



Ministry of
Transportation
and Infrastructure

Cariboo Road Recovery Projects Public Engagement

March 14 – 31, 2022

Discussion Guide



We want to hear from you about the future of transportation in the Cariboo.

The Cariboo Road Recovery Projects were formed to deliver solutions for 10 sites impacted by landslides in the north Cariboo.

The Ministry of Transportation and Infrastructure is working to maintain safe and reliable access for residents and businesses, while undertaking a thorough process to develop safe and resilient long-term solutions for each site.

Over the past few months, project teams have been meeting and communicating with residents, land owners, local governments and Indigenous communities about immediate needs and beginning the conversation about long-term solutions. During this engagement, we are inviting you to learn more about the projects and to provide feedback as we explore considerations for each of the sites. Future opportunities to provide feedback will be provided as we develop potential solutions.



Participate in Public Engagement – March 14 to 31, 2022

We want to hear from people who live, work, play or commute through this area.

We are engaging with community members, transportation users, local and regional governments, Indigenous communities and stakeholders as we determine potential solutions.

After reading this discussion guide, visit gov.bc.ca/cariboo-road-recovery-projects to:

- Complete the online feedback form
- Sign up for our virtual information session:
- Send an email to project managers with feedback or to request a meeting

> Thursday, March 17, 6-7:30pm

A video of the presentation portion will be available on the website following the meeting.

Please provide your feedback by Thursday, March 31, 2022

About the Cariboo Road Recovery Projects

The Cariboo Road Recovery Projects were formed in spring 2021 to deliver solutions for road impacts which occurred in 2020 and 2021 at 10 major landslide and washout sites in the Cariboo. Starting on page 9, you will find background on damage at each site, the current status of the road, and potential options being explored to provide safe and resilient solutions.

We have established dedicated project teams for each site which include qualified professionals covering a number of disciplines, including:

- Engineering/technical
- Environment
- Indigenous consultation
- Construction

We will work closely with local residents, Indigenous communities, local governments, road users and stakeholders to plan for the future of transportation for all users.



Landslides in the Cariboo Region

Landslides are the most common type of disaster that occurs in the province of British Columbia. They pose a significant threat to infrastructure (destruction of roads, communication networks, pipelines, homes, etc.) and natural resources (timber, fisheries, mines).

The very wet spring and summer months of the past couple of years, combined with the snow melt and impacts of wildfires, has brought more water into the ground than normal and caused unprecedented landslides and road damage in 2020 and 2021.

There have been several factors that have contributed to the severity of the damage seen at these sites. July 2020 marked an almost unparalleled wet season in the Cariboo region, during which Williams Lake recorded the second wettest July on record since 1961 with 126 ml (240% above average) and Quesnel recorded the wettest July on record since 1982 with 86 ml (30% above average). A year later, the summer of 2021 marked B.C.'s worst wildfire season on record in terms of area burned.

These events have resulted in impacts on people's lives and road infrastructure in the Cariboo region. In addition to localized community impacts, damage has occurred on Highway 97, a key provincial north-south route that originates at the Canada-USA border at Osoyoos and runs to the Yukon border near Watson Lake. The highway passes through many communities and plays a key role in B.C.'s northern natural resource sector.

Investing in Climate Action for B.C.'s Roads

We are designing and building transportation infrastructure that is resilient and adapted to the effects of extreme weather so they remain reliable and open.

Our Approach

For any highway infrastructure work planned around the province, it is a requirement for the ministry's design engineers and our consultants to consider how future climate events could affect the infrastructure, and what can be done to make our roads and bridges more resilient so they remain reliable and open. As part of this work, we are pile driving bridge footings, increasing the size of culverts, bridging areas of concern where culverts are no longer suitable, redesigning drainage channels for future flow and better armouring slopes. This approach means appropriate climate adaptation is considered over the entire design life of our infrastructure.

Significant investments and commitments

- Since 2017:
 - \$580 million in provincial and federal investment in addressing impacts of climate change on infrastructure in B.C.
 - \$230 million invested in the Cariboo
- Budget 2022 commits \$295 million over nine years in new province-wide climate adaptation funding
- Current commitments for the Cariboo:
 - \$146 million for engineering and construction of Cariboo Road Recovery Projects
 - \$103 million for West Fraser Road Realignment
 - \$55 million for side roads and adaptation projects

Our Priority: Addressing Immediate Needs

Since the creation of the Cariboo Road Recovery Projects, we have worked to restore and maintain safe access while we develop long-term solutions.

Each project is following a three-pronged approach:

Short-term: immediate stabilization and maintaining safety for all routes

Safety is the ministry's priority at all 10 sites. Significant efforts have been taken to reduce further regression of landslide sites, restoring access where possible or providing temporary, alternative access routes.

The team is also working in coordination with the local highway operations team to provide safe and reliable road networks throughout the winter and spring months, including temporary and alternative access routes.



Construction of Kersley Dale Landing Temporary Access



Geotechnical Drilling at Quesnel-Hydraulic Road

Medium-term: restoring roads to keep them open or establishing alternative routes

Where possible and safe, roads remain open, or alternative routes have been established.

We have completed stabilization and safety enhancements at the following sites:

- Excavation on Cottonwood Hill to reduce load on slope
- Interim paving:
 - Highway 97 at Cottonwood Hill
 - Highway 20 at Hodgson Road in Williams Lake
 - Blackwater Road in Quesnel

We have restored affected roads to keep them open or established alternative routes, including:

- Temporary access road for Kersley Dale Landing
- Interim safety improvements on French Road
- Interim drainage improvements on Bastin Road at Bastin Hill

Long-term: designing resilient solutions

The ministry is exploring potential long-term solutions for each of the project sites, which could include further stabilization, additional restoration, road relocation, or potential permanent alternative access.

Local governments, Indigenous communities, stakeholders and the public will be important in helping us identify key impacts and trade-offs to be considered in our evaluation.

While the timelines associated with each project will vary based on the complexity of the site and the specific technical work to be undertaken, each are going through the following four phase process:

○ Phase 1: Problem Definition Needs Assessment

Project teams assessed the significance of site issues by gathering data, undertaking technical assessments, and understanding local and regional considerations. This included discovery of the scale and stability of landslides, impacted parties, historical traffic volume and safety data, and environmental impact. Based on data and information collected during this phase, project teams generated potential concepts and alignments for each project site.

○ Phase 2: Concept Generation and “Short Listed” Option Evaluation

During this phase, project teams will undertake technical analysis of options for road restoration, and alternative solutions will be evaluated. Options will be assessed against multiple criteria such as constructability, financial considerations, user experience, resiliency, mobility and safety, and social, community, and environmental considerations.

○ Phase 3: Preferred Solution

Following the technical screening, the short-listed options will be put through a process called a Multiple Account Evaluation for further analysis and more detailed consideration. Through this process, a preferred site solution will be identified and presented to government for approval to advance to the next phase.

We are seeking your input regarding priorities for criteria to be considered in the Multiple Account Evaluation, as described on the next page.

○ Phase 4: Implementation

Once a preferred solution is approved, workplans will be developed and implemented to deliver safe and reliable solutions for Cariboo roads. Timelines will depend on the complexity at each site.

We are here

Engagement Topic: Considerations

There are a number of factors the ministry is considering as solutions are developed.

We want to hear how important the following criteria are to you as we undertake the Multiple Account Evaluation and develop long-term solutions.

 <h3>Economic Development</h3> <ul style="list-style-type: none">- Existing economic activity- Development potential- Revenue- Productivity	 <h3>Customer Service</h3> <ul style="list-style-type: none">- Travel time- Collisions- Travel demand- Vehicle operating costs- Walking and cycling	 <h3>Social & Community</h3> <ul style="list-style-type: none">- Noise and visual impacts- Pollution impacts- Land acquisition needs- Community connectivity- Consistency with community plans
 <h3>Environmental</h3> <ul style="list-style-type: none">- Land requirements- Vehicle emissions- Wildlife/habitat- Water and fisheries- Archaeology/historic	 <h3>Financial</h3> <ul style="list-style-type: none">- Capital costs- Periodic rehabilitation costs- Operation and maintenance costs	



We want to hear from you

Please visit gov.bc.ca/cariboo-road-recovery-projects to complete the online feedback form

Project overviews

Over the following pages, you will find background on damage at each of the Cariboo Road Recovery Projects sites, the current status of the roads, and options under consideration for long-term solutions.

Cariboo Road Recovery Projects



Quesnel-Hixon Road

- Road closed
- Potential options include stabilization, repair, relocation and permanent alternative access



Aerial view of the Landslide at Quesnel-Hixon Road (Spring 2021)



Cottonwood River Canyon Bridge at Quesnel-Hixon Road

Project Manager

Rob Struthers
QuesnelHixon@gov.bc.ca



Location

- 21 km north of Quesnel



Area of Slide

- Approximately 10.3 ha



Background

- In spring 2021, a slide impacted Quesnel-Hixon Road
- The slide has caused 3 to 5 metres of deformation, making a segment of the road impassable



Status

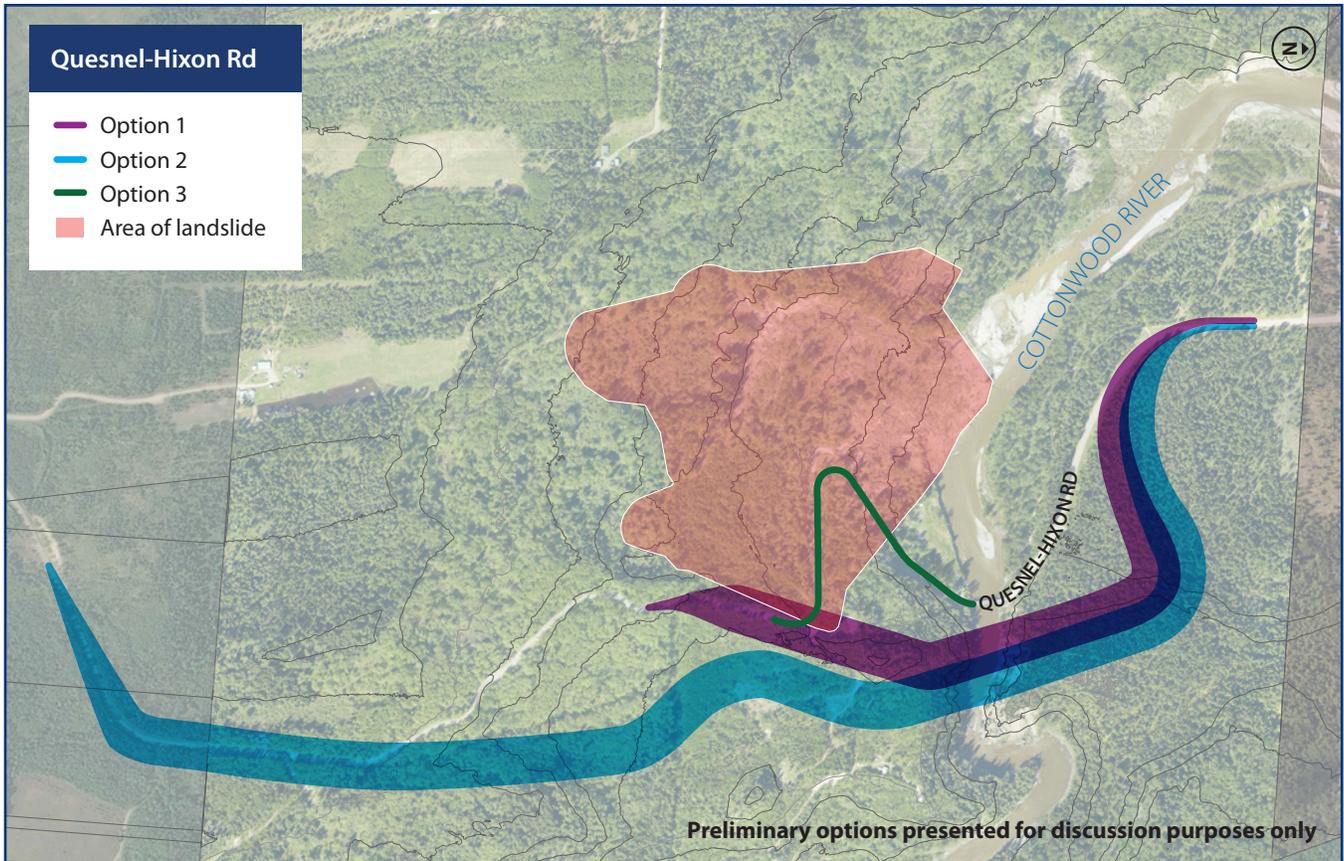
- Closed
- Road users diverted to Highway 97
- Residents have access south from Highway 97 at Quesnel or north where Cinema Road intersects with Highway 97
- Following conversations with Quesnel-Hixon residents, the ministry is also working with Canada Post to find solutions for more localized mail service for the community



Ongoing Work

- Geotechnical monitoring and evaluation of the slide area is continuing, including semi-annual aerial LiDAR surveys
- The road surface is monitored and maintained by the ministry's Maintenance Contractor

Potential options being considered



Highway 97 at Cottonwood Hill

- Road open
- Potential options include stabilization, repair or relocation



Slide area below Highway 97 (Fall 2021)



Temporary resurfacing (Fall 2021)

Project Manager

Scott McKenzie
Cottonwood.Hill@gov.bc.ca



Location

- 18 km north of Quesnel



Area of Slide

- Approximately 8.8 ha



Background

- A historic slide was reawakened in 2020, dropping approximately 45 centimetres, and remobilized in April 2021, dropping an additional 20 centimetres
- The site is undergoing continuous geotechnical monitoring and the stretch of road remains open and safe for road users
- Ground movement has slowed significantly, largely due to dry conditions experienced in 2021
- This has allowed the project team to remove surplus material from the slide area and improve drainage configurations
- Temporary resurfacing (pictured to the left) was also completed on Highway 97 at Cottonwood Hill in fall 2021 to improve rideability for road users



Status

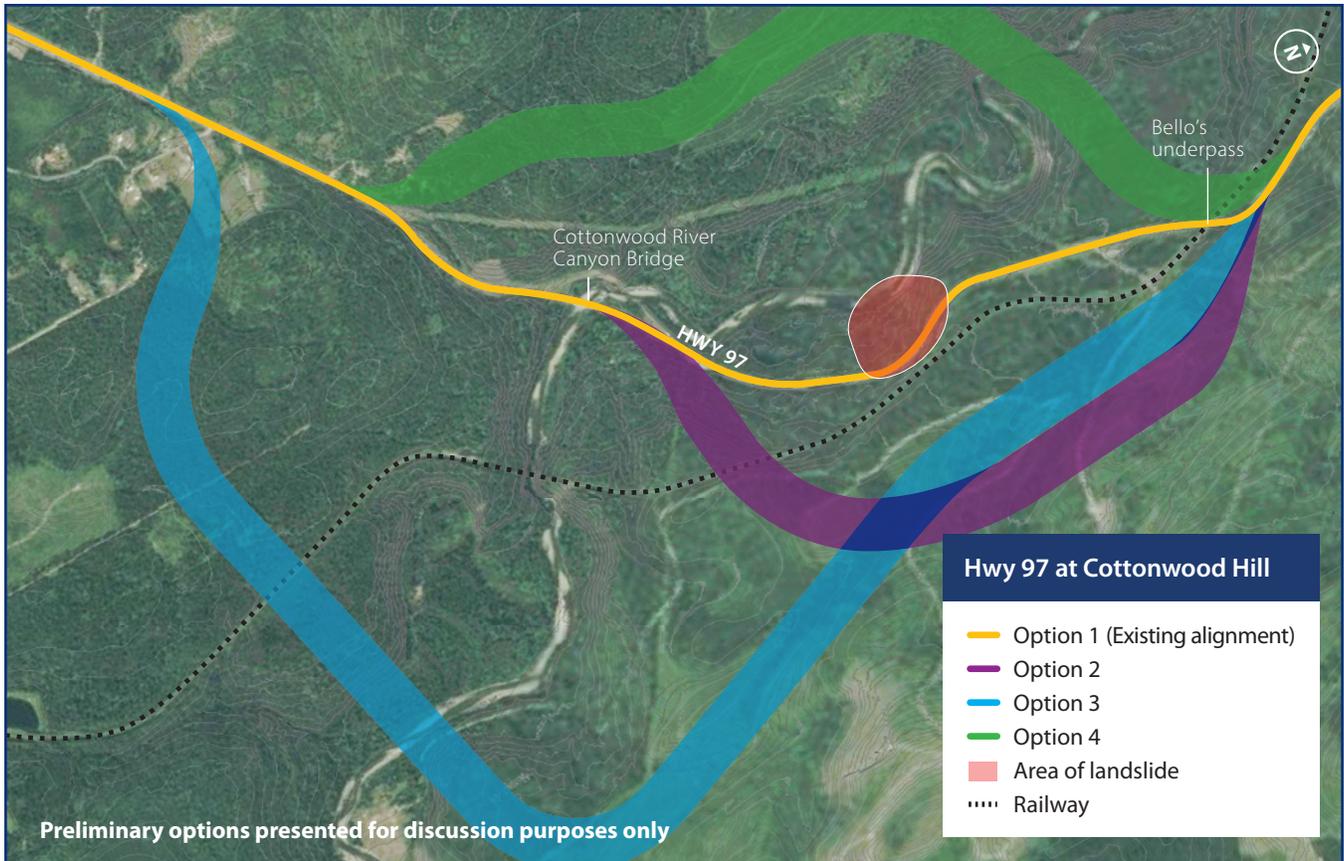
- Open
- Speed is reduced to 50 km/h through the 300m long slide zone



Ongoing Work

- The project team is conducting ongoing geotechnical investigations, including aerial LiDAR surveys, drilling and ground movement monitoring
- Due to the complexities of the historic landslides and surrounding area, it is anticipated that investigations, design and construction will take several years to complete

Potential options being considered



Blackwater Road at Knickerbocker Road

- Road open
- Potential options include stabilization, repair, relocation and permanent alternative access



Slide area below Blackwater Road (Spring 2021)



Temporary resurfacing (Fall 2021)



Slide area below Blackwater Road (Spring 2021)

Project Manager

Catherine Bartlett
Black.Water@gov.bc.ca



Location

- 9 km from Quesnel



Area of Slide

- Garbage Dump Slide: approximately 14 ha
- North Fraser Slide: approximately 3.4 ha



Background

- The historic Knickerbocker Slide, which reawakened in 2020 and again in 2021, remains active
- The site consists of two adjacent active slides – the historic Garbage Dump Slide and the North Fraser Slide in spring 2020 – causing compounding damage



Status

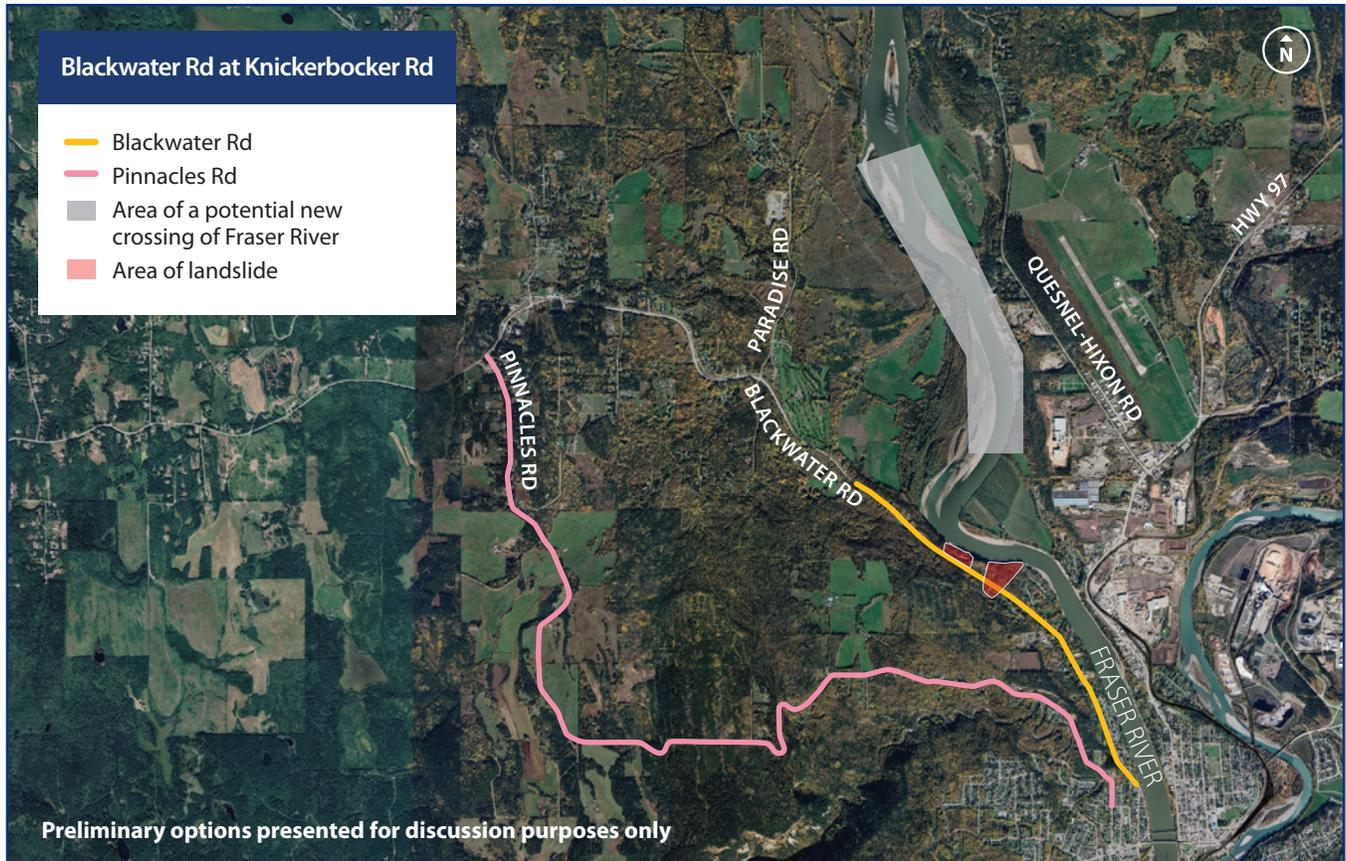
- Open at reduced speed



Ongoing Work

- Geotechnical monitoring and evaluation of the slide area is underway, including semi-annual aerial LiDAR surveys and subsurface investigation
- The road surface is monitored and maintained by the ministry's Maintenance Contractor
- New monitoring stations were installed in February 2022, allowing for further reconnaissance as long-term solutions are developed

Potential options being considered



Quesnel-Hydraulic Road

- Road closed
- Potential options include stabilization, repair, relocation and permanent alternative access



Slide area below Quesnel-Hydraulic Road (Spring 2021)



Geotechnical drilling investigative works (December 2021)



Geotechnical drilling investigative works (December 2021)

Project Manager

Paul Rae
Quesnel.Hydraulic@gov.bc.ca



Location

- 20 km south of Quesnel



Area of Slide

- Approximately 13 ha



Background

- Quesnel-Hydraulic Road has a documented history of landslide activity dating as far back as 1978
- Recent movement destabilized a significant portion of the road, resulting in cracking of the road surface and a 12 metre deep slump into the Quesnel River



Status

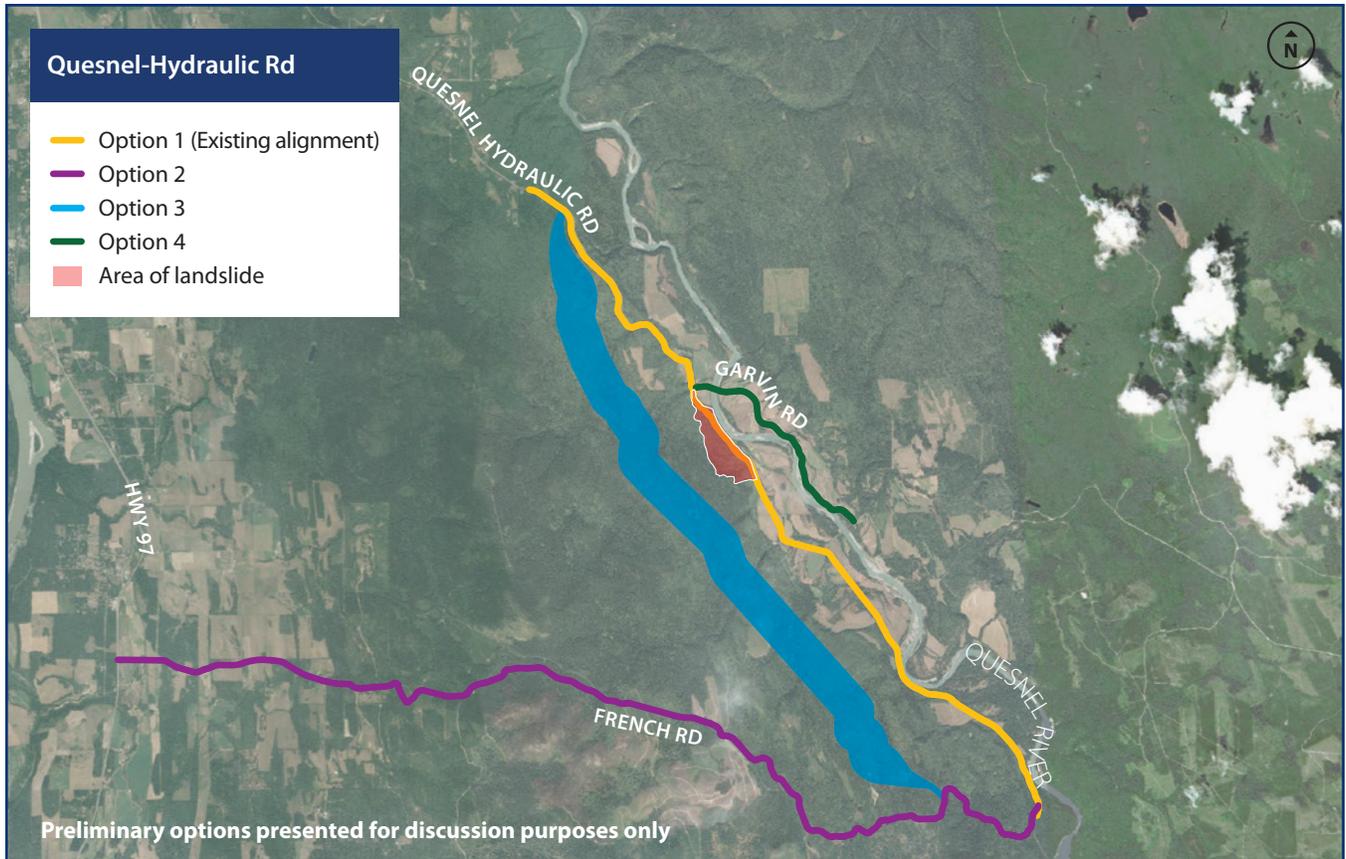
- Closed
- An alternative route along French Road (former Forest Service Road) is available for through traffic



Ongoing Work

- Geotechnical investigations, including drilling work, were completed in December 2021
- The data collected is being used as part of the engineering study examining options for addressing the impacts of the slides on Quesnel-Hydraulic Road

Potential options being considered



Bastin Road at Bastin Hill

- Road open
- Potential options include stabilization, repair, relocation and permanent alternative access



Implementing drainage improvements, slope repair, stabilization and debris removal at Bastin Road at Bastin Hill (January 2022)



Slide area adjacent to Bastin Road (Spring 2021)

Project Manager

Tyler Lu
Bastin.Hill@gov.bc.ca



Location

- Approximately 22km south of Quesnel



Area of Slide

- Approximately 3.5 ha



Background

- A landslide occurred in 2021 and remains active in the area
- A section of the road was temporarily closed but reopened after interim repairs were complete



Status

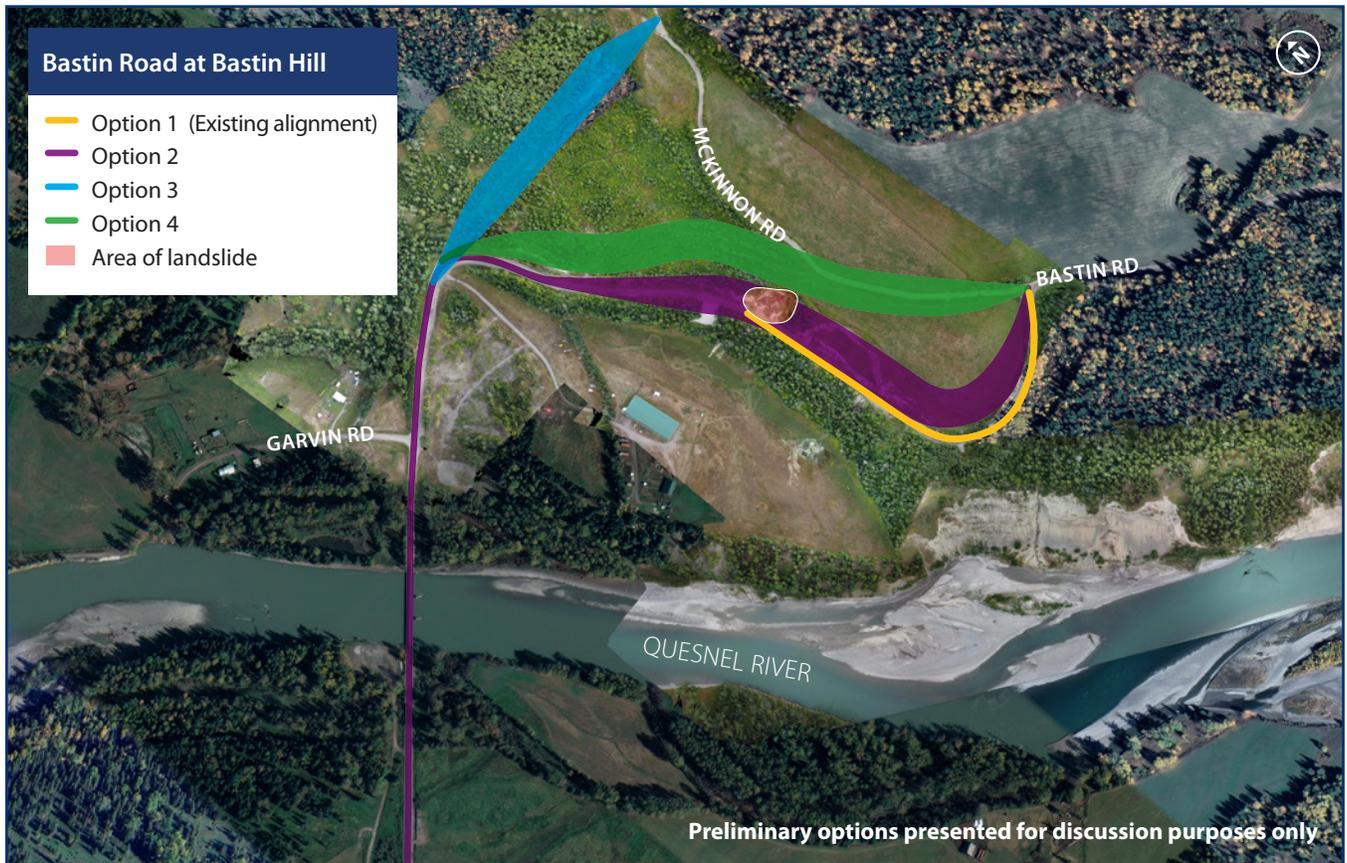
- Open
- Single lane, alternating traffic and reduced speeds



Ongoing Work

- Design option analysis is underway, including upcoming geotechnical investigation and evaluation
- In January 2022, further work was completed on drainage improvements, slope repair, stabilization and debris removal
- These works address safety, accessibility and reliability for road users through spring 2022
- Additional work includes removing debris from Hawthorne Creek and upsizing culverts and is planned for late spring, pending environmental permit approval

Potential options being considered



Durrell Road

- Road closed
- Potential options include stabilization, repair, relocation and permanent alternative access



Slide area at Durrell Road (Spring 2021)

Project Manager

Wayne Byczek
Durrell.Road@gov.bc.ca



Location

- Approximately 14 km south of Quesnel



Area of Slide

- Approximately 5 ha



Background

- The Durrell Road landslide in 2021 is a debris slump exhibiting ongoing creep, with small flow-slides occurring on the slope
- The slide has caused a vertical change of between 2 and 5 metres of the road area and a deep crack and surface water is present across the road



Status

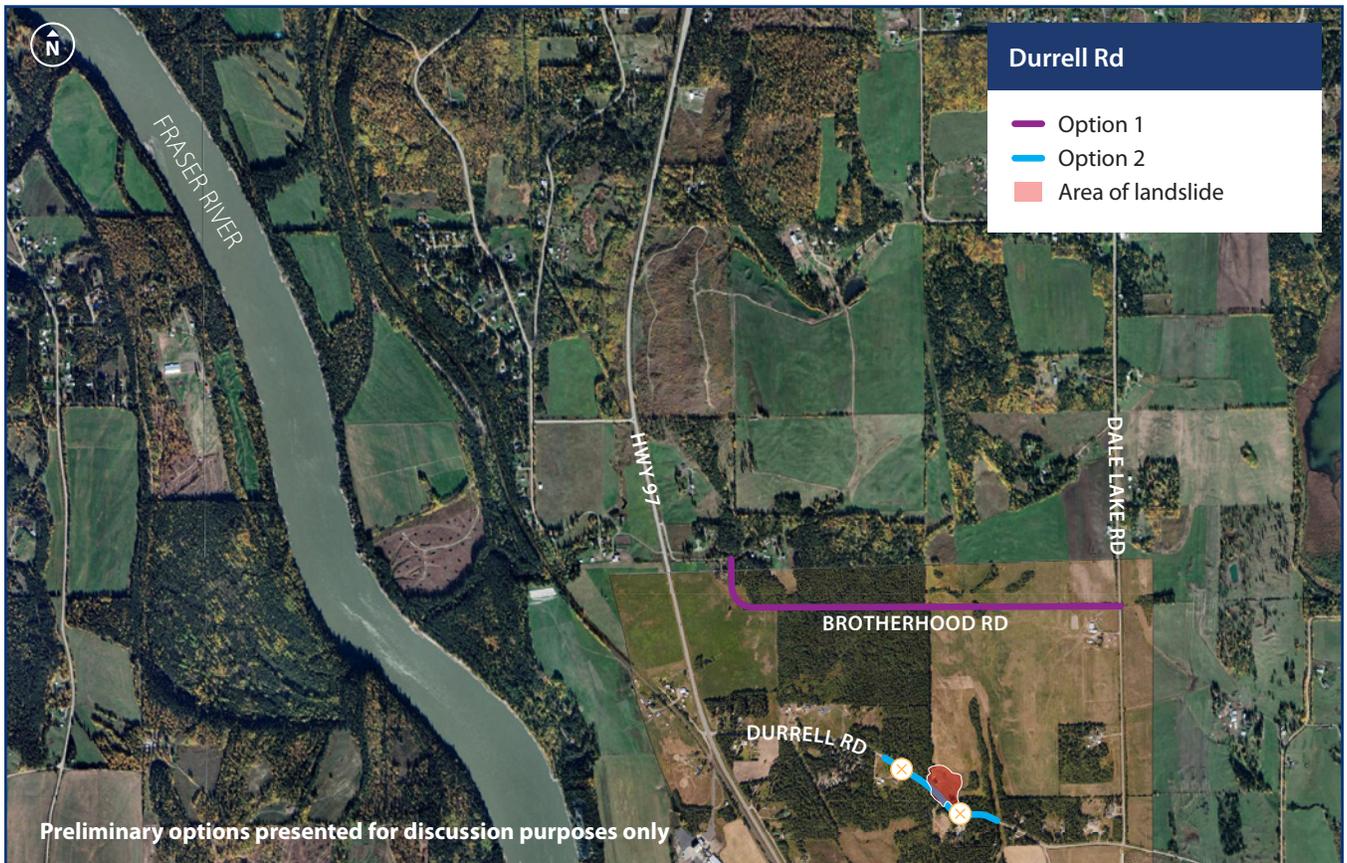
- Closed
- Access to surrounding area homes and businesses has been maintained with adjoining roads to Highway 97
- Durrell Road to the west and Dale Lake Road to the east of the slide connect to Highway 97



Ongoing Work

- Geotechnical monitoring and evaluation of the slide area is underway, including semi-annual aerial LiDAR surveys
- The road surface is monitored and maintained by the ministry's Maintenance Contractor
- Works for winter maintenance and additional vehicle and pedestrian signage has been added to help facilitate traffic flow and safety in the area

Potential options being considered



Kersley Dale Landing Road

- Temporary access road open
- Potential options include stabilization, repair, relocation and permanent alternative access



Constructing Kersley Dale Landing temporary access road (September 2021)



Constructing Kersley Dale Landing temporary access road (Fall 2021)



Aerial view of Kersley Dale Temporary Landing access road (Fall 2021)

Project Manager

Dave Shibata
Kersley.Dale@gov.bc.ca



Location

- Approximately 20 km south of Quesnel



Area of Slide

- Approximately 1.3 ha



Background

- Nine slide areas were discovered along Kersley Dale Landing Road in 2020



Status

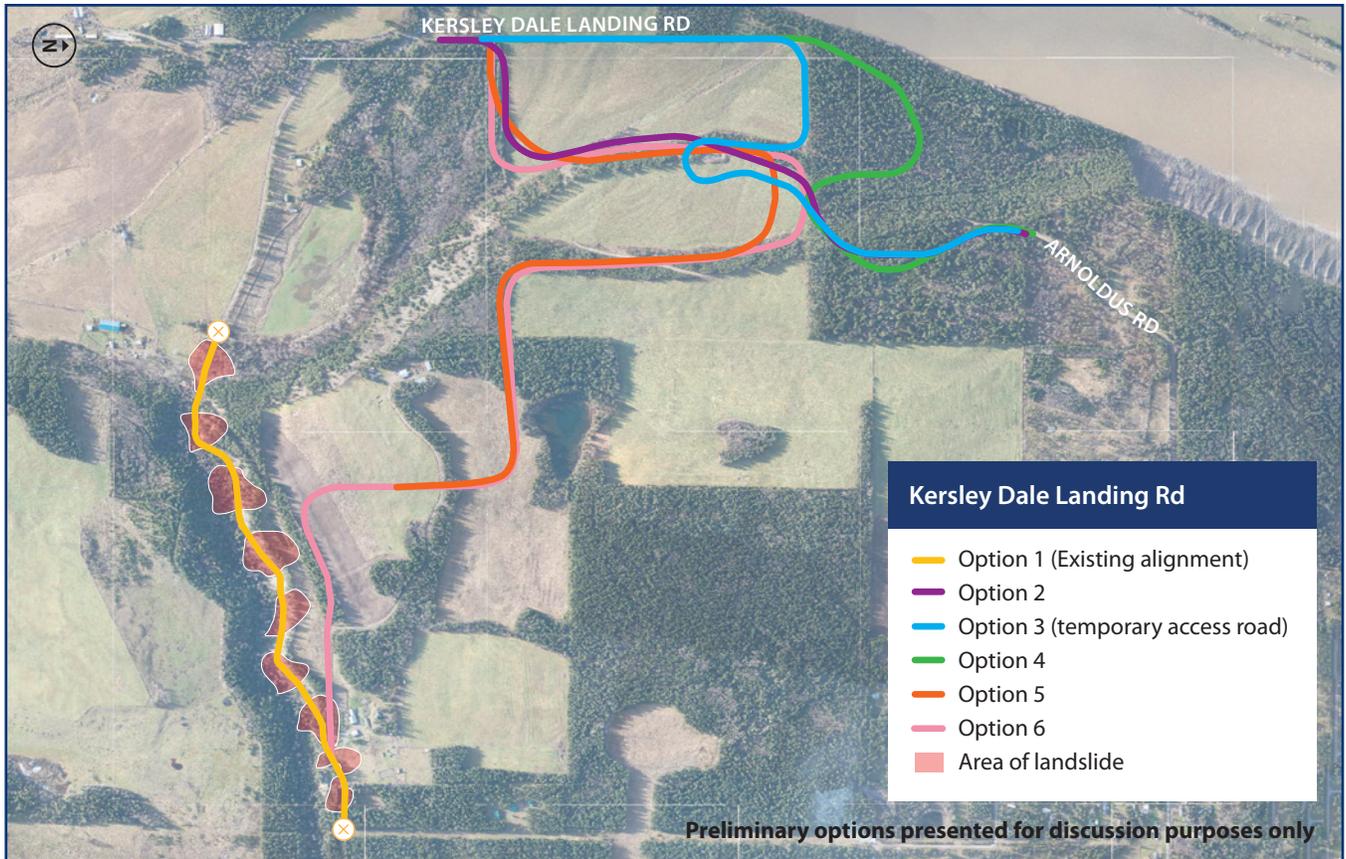
- The original road is closed
- A temporary access route was completed in December 2021



Ongoing Work

- Geotechnical monitoring and evaluation of the slide area is underway, including semi-annual aerial LiDAR surveys
- The road surface is monitored and maintained by the ministry's Maintenance Contractor

Potential options being considered



Highway 97 at Cuisson Creek

- Road open
- Potential options include stabilization, repair and relocation



Slide area below Highway 97 at Cuisson Creek (Spring 2021)

Project Manager

Bill Leitch
Cuisson.Creek@gov.bc.ca



Location

- Approximately 46 km south of Quesnel



Area of Slide

- Approximately 12.5 ha



Background

- Over the past 30 years, landslides triggered by erosion from the Fraser River have been regressing toward Highway 97 at an approximate rate of 0.5-1 metre/year
- Four slide sides are impacting a 4.4-kilometre segment of Highway 97, extending from approximately 1.9 km south of the Trudeau Road intersection to the Ross Road intersection, and a local public side road, Church Road



Status

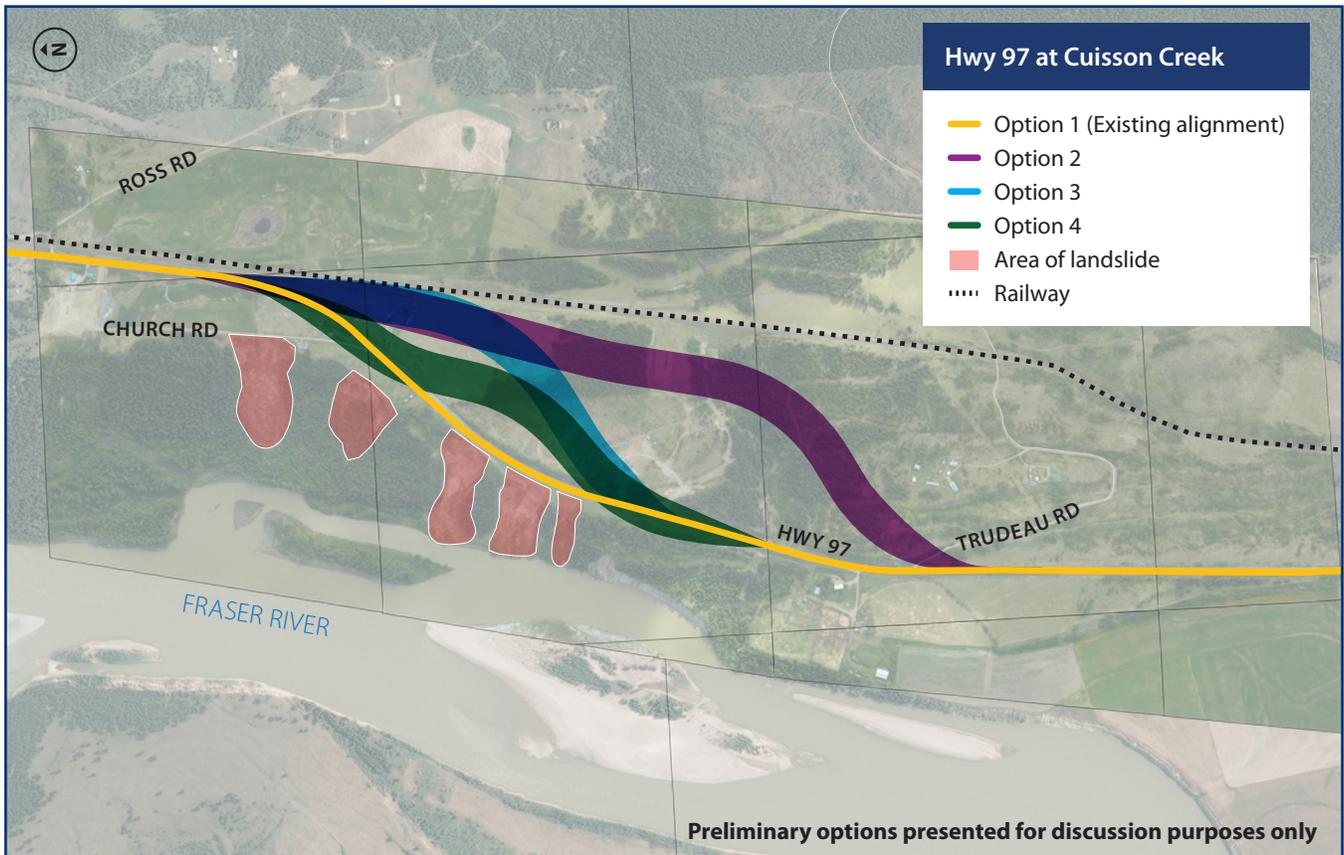
- Open
- Cracked pavement and other surface damage has been removed to improve driving conditions



Ongoing Work

- Geotechnical monitoring and evaluation of the slide area is underway, including semi-annual aerial LiDAR surveys and subsurface investigation
- The road surface is monitored and maintained by the ministry's Maintenance Contractor

Potential options being considered



Soda Creek – MacAlister Road

- Road closed
- Potential options include stabilization, repair, relocation and permanent alternative access



Slide area at Soda Creek – MacAlister Road (Spring 2021)

Project Manager

Wayne Byczek
SodaCreek@gov.bc.ca



Location

- 33km north of Williams Lake



Area of Slide

- Approximately 1.3 ha



Background

- In May 2020, a landslide occurred on Soda Creek MacAlister Road, approximately 3 kilometres north of the community of Soda Creek
- The road collapsed a day after tension cracks were observed, likely due to erosion at the river



Status

- Closed
- Access to Highway 97 is maintained to the south of the slide via Soda Creek Townsite Road
- To the north of the slide, residents can continue to use Soda Creek Road or Edmunds Road to Highway 97



Ongoing Work

- Geotechnical monitoring and evaluation of the slide area is underway, including semi-annual aerial LiDAR surveys
- The road surface is monitored and maintained by the ministry's Maintenance Contractor

Potential options being considered



Highway 20 at Hodgson/Dog Creek Road

- Road open
- Potential options include stabilization, repair and permanent alternative access



Geotechnical investigative drilling works (December 2021)



Geotechnical investigative drilling works (December 2021)

Project Manager

Brian Taylor
HodgsonDog.Creek@gov.bc.ca



Location

- Hodgson/Dog Creek Road in southwest Williams Lake



Background

- An enormous historic slide at the southwestern border of the City of Williams Lake continues to impact a number of roadways, developments and utilities in the area



Status

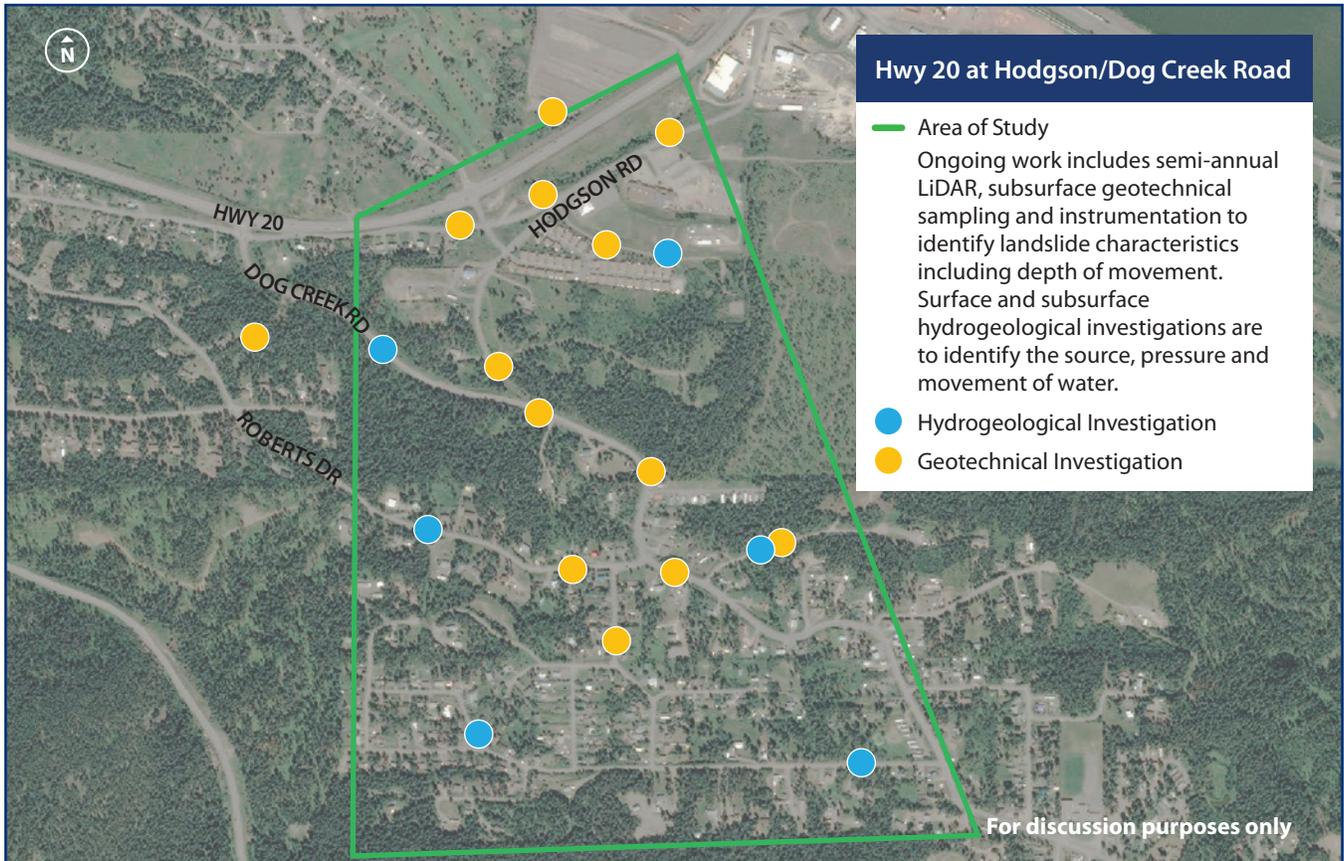
- Open



Ongoing Work

- As part of the exploratory and technical information gathering process, ministry contractors undertook site drilling for geotechnical and hydrogeological investigations in late 2021
- Works were completed at the intersection of Dog Creek Road and Roberts Drive in the summer of 2021 and at Johnson Way in September 2021
- In 2021, works also included substantial reprofiling and repaving of all four lanes of Highway 20, measuring over several hundred metres in length

Technical analysis underway



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Please provide your feedback by Thursday, March 31, 2022

How will input be used

Input received during this engagement period will be considered, along with technical and financial information, as we explore potential solutions for each of the project sites.

There will be future opportunities to provide feedback as potential solutions are developed.