



Governance Committee

Subject:	West Bragg Creek Emergency Access
Date:	September 12, 2023
Presenters:	Jeannette Lee, Manager
Department:	Capital and Engineering Services

REPORT SUMMARY

Currently, the only access to the West Bragg Creek area is via a crossing of the Elbow River on Balsam Avenue. Any natural disaster may strand the residents in West Bragg Creek without access to emergency services. The County retained Tetra Tech Canada Inc. to conduct an emergency access route study for the community of West Bragg Creek in 2017. An update to The West Bragg Creek Emergency Access Route Determination Functional Planning Study has been completed and is being presented to the Governance Committee for information.

In 2017, Route Option 2, which extends north from Wintergreen Road along Range Road 50 through Tsuut'ina Nation lands was recommended as it was the most cost-effective and direct route through Tsuut'ina Nation; however, Administration has not been successful in engaging with Tsuut'ina Nation on the finalization of an agreement.

Administration recommends that Council consider the secondary access for the West Bragg Creek area as a priority for the County and further discussion occur during the 2024 Capital Plan Budget preparation to undertake further assessment into the feasibility of Route Option 7B, extending south from Township Road 232 along Range Road 52 (partially developed and undeveloped road allowance), east across private lands, across the Elbow River and connecting to Hwy 758, Bracken Rd and Spruce Avenue bridge crossings.

ADMINISTRATION'S RECOMMENDATION

THAT Administration be directed to prepare a report for Council's consideration to complete the feasibility assessment for Option 7B and the Bracken Road and Spruce Avenue bridge crossing.

BACKGROUND

Currently, the only access to the West Bragg Creek area is via a crossing of the Elbow River on Balsam Avenue. Any disruption to the river crossing may strand the residents in West Bragg Creek without emergency access and hinder emergency services from responding adequately. During the 2013 Flood event, the river crossing at Balsam Avenue was temporarily closed, leaving residents without the ability to access their homes or exit the area. Similar consequences could be anticipated in a wildfire or any other emergency event.

In May 2015, the Federal Government approved the land transfer between the Government of Alberta and the Tsuut'ina Nation for the transfer of lands north of Bragg Creek to the Tsuut'ina Nation. The transfer that was completed exchanged over a thousand acres of existing Nation lands required for the construction of the Calgary Southwest Ring Road for the lands north of Bragg Creek. This land

West Bragg Creek Emergency Access

transfer added challenges to finding an emergency access route due to the potential for limited access directly north through what are now Nation lands.

May 10, 2016, Alberta Transportation (now Alberta Transportation and Economic Corridor (ATEC)) provided \$139,279 to the County for the completion of a West Bragg Creek Emergency Access Study. A Technical Review Committee was established that included representatives from the County Engineering, Planning and ATEC to administer the process of the study and oversee the progress. The area of focus included the Greater Bragg Creek community and extended out to the County boundaries. The study assessed surrounding local roads and provincial highways that could provide a suitable emergency access road connection for West Bragg Creek residents. The study limit is bounded by the M.D. of Foothills located to the south, Kananaskis Improvement District to the south and west, Township Road 242 to the north and Highway 22 to the east.

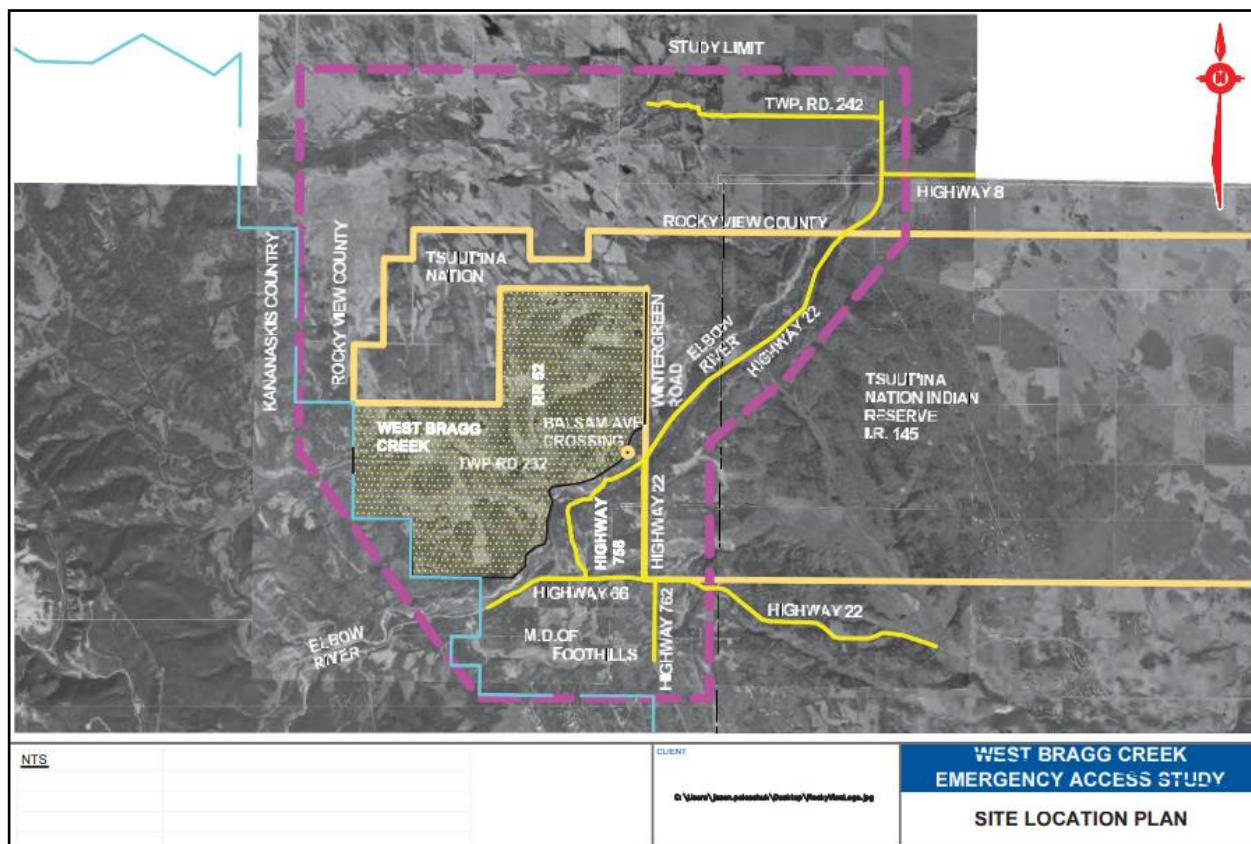


Figure 1: Study Limit

The purpose of the study was to determine an emergency access/egress route that serves the community, along with providing recommendations regarding the specific location of the access route to determine other infrastructure requirements associated with the route. A total of seven potential egress options were identified and evaluated against the following considerations:

- Maximizing the use of existing roadway infrastructure and County Road allowances.
- Minimizing impacts to adjacent landowners.
- Potential Elbow River crossing locations.
- Environmental impacts.

West Bragg Creek Emergency Access

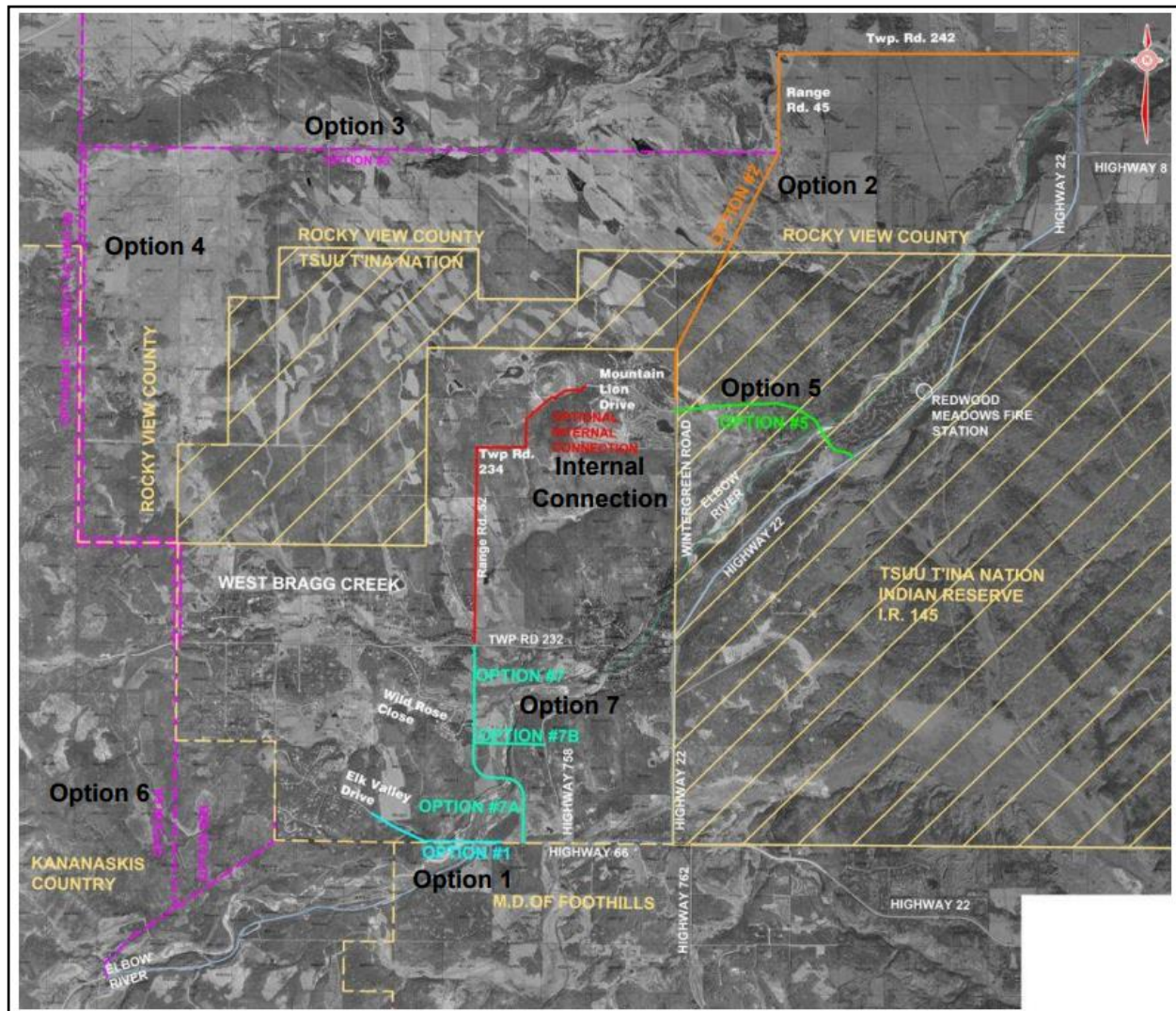


Figure 2: Potential Route Location

To provide a score/cost ration, evaluation criteria for potential access routes included emergency evacuation and response services, environmental constraints, geotechnical risks, historical resource areas, infrastructure, landowner impacts, operation/maintenance, topography, geometry, utility impacts, and construction costs. With construction costs taken into consideration, Route Option 2 ranked the highest and was considered the technically preferred route.

Route Option 2 extends north from Wintergreen Road along Range Road 50 (undeveloped road allowance) through Tsuut'ina Nation lands, east along Township Road 240 (undeveloped road allowance), then north along Range Road 45 (partially developed road allowance) to connect to the existing local road network. Option 2 then utilizes the existing portions of Range Road 45 and Township Road 242 to connect to Highway 22. The estimated construction cost for the new section of roadway, between Moose Drive and Range Road 45, as part of the Option 2 emergency access was \$14.5M in 2017 and has now increased to \$21.4M.

Route Option 7B extends south from Township Road 232 along Range Road 52 (partially developed and undeveloped road allowance), east across private lands, across the Elbow River and connecting to Hwy 758. The estimated construction cost for the new sections of roadway and a bridge crossing

West Bragg Creek Emergency Access

was \$20.1M in 2017 and has now increased to 40M for a complete vehicle bridge and \$23.3M for a modified pedestrian bridge crossing.

Administration presented the findings of the report to Council on October 10, 2017, where Council accepted the recommendation that Route Option 2 be identified as the preferred emergency access route for West Bragg Creek, and Administration was directed to continue working with ATEC and Tsuut'ina Nation on the project including finalizing the planning study and developing a funding strategy.

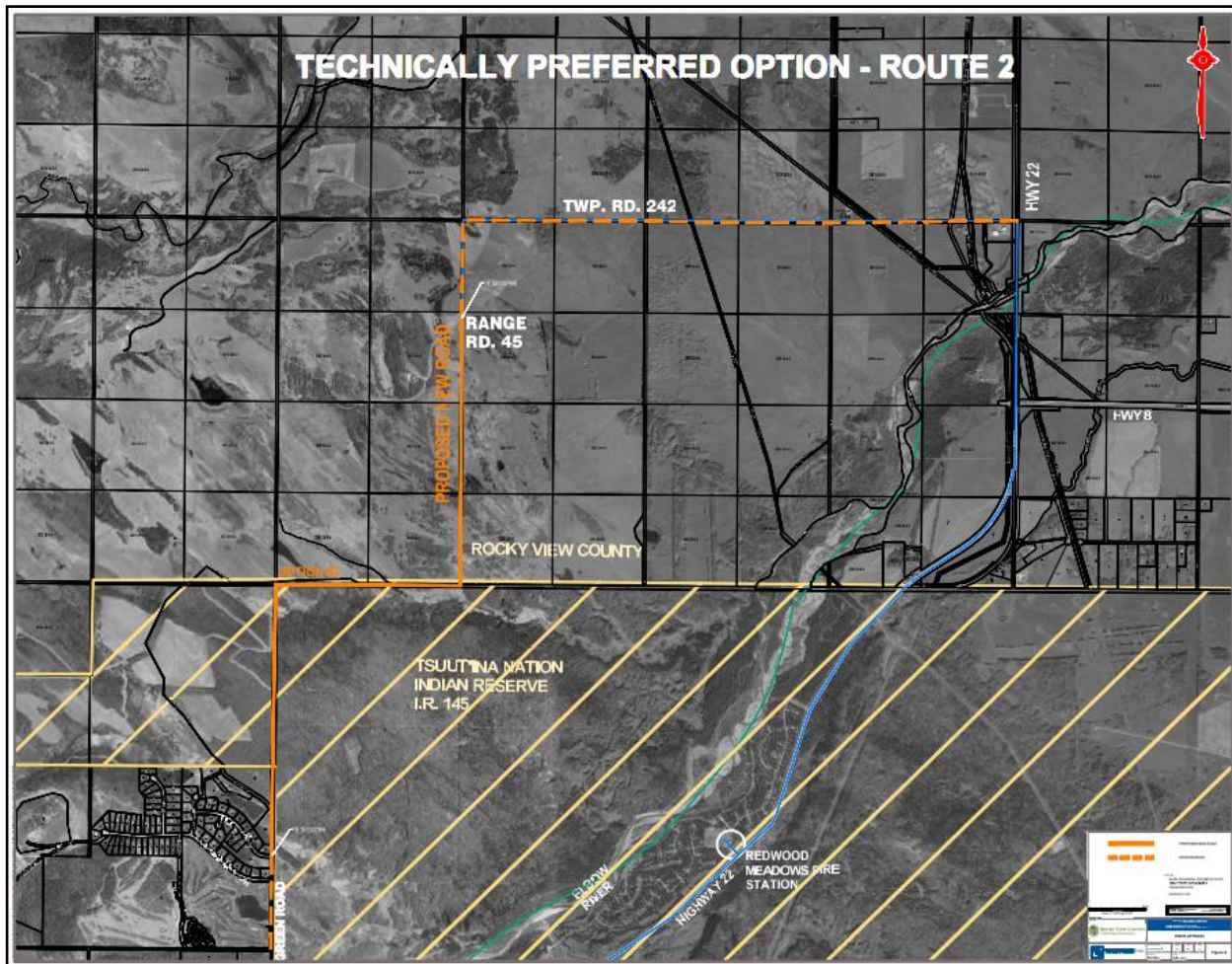


Figure 3: Preferred Option 2

Administration has had little success with the negotiation with Tsuut'ina Nation on the agreement to proceed with the recommended Option 2. An additional three options were explored as part of the update in 2023. The options consisted of constructing a pedestrian crossing across the Elbow River at an elevation that would not be impacted by flooding. The crossings would be primarily used for recreational use and constructed to accommodate emergency vehicles in the event of a natural disaster. The three options included a crossing at Spruce Ave (\$8.0M 2023 dollars), a crossing at Bracken Rd (\$8.1M 2023 dollars) and a modified bridge crossing for Option 7B (\$23.3M 2023 dollars)

DISCUSSION

The three bridge-crossing alternatives may not be favourable from the community perspective based on the stakeholder engagement that was undertaken in 2016. The residents of the Wildrose area were heavily opposed to Option 7B and a bridge crossing at Elbow River. In addition to the potential community opposition, further detailed assessment is required to compare the crossing at Bracken Road or Spruce Ave to ensure the constructability and integration into the overall active transportation network for Bragg Creek. Administration recommends undertaking further assessment into the feasibility of Option 7B, and that the Bracken Rd and Spruce Avenue bridge crossing option be considered for the 2024 Capital Plan Budget as this option can be incorporated with the Active Transportation Plan update for south County, and the Bragg Creek Area Structure Plan.

ALTERNATE DIRECTION

Should the Committee not choose Option 7B, Administration recommends continuing to engage with Tsuut'ina Nation on an agreement to finalize the planning and development of a funding strategy per the recommended Route Option 2. The updated cost estimate is \$21.4M (2023 dollars).

THAT Administration continue to work with Tsuut'ina Nation and ATEC on the 2017 preferred option through Tsuut'ina Nation lands.

ATTACHMENTS

- Attachment A: West Bragg Creek Emergency Access Route Determination Functional Planning Study – Report Update to 2023.
- Attachment B: West Bragg Creek Emergency Access Study Presentation



TETRA TECH

TECHNICAL MEMO

ISSUED FOR USE

To: Alvin Varma
Project Manager
Rocky View County

Date: August 31, 2023

c:

Memo No.: 001

From: Lou Mak, P.Eng.
Senior Transportation Engineer

File: 704-TRN.CHWY03568-01

Subject: Update to West Bragg Creek Emergency Access Study

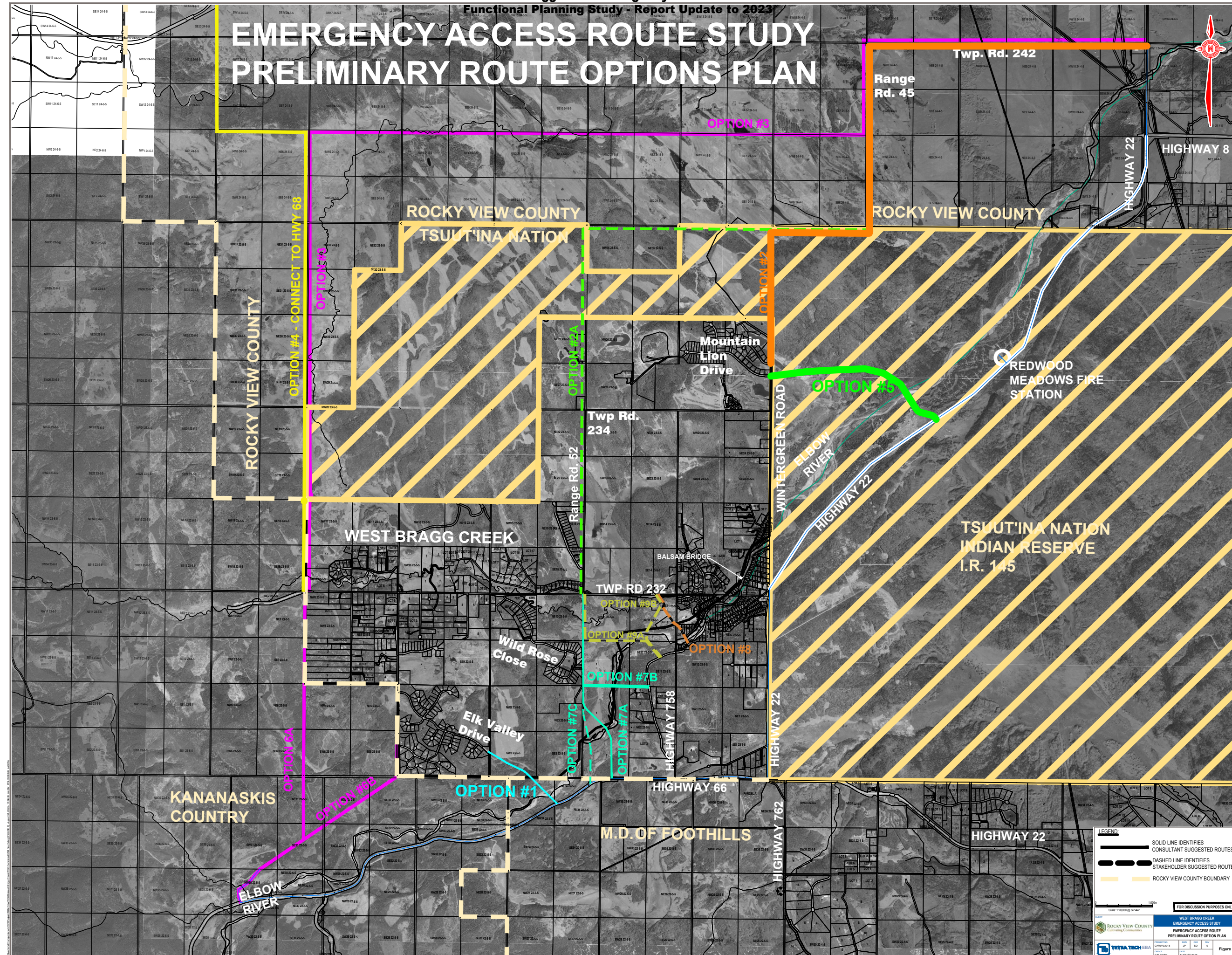
1.0 INTRODUCTION

In 2017, Tetra Tech Canada Inc. (Tetra Tech) was retained by Rocky View County (Rocky View) to complete functional planning study to determine an emergency access route for the West Bragg Creek area. Currently, the only access to the West Bragg Creek area is via a crossing of the Elbow River at Balsam Avenue. During times of catastrophic events such as flooding or forest fire, the crossing may be cut off, stranding the residences without an emergency access. The study objective is to plan for a two-lane, two-way emergency access that will be maintained and gated.

In 2013, the Alberta Government and the Tsuut'ina Nation entered a land transfer agreement as part of implementing the Calgary Southwest Ring Road that incorporated lands north of Bragg Creek into Tsuut'ina Nation. This land transfer exacerbates the challenge of finding an emergency access route.

2.0 ROUTE OPTIONS

Preliminary route options were developed on the premise of providing a connection from the existing roads within the West Bragg Creek area to the existing road/highway network outside of the study area, as shown on the figure below.



The significant advantages and disadvantages of the route options are as follows.

To the West (Route 3, Route 4, Route 6A, and Route 6B)

- Advantages:
 - These routes circumvent Tsuut'ina Nation lands and do not require a new bridge crossing.
- Disadvantages:
 - These routes have unfavourable emergency response and evacuation service times.
 - Route 6A and Route 6B require improvements to existing bridge on Highway 66.

Route 3, Route 4, and Route 6 traverse through areas with high forest fire potential and/or have a long exposure to wildfire risk and were screened out early in the study.

To the North Crossing Tsuut'ina Lands (Route 2, Route 2A, Route 5)

- Advantages:
 - These routes have favourable emergency response and evacuation service times.
 - Route 2 and Route 2A traverse overland do not require a new bridge crossing.
- Disadvantages:
 - Route 5 requires a new bridge crossing.

Route 2, Route 2A, and Route 5 traverse through Tsuut'ina lands and would require an agreement.

To the South Crossing Elbow River (Route 1, Route 7A, Route 7B, and Route 7C)

- Advantages:
 - These routes have desirable emergency response and evacuation service times.
- Disadvantages:
 - Requires a new extensive (200+ m) Elbow River crossing.
 - Route 1 traverses within a subdivision and crosses a key wildlife/biodiversity zone.
 - Route 7B strongly opposed by residents along Highway 758.

Route 1, Route 7A, Route 7B, and Route 7C required a new bridge crossing that would be costly. As the emergency route was to be gated during non-emergency events, stakeholders and the public opposed such costly routes.

To the East Crossing Elbow River [Route 8 (Bracken Rd), Route 9A/B (through Bragg Creek Provincial Park)]

- Route 8:
 - Located in flood plain/fringe and would require an extensive (300+ m) bridge crossing.
 - Bridge crossing may impact residences and affect Highway 758.
 - Emergency events that close Balsam may also close this Bracken Road crossing.

- Route 9A and Route 9B:
 - Connects to the Bragg Creek Provincial Park parking lot.
 - Impacts the provincial park which is identified as a “Park and Protected Area”.

Route 8, Route 9A, and Route 9B were not carried forward for further consideration due to potential costs and impacts.

3.0 EVALUATION OF ROUTE OPTIONS

An evaluation workshop was held with members of the technical review committee, County representatives, Alberta Transportation, and Tetra Tech to collaboratively evaluate the route options and select a technically preferred emergency access route. An evaluation criteria, developed jointly by Tetra Tech and the County, included the following criteria:

- Emergency Response Service – estimated response time from the Redwood Meadows fire hall to the various subdivisions within the West Bragg Creek area.
- Emergency Evacuation Service – estimated time for residents to reach a common muster point (Banded Peak School, Highway 22 and/or nearest highway decision point); based on GIS analysis.
- Environmental Constraints – impacts to valued environmental components such as crown reserves, parks and protected areas, significant/sensitive areas, wetlands, watercourse crossings, etc.
- Geotechnical Risk – challenges associated with unsuitable ground conditions.
- Historical Resource Areas – impact to areas of known or having potential historical significance.
- Infrastructure – utilization of existing roads, new bridge and road construction.
- Landowner Impacts – parties involved, possible extent of impact.
- Operations and Maintenance – frequency, reliability, route directness and familiarity or route (wayfinding).
- Topography and Geometry – relative steepness of grade impacting response and evacuation effectiveness.
- Utility Impacts – impacts to existing utilities.
- Construction Cost Estimates – total estimated cost for construction of new road and any bridgework.
- Risks Management – defines the potential risk impacts associated with each route option.

The results of the workshop evaluation are as follows:

- The evaluation was based on a balanced multi-bottom-line approach in that the option that has the highest technical points per construction dollar (i.e., greatest value for money spent) would be the most preferred option.
- Option 1 scored the highest overall in terms of technical points with Option 5 second highest at 0.5% lower. The three Option 7 variations scored third, fourth, and fifth, at 7%, 10%, and 11%, respectively, lower than Option 1.

- With construction costs taken into consideration through technical scoring/cost ratio, the high construction costs for Option 1, Option 5, and Option 7 (as these options involve an Elbow River Crossing) lower the value for these three options, while promoting Option 2 and Option 2A to be ranked first and second overall, respectively.

A major risk associated with Option 2 is that the route traverses through Tsuut'ina lands. Agreements to access Reserve lands may require timely discussion involving Tsuut'ina, the Federal government, Alberta Transportation, and Rocky View County.

If land negotiation with Tsuut'ina is not successful for the technically preferred option, an alternate plan would include either Option 7A or Option 7B which scored the next highest in terms of overall value for non-Tsuut'ina options. Option 7A and Option 7B have received significant community opposition and the challenges associated with the community and social impacts would be major obstacles to overcome. Furthermore, Option 7A and Option 7B involves building a new Elbow River bridge crossing, where the concept of building a multi-million dollar bridge that is not to be opened except during emergency events has not been well accepted.

Option 7A and Option 7B can and should be assessed as part of the long-term transportation network plan for the West Bragg Creek community, when a permanent second community access is required for future development. At that time, other options may too be more favourable for long-term establishment, since determining the location of a permanent access will require options to be evaluated with different criteria.

4.0 TECHNICALLY PREFERRED OPTION

Tetra Tech presented the project and the preferred Route Option 2 to the Rocky View County Policy and Priorities Committee on October 3, 2017. The Policy and Priorities Committee made the following motions which were carried.

- Motion No. 1. That the presentation from Tetra Tech on the West Bragg Creek Emergency Access Study be received for information.
- Motion No. 2. That the Policy and Priorities Committee recommends to Council that Route No. 2 be identified as the preferred emergency access route for West Bragg Creek and direct Administration to continue working with Alberta Transportation and Tsuut'ina Nation on the project including finalizing the planning study and developing a funding strategy.

Subsequently, On October 10, 2017, Council accepted Policy and Priorities Motion No. 2.

During the course of this study, the County has communicated with Tsuut'ina Nation to discuss the various preliminary route options including the technically preferred route option. Tsuut'ina Nation has agreed that the route has enough merit to continue a dialogue with the County. Upon completion of the study, Tsuut'ina Nation and the County were continuing to work together towards a mutually beneficial solution that follows closely to Option 2.

The estimated cost for Option 2 was \$14.5 M (2017 dollars), which has now increased to \$21.4 M (2023 dollars).

5.0 2023 UPDATE TO THE STUDY

In 2023, Rocky View County indicated that discussions with Tsuut'ina Nation to implement Route Option 2 has not progressed in a timely manner. As such, Rocky View County is exploring options that do not cross Tsuut'ina Nation lands. These options include a previously considered bridge (2-lane, 9.0 m wide) crossing of the Elbow River as well as a modified bridge (1-lane, 5.0 m wide) design suitable for emergency vehicles.

Based on the evaluation of the route options, Route Option 7B, which crosses the Elbow River from Range Road 52 (Wildrose Close subdivision) to Highway 758, was the technically preferred option that did not cross Tsuut'ina Nation lands. The cost of Option 7B (road approaches and two-lane bridge structure) is estimated at \$40.0 M (2023 dollars). The cost of Option 7B with a modified bridge design (road approaches and one-lane bridge structure) is estimated at \$23.3 M (2023 dollars).

Two other bridge crossing options are also being considered in light of the flood mitigation works that were completed along the Elbow River through the Bragg Creek community. These bridge crossings would include a 5.0 m bridge design width that would allow 2.5 m opposing pedestrian pathways during non-emergency times and have sufficient width to accommodate an ambulance or a fire truck during emergency.

Spruce Avenue Crossing

This crossing would be located approximately 200 m downstream of the Balsam Avenue bridge and would connect Wintergreen Road and Spruce Avenue as shown in Exhibit 1 below. The cost of this Spruce Avenue Crossing, with a 5.0 m bridge is estimated at \$8.1 M (2023 dollars). This cost estimate does not include any road improvements beyond tying the bridge to the existing roadway infrastructure.

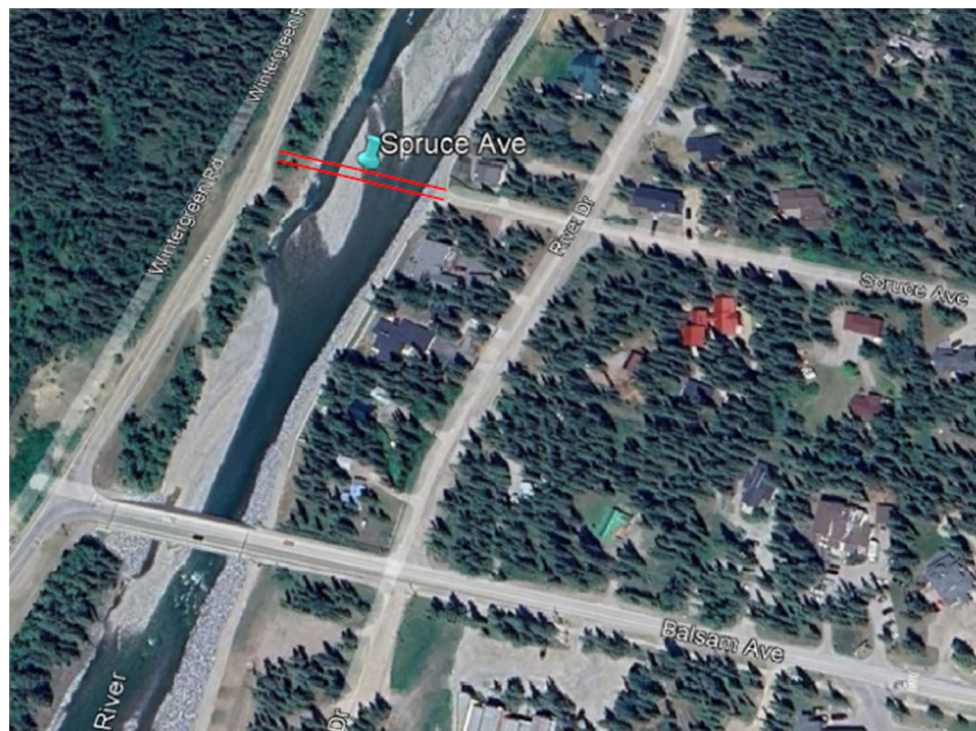


Exhibit 1: Bridge Crossing Location Option: Spruce Avenue to Wintergreen Road

Bracken Road Crossing

This crossing would be located approximately 1.5 km upstream of the Balsam Avenue bridge and would connect Bracken Road to Highway 758, as shown in Exhibit 2 below. This crossing would be in a similar location as Route Option 8 of our preliminary route options, which was not carried for further review due to the potential cost to cross the flood plain, constructability issues to tie to Highway 758, and potential impacts to residences. However, with the flood mitigation measures now in place, the length of bridge required to span up to the flood wall is shortened. The cost of this Bracken Road Crossing, with a 5.0 m bridge is estimated at \$8.1 M (2023 dollars). This cost estimate does not include any road improvements beyond tying the bridge to the existing roadway infrastructure.

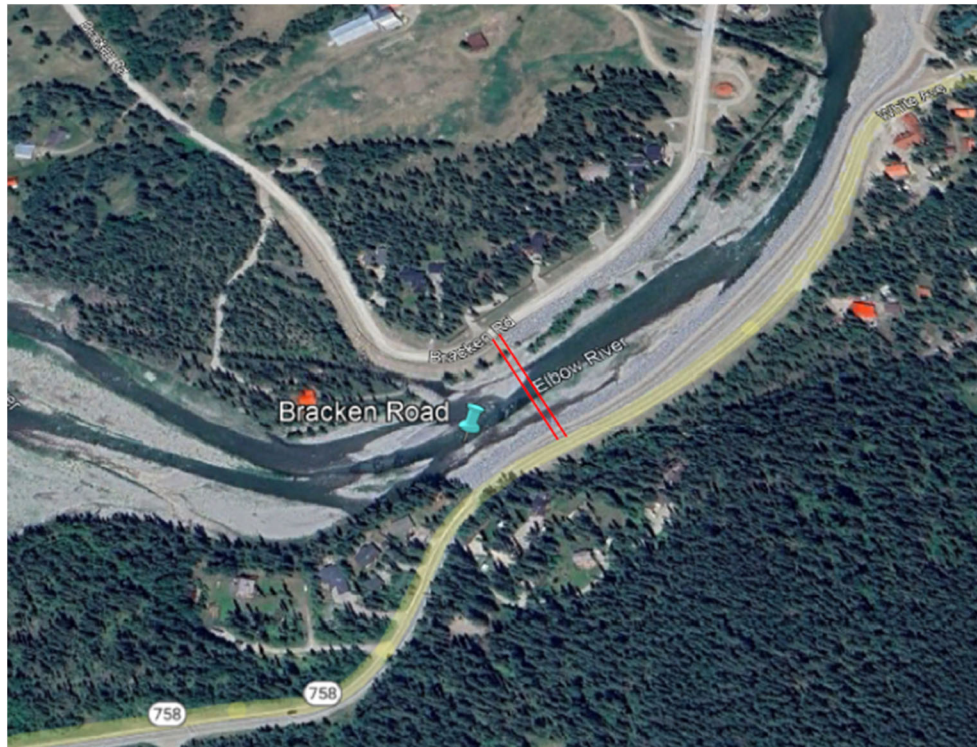


Exhibit 2: Bridge Crossing Location Option: Bracken Road to Highway 758

Potential Risks

A potential risk for the Spruce Avenue and Bracken Road crossings is that should the Balsam Avenue bridge be compromised during a flood event, there is a potential for that same cause to compromise these two alternative crossings. During emergency situations, there may also be traffic congestion as residents drive to the bridge which may be blocked by oncoming emergency vehicles. Traffic management during an emergency will be critical to expedite evacuation.

Another risk is that the purpose of the pathways on top of the flood mitigation berms have been conveyed as being for maintenance purposes only to adjacent landowners. If the crossing is open to active transportation users during non-emergency, the implementation of the crossing may face strong opposition. It is recommended that an Active Transportation Network Study be completed to determine a suitable location for such pedestrian bridge crossings that also identifies connections required to reach the existing pathway system.

Comparison of Spruce Avenue and Bracken Road Crossings

Comparing the Spruce Avenue and Bracken Road crossing options, the Bracken Road crossing is technically less challenging to construct. The Spruce Avenue bridge will require consideration of property impacts to adjacent residences, tie-in to the existing pathway on the berm, and requirement to cross-over the flood wall. The Bracken Road bridge may tie to Highway 758 at-grade where the highway begins to rise in elevation and the flood berm ends, and tie directly to Bracken Road, east of the end of flood wall.

The Bracken Road crossing would still traverse through the Elkana community; however, the community may see this as an opportunity for an active transportation connection. The crossing would also provide a connection to nearby attractions (e.g., Trading Post) and to Bragg Creek business district.

It is recommended that the Bracken Road Crossing be reviewed in further detail.

Next Steps

If Bracken Road Crossing is to be open to pedestrian usage during non-emergency, it is suggested that an Active Transportation Network Study be undertaken to determine a suitable location for such pedestrian bridge crossings that also identifies connections required to reach the existing pathway system.

Should Rocky View County wish to proceed to implement such crossing, the next step would be to undertake a topographical survey, geotechnical investigations, environmental and historical resource assessment, and to proceed to preliminary design and regulatory permitting.

If funding is not available, investigation to potential sources of funding should be undertaken to identify potential grants and/or cost-sharing opportunities with other levels of government.

6.0 CLOSURE

We trust this technical memo meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,
Tetra Tech Canada Inc.

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West Bragg Creek Emergency Access Study Presentation to Rocky View County Council



August 2023

Lou Mak, Project Manager
Shane Duval, Project Director

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Presentation Outline

- Study Background
- Road Function and Design Criteria
- Preliminary Route Options
- Evaluation of Options
- Technically Preferred Option
- 2023 Update
- Other Bridge Crossing Options
- Potential Risks
- Comparison
- Next Steps

2017 Study - Background

Purpose:

Determine an emergency access route for the West Bragg Creek area.

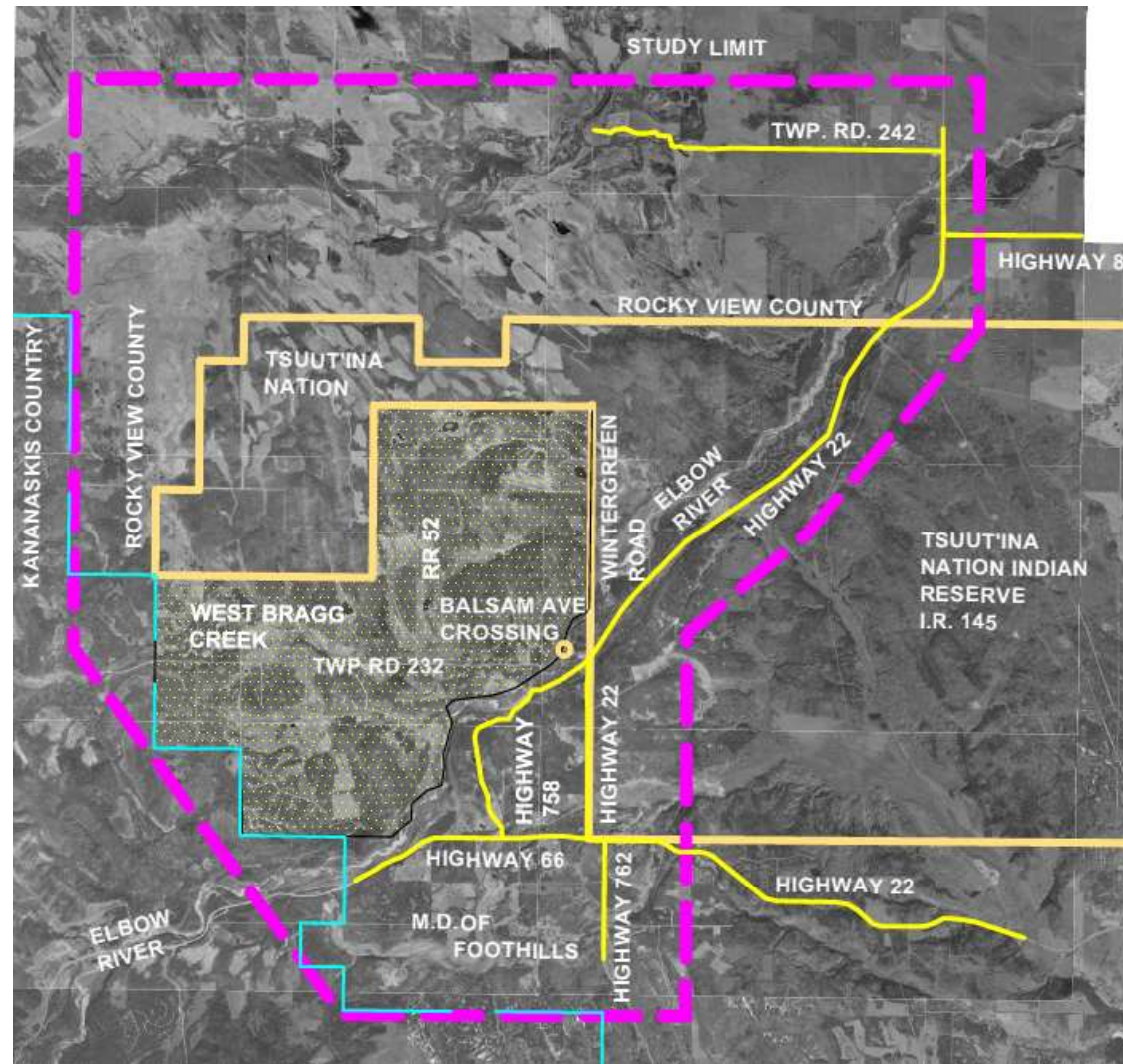
Issue:

Balsam Avenue Bridge provides the only access to the area.

During catastrophic events (e.g., flooding or forest fire), the crossing may be inaccessible (e.g., 2013 flood event).

Study Area Constraints:

- Elbow River
- Tsuut'ina Nation
- Foothills Terrain (slope >25%)
- Kananaskis County



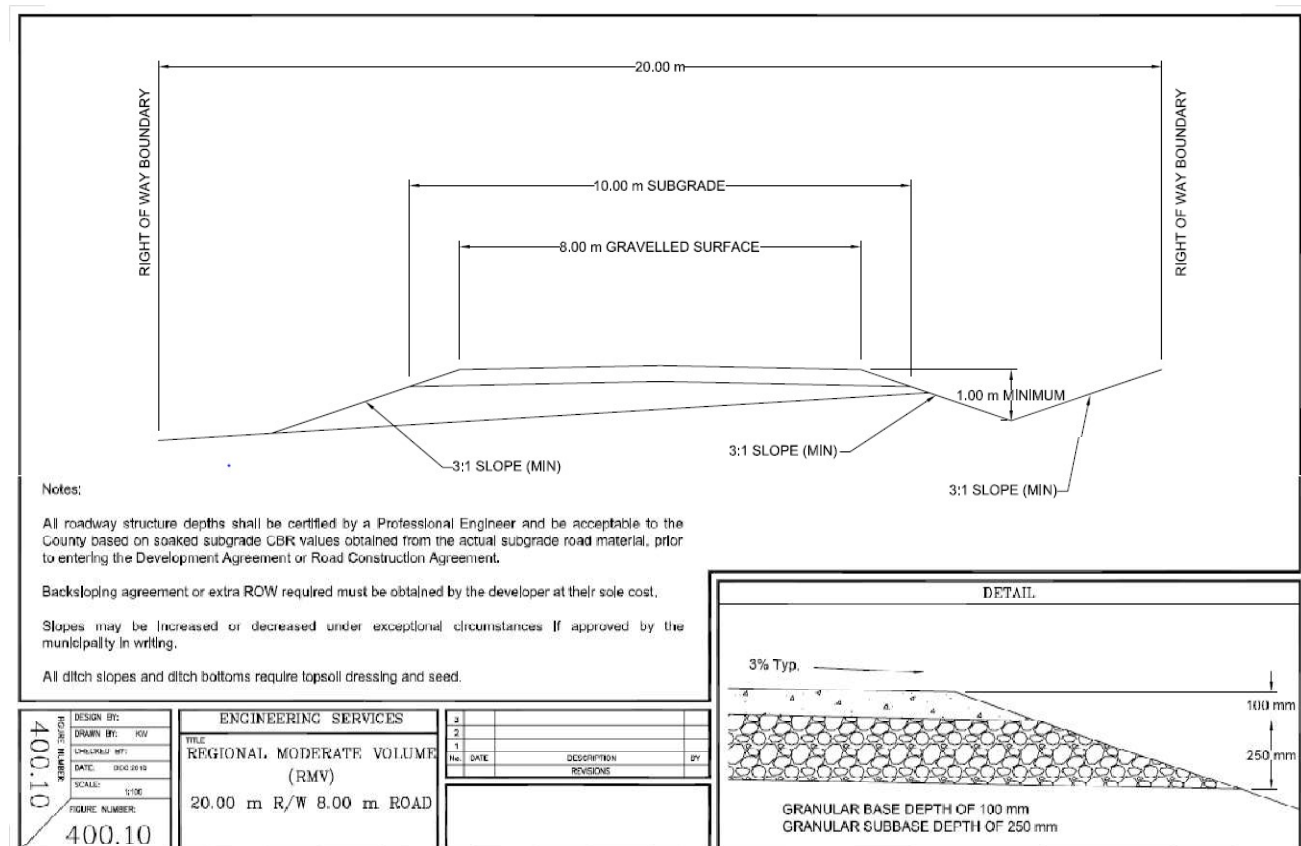
Road Function and Design Criteria

Roadway Function:

- Support two-way traffic:
 - Entering: Emergency response vehicles
 - Exiting: Residents evacuating
- Access for use during emergency events only. Gated during non-use.

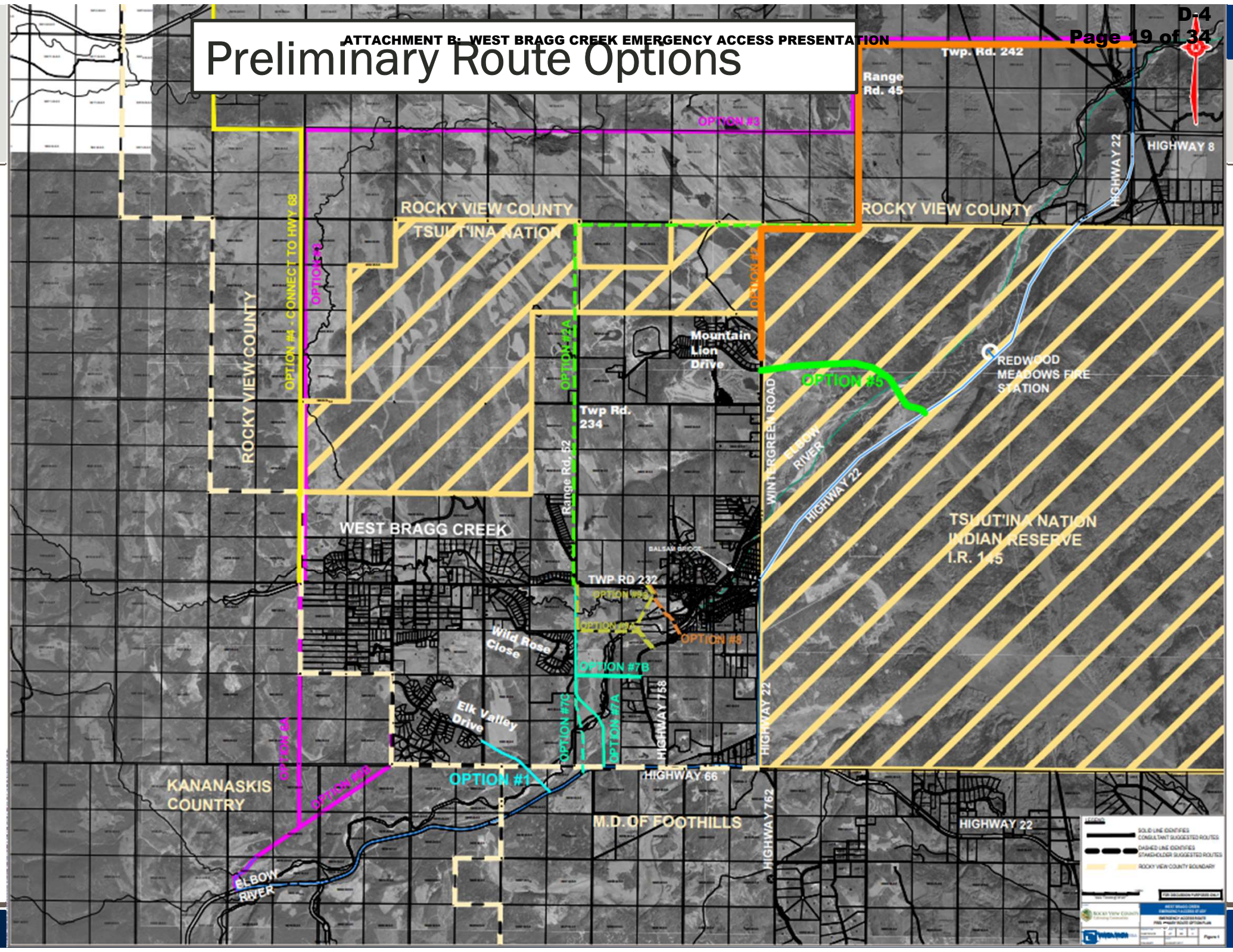
Design Features:

- 2-lane, 2-way road
- 8.0 m wide gravel surface
- 20 m basic right-of-way
- Maximum gradient of 8%



ATTACHMENT B- WEST BRAGG CREEK EMERGENCY ACCESS PRESENTATION

Preliminary Route Options



LEGEND

- SOLID LINE IDENTIFIES CONSULTANT SUGGESTED ROUTES
- DASHED LINE IDENTIFIES STAKEHOLDER SUGGESTED ROUTES
- YELLOW SHADING ROCKY VIEW COUNTY BOUNDARY

WEST BRAGG CREEK EMERGENCY ACCESS PRESENTATION

ROCKY VIEW COUNTY

TSUUT'INA NATION

WEST BRAGG CREEK

KANANASKIS COUNTRY

M.D. OF FOOTHILLS

TSIUT'INA NATION INDIAN RESERVE I.R. 145

ELBOW RIVER

REDWOOD MEADOWS FIRE STATION

WINTERGREEN ROAD

WILD ROSE CLOSE

EIK VALLEY DRIVE

MOUNTAIN LION DRIVE

BALSAM BRIDGE

TWP RD 232

TWP RD 234

RANGE RD 52

RANGE RD 45

TWP RD 242

HIGHWAY 22

HIGHWAY 66

HIGHWAY 762

HIGHWAY 8

OPTION #1

OPTION #2

OPTION #3

OPTION #4

OPTION #5

OPTION #6

OPTION #7A

OPTION #7B

OPTION #7C

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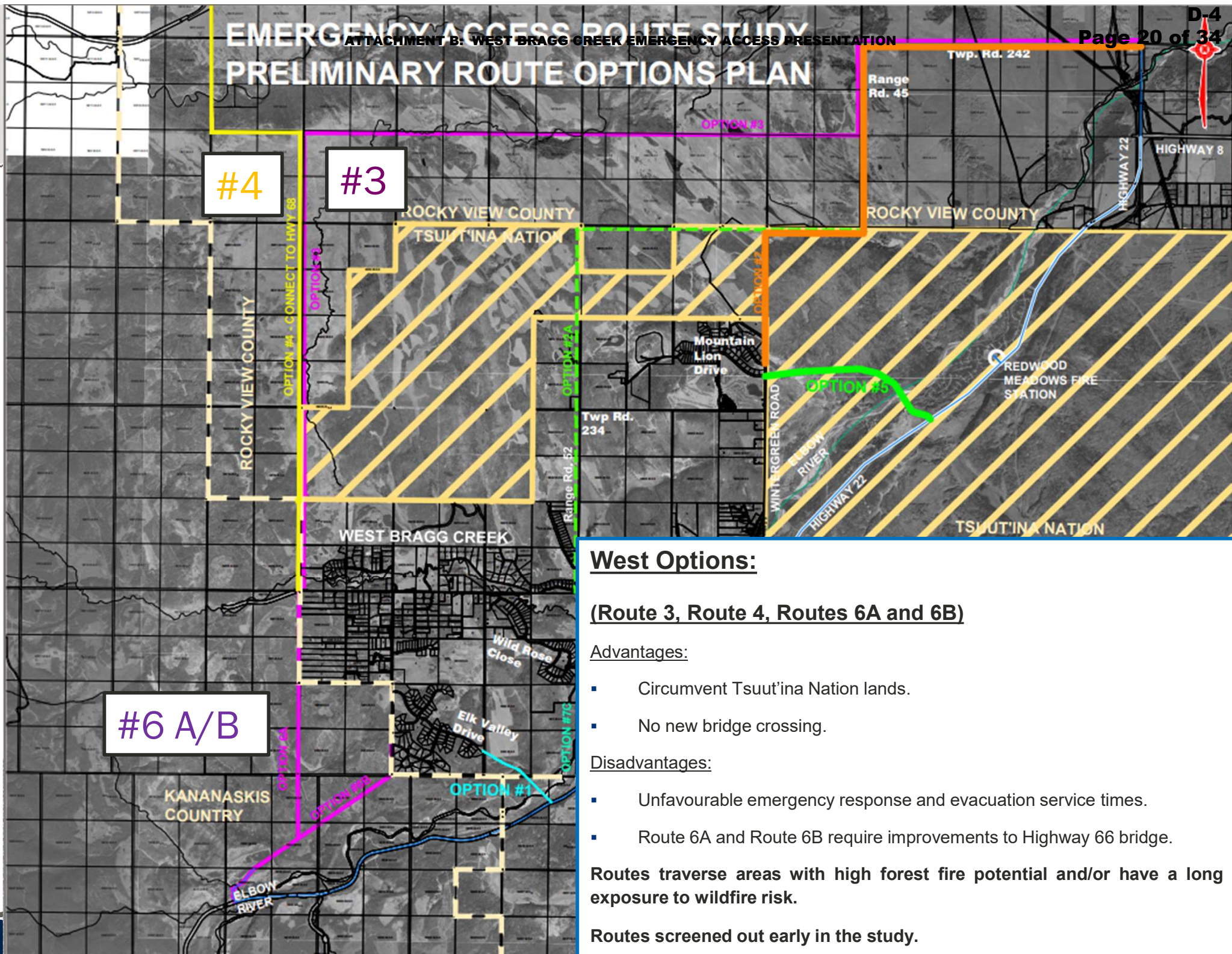
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EMERGENCY ACCESS ROUTE STUDY PRELIMINARY ROUTE OPTIONS PLAN

ATTACHMENT B: WEST BRAGG CREEK EMERGENCY ACCESS PRESENTATION

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West Options:

(Route 3, Route 4, Routes 6A and 6B)

Advantages:

- Circumvent Tsuut'ina Nation lands.
- No new bridge crossing.

Disadvantages:

- Unfavourable emergency response and evacuation service times.
- Route 6A and Route 6B require improvements to Highway 66 bridge.

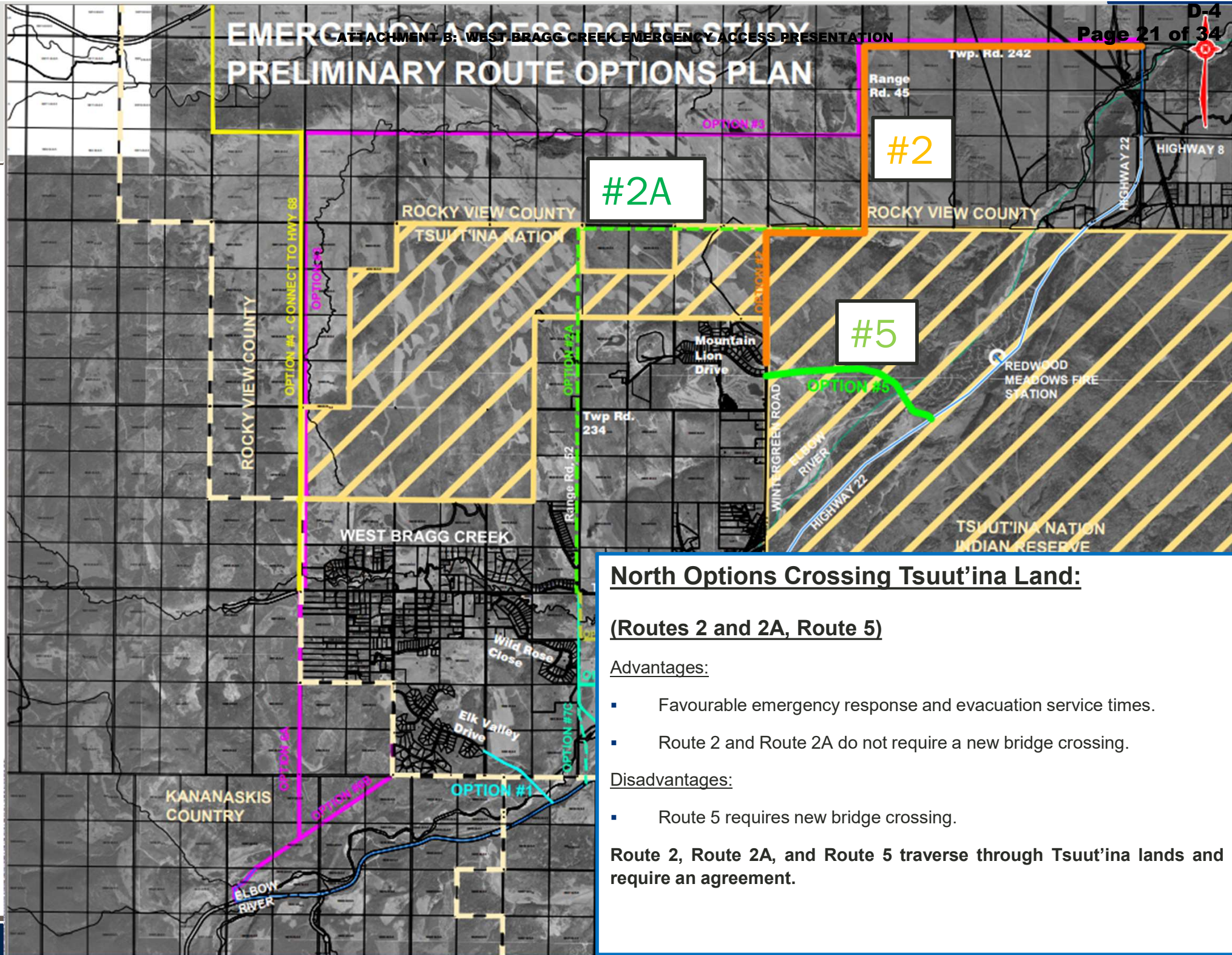
Routes traverse areas with high forest fire potential and/or have a long exposure to wildfire risk.

Routes screened out early in the study.

EMERGENCY ACCESS ROUTE STUDY PRELIMINARY ROUTE OPTIONS PLAN

ATTACHMENT B: WEST BRAGG CREEK EMERGENCY ACCESS PRESENTATION

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North Options Crossing Tsuut'ina Land:

(Routes 2 and 2A, Route 5)

Advantages:

- Favourable emergency response and evacuation service times.
- Route 2 and Route 2A do not require a new bridge crossing.

Disadvantages:

- Route 5 requires new bridge crossing.

Route 2, Route 2A, and Route 5 traverse through Tsuut'ina lands and require an agreement.

EMERGENCY ACCESS ROUTE STUDY PRELIMINARY ROUTE OPTIONS PLAN

ATTACHMENT B: WEST BRAGG CREEK EMERGENCY ACCESS PRESENTATION

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South Options Crossing Elbow River:

(Route 1 and Routes 7A, 7B and 7C)

Advantages:

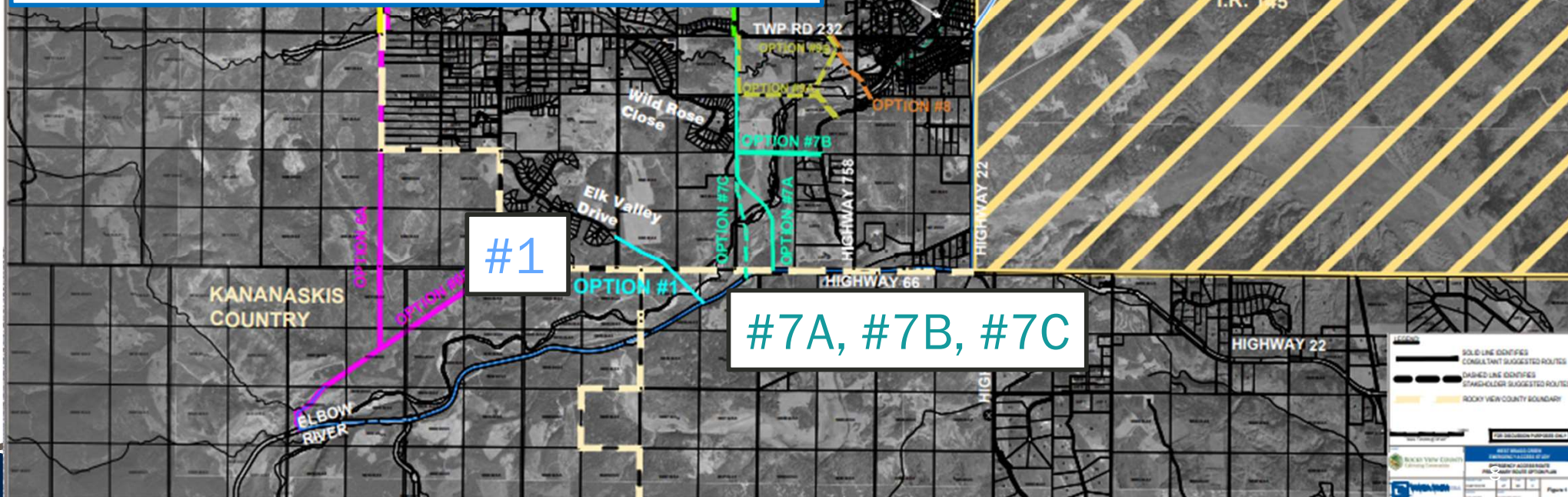
- Desirable emergency response and evacuation service times.

Disadvantages:

- Requires a new extensive (200+ m) Elbow River crossing.
- Route 1 traverses within a subdivision and crosses a key wildlife/biodiversity zone.
- Route 7B strongly opposed by residents along Highway 758.

Route 1, Route 7A, 7B and 7C require a new costly bridge crossing.

As the emergency route was to be gated during non-emergency events, stakeholders and the public opposed such costly routes.



-
- BALSAM BRIDGE
- TWP RD 232
- OPTION #9B
- OPTION #9A
- OPTION #8
- #8
- #9A, #9B

Evaluation of Options: Workshop

- Evaluation workshop representatives:
 - Technical review committee members
 - County representatives
 - Alberta Transportation
 - Tetra Tech
- Evaluation criteria developed jointly by Tetra Tech and the County

Evaluation of Options: Criteria

- Emergency Response Service – response time from the Redwood Meadows fire hall.
- Emergency Evacuation Service – evacuation time to reach a common muster point (Banded Peak School and/or nearest highway decision point).
- Environmental Constraints – impacts to valued environmental components (e.g., crown reserves, protected areas, significant/sensitive areas, wetlands, watercourse crossings, etc.).
- Geotechnical Risk – challenges associated with unsuitable ground conditions.
- Historical Resource – impact to historical significant areas.
- Infrastructure – utilization of existing roads, new bridge and road construction.
- Landowner Impacts – parties involved, possible extent of impact.
- Operations and Maintenance – frequency, reliability, route directness and familiarity or route (wayfinding).
- Topography and Geometry – steepness of grade impacting response and evacuation.
- Utility Impacts – impacts to existing utilities.
- Construction Cost Estimates – estimated cost for new road and any bridgework.
- Risks Management – potential risk impacts associated with each route option.

Evaluation of Options: Results

Most preferred option: highest technical points per construction dollar (i.e., greatest value for money spent)

- **Point Scoring;** Option 1 scored the highest; Option 5 second and Option 7A/7B scored third.
- **Technical scoring/Cost Ratio:** Option 2 and Option 2A rank first and second overall.

Risk: Option 2 traverses through Tsuut'ina lands. Agreements to access Reserve lands may require timely discussion involving Tsuut'ina, the Federal government, Alberta Transportation, and Rocky View County.

If land negotiation with Tsuut'ina is not successful, alternate plan would be Option 7A or Option 7B scored next highest for overall value for non-Tsuut'ina options.

Risk: Option 7A and Option 7B have significant community opposition. Community and social impacts challenges would be major obstacles to overcome.

Option 7A and Option 7B require new Elbow River bridge crossing that is to be gated. This has not been well received by the public.

Option 7A and Option 7B should be assessed as part of the long-term transportation network plan for a permanent second community access.

Technically Preferred Option

Project presented to Rocky View County Policy and Priorities Committee (October 3, 2017)

The following motions were carried.

- Motion No. 1. That the presentation from Tetra Tech on the West Bragg Creek Emergency Access Study be received for information.
- Motion No. 2. That the Policy and Priorities Committee recommends to Council that Route No. 2 be identified as the preferred emergency access route for West Bragg Creek and direct Administration to continue working with Alberta Transportation and Tsuut'ina Nation on the project including finalizing the planning study and developing a funding strategy.

Council accepted Policy and Priorities Motion No. 2 (October 10, 2017)

Upon completion of the study, Tsuut'ina Nation and the County were continuing to work together towards a mutually beneficial solution that follows closely to Option 2.

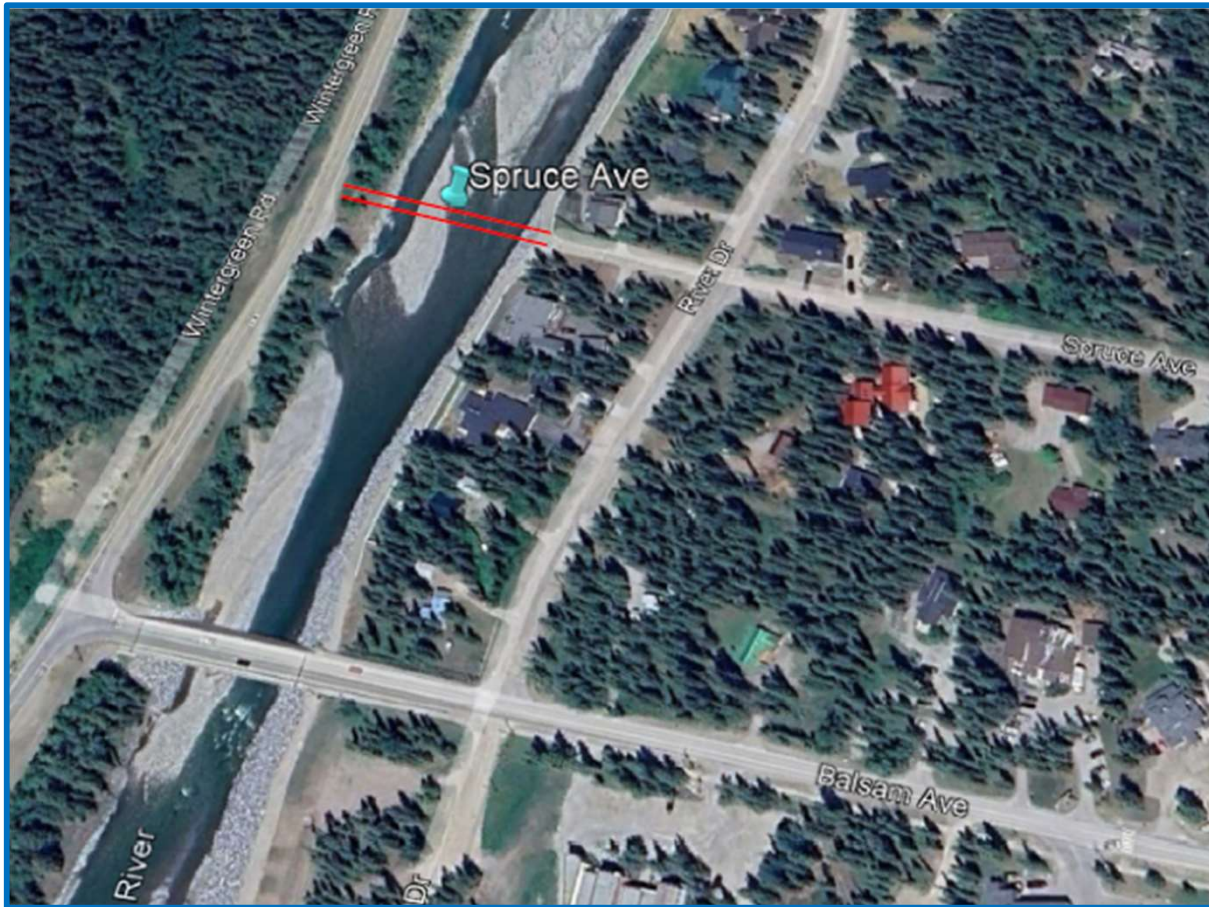
Estimated Cost: Option 2 \$14.5 M (2017 dollars); **\$21.4 M (2023 dollars)**

2023 Update

- Discussions with Tsuut'ina Nation has not progressed in a timely manner.
- Administration exploring options that do not cross Tsuut'ina Nation lands.
 - Previously considered bridge (2-lane, 9.0 m wide) crossing of the Elbow River.
 - Modified bridge (1-lane, 5.0 m wide) design suitable for emergency vehicles.
- **Option 7B**
 - Technically preferred option that did not cross Tsuut'ina Nation lands.
 - Estimated Cost: Option 7B (\$40.0 M) for two-lane bridge crossing option and approach roads.
 - Estimated Cost: Option 7B (\$23.3 M) for one-lane bridge crossing option and approach roads.

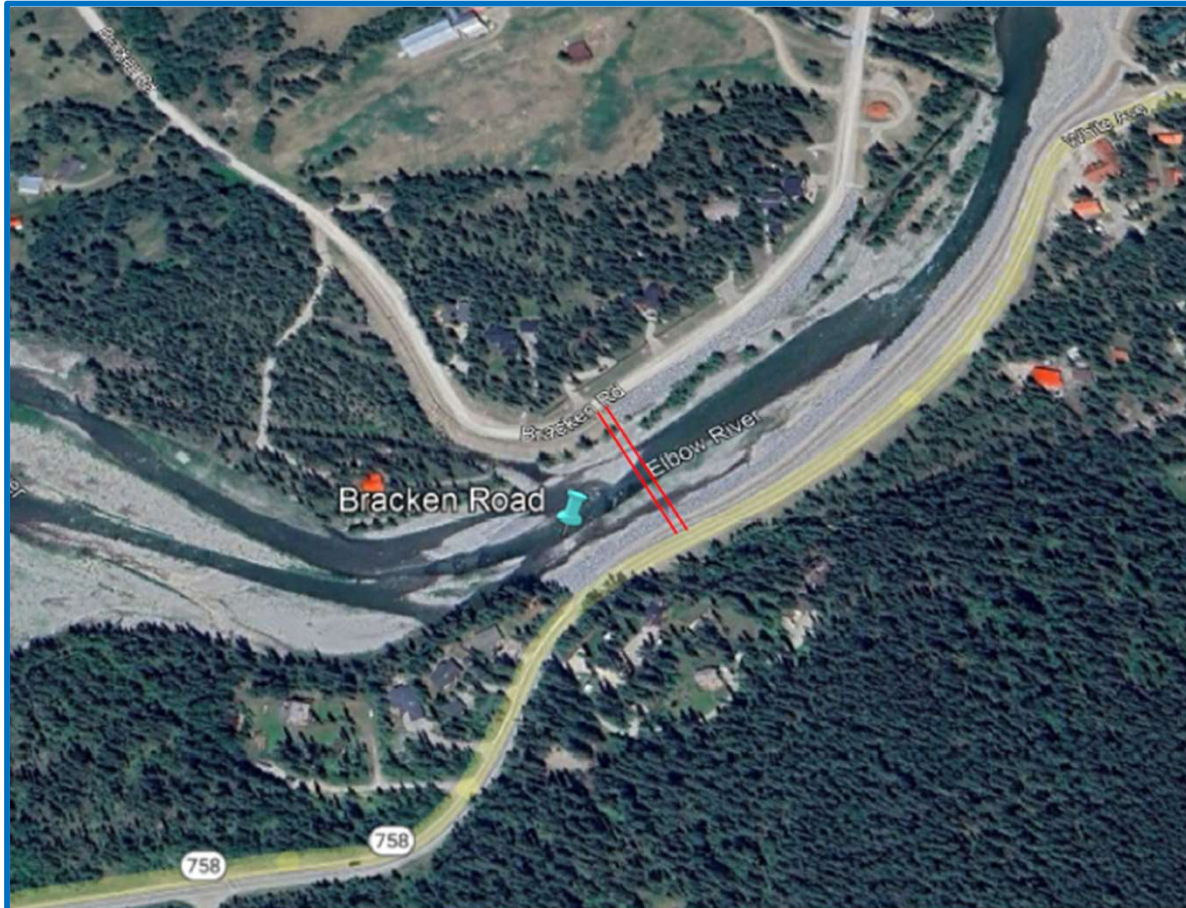
Other Bridge Crossing Options

- Spruce Avenue Crossing
 - 200 m downstream of the Balsam Avenue bridge
 - Connect Wintergreen Road and Spruce Avenue
 - Estimated Cost: \$8.1 M (2023 dollars) for a one-lane bridge (excludes road improvements beyond tie-ins)



Other Bridge Crossing Options

- Bracken Road Crossing
 - 1.5 km upstream of the Balsam Avenue bridge (similar to Option 8)
 - Connect Bracken Road to Highway 758 (takes advantage of flood mitigation works)
 - Estimated Cost: \$8.1 M (2023 dollars) for a one-lane bridge (excludes road improvements beyond tie-ins)



Potential Risks

- Catastrophic events that compromise Balsam Avenue bridge may also compromise these two alternative crossings.
- Potential for traffic congestion and bridge blockage due to oncoming emergency vehicles.
- Strong opposition if the crossing is open to active transportation users during non-emergency.
 - Flood mitigation berms were conveyed as being for maintenance purposes only to adjacent landowners.
 - Active Transportation Network Study recommended to identify location for pedestrian bridge crossings and connections to existing pathway system.

Comparison: Spruce vs Bracken

- Spruce Avenue Crossing
 - Require consideration of property impacts to adjacent residences, tie-in to the existing pathway on the berm.
 - Technically challenging to construct.
- Bracken Road Crossing
 - Crossing can be seen as opportunity to active transportation network improvement connecting to nearby attractions.
 - Less impacts to adjacent residences.
 - Less challenging to construct.

Recommendation: Bracken Road Crossing be reviewed in further detail.

Next Steps

- If crossing is open to pedestrian usage during non-emergency, undertake Active Transportation Network Study.
- Implement crossing: topographical survey, geotechnical investigations, environmental and historical resource assessment, and preliminary design and regulatory permitting.
- If funding is not available, investigate potential sources of funding to identify potential grants and/or cost-sharing opportunities.

Questions/Comments

Questions / Comments?
Thank you!