opportunity here and that we will be able to collaborate with them, the Town of Canmore, and perhaps other Housing Agencies to address some of the housing crisis in the Bow Valley.

RESOURCES

- In an emergency, please dial **911**
- For 24/7 nurse advice and general health information for Albertans information on diseases, treatments, staying well, and healthcare services, dial **811**
- For 24/7 community service information, including affordability programming for residents of the Bow Valley, dial **211**

ABOUT BOW VALLEY REGIONAL HOUSING

Bow Valley Regional Housing (BVRH) is a Housing Management Body (HMB) serving the Government of Alberta and the Bow Valley Region. HMB operational funding sources vary. Tenants pay accommodation fees. Those fees are subject to affordability limits, preventing them from fully covering operations costs. Provincial grants and municipal ratepayer requisitions subsidize seniors lodge deficits, while the Province also finances deficits in independent seniors and community housing.

As the HMB for the Bow Valley region, BVRH is responsible for social housing, as well as affordable supportive living accommodation for seniors throughout Kananaskis Country, the Bow Corridor, the MD of Bighorn, and all of Banff National Park, an area covering about 13,500 square kilometers. All told, we currently house or help to house approximately 400 residents of the Bow Valley in eight permanent housing projects encompassing 36 separate buildings.



More information is available on our website at
www.bvrh.ca



Administrative Update

DATE OF MEETING:

May 16, 2023

Agenda #: F-1

A. CAO's Office

1. CAO

- a) Several members of the Executive Office attended the Provincial announcement about the transfer of the moustache lands to the Town for affordable housing. Administration has signed a reservation agreement for these lands with Alberta Seniors, Community, and Social Services that gives us three years to prepare an affordable housing project proposal that aligns with the community's affordable housing needs assessment, ensure the proposed development aligns with the *Affordable Housing Partnership and Asset Management Frameworks* of Alberta Social Housing Corporation, pursue adequate funding commitments for construction, and secure all required permits and approvals. Once the Palliser ASP is approved, Administration will begin working on next steps for these lands.
- b) Attended a meeting with Deputy Mayor Foubert, the President of the Bow Valley Chamber of Commerce, Minister Nixon, MLA Rosin, and the Mayor and Town Manager from the Town of Banff to discuss the need for employee housing in the Bow Valley.
- c) Attended an event with Deputy Mayor Foubert, Philippine Consulate General Zaldy Patron, and members of the Canmore Filipino Society celebrating Filipino restaurant month.
- d) Work on the 2022 capital project to create a Service Level Inventory is well underway. Draft service levels for all departments have been drafted and managers have met with the consultant to verify the accuracy of the drafts. The next stage is to finalize the inventory. Once this is complete the inventory will be brought to Council before beginning the second stage of this work, which is to determine current service levels as a potential tool for budget discussions.

B. MUNICIPAL SERVICES

1. Community Social Development

- a) In Partnership with YWCA Banff, the Town of Canmore's Community Evaluator has finished administering surveys for Rural Development Network's (RDN) Housing and Service Needs Assessment (formerly the homelessness estimation project). The resulting report will be presented to council in fall, 2023.
- b) An amended Affordable Services program opened on May 1, 2023. The Affordable Services Program is a coordinated community response that provides eligible residents with increased access to supports aimed at making Canmore a livable community for all. For more information, please visit: [Town of Canmore - Affordable Services Program](#)
- c) To support Ukrainian individuals who live in Canmore, the Community Evaluator, organized a Pysanky workshop, in partnership with Settlement Services and artsPlace. The workshop was designed to connect the Ukrainian community, to understand how Ukrainians are integrating into the Bow Valley, and to understand what additional supports are needed. 61 individuals attended the workshop. All participants commented that they are grateful for the supports that they have received in the Bow Valley. Recommended additional supports included: social

activities, resume building, support with transferring professional qualifications, understanding the road to Permanent Residency, and legal/contract advice.

2. Fire-Rescue

- a) Fire-Rescue has moved a full-time firefighter into an acting position to coordinate and schedule training activities for the fire department while recruiting for the Deputy Chief of Training/Safety is proceeding.
- b) Four new firefighter recruits have been onboarded into casual positions.

3. Protective Services

- a) The paid parking enforcement team are taking the Peaks Academy training provided by Tourism Canmore Kananaskis to promote and enhance the visitor experience. This online training tool will further enrich the public interactions of the paid parking enforcement team while they are conducting patrols in both the downtown and at Quarry Lake.

4. Economic Development

- a) Canada Day celebrations will look a little different in 2023. The Canada Day Society has dissolved, and as such, a variety of community activities will no longer be included in the days' celebrations, including; afternoon programming and live music at the Stan Rogers Stage and the fireworks display at Millennium Park.

Due to a lack of visitation at Centennial Park during Canada Day, the In-field Marching Band performance will not occur and instead, Arts & Events (A&E) intends to showcase marching bands via an extended parade route. The extended parade route will include both Railway Avenue and 10th St, which were previously utilized as a disbanding route (map attached).

- b) Engagement has started on the Labour Market Strategy and employees are invited to provide feedback on <https://www.mycanmore.ca/labour-market-survey>. The Employer Surveys was sent out through the Economic Development Business e-update as well as through partner organizations such as the Chamber of Commerce, Bowda, TCK, Downtown Canmore BIA and the Banff Canmore Job Resource Centre. Consultation with the Stoney Nakoda Nation is also underway.

C. CORPORATE SERVICES

1. Communication

- a) Website Renewal Project Update - We continue to work with our website design vendor, LOOP, to develop a refreshed and more user-friendly website for the Town of Canmore which will improve our online presence and enhance the services we provide to the community. New features will include a digital calendar, enhanced search function, interactive trails map tool, and a report an issue tool with backend tracking. Our new site map is finalized and we are streamlining our web content to better serve our residents. The new site is scheduled to launch in early July. Follow our progress at www.mycanmore.ca/newwebsite

2. Municipal Clerk

- a) We are working with a consultant to develop governance and procedures for carrying out privacy impact assessments (PIAs). A PIA is a standardized tool used to identify, document, and

address privacy risks associated with programs and initiatives of public bodies. We have been attempting to carry out PIAs using templates from the Privacy Commissioner’s website, however we lack experience and expertise in this area and have entered into a contract with a FOIP expert to provide a privacy breach determination form, and PIA assessment process, and a customized PIA template.

D. MUNICIPAL INFRASTRUCTURE

1. Planning & Development

- a) New Information Guides - As the 2023 construction season begins to kick-off, the Planning Department has prepared new informational guides to help residents with their spring construction projects. There are three new guides for Decks, Fences, and Accessory Buildings. These guides answer frequently asked questions and provide advice on required permits and can be downloaded from the Town’s website at: <https://canmore.ca/municipal-services/residents-development-planning> and scrolling down to the How Can We Help You Today? Section.
- b) E-newsletter – Those who are interested in staying up to date on the latest development and construction process and policy updates, as well as Land Use Bylaw and Engineering Design and Construction Guideline interpretations, are encouraged to sign-up for Planning and Engineering e-newsletter by going to: <https://canmore.ca/municipal-services/residents-development-planning> and entering their e-mail address.

2. Engineering Services

- a) Cougar Creek (1562): Drilling and grouting is progressing on schedule with rock conditions consistent with expectations.
- b) Community speed limit changes will be implemented late May or in June. The initial work includes speed monitoring before changes at 14 locations, and signage replacement. Data collected after the speed limit changes will be used to determine where traffic calming will be implemented. Budgets will permit up to 5 locations to receive traffic calming islands in 2023. Materials have been ordered, and fall installation is anticipated.

3. Facilities

- a) Fire Station Construction (7229): Construction continues to progress. There is interest in building for net-zero among the building and development community of the Bow Valley and some builders have requested and received tours of the facility. As a leader in sustainable building development, we have supported showcasing the site to interested builders and welcome their interest in better understanding our building assembly and best practices.
- b) CRC Rooftop Solar Expansion - Phase 2 (7232): Work is completed with minor deficiencies being completed by the contractor prior to issuing the Construction Completion Certificate. Work was completed ahead of schedule and on budget.
- c) CRC Lifecycle Maintenance (LCM) – Remnant Funds (7009): Remnant LCM funds are being applied to a roofing replacement over rooms 115, 116 and the hallway connecting to the gymnastics space, as well as brick façade repairs in this section. This area was originally removed from scope from the LCM project, however, there have been roof leaks. This scope of work is currently being procured.

- d) Elevation Place Lifecycle Maintenance Project (7287):
- Pool gutter repairs and tile repairs for the leisure pool and hot tub will be completed during the annual shutdown. The pool gutter contractor has been procured. Procurement for tile repairs is underway.
 - Waterslide Repairs: Structural consultants have completed preliminary design for the concrete platform repairs for the waterslide in the Aquatic Centre at Elevation Place. Once the design solution is vetted preliminary pricing estimates will be submitted for review. The slide will remain closed until the repairs are completed.

4. Public Works

- a) Wapiti Campground
- Campground will be open on April 28 until Thanksgiving weekend.
 - Rates are unchanged from last year, according to their website the rate for an un-serviced, walk in only tent site is \$32.00 per unit, per night and the rate for a powered RV site is \$42.00 per unit, per night.
- b) Parks
- The Parks FT team is actively recruiting for Parks Workers. Cost and availability of housing and higher wages elsewhere are presenting recruiting challenges.
 - Memorial Plaque allocations for this year are completed. Plaques have been installed on the benches. We received 15 applications; 1 person withdrew so 14 total were completed. Applications for the 2024 program will open October 2nd this year.
- c) Streets and Roads
- Street sweeping – the formal street sweeping program began on Monday April 24 and will continue for approximately 2-4 weeks depending on weather. This program cleans salt and sand from the roadways to keep contaminants out of drainage and watersheds, control dust, and create safe operating surfaces for users. Enforcement, Communications, and Fleet Services technicians are key supports to a successful program.
 - Electric Vehicles – all three new electric vehicles have been received. The Town of Canmore now owns two Hyundai Kona's and one Chevrolet Bolt. Funding from the Municipal Climate Action Centre supported these vehicle purchases as the Town moves toward electrification of its fleet.
- d) Solid Waste Services
- Compost Giveaway – After the sold out success of the events of the past two years an additional event will be added this year. The events promote food waste diversion, and will happen on May 18th and May 25th from 2pm-7pm. Sign up details were advertised beginning in early May. Residents will sign up for a time slot for either day and will be able to take 100 litres of compost.
 - Yard Waste – the yard waste containers are back at the Boulder Crescent Recycling Depot. Residents can bring grass clippings, leaves and branches. The yard waste is hauled to the Francis Cooke Resource Recovery Centre and Landfill where it is composted or chipped for reuse.
 - Spring Clean Up – Strides Running Store and the Rotary Club organized litter clean ups for Earth Day on April 22. The Town supported these events by providing picker sticks, bags, and gloves. Five hundred kilograms of litter was collected between both events.

e) Utilities

- Regulatory: There was a contravention of the Town's Wastewater Approval to Operate on March 30th. It was an administrative contravention when an influent sample pump failed to take samples between 8AM and 4:30PM. This did not affect the quality of the effluent discharged to the Bow River. EPCOR has completed an investigation have put in place actions to prevent this from happening in the future.
- Services Disruptions / Operational Work:
 - March 17: EPCOR responded to several areas of Town to address poor drainage of the storm system. Locations include Grizzly Crescent and 17th Street by Canmore Collegiate.
 - March 23: EPCOR responded to a sewer back up along Kananaskis Way. The service was blocked due to large amounts of grease. The service line was cleaned and inspected with no other issues noted.
 - March 30: EPCOR responded to a request to close a sanitary service along the 2nd Avenue (as part of the Low-Pressure Sewer System) to replace the check valve. The request was premature as the issue was on the private side and related to a closed gate valve was in the closed position. In summary there was no need to excavate the line, saving approximately \$12,000.
 - April 11: EPCOR responded to a damaged hydrant in the Canmore Recreation Centre parking lot. It was damaged due to a concrete jersey barrier being placed too close. The barrier was removed, and EPCOR completed the hydrant repair.
 - April 14: EPCOR responded to a utility strike by a contractor working on the ATCO gas line along Hwy 1. A site visit confirmed damage to a valve casing and it was repaired the same day.

f) Sustainability

- Administration will be coming to Council on July 4, 2023, with a recommendation to address open doors of commercial businesses in Canmore. This presentation from Administration is in response to the presentation received by Council from the Bow Valley Clean Air Society in July 2022 requesting that Council implement a Closed-Door Bylaw from early September to early June.
- Administration has partnered with ICLEI Local Governments for Sustainability Canada and Co-operators in a Financing Resilient Infrastructure Project. Canmore was one of 13 municipalities from across Canada invited to participate in this project. The goal of this project is to build capacity to support the implementation of climate adaptation projects in the face of climate change and increasing natural hazards and risks. Through this project the Town will have a suite of infrastructure project prospectuses developed. These prospectuses will include elements relating to budgeting, project financing, timing, partnerships, measuring progress, and trouble shooting. These prospectuses will be reviewed by Co-operators and may be eligible for funding from them. The prospectuses will also put the Town in the position to have project information on hand for grant opportunities that come up. All prospectuses will be written in a way that aligns with the questions asked in major grant applications.
- The Municipal Climate Change Action Centre (MCCAC) funded project for the development of the Emergency Response Plans for Extreme Heat and Wildfire Smoke wrapped up in late April. To meet the grant requirements, a post was made on social media to thank MCCAC for this funding opportunity in early May. Administration plans to return to Council this year to provide an overview of the results of this project.

- Administration (Sustainability and Municipal Enforcement) attended Bear Days on April 22 to increase awareness of the Town's Fruit Tree Incentive Program, which was revamped and launched in mid-April.
- The Lower Silvertip Wildlife Corridor (LSWC) Working Group is in the process of reviewing the draft LSWC Management Plan and circulating it within their respective organizations. A final draft of the LSWC Management Plan is expected to be completed in June. The Working Group has also set up an engagement session in late May with the organizations that represent the various trail user groups to discuss the trail network within the LSWC. The results of this engagement session will be incorporated into the final LSWC Management Plan and presented to Council during summer/fall 2023.
- Administration (Sustainability and Solid Waste Services) has hired a 'Sustainability Scholar' to conduct research into best practices for the management of Construction, Renovation and Demolition (CRD) waste. The University of Alberta coordinates the Sustainability Scholar program, which connects graduate students with municipalities and other organizations to work on sustainability-related projects. The Town is providing \$5,000, with the remainder of the student salary paid by the University of Alberta. The Scholar will be working remotely from May 15 to August 25. Their research and recommendations will provide the foundation for a 2024 project to develop a CRD waste strategy.

Council Resolution Action List

G1

Motion #	Agenda Item	Resolution	Council Mtg Date	Service Area	Action Status	Last Update	Date Complete
99-2021	MOU with Stoney Nakoda	Direct administration to investigate and report back on the scope, process and resources needed to establish a Memorandum of Understanding (MOU) with the Stoney Nakoda Nation.	27-Apr-21	CST	The Stoney Nakoda Nation have indicated that they would like access to lands within the Town of Canmore boundaries for cultural ceremonies. This would help in building relationships that will assist with establishing an MOU in the future. Council approved a request to advance this work at the Sept 7, 2021 council meeting. Administration continues to reach out to the Stoney Nakoda Administration to advance this work.	18-Apr-23	
216-2021	Advancing Truth and Reconciliation with the Stoney Nakoda Nation	Direct administration to work with the Stoney Nakoda Nation to identify lands within the Town of Canmore boundaries that would be appropriate for cultural ceremonies and assist with any necessary agreements for the use of these lands.	7-Sep-21	CST	Work is ongoing. The next step for this items rests with the Stoney Nakoda Nation.	18-Apr-23	
219-2021	Lower Silvertip Wildlife Corridor	Direct administration to assemble a working group consisting of key Lower Silvertip Wildlife Corridor landowners to develop principles for and an approach to shared management of the corridor.	7-Sep-21	Public Works Admin	The Lower Silvertip Wildlife Corridor Working Group has produced a draft shared management plan. Engagement with various trail user groups is underway. After the engagement is complete, the shared management plan will be finalized.	5-Apr-22	
79-2022	Procedural Bylaw Amendment 2022-04 Omnibus	Direct administration to investigate the options for video and audio being treated as written submissions and imbedded in the record of public submissions.	5-Apr-22	Clerks	IT and the Municipal Clerk continue to investigate options as part of the capital project to update Council Chambers A/V. This would be part of phase 2 of this project - Agenda Management Software	13-Feb-23	
149-2022	Bow Valley Clean Air Society	Review and recommendation of implementing a closed-door bylaw from approximately early September to early June; and, if the recommendation is in support of the request, to provide Council with a draft closed door bylaw for consideration.	5-Jul-22	Public Works	An administration update was provided to the Committee of the Whole in November 2022. Monitoring of doors occurred over the winter with a report planned to come to Council in July.	27-Apr-23	
258-2022	Bylaws 2022-09 and 2022-10 800 3rd Avenue Municipal Development Plan and Land Use Bylaw Amendments	Return no later than June 2023 with a response from the applicant regarding motion 125-2022: That Council direct administration to work with the Applicant to prepare a recommendation and/or wording for a potential amendment with respect to Bylaws 2022-09 and 2022-10 ("the Bylaws") regarding each of the following topics and provide the said recommendation and/or wording to Council prior to the 2nd reading of the Bylaws. • Limiting house sizes in the subject area; • Creation of a legal instrument upon all parcels of the subject lands, which will include the following elements: (i) if a palliative care facility is not constructed in Area A then Area A will revert to the owner and the land in Area A will remain in a natural state; (ii) there is to be no trail or road connection between the Spring Creek development and 3rd Avenue through the subject lands; and (iii) the lands shall be protected in perpetuity from any further development except as described in the application; • Minimizing the distance between the buildings in Area B and 3rd Avenue in order to minimize the disruption to the undeveloped areas of the lands; • Removing the buildings in Area C, subject to an agreement between the Spring Creek development and the Applicant whereby the Spring Creek development provides at its own cost water servicing to the palliative care facility (if such is determined to be needed) and provides at its own cost fill, landscaping, and a trail for Area C to become a park; and • Limiting maximum building height.	1-Nov-22	Planning	This item will be on the June 6, 2023 regular meeting agenda.	25-Apr-23	
31-2022FIN	Finance Committee Deliberation and Direction	Develop a Paid Parking Revenue Allocation Model (PPRAM) for approval prior to the 2024 budget amendment in fall of 2023.	24-Nov-22	Fin	Administration began preliminary discussions on the allocation model in April.	25-Apr-23	
57-2022FIN	Finance Committee Deliberation and Direction	Explore options with regards to a car share program and report back to Council no later than the end of 2023.	29-Nov-22	Eng			
61-2022FIN	Finance Committee Deliberation and Direction	Reassess the Canmore Community Housing requisition in the fall of 2023 for the 2024 budget amendment to ensure alignment with any new programs or priorities.	29-Nov-22	Council/CCH	This motion has been sent to the Interim ED of CCH for planning purposes	27-Mar-23	

62-2022-FIN	Finance Committee Deliberation and Direction	Include provincial downloading in the annual budget process.	29-Nov-22	CST	Administration has started a tracking system in advance of the 2024 budget amendments process.	2-Feb-23	
285-2022	Update on Council Resolution 251-2021 – Election Signage	Return to Council with options for regulating or managing election signage on municipal property by December 2023.	6-Dec-22	Planning			
69-2023	Mandatory Commercial Food Waste Diversion Bylaw	Direct administration to return with a process and recommendations for directing revenue resulting from enforcement from the specified fine+C2s except for sections 4.7(a) and 7.1 in Bylaw 2023-15 to the Wildsmart Program.	4-Apr-23	Finance			
70-2023	Procedural Bylaw Amendment 2022-04 Omnibus	Have the procedural bylaw amendment 2023-16 omnibus and bylaw 2016-19(finance committee bylaw) reviewed by an independent governance expert and that council direct administration to report back to council with alternative methods for the public to be heard by council before or during regular business meetings and committee of the whole meetings.	4-Apr-23	CAO	Requests for quotes on the procedural bylaw and finance committee bylaw reviews have been sent to multiple individuals with governance expertise and agencies that have governance expertise in their portfolio. The work was awarded to Nolan Crouse and is on track to return to Council at the June business meeting.	18-Apr-23	



Correspondence

DATE OF MEETING:

May 16, 2023

Agenda #: H

1. Letter from Minister Dreeshen Re: Calgary-Banff Passenger Rail
2. Letter from Alberta Municipal Affairs Re: ICFs
3. Marigold Library System Annual Documents and Plan of Service
4. Letter from the RCMP Re: Wildfire Situation



ALBERTA

TRANSPORTATION AND ECONOMIC CORRIDORS

*Office of the Minister
MLA, Innisfail-Sylvan Lake*

March 7, 2023

AR 92518

Her Worship Jyoti Gondek
Mayor
City of Calgary
Office of the Mayor
PO Box 2100, Station M
Calgary AB T2P 2M5
themayor@calgary.ca

Her Worship Corrie DiManno
Mayor
Town of Banff
110 Bear Street
PO Box 1260
Banff AB T1L 1A1
corrie.dimanno@banff.ca

His Worship Sean Krausert
Mayor
Town of Canmore
902 - 7 Avenue
Canmore AB T1W 3K1
sean.krausert@canmore.ca

His Worship Jeff Genung
Mayor
Town of Cochrane
101 RancheHouse Road
Cochrane AB T4C 2K8
jeff.genung@cochrane.ca

Dear Mayors:

Honourable Danielle Smith, Premier of Alberta, forwarded me your letter regarding development of a transit system connecting the City of Calgary to Banff National Park. As Minister of Transportation and Economic Corridors, I appreciate the opportunity to provide the following information.

As you may be aware, I have a mandate from the Premier to explore opportunities to work on the construction of a light-rail transit (LRT) and rail link between Calgary International Airport, downtown Calgary, and Canmore/Banff.

A proposal was submitted through the Government of Alberta's unsolicited proposal process in late 2021 to explore the Calgary-Banff Passenger Rail Line. The initial proposal for the private development of a passenger rail service has been reviewed, and Transportation and Economic Corridors continues to work with the proponent.

.../2

In addition to the passenger rail from Calgary to Banff, the Premier has shared the view that a direct link between Calgary International Airport and downtown, via the City of Calgary LRT network, should be a transportation priority for both the City and the Government of Alberta.

The needs of the City of Calgary, the Calgary Airport Authority, and the freight supply chain for Alberta's grain and other rail exports must be considered while exploring future transit investment priorities and opportunities with the private sector in the Calgary and Bow Valley regions.

Thank you for sharing the Bow Valley Alliance's support and vision of positive benefits of the development. Given the complexity, the Government of Alberta is looking forward to continued work with you and other stakeholders on the Calgary-Banff Passenger Rail project and other important infrastructure projects in the region.

Thank you for writing.

Sincerely,



Honourable Devin Dreeshen, ECA
Minister of Transportation and Economic Corridors

cc: Honourable Danielle Smith, ECA, Premier of Alberta
Honourable Jason Copping, ECA, MLA for Calgary-Varsity
Honourable Peter Guthrie, ECA, MLA for Airdrie-Cochrane
Honourable Matt Jones, ECA, MLA for Calgary-South East
Honourable Mike Ellis, ECA, MLA for Calgary-West
Honourable Mickey Amery, ECA, KC, MLA for Calgary Cross
Honourable Tanya Fir, ECA, MLA for Calgary-Peigan
Honourable Whitney Issik, ECA, MLA for Calgary-Glenmore
Miranda Rosin, MLA for Banff-Kananaskis
Richard Gotfried, MLA for Calgary-Fish Creek



ALBERTA
MUNICIPAL AFFAIRS

*Office of the Minister
MLA, Calgary-Shaw*

AR111331

April 11, 2023

Dear Chief Elected Official:

Intermunicipal Collaboration Framework agreements (ICFs) between municipalities with shared boundaries are designed to provide for integrated and strategic planning, delivery, and funding of intermunicipal services.

ICFs are created with the understanding that things change over time, and there is a requirement to review those frameworks regularly to ensure they are current and meet the needs of the municipalities that are parties to the framework.

I have heard from some municipalities that it will be challenging to meet the review period of “at least every five years” from the date that their original ICF was signed while the ministry is concurrently reviewing the ICF provisions within the *Municipal Government Act*. Given those concerns, I have signed Ministerial Order No. MSD:24/23, extending the review period from five to seven years.

For clarity, this does not impact the obligation to have an ICF in place and current agreements are still in effect. In other words, the time extension does not mean municipalities can forfeit their obligations within their agreement, including cost-sharing, shared services, and any agreed-upon review period. We recommend municipalities hold off on renegotiation discussions in light of the potential for further amendments.

In addition to this extension, my ministry can provide additional supports to assist with mediation or facilitation services if needed. Questions regarding ICFs can be directed to a Municipal Collaboration Advisor at icf@gov.ab.ca or toll-free by first dialing 310-0000, then 780-427-2225.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Rebecca Schulz'.

Rebecca Schulz
Minister

Attachment: Ministerial Order No. MSD:024/23

cc: Chief Administrative Officers

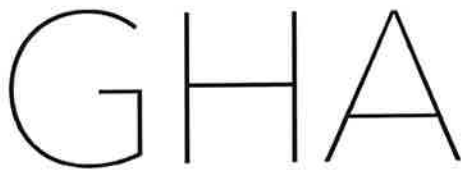
MARIGOLD LIBRARY SYSTEM
FINANCIAL STATEMENTS
DECEMBER 31, 2022

MARIGOLD LIBRARY SYSTEM

DECEMBER 31, 2022

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GREGORY
HARRIMAN
& ASSOCIATES LLP
CHARTERED PROFESSIONAL ACCOUNTANTS

INDEPENDENT AUDITOR'S REPORT

To the Board of Marigold Library System:

Opinion

We have audited the financial statements of Marigold Library System (the System), which comprise the statement of financial position as at December 31, 2022, and the statement of operations and changes in fund balances and cash flows for the years then ended, and notes to the financial statements, including a summary of significant accounting policies.

In our opinion, the accompanying financial statements present fairly, in all material respects, the financial position of Marigold Library System as at December 31, 2022, the results of its operations and its cash flows for the year then ended in accordance with Canadian accounting standards for not-for-profit organizations.

Basis for Opinion

We conducted our audit in accordance with Canadian generally accepted auditing standards. Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are independent of the System in accordance with the ethical requirements that are relevant to our audit of the financial statements in Canada, and we have fulfilled our other ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Responsibilities of Management and Those Charged with Governance for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with Canadian accounting standards for not-for-profit organizations, and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is responsible for assessing the System's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the System's financial reporting process.

Auditor's Responsibility for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an Auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Canadian generally accepted auditing standards will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements. As part of an audit in accordance with Canadian generally accepted auditing standards, we exercise professional judgment and maintain professional skepticism throughout the audit.

We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omission, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the System`s internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management`s use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the System`s ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our Auditor`s report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our Auditor`s report. However, future events or conditions may cause the System to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

Gregory, Harriman & Associates LLP

Strathmore, Alberta
April 22, 2023

Gregory, Harriman & Associates LLP
Chartered Professional Accountants

**MARIGOLD LIBRARY SYSTEM
STATEMENT OF FINANCIAL POSITION
AS AT DECEMBER 31, 2022**

	OPERATING FUND	CAPITAL FUND	TOTAL
	2022	2022	2021
CURRENT ASSETS			
Cash (Note 4)	\$ 1,706,230	\$ 403,000	\$ 2,109,230
Accounts Receivable	39,782	-	39,782
Goods and Services Tax Receivable	5,523	-	5,523
Prepaid Expenses (Note 5)	187,151	-	187,151
	<u>1,938,686</u>	<u>403,000</u>	<u>2,341,686</u>
LONG TERM PREPAID EXPENSE (Note 5)	54,204	-	54,204
TANGIBLE CAPITAL ASSETS, Net (Note 6)	-	7,039,675	7,039,675
INTANGIBLE CAPITAL ASSETS, Net (Note 7)	-	52,969	52,969
TOTAL ASSETS	<u>\$ 1,992,890</u>	<u>\$ 7,495,644</u>	<u>\$ 9,488,534</u>
CURRENT LIABILITIES			
Accounts Payable and Accrued Liabilities (Note 8)	\$ 272,285	\$ 11,811	\$ 284,096
Deferred Revenue (Note 9)	417,139	-	417,139
Current Portion of Capital Lease (Note 10)	-	11,084	11,084
	<u>689,424</u>	<u>22,895</u>	<u>712,319</u>
LONG TERM DEBT			
Obligations under Capital Lease (Note 10)	-	8,645	8,645
Unamortized External Contributions (Note 11)	-	2,311,323	2,311,323
	<u>-</u>	<u>2,319,968</u>	<u>2,319,968</u>
TOTAL LIABILITIES	<u>689,424</u>	<u>2,342,863</u>	<u>3,032,287</u>
FUND BALANCES			
Invested in Capital Assets (Note 12)	-	4,749,781	4,749,781
Internally Restricted (Notes 3, 13)	1,121,467	403,000	1,524,467
Unrestricted	181,999	-	181,999
	<u>1,303,466</u>	<u>5,152,781</u>	<u>6,456,247</u>
TOTAL LIABILITIES AND FUND BALANCES	<u>\$ 1,992,890</u>	<u>\$ 7,495,644</u>	<u>\$ 9,488,534</u>
ECONOMIC DEPENDENCE (Note 2)			
SUBSEQUENT EVENTS (Note 16)			
SIGNIFICANTLY INFLUENCED NOT-FOR-PROFIT ORGANIZATION (Note 17)			

Approved by: _____ Director *M.S. Kirbank* Director

The accompanying notes form an integral part of these financial statements.

MARIGOLD LIBRARY SYSTEM
STATEMENT OF OPERATIONS AND CHANGES IN FUND BALANCES
FOR THE YEAR ENDED DECEMBER 31, 2022

	2022	2022	2022	2021
	OPERATING FUND	CAPITAL FUND	INTERNALLY RESTRICTED	TOTAL
REVENUE (Schedule 1)	\$ 5,864,179	\$ 149,145	\$ -	\$ 6,013,324
EXPENSES (Schedule 2)	5,566,056	374,276	-	5,940,332
EXCESS (DEFICIENCY) OF REVENUE OVER EXPENSES	298,123	(225,131)	-	72,992
Direct Increase in Capital Fund (Note 11)				571,556
Transfers from (to) Reserves (Note 13)	(120,000)	(90,000)	210,000	-
Interfund Transfers (Note 15)	(175,426)	175,426	-	-
	2,697	(139,705)	210,000	72,992
Fund Balances, beginning of year	179,302	4,889,486	1,314,467	6,383,255
FUND BALANCES, END OF YEAR	\$ 181,999	\$ 4,749,781	\$ 1,524,467	\$ 6,456,247
				\$ 6,383,255

The accompanying notes form an integral part of these financial statements.

MARIGOLD LIBRARY SYSTEM
STATEMENT OF CHANGES IN FUND BALANCES
FOR THE YEAR ENDED DECEMBER 31, 2022

	<u>2022</u>	<u>2022</u>	<u>2022</u>	<u>2022</u>	<u>2022</u>	<u>2021</u>
	Total	Capital Internally Restricted	Operating Internally Restricted	Operating Unrestricted	Total	Total
FUND BALANCES, beginning of year	\$ 4,889,486	\$ 313,000	\$ 1,001,467	\$ 179,302	\$ 6,383,255	\$ 5,701,633
EXCESS (DEFICIENCY) OF REVENUE OVER EXPENSES	(225,131)	-	-	298,123	72,992	110,066
DIRECT INCREASE IN CAPITAL FUND (Note 11)	-	-	-	-	-	571,556
INTERFUND TRANSFERS (Note 15)	85,426	90,000	120,000	(295,426)	-	-
FUND BALANCES, end of year	<u>\$ 4,749,781</u>	<u>\$ 403,000</u>	<u>\$ 1,121,467</u>	<u>\$ 181,999</u>	<u>\$ 6,456,247</u>	<u>\$ 6,383,255</u>

The accompanying notes form an integral part of these financial statements.

**MARIGOLD LIBRARY SYSTEM
STATEMENT OF CASH FLOWS
FOR THE YEAR ENDED DECEMBER 31, 2022**

	OPERATING ACTIVITIES		FINANCING & INVESTING		TOTAL	
	Operating Fund	2022	Capital Fund	2022	2022	2021
SOURCES OF CASH	\$	\$	\$	\$	\$	\$
Municipal Levies	3,657,507	3,657,507	-	-	3,657,507	3,403,388
Grants	1,933,852	1,933,852	-	-	1,933,852	1,953,636
Other Contributions	24,873	24,873	129,812	129,812	154,685	(127,541)
Reimbursements	137,359	137,359	-	-	137,359	234,738
Investment Income	68,126	68,126	-	-	68,126	29,712
	<u>5,821,717</u>	<u>5,821,717</u>	<u>129,812</u>	<u>129,812</u>	<u>5,951,529</u>	<u>5,493,933</u>
USES OF CASH						
Purchases and Salaries	(5,609,853)	(5,609,853)	(82,637)	(82,637)	(5,692,490)	(5,068,338)
Purchase of Tangible Capital Assets	-	-	(137,008)	(137,008)	(137,008)	(3,816,643)
Proceeds from Disposal of Capital Assets	-	-	15,000	15,000	15,000	-
Repayment of Obligations under Capital Lease	(5,609,853)	(5,609,853)	(10,593)	(10,593)	(10,593)	(10,124)
	<u>211,864</u>	<u>211,864</u>	<u>(85,426)</u>	<u>(85,426)</u>	<u>126,438</u>	<u>(3,401,172)</u>
NET CASH INCREASE (DECREASE)						
Cash, Opening	1,669,792	1,669,792	313,000	313,000	1,982,792	5,383,964
Interfund Adjustments	(175,426)	(175,426)	175,426	175,426	-	-
	<u>1,706,230</u>	<u>1,706,230</u>	<u>403,000</u>	<u>403,000</u>	<u>2,109,230</u>	<u>1,982,792</u>
CASH CLOSING (Note 4)	\$	\$	\$	\$	\$	\$

The accompanying notes form an integral part of these financial statements.

MARIGOLD LIBRARY SYSTEM
SCHEDULE 1 - REVENUE
FOR THE YEAR ENDED DECEMBER 31, 2022

	OPERATING FUND		CAPITAL FUND		TOTAL	
	2022	2021	2022	2021	2022	2021
REVENUE						
Municipal Levies	\$ 3,657,507	\$ 3,403,388	\$ -	\$ -	\$ 3,657,507	\$ 3,403,388
Provincial Grants	1,851,329	1,851,329	149,145	169,254	2,000,474	2,020,583
Indigenous Grant	93,624	93,624	-	-	93,624	93,624
Adjustment for deferral - Indigenous Grant	19,000	(24,642)	-	-	19,000	(24,642)
Reimbursements	151,436	203,020	-	-	151,436	203,020
Interest	68,126	29,712	-	-	68,126	29,712
Special Grants	8,821	8,682	-	1,988	8,821	10,670
Other Revenue	14,336	8,772	-	-	14,336	8,772
TOTAL REVENUE	\$ 5,864,179	\$ 5,573,885	\$ 149,145	\$ 171,242	\$ 6,013,324	\$ 5,745,127

The accompanying notes form an integral part of these financial statements.

MARIGOLD LIBRARY SYSTEM
SCHEDULE 2 - EXPENSES
FOR THE YEAR ENDED DECEMBER 31, 2022

	OPERATING FUND		CAPITAL FUND		TOTAL	
	2022	2021	2022	2021	2022	2021
EXPENSES						
Salaries and Wages	\$ 2,050,948	\$ 1,986,003	\$ -	\$ -	\$ 2,050,948	\$ 1,986,003
Materials	1,268,097	1,310,144	-	-	1,268,097	1,310,144
Transfer Payments	717,396	669,390	-	-	717,396	669,390
Employee Benefits and Payroll Expenses	321,961	308,038	-	-	321,961	308,038
Building (Note 14)	230,531	139,441	-	-	230,531	139,441
The Regional Automation	222,558	206,760	-	-	222,558	206,760
Consortium Funding (Note 14)						
Equipment	163,346	156,356	-	-	163,346	156,356
Reimbursed Purchases and Expenses	151,436	203,020	-	-	151,436	203,020
Delivery	67,994	58,670	-	-	67,994	58,670
Training and Development	64,520	20,766	-	-	64,520	20,766
Network	56,527	71,488	-	-	56,527	71,488
Travel and Meetings	55,772	29,643	-	-	55,772	29,643
Supplies	46,721	45,860	-	-	46,721	45,860
Professional Fees (Note 14)	42,850	26,915	-	-	42,850	26,915
Programs	41,892	23,526	-	-	41,892	23,526
Marketing	29,646	16,078	-	-	29,646	16,078
Memberships	15,310	14,618	-	-	15,310	14,618
Interest on Long Term Debt	14,239	-	-	-	14,239	-
Bank Charges	2,233	3,924	-	-	2,233	3,924
Postage and Freight	2,079	1,841	-	-	2,079	1,841
Miscellaneous	-	9,235	-	-	-	9,235
Amortization	-	-	380,561	330,271	380,561	330,271
(Gain)/Loss on Disposal of Capital	-	-	(6,285)	3,074	(6,285)	3,074
TOTAL EXPENSES	\$ 5,566,056	\$ 5,301,716	\$ 374,276	\$ 333,345	\$ 5,940,332	\$ 5,635,061

The accompanying notes form an integral part of these financial statements.

**MARIGOLD LIBRARY SYSTEM
NOTES TO THE FINANCIAL STATEMENTS
DECEMBER 31, 2022**

1) Purpose of the Organization

Marigold Library System ("System") is a library resource and information centre established for all participating residents of the System. The Board of Management of the Marigold Library System is established by virtue of the Alberta Libraries Act.

2) Economic Dependence

The System is dependent on contributions from the Province of Alberta in order to continue operations.

3) Significant Accounting Policies and Reporting Practices

Basis of Presentation

The financial statements were prepared in accordance with Canadian accounting standards for not-for-profit organizations (ASNFPPO).

Basis of Accounting

Marigold Library System follows the restricted fund method of accounting for contributions.

The Operating Fund accounts for revenue and expenses relating to the organization's program delivery and administrative activities.

The Capital Fund reports the assets, liabilities, revenue and expenses related to the organization's capital assets.

Revenue Recognition

Restricted contributions related to general operations are recognized as revenue of the Operating Fund in the year in which the related expenses are incurred. All other restricted contributions are recognized as revenue of the Capital Fund.

Unrestricted contributions are recognized as revenue of the Operating Fund in the year received or receivable if the amount to be received can be reasonably estimated and collection is reasonably assured.

Externally restricted non-capital contributions are deferred and recognized as revenue in the year when the related expenses are incurred.

Externally restricted capital contributions are recorded as deferred capital contributions until the amount is invested in capital assets. Amounts invested representing externally funded capital assets are then transferred to unamortized external capital contributions. Unamortized external capital contributions are recognized in the periods in which the related amortization expense of the funded capital asset is recorded.

Internally Restricted Assets

The Internally Restricted balance is not available for other purposes without the approval of the Board of Directors.

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**MARIGOLD LIBRARY SYSTEM
NOTES TO THE FINANCIAL STATEMENTS
DECEMBER 31, 2022**

3) Significant Accounting Policies and Reporting Practices (continued)

Tangible Capital Assets

Purchased tangible capital assets are recorded at cost. Contributed tangible capital assets are recorded at fair market value at the date of contribution. Additions to the organization's tangible capital assets are recognized for expenditures in excess of \$2,000 with a useful life beyond two years.

All tangible capital assets are amortized at fixed rates applied to diminishing balances. The rates can be summarized as follows:

Buildings	4%
Computer Equipment	55% and 100%
Equipment Under Capital Lease	20%
Furniture and Equipment	20%
Automotive Equipment	30%

Amortization expense is reported within the Capital Fund.

The half year rule is in effect in the year of acquisition. No amortization is taken in the year of disposition or if the asset is not ready for use.

Intangible Capital Assets

Intangible capital assets are recognized at cost and amortized on the basis of their useful life using the straight-line method. The rates are summarized as follows:

Website	10 years
---------	----------

Amortization expense is reported within the Capital Fund.

The half year rule is in effect in the year of acquisition. No amortization is taken in the year of disposition or if the asset is not ready for use.

Capitalized Leases

A lease that transfers substantially all of the benefits and risks of ownership is classified as a capital lease. At the inception of a capital lease, an asset and a payment obligation are recorded at an amount equal to the lesser of the present value of the minimum lease payments and the property's fair market value. All other leases are accounted for as operating leases and rental payments are expensed as incurred.

Contributed Materials and Services

An undeterminable amount of materials and volunteer services are contributed in order to assist the System in carrying out its library services. Because of the difficulty in determining their fair value, contributed materials and services are not recognized in the financial statements.

Income Taxes

As a registered charity, the organization is exempt from paying income taxes under Section 149(1)(f) of the Income Tax Act (Canada).

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**MARIGOLD LIBRARY SYSTEM
NOTES TO THE FINANCIAL STATEMENTS
DECEMBER 31, 2022**

3) Significant Accounting Policies and Reporting Practices (continued)

Government Assistance

Funding to finance operating expenses is provided by Municipal Levies, First Nations Grant and Province of Alberta Library Service Grant. This funding is recorded as revenue when earned in the Statement of Operations.

Foreign Currency Translation

All assets and liabilities of operations denominated in currencies other than Canadian dollars have been translated into Canadian dollars at the rate of exchange in effect at the balance sheet date. Gains and losses resulting from the translation of assets and liabilities are reflected in net income.

Revenue and expense accounts are translated at the average rates of exchange prevailing during the period.

Library Books and Periodicals

All books and periodicals purchased as library stock are expensed in the year of acquisition. This accounting policy best matches the services potential of these acquisitions to the period of substantial benefit.

Financial Instruments

The organization initially measures its financial assets and financial liabilities at fair value, except for certain non-arm's length transactions. The organization subsequently measures all its financial assets and financial liabilities at amortized cost, except for investments in equity instruments that are quoted in an active market, which are measured at fair value. Changes in fair value are recognized in net income.

4) Cash

	2022	2021
Operating		
Bank	\$ 1,706,030	\$ 1,669,592
Petty Cash	200	200
	\$ 1,706,230	\$ 1,669,792
Capital		
Bank	\$ 403,000	\$ 313,000
Total	\$ 2,109,230	\$ 1,982,792

The System holds funds that are restricted in use and are to be utilized as funding for specific projects. Since these projects have not been completed for which the funding has been received, \$417,139 (Note 9) is not available for general use.

5) Prepaid Expenses

	2022	2021
Operating		
Current		
Electronic Resources and Telecommunication	\$ 173,499	\$ 130,402
Other	13,652	35,090
	\$ 187,151	\$ 165,492
Long Term		
Electronic Resources and Telecommunication	\$ 54,204	\$ -
Total	\$ 241,355	\$ 165,492

**MARIGOLD LIBRARY SYSTEM
NOTES TO THE FINANCIAL STATEMENTS
DECEMBER 31, 2022**

6) Tangible Capital Assets

			2022	2021
	Cost	Accumulated Amortization	Net Book Value	Net Book Value
Tangible Assets				
Buildings	\$ 7,222,219	\$ 1,239,119	\$ 5,983,100	\$ 6,151,444
Computer Equipment	44,817	44,718	99	220
Equipment Under Capital Lease	43,328	18,371	24,957	31,196
Furniture and Equipment	567,915	195,554	372,361	450,258
Automotive Equipment	275,098	187,496	87,602	86,727
Land	571,556	-	571,556	571,556
Total	<u>\$ 8,724,933</u>	<u>\$ 1,685,258</u>	<u>\$ 7,039,675</u>	<u>\$ 7,291,401</u>

7) Intangible Capital Assets

			2022	2021
	Cost	Accumulated Amortization	Net Book Value	Net Book Value
Intangible Assets				
Website	\$ 86,375	\$ 33,406	\$ 52,969	\$ 61,606
Total	<u>\$ 86,375</u>	<u>\$ 33,406</u>	<u>\$ 52,969</u>	<u>\$ 61,606</u>

8) Accounts Payable and Accrued Liabilities

	2022	2021
Operating		
Trade Payables	\$ 116,333	\$ 79,582
Vacation Payable	61,481	57,741
Wages Payable	44,780	42,203
Accrued Liabilities	18,475	18,475
Payroll Remittances Payable	17,473	17,228
Credit Card Payable	13,743	23,988
	<u>\$ 272,285</u>	<u>\$ 239,217</u>
Capital		
Trade Payables	\$ 11,811	\$ 102,544
Total	<u>\$ 284,096</u>	<u>\$ 341,761</u>

9) Deferred Revenue

	2021	Increases	Decreases	2022
Operating				
Establishment Grants	389,293	-	-	389,293
Indigenous Project Funding	47,768	93,624	113,546	27,846
Total	<u>\$ 437,061</u>	<u>\$ 93,624</u>	<u>\$ 113,546</u>	<u>\$ 417,139</u>

Amounts represent unspent contributions received for future projects.

**MARIGOLD LIBRARY SYSTEM
NOTES TO THE FINANCIAL STATEMENTS
DECEMBER 31, 2022**

10) Obligations under Capital Lease

	2022	2021
2021 Canon photocopier lease contract, repayable in quarterly payments of \$2,949.16, 4.55% interest. Secured by equipment with a carrying value of \$24,957.	\$ 19,729	\$ 30,322
	19,729	30,322
Amounts payable within one year	(11,084)	(10,593)
Total	\$ 8,645	\$ 19,729
Capital lease repayment terms are approximately:		
2023	11,797	
2024	8,842	
Total minimum lease payments	20,639	
Less: amount representing interest	(910)	
Present value of minimum lease payments	\$ 19,729	

11) Unamortized External Contributions

	2022	2021
Capital		
Building Grant	\$ 2,311,323	\$ 2,460,468
Total	\$ 2,311,323	\$ 2,460,468

The unamortized external capital contributions will be recognized in revenue as the related amortization expense for the capital addition is incurred. An amount of \$149,145 has been recognized in the current year. This amount has been recognized as income for current year amortization on these projects. In 2021, \$571,556 was added to land and recognized as a direct increase to the Capital Fund.

12) Invested in Capital Assets

This balance represents Marigold Library System's net investment in capital assets. It is the original asset cost, less accumulated amortization, unamortized external contributions and debt directly related to the capital assets.

**MARIGOLD LIBRARY SYSTEM
NOTES TO THE FINANCIAL STATEMENTS
DECEMBER 31, 2022**

13) Internally Restricted Funds

The organization has internally restricted funds for operations and special projects as well as for capital purchases as listed below. The internally restricted funds are not available for unrestricted purposes without approval of the Board of Directors.

	<u>2021</u>	<u>Increases</u>	<u>Decreases</u>	<u>2022</u>
<i>Operating Internally Restricted</i>				
Operating	\$ 951,467	\$ 145,000	\$ -	\$ 1,096,467
Airdrie Collection	50,000	-	(25,000)	25,000
	<u>\$ 1,001,467</u>	<u>\$ 145,000</u>	<u>\$ (25,000)</u>	<u>\$ 1,121,467</u>
<i>Capital Internally Restricted</i>				
Building, Equipment & Furniture	\$ 160,000	\$ 25,000	\$ -	\$ 185,000
Vehicle Replacement	123,000	40,008	(25,008)	138,000
Computer - Hardware/Software upgrade	30,000	50,000	-	80,000
	<u>\$ 313,000</u>	<u>\$ 115,008</u>	<u>\$ (25,008)</u>	<u>\$ 403,000</u>
<i>Total Internally Restricted</i>	<u>\$ 1,314,467</u>	<u>\$ 260,008</u>	<u>\$ (50,008)</u>	<u>\$ 1,524,467</u>

14) Related Party Transactions

The Regional Automation Consortium

During the year Marigold Library System contributed \$222,558 (2021 - \$206,760) towards The Regional Automation Consortium ("TRAC"), shown under Expenditures on the Statement of Operations and Changes in Fund Balances. TRAC is a not-for-profit organization in which Marigold is one of four participating organizations along with Northern Lights Library System, Yellowhead Regional Library System and Peace Library System, which share a centralized computer system for library automation.

This funding was determined based on an equal funding from each member and the members' intent was to provide financial assistance to this organization.

Getz, Collins & Associates

During the year Marigold Library System paid \$8,079 (2021 - Nil) to Getz, Collins & Associates, shown under Expenditures on the Statement of Operations and Changes in Fund Balances. John Getz is the chair of the board for Marigold and is Senior Counsel at Getz, Collins & Associates.

Pine Street Condo Corporation

During the year Marigold Library System paid \$10,000 (2021 - Nil) to Pine Street Condo Corporation, shown under Expenditures on the Statement of Operations and Changes in Fund Balances. Pine Street Condo Corporation is the condominium association for Marigold Library System's building.

These transactions are in the normal course of operations and are measured at the exchange amount, which is the amount of consideration established and agreed to by the related parties.

15) Interfund Transfers

Interfund transfers were required to fund the cash outlays for capital asset acquisitions and loan principal payments. During the year, \$175,426 was transferred from operations, \$90,000 was transferred to capital reserves, \$120,000 was transferred to operating reserves and \$85,426 was transferred to fund capital purchases.

**MARIGOLD LIBRARY SYSTEM
NOTES TO THE FINANCIAL STATEMENTS
DECEMBER 31, 2022**

16) Subsequent Events

On December 24, 2022 Marigold Library System signed a conditional offer to purchase agreement for the sale their building at 710-2nd Street, with an expected closing date of April 27, 2023. The net proceeds of the sale outlined in the agreement is \$1.2 million for tangible capital assets with a net book value of \$492,790.

17) Significantly Influenced Not-For-Profit Organization

During the year Western Irrigation District and Marigold Library System formed Pine Street Condo Corporation. Marigold exercises significant influence over Pine Street Condo Corporation (The Condo Corporation) by its ability to participate in policy making process and its representation on the Board of Directors. The Condo Corporation has been formed to serve as the condominium association for the jointly owned building between Marigold Library System and Western Irrigation District. The Condo Corporation is a standalone type of corporation, not a non-profit nor society.

18) Financial Instruments

The organization's financial instruments consist of: cash, accounts receivable, accounts payable and accrued liabilities and obligations under capital lease. The risks attached to these financial instruments are as follows:

Credit Risk

Credit risk arises from the possibility that the entities to which the organization provides services may experience financial difficulty and be unable to fulfill their obligations. The organization is exposed to financial risk that arises from the credit quality of the entities to which it provides services. As the organization provides products and services to a variety of customers, its credit risk is minimized.

Interest Rate Risk

Interest rate risk arises from the possibility that the value of, or cash flows related to, a financial instrument will fluctuate as a result of changes in market interest rates. The organization is exposed to financial risk from interest rate differentials between market interest rates and the rates used on their financial instruments.

Fair Value

The fair values of cash, accounts receivable and accounts payable and accrued liabilities, correspond closely to their carrying amount because of their short term maturity dates.

Currency Risk

Currency risk is the risk to the entity's earnings that arise from fluctuations of foreign exchange rates and the degree of volatility of these rates. The organization is exposed to foreign currency exchange risk on Cash and accounts payable held in U.S. dollars.

19) Comparative Figures

Some of the comparative figures have been reclassified to conform to the current year's presentation.

20) Approval of Financial Statements

The Board of Directors approved these financial statements.

Canmore Public Library

2022 Value of Your Investment



This report shows the value of services provided by Marigold Library System. **Working together, Marigold members accomplish more than any one library or municipality could achieve alone.** Members benefit from economies of scale including bulk purchasing and streamlined operations from centralized workflows, IT infrastructure and delivery logistics. Marigold provides essential and community-focused services that enhance local library operations and the experience of library patrons.

2022 Levy Payments from Canmore to Marigold (2021 Alberta Population)

	Per Capita Levy	Population	Contribution
Municipality	\$6.24	14,370	\$89,668.80
Library Board	\$4.50	14,370	\$64,665.00
Levy Payments from Canmore to Marigold TOTAL			\$154,333.80

Direct Financial Return from Marigold to Canmore Public Library

Operating grants and allotments from Marigold to the member library.

Services Grant (Operating Grant from Marigold)	\$35,925.00
IT Capacity Fund (Spending Account from Marigold)	\$1,000.00
Physical Library Collection Allocations & Bestsellers	\$68,620.00
SUBTOTAL	\$105,545.00

Financial Value of Marigold Services

These amounts indicate what it would cost your library to offer the same standard of service to meet community needs and interests. Details on following pages.

SUBTOTAL **\$1,189,154.15**

Direct Financial Return & Value of Marigold Services TOTAL **\$1,294,699.15**

2022 Total Levy Payments from Canmore to Marigold

\$154,333.80

2022 Total Direct Financial Return & Value of Marigold Services

\$1,294,699.15

Canmore Public Library

2022 Value of Your Investment



Financial Value of Marigold Services

These amounts indicate what it would cost your library to offer the same standard of services to meet community needs and interests.

Collections

Collections Discounts for Your Library

\$24,017.00

Marigold's bulk purchasing power provides deep discounts for new collections allotted to your library. Without membership in Marigold, your library would spend more to purchase the same collection materials. Marigold staff save library staff time by assisting with collection selection.

Marigold's membership in TRAC (The Regional Automation Consortium) gives **your library patrons access to over 3.3 million items in over 185 public library collections across Alberta**. The TRACpac online catalogue and app allow your patrons to place holds on an item anywhere in Alberta and have it delivered to their local library through Marigold van delivery.

Cataloguing & Processing of New Materials by Marigold

\$16,555.00

Professional cataloguing makes it possible for patrons to locate and request popular books, video games, movies, equipment and more in the online catalogue or app. New materials are delivered shelf-ready to your library with barcoding, mylar protection, durable cases for AV and labelling.

Unique eBook & eAudiobook Titles Borrowed by Your Cardholders

\$507,302.57

Marigold provides a wide range of digital collections for reading, watching, listening and learning! The average cost for an eBook is \$35 and \$42 for an eAudiobook. Marigold's membership in TRAC provides your patrons with access to shared Overdrive/Libby and Cloud Library collections.

Kits, Games & Travelling Displays Borrowed from Marigold

\$450.00

Libraries save money by borrowing kits, games and displays from Marigold, such as craft and makerspace kits, travelling book displays, a karaoke machine, life size games like Jenga, and objects like a prize wheel and puppet theatre.

Collection Insurance

\$2,269.05

Marigold insures the physical collections at member libraries.

Canmore Public Library

2022 Value of Your Investment



Delivery & Resource Sharing

Unique Physical Titles Borrowed from Other Libraries by Your Patrons

\$443,450.00

As a member of TRAC and an Alberta Public Library Network Partner, patrons registered at Marigold libraries can request an item through tracpac.ab.ca or the TRAC app from any of the 185+ libraries in TRAC, plus other libraries across the province.

Library to You (L2U) is a free mail service for those who face physical or geographic difficulties in visiting their public library in person. For patrons across Marigold, Marigold staff fill holds for homebound or remote patrons and mail items to the patron with a free return label.

Weekly Van Delivery Service

\$96,235.71

All interlibrary holds requested by patrons pass through Marigold headquarters for sorting, and transportation to their destination through Marigold van delivery. Likewise, items being sent out for loan at other libraries and library systems are transported to Marigold for sorting before going on to the next location, either by Marigold van, provincial courier (other systems) or by mail (e.g. academic libraries). Drivers also deliver new collection materials, kits, games, supplies and promotional materials to member libraries.

IT

IT Site Visits, Helpdesk, Remote Support & Consultation

\$9,181.12

IT staff provide remote support, troubleshooting, cyber security training, and onsite installations and upgrades for your library, with the goal of reliable IT support for library staff and a positive patron experience. Marigold helps library staff plan for the lifecycle of their computer equipment.

Marigold IT manages the network of computers, devices, and systems that connect member libraries and library service to the world. Member libraries can rely on our team to offer technical support, monitor bandwidth, implement firewall protocols, troubleshoot connection issues, and perform software updates.

Equipment, Software, Licensing, and Library Software

\$62,069.14

Libraries need the right equipment, the right software, the right network, and Marigold provides the expertise to help put it all together. Networked services include email hosting, cloud-based file storage, software licensing, file sharing, a toll-free telephone system, and patron access to library collections and digital content in a safe and secure environment. Marigold staff negotiate complex IT vendor contracts on behalf of the system.

Canmore Public Library

2022 Value of Your Investment



Supernet & Internet

\$8,429.20

Internet and wifi available to patrons and staff at member libraries is provided via Marigold on a robust, secure fibre-optic network. The Alberta Public Library Services Branch (PLSB) pays for monthly SuperNet costs for libraries who are members of Marigold. Marigold pays for monthly internet costs (bandwidth).

Website

\$9,392.00

Marigold provides a website for your library to share information on everything your library has to offer! The websites allow libraries to engage with community members and provide information, resources and services to the public. Marigold staff are available to assist libraries with website updates.

Training, Professional Development & Consultation

Training Sessions (in-person & webinars)

\$180.00

Marigold provides training to library staff on topics such as using eBooks for mobile devices, or using eMagazines, eResources and library apps.

Marigold Conference & Professional Development

\$2,314.80

Marigold pays for up to two library staff to travel and attend the Marigold Conference, which featured keynote speakers Hal Johnson & Joanne McLeod (BodyBreak) in 2022, in addition to a day of sessions and networking with peers. Marigold also organizes and pays for library staff to travel and attend Library Leaders training in September, which featured a session on Corporate Storytelling for 2022.

Consultation, Support & Expertise

\$622.89

Each member library is assigned a consultant from our team of professional librarians. Our consultants have a wide range of skills and backgrounds and are experts in problem-solving and teamwork!

Your Library Services Consultant provides advice, solutions and support for library manager and staff training, personnel management, needs assessments, professional development, program planning & support, outreach program development, collection development, weeding & inventory, board & policy development, standards and best practices, reference questions, performance measures and space planning.

Canmore Public Library

2022 Value of Your Investment



Marketing Materials & Supplies

Paper and Supplies for Local Collection Processing	\$1,469.00
Marigold provides a paper allocation to support resource sharing and the cost of interlibrary loans. For eligible items added by library staff into the library catalogue, Marigold provides a supply of barcodes, spine labels and library location stickers.	
Customized Plastic Library Cards	\$0.00
Marigold pays for new batches of library cards, which require a special numbering sequence for each library.	
Printing of Promotional & Training Material	\$5,119.92
Marigold prints custom promotional materials on behalf of your library. Marigold develops and provides professional quality publications, displays and marketing software to promote resources, events and services available at the library.	

Marigold Programming at Member Library

Marigold Staff Led Programs	\$96.76
Marigold staff delivered 60 programs at 22 libraries to 357 participants in 2022, saving libraries staff time and money.	
Financial Benefit TOTAL	\$1,189,154.15



MARIGOLD
LIBRARY SYSTEM

2022 Annual Report

We are pleased to present the 2022 Annual Report for Marigold Library System. The ongoing demand for public library service in Marigold communities is tangible.

Public libraries are beacons of connection and community that bring people together, provide opportunities for recreation, inquiry, and conversation, and promote civic engagement. Marigold continues to provide value for residents of member municipalities by enhancing the depth and breadth of public library resources in your community, no matter where you live.

Marigold maximizes the financial investment of our members by pooling resources and capitalizing on partnerships to obtain the most valuable products and services at the lowest cost, delivering more than any one library or municipality could achieve and at a fraction of the cost of doing it alone.

As the operational hub for the system, our services do not overlap with what public libraries provide to their communities. Marigold Library System services and support enrich public library service to all member communities.

110,235 people/families
have a library card!



4,216 hours of IT support
for member library staff



351 kits & games loaned for
member library programs



346,012 eBooks borrowed
by Marigold member library
patrons



277,825 KMS driven by
Marigold staff for deliveries,
library service & support!



Find out more at marigold.ab.ca

Message from Leadership

2022 was a year of successful transition in many ways. We said goodbye to former Marigold Board Chair Lynda Lyster after 16 years, and to CEO Michelle Toombs after 13 years. We completed our first full year of operations in our new space. Marigold demonstrated resiliency and stability in the face of change and continues to evolve as a collaborative and highly efficient organization. We extend a heartfelt thank you to the Marigold Library Board and Marigold staff for your vital roles in the delivery of sustained, topical and relevant public library service for member communities.

Looking ahead to 2023, we have rooted our priorities in increasing engagement with library staff, library boards, member municipalities, Stoney Nakoda Nation, and Siksika Nation. We will strive to generate opportunities to connect library staff to each other and the larger library community, position Marigold for a sustainable and impactful future, and invite new audiences to learn about everything public libraries have to offer. We will continue to share stories with the province and municipalities that demonstrate the value and importance of public library service to thriving communities. We look forward to another year of growth and change shaped by the resourcefulness and creativity of staff, the governance of a committed board, and, most importantly, the needs of Marigold's members.



John Getz, Chair



Lynne Price, CEO



Laura Taylor, COO



MARIGOLD
LIBRARY SYSTEM

Participating Municipalities & Board Members (as of April 2023)

Acadia M.D. #34	Maxine Booker* (Vice Chair)	Kananaskis ID	Manon Miller
Village of Acme	Daniel Leronowich	Kneehill County	Faye McGhee
City of Airdrie	Natasha Roberts*	Village of Linden	Cynthia Klassen
Town of Banff	Manuela Olibera-Dorn	Village of Longview	Jan Dyck
Village of Beiseker	Sharon King	Village of Morrin	Alenda Gridley
Bighorn M.D. #8	Vacant	Village of Munson	Leslie Landon
Town of Black Diamond**	Ian Huffman	Town of Okotoks	Nicole Kieffuik*
Town of Canmore	Judith Smith	Town of Oyen	Ed Hogan
Village of Carbon	Michelle Lomond	Village of Rockyford	Tyler Henke
City of Chestermere	Daina Barbary	Rocky View County	Nick Wiebe*
Town of Cochrane	Vacant	Special Areas Board:	
Village of Consort	Michael Beier	Area #2	Helen Veno
Town of Crossfield	Luke Brennan	Area #3	Elaine Michaels
Village of Delia	Melody Christofferson	Area #4	Jodi Kurek
Town of Drumheller	Margaret Nielsen*	Village of Standard	John Getz* (Chair)
Village of Empress	Kelly Burgess	Starland County	Lil Morrison*
Foothills County	Eleanor Chinnick	Town of Strathmore	Melissa Langmaid*
Ghost Lake Summer Village	Corrine Smith	Town of Three Hills	Carol Best
Town of Hanna	Sandra Murphy	Town of Trochu	Jenny Lyver
Town of High River	Lynne Thornton	Town of Turner Valley**	Ian Huffman
Village of Hussar	Kristen Anderson*	Waiparous Summer Village	Janine Jevne
ID 9	Alexandra Parkinson	Wheatland County	Amber Link
Town of Irricana	Teresa Cameron	Village of Youngstown	Renee Laughlin

*Member of Executive Committee

**Amalgamated to Town of Diamond Valley in 2023

Marigold thanks the following members for serving on the Board in 2022: Donna Bauer, Darren Enns, Lynda Lyster, Karen Neill, Susan Roper, and Nora Sunderland.

Marigold Library Board & Activities

4 Board

Meetings

January, April (AGM), August
& November

27 Executive &

Committee

Meetings



16 Trustees at
Orientation &
Training Sessions

Board Committees

Committees develop policies and make recommendations to the Board. Staff support policy development through research on service, technology, governance, programs and advocacy. Committees are catalysts for growing new ideas and ensuring regular policy review that embraces sustainability and accountability.

Executive Committee

Ensures that the organization has the necessary resources to be able to respond to new opportunities, financial and environmental trends. Policies are presented to the Executive before being presented to the Board.

Standards & Services Committee

Reviews resource distribution through policy and schedules, and provides governance in the areas of programs and services to members.

Governance Committee

Ensures that governance of Marigold is practical, efficient and functional. Governance Committee work includes policies for community libraries and member agreements.

HR (Human Resources) Committee

Reviews HR policies to support sound business practices and safe workplace that complies with employment standards and health and safety legislation.

Finance Committee

Monitors policy statements in the areas of finance and provides recommendations to the Executive on banking, investments and financial practices.

Advocacy Committee

Reviews the Making A Difference Award submissions from member libraries for presentation at the Marigold Conference. Assists with the development of advocacy strategies and initiatives to inform decision makers and stakeholders.

Ad Hoc Nominating Committee

Brings forward the names of Marigold Board members willing to stand for Chair and committee positions.



Financial Overview

The Annual Report provides information regarding Marigold's finances for the purpose of providing quality services and ongoing operations.

Expenses 2022: \$5,940,332

Salaries & Benefits 40%

Marigold employs 29 staff (27.09 FTE). Staff organize and deliver services to member libraries and residents. Includes salaries, benefits, payroll expenses and training.

Materials & Delivery 22%

Library collections including ebooks and eresources (e.g. Ancestry.com), print books, audiobooks, DVDs/blu-ray, video games, large print materials and more. Physical items are delivered shelf-ready to member libraries for patron browsing and checkout.

Transfer Payments/Operating Grants 12%

Cash payments assist member libraries with resource sharing .

TRAC Contract, Computers & Software 4%

TRAC includes library software license and support that enables patron service, account management, inventory and reporting, and ebook purchases.

Computers & Software 5%

Maintenance agreements, network and applications, server and operational hardware.

Facility (includes old HQ and new HQ) 3%

Caretaking, insurance, maintenance, utilities.

Other Expenses 14%

Professional fees, travel, meetings, supplies, programs, memberships, marketing, postage, freight, furniture and equipment.

Revenue 2022: \$6,013,324

Municipal & Library Board levies paid to Marigold (based on 2021 population) 61%

\$6.24 per capita: Municipalities with library boards

\$10.74 per capita: Municipalities without library boards

\$4.50 per capita: Library Board

Provincial Grants (based on 2016 population) 32%

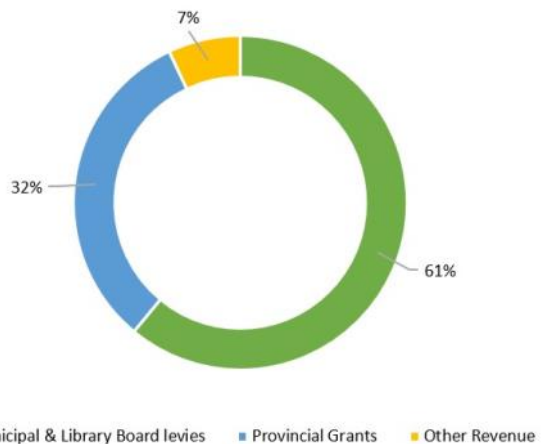
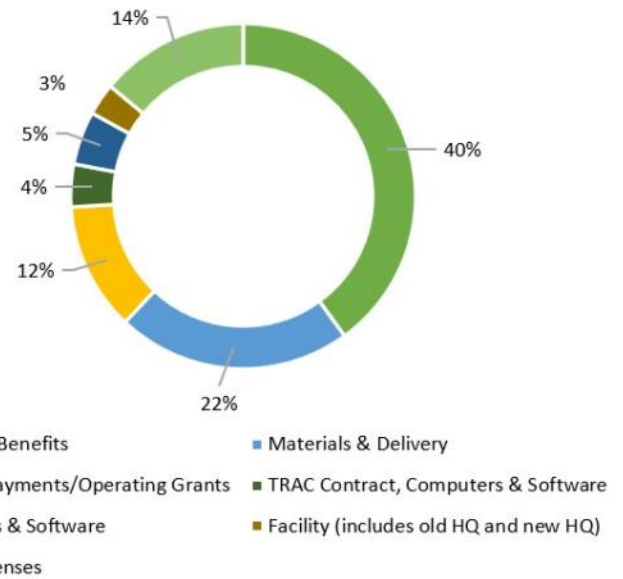
\$4.70 per capita: Library System Board Operating Grant to run System and provide services

\$5.55 per capita: Rural Library Services Grant for populations where Marigold is the governing board. Pooled and redistributed as operating grants and services.

\$10.25 per resident for Indigenous Project Grant (Stoney Nakoda and Siksika Nations)

Other Revenue 7%

Interest, donations, contracts, grants.



Access Marigold's financial statements at marigold.ab.ca/About-Us/Financial



eResources & Digital Content

357,605

eBooks, eMagazines &
eAudiobooks circulated

\$319,456

Spent on eResources & digital
content

56,131

eBooks, eAudiobooks &
eMagazines titles available in
Libby & Cloud for member
library patrons!

Marigold provides a wide range of digital collections for reading, watching, listening, and learning! Your residents have access to **eBooks, eAudiobooks, eMagazines, streaming movies, music, newspapers, early literacy resources, training videos, school study prep, and more.**

Marigold negotiates licensing and platform contracts with vendors and obtains better value by pooling revenue. We provide libraries with training on use and access, statistics and troubleshooting, and we create and provide marketing materials and videos for patrons to learn how to use digital collections.



..and more at

marigold.ab.ca/eresources

Marigold's membership in TRAC stretches dollars by sharing **Overdrive/Libby and Cloud Library eBooks and eAudiobooks, eMagazines, and eResources like Novelist.**

Marigold's membership in **The Alberta Library** allows us to obtain the best pricing on eresources and digital content, such as **Ancestry.com, Consumer Reports, and Solaro online study help for grades 3-12.**



Collection Services

Marigold orders, receives and processes new materials for member libraries to maximize vendor discounts. Professional cataloguing makes it possible for patrons to locate and request **popular books, video games, movies, equipment, and more** in the online catalogue or app. New materials are delivered to member libraries ready for patrons to check out with barcoding, mylar protection, durable cases for AV, and labeling.

Collection use is increasing!!

2,052,047

Items checked out by patrons
at Marigold member libraries



21.8% increase from last year!



The number of unique patrons
borrowing items from libraries
increased by **23.3%**!



62,988

New items added
to library collections

\$882,784

Marigold spent on new
physical library materials

3,311,061

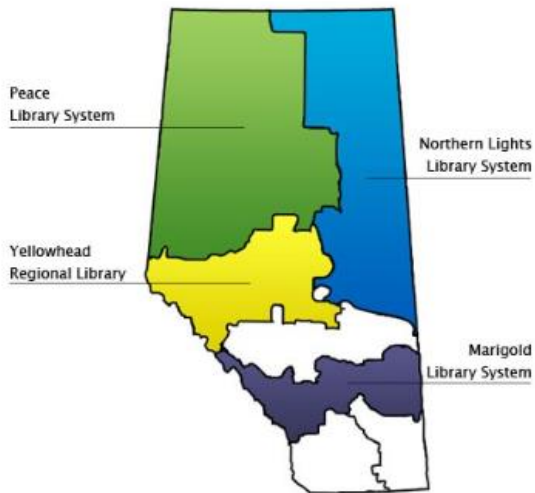
Items available for your patrons
to borrow at tracpac.ab.ca!

**Check out an eScooter, cooking
equipment or trekking poles!
It's the Library of Things!**

Marigold staff assist libraries with making non-traditional collections ready for residents to borrow by adding them to the library catalogue! 2022 included cooking and home gardening equipment, booster cables, power tools, and more!



TRAC (The Regional Automation Consortium)



11 million visits to
tracpac.ab.ca in 2022!

TRAC is a society formed by Marigold Library System, Peace Library System, Yellowhead Regional Library and Northern Lights Library System that finances and supports a shared library catalogue, eBooks and some eResource collections.

Patrons from Marigold member libraries can access over 3.3 Million physical items in over 185 public libraries across Alberta!

The TRACpac online catalogue and app allow your patrons to place holds on an item anywhere in Alberta and have it delivered to their local library through Marigold van delivery.

Patrons browsed and placed holds in over
1,449,054
sessions on tracpac.ab.ca

727,615 items
loaned to Marigold
patrons by TRAC libraries



3,311,061 items
Available on tracpac.ab.ca
for patrons to borrow!

TRAC working groups represent the four member systems:

TRAC Directors meet with Clarivate (Polaris software provider), negotiate with vendors, collaborate with other regions to maximize cost-effectiveness.

System Administrators Group reviews technology for TRAC, enhances authentication services for patron access, implements best practices for end users.

Public Services Group reviews procedures for patron accounts and circulation of library materials, shared eContent selection.

Bibliographic Services Group reviews workflows in shared cataloguing and acquisitions, database quality and initiatives (e.g. decolonizing subject headings).

Training Group reviews TRAC communication, procedures and best practices.



Delivery Services & ILL



Interlibrary holds requested by patrons pass through Marigold headquarters for sorting, and are transported to their destination through Marigold van delivery. Likewise, items being sent out for loan at other libraries and library systems are transported to Marigold for sorting before going on to the next location, either by Marigold van, provincial courier (other systems) or by mail (e.g. academic libraries).

Hold requests placed by patrons are delivered to member libraries and lending lockers for patron pickup via weekly van delivery from Marigold. Drivers also deliver new collection materials, kits, games, supplies and promotional materials to member libraries.

ME Alberta
Wide
Borrowing **Increased by 36.8%!**
LIBRARIES

In addition to TRAC items, cardholders from Marigold member municipalities can register online to access over 19 million items from public libraries across the province.

1,453,500

Patron interlibrary loans via HQ!

3,024

Delivery stops at member libraries

228,900

KMs driven for ILL delivery!

7 vehicles driven 1,910

times for deliveries, IT site work, programs, & consultation support!



Consultation & Professional Support

“Consultation services are *essential* for me. As Library Director, I am in a position where I cannot discuss certain issues with other staff. Having Marigold professional staff fill that gap is *incredibly important* to my work.”

- Sarah McCormack, Library Director, Banff Public Library



Marigold *Library Services Consultants* provide advice and solutions for member libraries:

- Library Manager Training
- Professional Development
- Program Planning & Support
- Outreach Program Development
- Collection Development
- Weeding & Inventory
- Board Development
- Policy Development
- Standards and Best Practices
- Performance Measures
- Space Planning... and MORE!

90 Consultation visits with member library managers and staff

4 Virtual *Coffee Chat* Meetings



476 Hours of In-Person *Consultation*

Library Manager Orientation at

Berry Creek, Carseland, Cochrane, Hanna, Oyen, Linden, Morrin, Strathmore

Supported the New *Langdon Community Library*



Trustee Orientation & Training at

Banff, High River, Sheep River

Inventory & Weeding Projects at

Acme, Carseland, Consort, Delia, Drumheller, Hanna, Morrin, Standard, Trochu

Marigold Conference & Making a Difference Award Winners!



“Such a fantastic conference that it is hard to say what my favourite part was. Keynote was fabulous. All my sessions were excellent and informative.” *Library staff member*

The theme of the 2022 Conference was **From Disruption to Direction**. **197 people were in attendance**, including library staff, trustees and guests.

Keynote speakers Hal Johnson and Joanne McLeod of BodyBreak set the tone for the day! Using their Amazing Race Canada experience as the backdrop, Hal and Joanne showed us life is full of u-turns, but how you cope determines failure or success. As a part of the festivities, retiring Board Chair Lynda Lyster and retiring CEO Michelle Toombs were celebrated and sent off in style! Sessions included staff recognition ideas, online best practices, advocacy, programming and more.

Marigold’s Marigold Making a Difference Awards acknowledge the excellent work taking place at member libraries in programming, outreach, advocacy, public relations, and partnerships. Thank you to the Marigold Board Advocacy Committee for reviewing the submissions and selecting this year’s winners.

2022 Winners

Strathmore Municipal Library
Book Buddies Program

Banff Public Library
Library of Things Program

Delia Municipal Library
Drone Engineering Camp

Honourable Mentions

Canmore Public Library
50th Anniversary Celebration

Irricana & Rural Municipal Library
Family Activity Grab Bags

Standard Municipal Library
Rec Room



Training & Professional Development

Marigold supports member library staff in growing their knowledge, skills and abilities. Training is provided in the best way for library staff to access it, whether in-person at member libraries, at Marigold headquarters, virtually or by webinar!

In 2022:

74 library staff attended **10** webinars and virtual training sessions on eResources, Biblioboard and websites

172 library staff attended 16 in person training sessions on eResources, Leap, Websites, LibraryAware, and Services for Patrons with Print Disabilities

171 participants completed 8 eResources challenges to learn about Marigold-provided digital content

32 library staff and trustees attended a corporate storytelling workshop at Marigold's annual Library Leaders event in September



Marigold staff train on topics such as:

- Polaris & LEAP (patron & circulation software)
- Collection Development & Management
- Simply Reports (reporting & inventory software)
- Relais (Interlibrary Loan software)
- Website Editing
- Library Apps
- LibraryAware (promotional & marketing materials)
- Using eBooks and eResources

Indigenous Relations



2,603

**People/families
have library cards**



23

**Story & craft programs
for 500 participants**



2

**Advisory committee
meetings with library
staff**

With money from Alberta government Grant for Public Library Service to Indigenous Communities, Marigold was able to provide essential public library services to two First Nations reserves—Stoney Nakoda and Siksika Nation.



Marigold staff created a Nakoda language program for children, which was presented at Banff, Canmore and Bighorn Libraries. Staff also created and delivered weekly craft and literacy programs in Mîni Thnî, and an Indigenous Language Resource brochure that has been promoted at Banff, High River, Longview, Standard, Delia, Bighorn, Canmore, Airdrie. The Morley Community Market and Marigold staff partnered with Canmore Public Library to gift wrap and distribute over 200 donated children's picture books for community members.

The Whyte Museum of the Canadian Rockies allowed Marigold's Indigenous Outreach staff to go through archival documents and create booklets for the Mîni Thnî Book Deposit: Stoney Country, Stoney Language, Stoney News, Stoney Education and Stoney Place Names. These have been extremely popular as a lot of nation members are very interested in these documents.



Marigold's Rose Reid was interviewed by Alberta Prime Time, an online magazine, about Indigenous Book Reviews Rose has created.

The Indigenous Grant enabled unique programs at member libraries: Airdrie (Drum Circle, Indigenous backpacks, beading workshop by Metis artist), Cochrane (Smudging & Medicine Wheel Teachings, Metis Fingerweaving, Storystones and Indigenous Drumming, Songs and Storytelling) Irricana (beading and arts program) Okotoks (improve Indigenous Collection and Indigenous Early learning kits), Rockyford (dreamcatcher program), and Strathmore (Kairos blanket exercise, soapstone carving, ribbon skirt workshop, Seven Sacred Teachings Yoga). Library cards were issued to students and staff at schools in the Stoney Education Authority - Ta Otha School, Chief Jacob Bearspaw School, Nakoda Elementary School and Morley Community School. Strathmore library staff and Marigold issued cards to students attending Old Sun College on Siksika.



Marigold partnered with the Rotary Club of Canmore to create and install a permanent Story Walk display, "Âba Wathch Inâ Makoche" by Sherry Shotclose!

IT Support & Services

Libraries need the right equipment, the right software, the right network, and the expertise to put it all together.

254

Hours of onsite work at Marigold member libraries



1189

Remote support sessions



933

Hours providing remote support for library staff



Marigold IT strives to deliver a positive patron experience. Internet and wifi available to patrons and staff at member libraries is provided via Marigold on a robust, secure fibre-optic network. Patrons can access online library services like downloading ebooks or placing holds because IT ensures patron accounts are sustained in a safe and secure environment.

Member libraries rely on our team to offer remote support, monitor bandwidth, implement firewall and security protocols, troubleshoot connection issues, perform software and onsite equipment upgrades, and help library staff plan for the lifecycle of their computer equipment.

Networked services includes email hosting, cloud-based file storage, library software (circulation, patron accounts and notification systems, inventory and reporting), software licensing, file sharing, and a toll-free telephone system.

Programming & Support



Marigold staff delivered
60 programs
at *22 libraries*
to *357 participants*

and coordinated the national TD Summer Reading Program on behalf of participating libraries.

11 Story Walks were borrowed 41 times by 20 member libraries.

Kits, Games & Traveling Displays were loaned to member libraries 351 times!!!

Libraries save money by borrowing kits, games and displays from Marigold, such as craft and makerspace kits, travelling book displays, a karaoke machine, life size games like Jenga, and objects like a prize wheel.



34 Summer programs delivered!

Marigold's summer student delivered 34 programs at member libraries including Banff (2), Beiseker (2), Bighorn (2), Carbon, Cochrane (2), Consort, Crossfield, Delia, Gleichen (2), Hanna (2), High River (2), Irricana (2), Longview, Millarville (2), Morrin (2), Okotoks (2), Oyen, Standard (2), Three Hills, Trochu (2), Youngstown.



Patron & Direct Services

2,864 Items mailed to Marigold patrons via Library to You (L2U)!

L2U is a free mail service for those who face physical or geographic difficulties in visiting their public library in person. For patrons across Marigold, Marigold staff fill holds for **homebound or remote patrons** and mail items to the patron with a free return label.

441 New Large Print books, audiobooks, high demand movies & more!

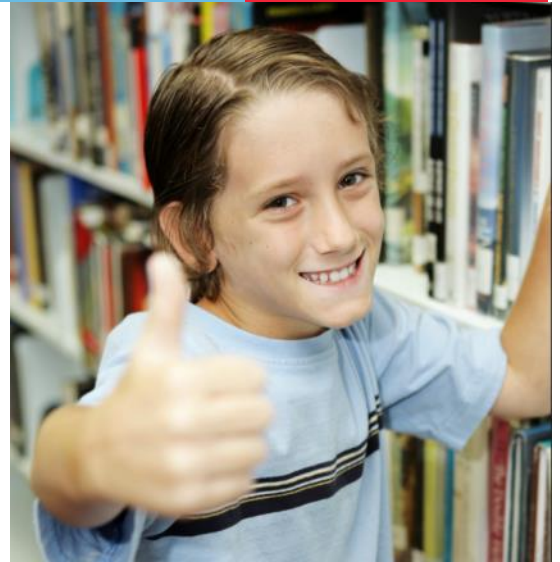
These expensive collections are shared with libraries and rotated to ensure fresh browsing material for patrons. Libraries also collaborate with senior's lodges to provide Marigold collection large print materials for residents. **Special collections circulated from Marigold headquarters 5,988 times!**

1,610 New books for Book Deposits!

Book Deposits are located in small communities across the Marigold region. Marigold staff support local volunteers in maintaining these honour-system collections. Each month, the deposit receives new popular material from Marigold and the collection is replenished annually.

2,435 holds picked up by patrons at Bragg Creek & Hussar Lending Lockers!

Patrons place holds using tracpac.ab.ca or the TRACpac app to pick up library materials in Hussar (Credit Union), Bragg Creek (Community Centre), or Airdrie Genesis Place. Marigold staff service the **Hussar and Bragg Creek lockers**. Patrons receive automated messages that their items are ready for pick up.



Collaborations



SAIT

Marigold has a long-standing partnership with the SAIT Library & Information Technology (LIT) program!

- ◆ In April, Marigold hosted a SAIT LIT student for a three-week practicum.
- ◆ In November, the SAIT LIT class toured the Marigold facility to learn more about Marigold's operations and opportunities for LIT's in regional library systems.



Canadian Urban Libraries Council (CULC)

Marigold joined CULC, a membership organization open to libraries that serve an urban region of 100,000 people or more. COO Laura Taylor participated on CULC's Futures Lab, and Executive Assistant and HR Specialist Nora Ott participated on the Safety and Security Working Group.

The Alberta Library (TAL)

Marigold staff participated on a working group to form a proposal to acquire funding for a province-wide project in partnership with CBC/Radio Canada.



Staff Represented Marigold at the Following Conferences:

- Alberta Association of Library Technicians (AALT) - March 31—April 3, 2022, Canmore, Alberta
- Innovative Users' Group (IUG) - April 5-8, 2022, Virtual
- Southern Alberta Library Conference (SALC) - April 29, 2022, Lethbridge Alberta
- The American Library Association (ALA) - June 23-28, 2022, Washington, D.C.
- Stronger Together—October 6-7, 2022, Virtual

Advocacy & Marketing Support

Website Templates

Marigold provides website templates for member libraries to promote everything the public library has to offer! Libraries can engage with community members and provide information on resources, programming and more.



Library Cards

Marigold pays for customized library cards for member libraries to issue to patrons!

43,167

brochures were printed at Marigold and distributed to member libraries for staff training and patron use! Brochures promote and inform library staff and patrons on various eResources, using eBook devices, accessing interlibrary loans and much more!

Marigold's CEO presented on the value of public libraries and Marigold services and support to member Councils:

Town of Crossfield
Kneehill County
Town of Strathmore

Town of Three Hills
Wheatland County
Town of Trochu

Rocky View County Public Presentation Committee (presented with COO)

Regional Systems Advocacy Committee

Board Chair John Getz, Vice Chair Maxine Booker, and Marigold CEO Lynne Price participated on the Alberta Systems Advocacy Committee, formed by the seven regional library systems in Alberta. The systems collaborated successfully to increase provincial funding for library grants in the 2023 budget. Joint letters were sent to Premier Danielle Smith and Municipal Affairs Minister Rebecca Schulz, and information packets to inform elected officials about the value of public library service were circulated to member libraries.



Libraries
**VALUE
BEYOND
words**



Public Libraries are Thriving!!!!



MARIGOLD
LIBRARY SYSTEM

Across Marigold...

110,235 people/families have a library card

346,012 eBooks borrowed

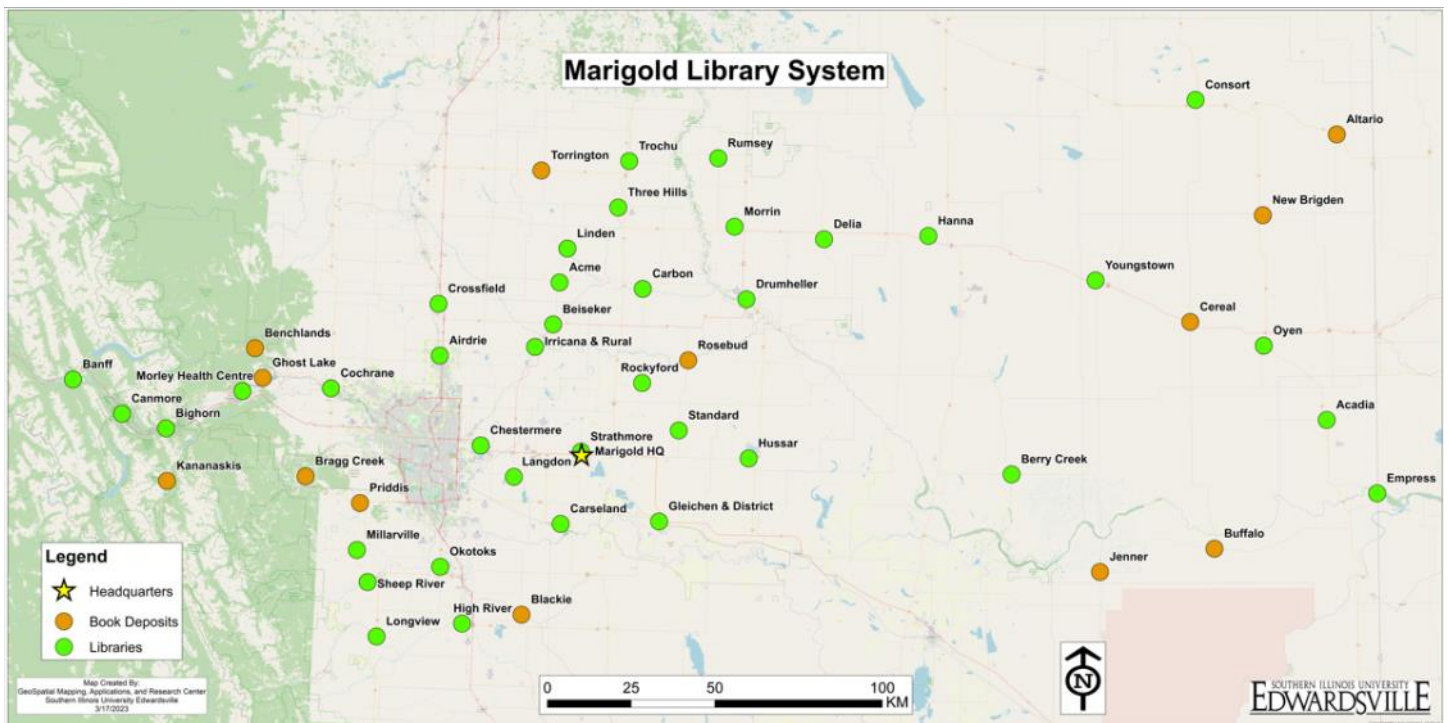
2,052,467 items loaned to Marigold cardholders, a 22% increase over 2021!

7,145 programs with **102,545** participants

62,988 new items added to Marigold library collections

11 million visits to the online library catalogue

IT Staff completed **1189** remote support sessions totaling **932** hours and **27** minutes



Find out more at marigold.ab.ca!



MARIGOLD
LIBRARY SYSTEM

Connecting Communities

2023-25 Marigold Library System Plan of Service



MARIGOLD
LIBRARY SYSTEM

Introduction

On behalf of our dedicated Board and staff, we are proud to share the 2023-2025 Marigold Library System Plan of Service. This plan represents the collective wisdom of our stakeholders and aims to continually drive improvement in the delivery of services.

Marigold is a dynamic, responsive organization that strives to respond to the needs of our members and support our service population. We are the operational hub for the system. While we work behind the scenes, this does not distance us from our commitment to helping people use libraries for learning and enjoyment. Our success is measured in stories of lives changed, families enriched, youth inspired and seniors connected.

The value of Marigold is to enhance the depth and breadth of quality public library resources to your community, no matter where you live. Together with Marigold member libraries, we get the latest books, technology, resources and materials in people's hands and on their screens. Marigold provides training, support, IT infrastructure and digital content that individual libraries could not affordably provide on their own. Our ability to leverage resources for the entire region provides tremendous benefits and cost savings while recognizing the unique needs of each member library, whether located in large urban centres or rural and remote communities.

Mission:

Empowering communities through exceptional library service and support.

Values:





Strategic Priority #1

Increase Community Awareness

Marigold builds and strengthens community awareness of the value of public library service.

Developing and sustaining community awareness of the value of public libraries is fundamental to ongoing funding and support for libraries and systems. People will learn that libraries are dynamic, thriving and relevant, and moreover, people will think about libraries in new ways.

Goals

- ▶ Marigold's stakeholders and community members increasingly access the full range of collections, services and technology available to them for recreation, creativity, exploration, learning and growth.
- ▶ Stakeholders understand that membership in Marigold Library System provides the best value for money.
- ▶ Effective advocacy articulates the importance of sustainable funding to ensure responsive, relevant library service that meets people's needs.

Objectives

- ▶ Annual reports reflect the increased use of library services, resources and collections.
- ▶ Updated Value of Your Investment reports effectively convey the value of membership in Marigold to stakeholders.
- ▶ Advocacy efforts raise awareness about the need for library funding and the value of public library services.
- ▶ Marketing and promotional materials are accurate, user-friendly and up-to-date.
- ▶ Marigold staff are visible at library and community events to promote services.





Strategic Priority #2

Connect the Marigold Community

Marigold fosters a connected library community that maximizes sharing, collaboration and dialogue to inform service delivery.

Supporting and collaborating with member library staff are key parts of Marigold's focus. The services and access that Marigold provides help to build capacity for libraries large and small. Working together, Marigold and its members can meet the diverse needs of the people of our region.

Goals

- ▶ Member library staff and trustees have meaningful opportunities to build a strong sense of connection with and belonging to the Marigold community.
- ▶ Engagement with member library staff is an essential component in the development and delivery of new Marigold services and programs.
- ▶ The diverse priorities, challenges and needs of member libraries and communities are reflected in Marigold's responsive service design.

Objectives

- ▶ Marigold receives positive feedback from Marigold board trustees and member library staff through evaluations and surveys.
- ▶ Staff participate in opportunities to learn more about Indigenous cultures and remove barriers to library service for Indigenous peoples.
- ▶ Marigold and library staff are better equipped to build diversity, equity and inclusion (DEI) into their operations, services and programs.





Strategic Priority #3

Strengthen Organizational Capacity

Marigold is a sustainable, trusted and innovative library system known for organizational excellence.

Libraries are constantly evolving to meet the needs of their patrons and emerging technologies. Keeping pace with change is a core service. Members trust Marigold to investigate and assess new technologies and resources and can rely on Marigold's expertise.

Goals

- ▶ Marigold provides exceptional value to members through responsible fiscal stewardship.
- ▶ Marigold trustees demonstrate excellence in governance.
- ▶ Marigold Library System has a reputation as an employer of choice.
- ▶ Marigold is operationally resilient, resourceful and prepared for emergencies.
- ▶ Marigold promotes an internal culture that integrates sustainability into the daily habits of the library community.

Objectives

- ▶ Board activities are achievable and realistic for volunteers, cost-efficient and reflect the diversity of the communities we serve.
- ▶ Trustees are engaged, informed and able to articulate the value of public libraries and membership in Marigold to stakeholders and the public.
- ▶ Headquarters staff have the support and resources needed to thrive in their work.
- ▶ Employee retention is a priority, and employees have access to opportunities for professional growth and development.
- ▶ Marigold's Business Continuity Plan and Emergency Response Plan are current.





Strategic Priority #4

Expand Community Capacity

Marigold provides training, professional development and resources for staff and trustees that meet evolving needs.

Keeping abreast of changes in library operations, and understanding the needs of frontline library staff, are crucial. Marigold provides the training, insights and technology that help its members adapt to and evolve with the speed of life today. Patrons are savvy, and Marigold supports member libraries in keeping pace while resources and services evolve.




Goals

- ▶ Library staff and trustees have access to the information, training and resources they need to provide library service to their communities.
- ▶ Library staff and trustees are supported in adapting to and using new Marigold-provided technology, services and resources.
- ▶ Library staff and trustees have opportunities to connect with and learn from each other at Marigold-hosted events.

Objectives

- ▶ Training content and delivery methods are accessible and relevant to staff and trustees.
- ▶ Attendees at the Marigold Library System Conference, Library Leaders meetings, training sessions, webinars and other events receive timely, relevant and useful skills and information.
- ▶ Marigold trustees have the information needed for effective governance and succession planning.
- ▶ Marigold sees increased readership of the eNewsletter, views of the website and utilization of training tools.



Marigold Library System is committed to delivering quality services to its members and community residents. We look forward to a future full of potential and impactful collaboration with our members to meet the diverse needs of people across this region.

Connecting Communities to information, ideas and innovation is at the core of Marigold's commitment to the people it serves.

Visit marigold.ab.ca for more information.



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Notes to Council



April 22, 2023 AGM & Board Meeting Highlights

Audit

2022 Audited Financial Statements were presented by auditors Gregory, Harriman & Associates and approved by the Marigold Board. It was a clean audit and Marigold is in a good financial position.

Financial Statements

Unaudited financial statements to March 31, 2023 were accepted as presented.

Value of Your Investment Reports

Chief Operating Officer L. Taylor presented updated Value of Your Investment Reports reflecting what it would cost to recreate Marigold services at a local level. The new reports showcase the value to member municipalities of Marigold's bulk purchasing power and centralized operations. Members get more for each dollar, and can provide the same quality of public library service to residents no matter where they live.

HQ Building Sale

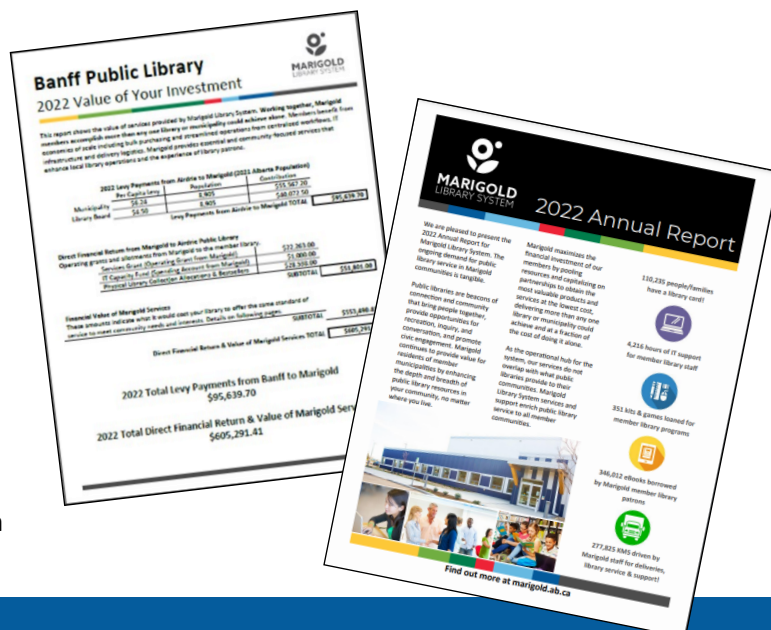
The old Marigold headquarters facility has been conditionally sold with a closing date in the spring.

2022 Annual Report

The Board approved the 2022 Annual Report as presented, for distribution to stakeholders. The report can be accessed online at: <https://marigold.ab.ca/About-Us/Publications>

Plan of Service 2023—2025

The Board accepted the Plan of Service 2023—2025: Connecting Communities. The new plan includes Marigold's updated Mission and Values. The plan can be accessed online at: <https://marigold.ab.ca/About-Us/Publications>



Upcoming Board Meetings:

Saturday, August 26, 2023 9:30 AM
Marigold Library System & Western Irrigation
District Community Room, Strathmore

Saturday, November 18, 2023 9:30 AM
Virtual Meeting

Questions?

Contact CEO Lynne Price
lynne@marigold.ab.ca

Marigold Library System

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Notes to Council—April 22, 2023

Policy Approval & Decision

The following policies were reviewed and approved:

- Executive Committee Mandate, Composition & Job Descriptions
- Board Committee Mandate Statements
- Policy Development Policy
- Board Member Compensation Policy
- Records Management Policy
- Library Service Points—Records Management Policy
- Operational Governance Policy
- TRAC Card Operational Bylaw
- Transfer Payments Policy

Board & Staff Service Recognition

Board members recognized for long service:

- Cynthia Klassen from the Village of Linden - 5 years
- Michelle Lomond from the Village of Carbon – 5 years
- Jodi Kurek from Special Area #4 – 5 Years
- Renee Laughlin from the Village of Youngstown - 5 Years
- Amber Link from Wheatland County - 5 Years
- Ian Huffman from the Town of Diamond Valley - 5 Years
- Teresa Cameron from the Town of Irricana - 5 Years
- Margaret Nielsen from the Town of Drumheller – 10 years

Staff members recognized for long service:

- Kristine den Boon – 5 years
- Ian John – 5 years
- Bruce Paschal - 5 years
- Jessie Bach – 10 years
- Steven Copland - 10 years
- Glenn Russell - 10 years
- Jaspreet Singh - 10 years
- Lynn Blain – 15 years
- Barb Froese - 15 years
- Richard Kenig - 15 years

Staff Updates

COO L. Taylor spoke about the increasing challenges to have books banned from schools and libraries. There are organized movements in the US and Canada to remove an individual's right to read what they want and to penalize those who supply reading materials that do not meet the organizer's approval. Taylor will be attending a meeting in Toronto sponsored by the Canadian Urban Libraries Council (CULC) to discuss how libraries can provide solutions and review policies to ensure intellectual freedom.

CEO L. Price provided updates on planned Municipal council visits, Marigold HQ news and Indigenous outreach services. Libraries received word in February that funding from the province would be increased from 2016 Municipal Population to 2019, and that the per capita amounts would be increased in tandem. The Regional Systems Advocacy Committee will continue to advocate for stable and sustainable funding for Alberta public libraries.



Royal Canadian Mounted Police

Commanding Officer
Alberta



Gendarmerie royale du Canada

Commandant
de l'Alberta

May 8th, 2023

Dear Mayor Sean Krausert,

As the wildfire situation evolves throughout the province, the RCMP continues to act to preserve the peace and protect the safety of affected persons, property and communities across Alberta. This is a dynamic situation that has impacts to public safety.

Under the Provincial and Municipal Police Service Agreements (PPSA and MPSA), this constitutes an emergency. The Minister of Public Safety and Emergency Services for the Province of Alberta has granted emergency provisions under Article 9 in the PPSA and MPSA, allowing for the temporary redeployment of resources to assist in addressing this emergency situation.


The need for an ongoing police response to ensure the safety and security of people and property in affected communities means we may need to draw on resources from your municipal police service. I want to assure you that decisions around temporary redeployment of resources to address this emergency situation are balanced with the need to maintain an adequate level of policing in local communities.

It is important to note that if resources are redeployed from your municipal police service, your municipality will not bear any costs directly related to the redeployment, including salary, transportation, overtime, and other operating costs. However, if you choose to backfill your police officer positions while resources are redeployed, your municipality would be responsible for the backfill costs.

Should you have any questions or concerns, please do not hesitate to contact your Detachment Commander or Supt. Dave Kalist, Oi/c Operations Strategy Branch, at 780-412-5435.

Thank you for your support in assisting us to address this emergency situation in the Province.

Yours truly,


C.M. (Curtis) Zablocki, M.O.M.
Deputy Commissioner
Commanding Officer/Alberta RCMP

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