North Coast Electrification

Virtual Open House

March 2024

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Virtual Meeting Etiquette

Welcome!

- Cameras are turned off to save bandwidth
- Use the ‘raise your hand’ button for comments/ questions
- Mute your microphone when not speaking
- Share air space so that everyone can participate
- Challenge ideas, not people
- We aren’t recording this session, and kindly ask that others don’t record

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Agenda

- Introductions
- North Coast Electrification Overview
- Working in partnership with Indigenous Nations
- PGGT and GTTT Overview
- Transmission Line Development
- PGGT and GTTT Routing Options
- Studies
- Schedule
- Procurement and Employment
- Thermal Upgrades
- Beyond Terrace

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Electrification Overview

- We're proposing to bring more clean, reliable electricity to the North Coast to help customers switch to clean electricity from fossil fuels
  - Electrification supports the Government's CleanBC Plan and economic development goals
- We're proposing new transmission infrastructure from Prince George to Terrace now due to the long lead times to develop infrastructure
  - We're building the Prince George to Terrace Capacitors Project; however, it is already fully subscribed
  - Depending on the level and location of demand, we may need to build new transmission lines and associated infrastructure from Terrace to Kitimat, Aiyansh, and Prince Rupert

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Working in Partnership with First Nations

- We're working to implement the BC Government's commitment to the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP).
- Transmission system expansion gives us a chance to take a different approach and work in partnership with First Nations:
  - Building economic relations with Indigenous peoples, including:
    - Exploring Indigenous co-ownership of new transmission lines
    - Procurement opportunities
  - Co-designing environmental review
  - Shared decision making
- We're thinking differently about how we do our business, and this new approach is an example of our work to advance reconciliation with First Nations.

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Power Lingo

Substation: brings together power lines of varying voltages; contains equipment that can change the voltages of these lines and safely control the flow of power

Capacitor station: contains equipment that boosts voltage, allowing more electricity to be carried along a transmission line

Transmission lines: move electricity from one point to another via numerous towers; lines vary in size with those carrying more electricity requiring larger towers

Node: used in transmission line route planning to identify where the line connects with other infrastructure like a sub-station or capacitor station or where a route can change direction

- Nodes are numbered to make reference to them easier

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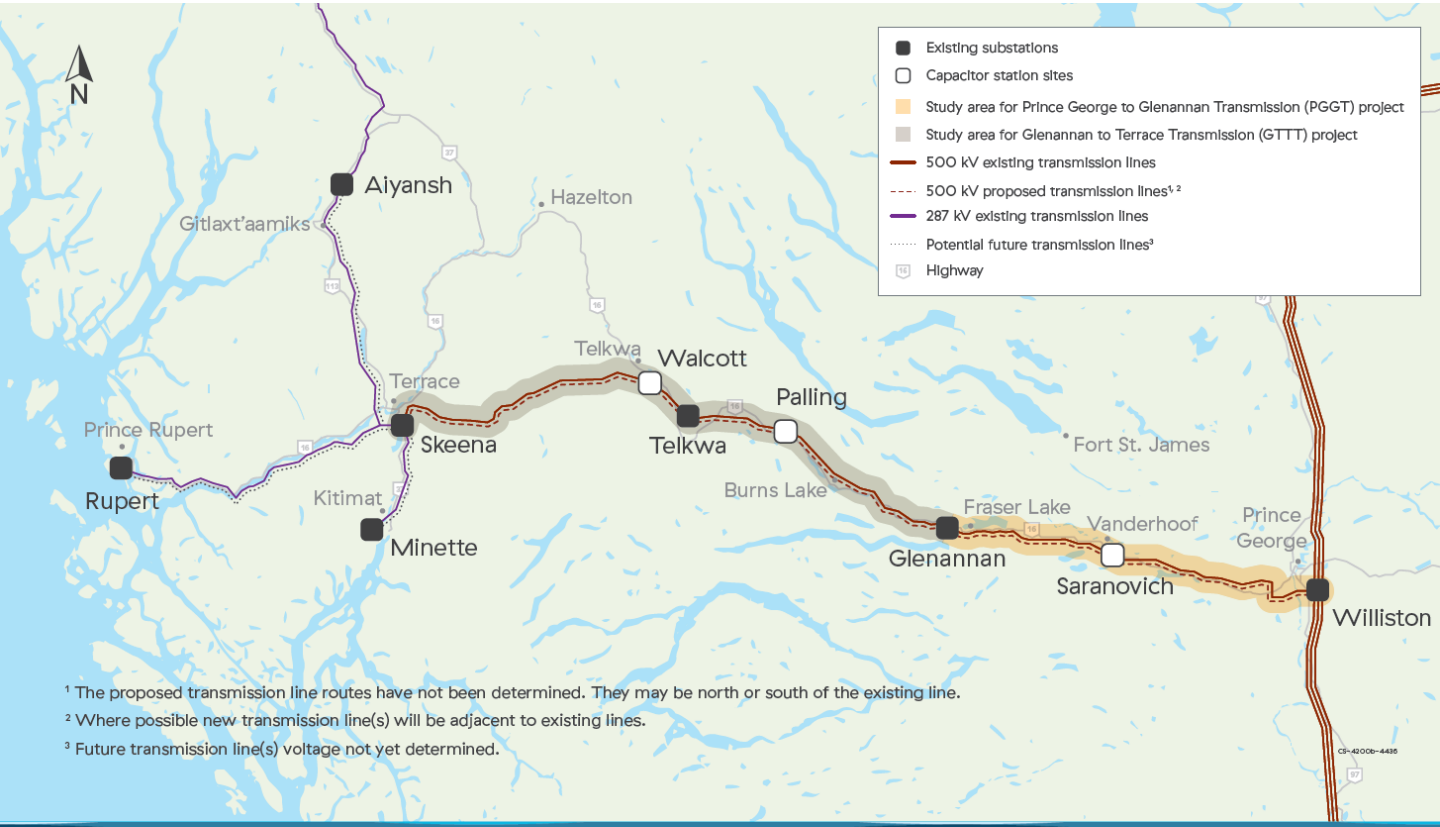
Transmission System Expansion



Prince George to Glenannan Transmission (PGGT)

- New 500 kV transmission line from Williston to Glenannan substation
  - Approximately 170km long
  - Will generally follow existing transmission corridors
- Expansion of Saranovich Capacitor Station
- Expansion of Williston Substation to the east
- Expansion or upgrade of Glenannan Substation
- Fibre optic cable on new or existing transmission structures

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PGGT Key Activities

- Potential corridor and route options identified
  - Desktop environmental analysis completed
  - Preliminary access and clearing requirements being prepared
- Permits required to conduct studies being prepared
  - Environmental studies starting spring 2024
  - Geotechnical drilling starting March 2024
- Collaboration and consultation with First Nations is underway
- Stakeholder engagement underway
  - Second round of Open Houses underway
  - Discussions with stakeholders
  - Meetings with government representatives and agencies
- Objective is to select a leading route for further study by mid-2024

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Glenannan to Terrace Transmission (GTTT)

- Two new 500 kV transmission lines
  - Glenannan Substation to Telkwa Substation (approximately 130km long)
  - Telkwa Substation to Skeena Substation (approximately 145 km long)
- Will generally follow existing transmission lines
  - Challenging terrain and access, conflicts with pipeline
- Upgrades or expansion of Glenannan, Telkwa and Skeena substations
- Expansion of Palling and Walcott capacitor stations
- Fibre optic cable on new or existing transmission structures

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GTTT Key Activities

- Corridor and route options
  - Desktop environmental analysis completed
  - Work initiated to identify preliminary access and clearing requirements
  - Environmental field studies starting in summer/fall 2024
  - Geotechnical drilling planned to start fall 2024
  - Access upgrades for studies (e.g., helipads, road work) summer/fall 2024
- Collaboration and consultation is underway with First Nations
- Stakeholder engagement underway:
  - Open houses underway
  - Discussions with stakeholders
  - Meetings with government representatives and agencies
- Objective is to select a leading route for further study in late 2024

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Steps in Building a Transmission Line

GTTT PGGT

Planning	Transmission line design	Pre-construction	Construction
○ Identify route corridors ○ Identify route options ○ Identify right-of-way requirements ○ High-level environmental review ○ Initial engineering and environmental field studies to determine if lines can be built in an area ○ Route selection	○ Detailed engineering and environmental studies ○ Permit applications ○ Confirm placement of structures ○ Confirm new right-of-way ○ Acquire property rights including access	○ Clearing ○ Access ○ Prepare ROW so that foundations and towers can be installed ○ Purchase construction materials	○ Foundations ○ Towers ○ Line stringing ○ Restoration

We're working in partnership with First Nations throughout all phases of the proposed projects.

Stakeholder engagement will be ongoing through all project phases.

Identifying Route Options

We've identified potential route options as a starting point based on:

- Minimizing impacts and costs
- Identifying the shortest, most direct route
- Minimizing land fragmentation by placing routes next to existing corridors
- Using existing rights-of-way, where possible
- Ensuring safe construction and operation

We're working in partnership with First Nations to review and assess the route options and select a leading route option. We're considering:

- First Nations interests
- Environment
- Archaeology
- Social
- Economic
- Stakeholder input
- Constructability
- Public safety
- Other technical factors
- Others to be identified

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PGGT Route Corridor and Options

We have identified a route corridor as well as route options along certain parts of the corridor:

- Four route options from Williston Substation (Prince George) to Node 5
- One route option from Node 5 to Node 8
- Two route options from Node 8 to Node 9
- One route option from Node 9 to Glenannan Substation

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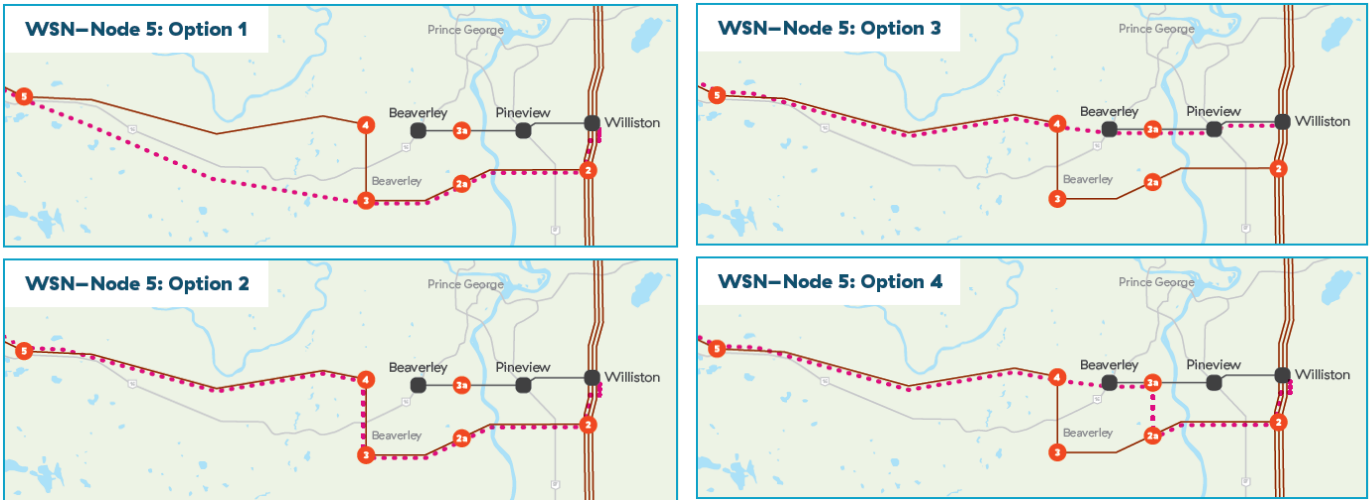
PGGT Routing Options – Williston to Node 5



The proposed transmission line routes will be confirmed as planning advances.

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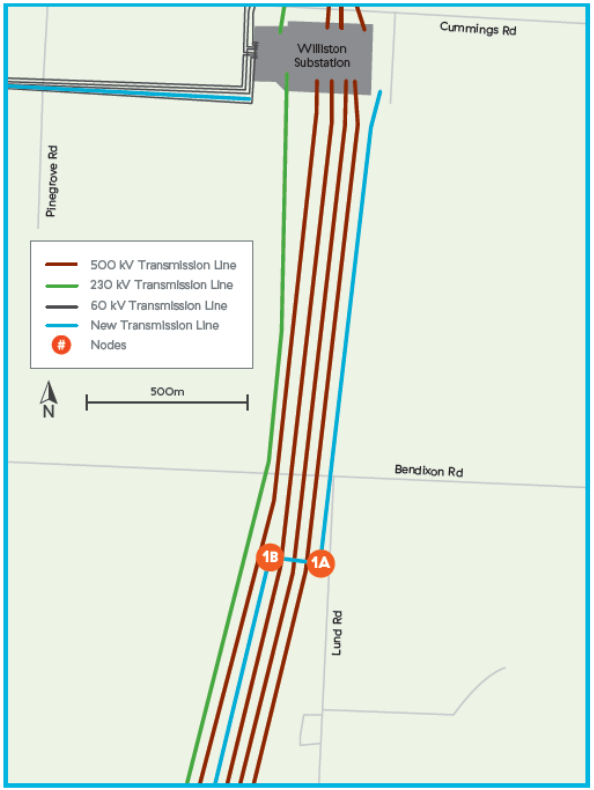
Potential Routing from Williston Substation



- Going west
  - existing 60kV line is proposed to be energized to 500 kV
  - a new 60 kV line built north of the existing line.
  - routing leaving the substation is to be determined
- Going south a new line is proposed
  - to be located east of the existing lines to Node 1A
  - cross the existing lines to Node 1B
  - travel between existing lines to where it turns west

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Routing Options – Williston to Node 5

Consideration	Option 1	Option 2	Option 3	Option 4
Minimize impacts to Aboriginal Rights and Title	TBD	TBD	TBD	TBD
Route length (km)	53	58	50	53
New right of way not adjacent to existing lines (km)	30	0	4	8
Relative amount of habitat fragmentation	Higher	Medium	Lower	Medium
Vegetation clearing	○ Clearing along existing right-of-way ○ Extensive clearing along new right-of-way	Clearing along existing right-of-way	Clearing along new and existing right-of-way	○ Clearing along new and existing right-of-way ○ Extensive clearing in Prince George on municipal property
Effects on other transmission lines	Crosses three 500 kV lines	Crosses three 500 kV lines	○ Crosses five 500 kV lines ○ Operate existing line at 500 kV ○ Need to build a new 69 kV line	○ Crosses five 500 kV lines ○ Need to build a new 69 kV line
Private properties along the route corridor	86	101	87	88
Overlap with ungulate winter habita	More	More	Less	Less
Birds	Critical habitat for bank swallow		Critical habitat for bank swallow	
Cost	Highest	Mid-range	Lowest	Mid-range

Routing Options – Williston to Node 5

All options:

- Require upgrades to existing and creation of new access
- Interact with other land users including agricultural land, traplines, woodlots
- Cross wetlands
- Cross waterways, including waterways that are home to White sturgeon (listed species)
- Are within 200m of archaeology sites

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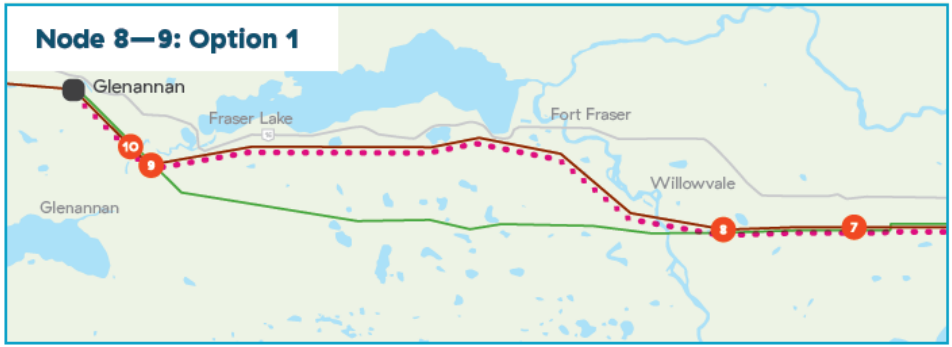
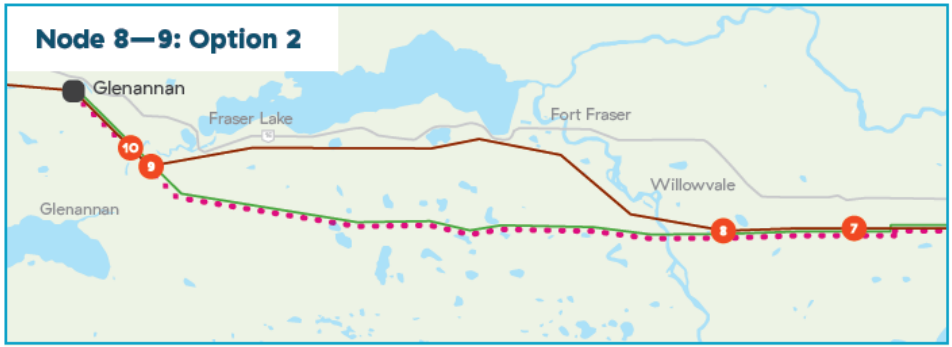
Routing Options – Node 8 to 9





Proposed 500 kV transmission line

Existing 500 kV transmission line

Existing 230 kV transmission line

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Routing Options – Nodes 8 to 9

Consideration	Option 1	Option 2
Minimize impacts to Aboriginal Rights and Title	TBD	TBD
Total length	35	34
New right-of-way required	35	34
Provincial parks	Crosses Beaumont Provincial Park	No provincial parks identified
Communities	Crosses First Nations Reserve close to Fraser Lake	Avoids First Nations Reserve, avoids Fraser Lake
Private properties	71	24
Vegetation clearing	Clearing along right-of-way, paralleling existing 500 kV line	Clearing along right-of-way, paralleling existing 230 kV line

Both options:

- Overlap archaeology sites
- Cross wetlands
- Cross waterways, including those home to White Sturgeon (listed species)
- Interact with other land use

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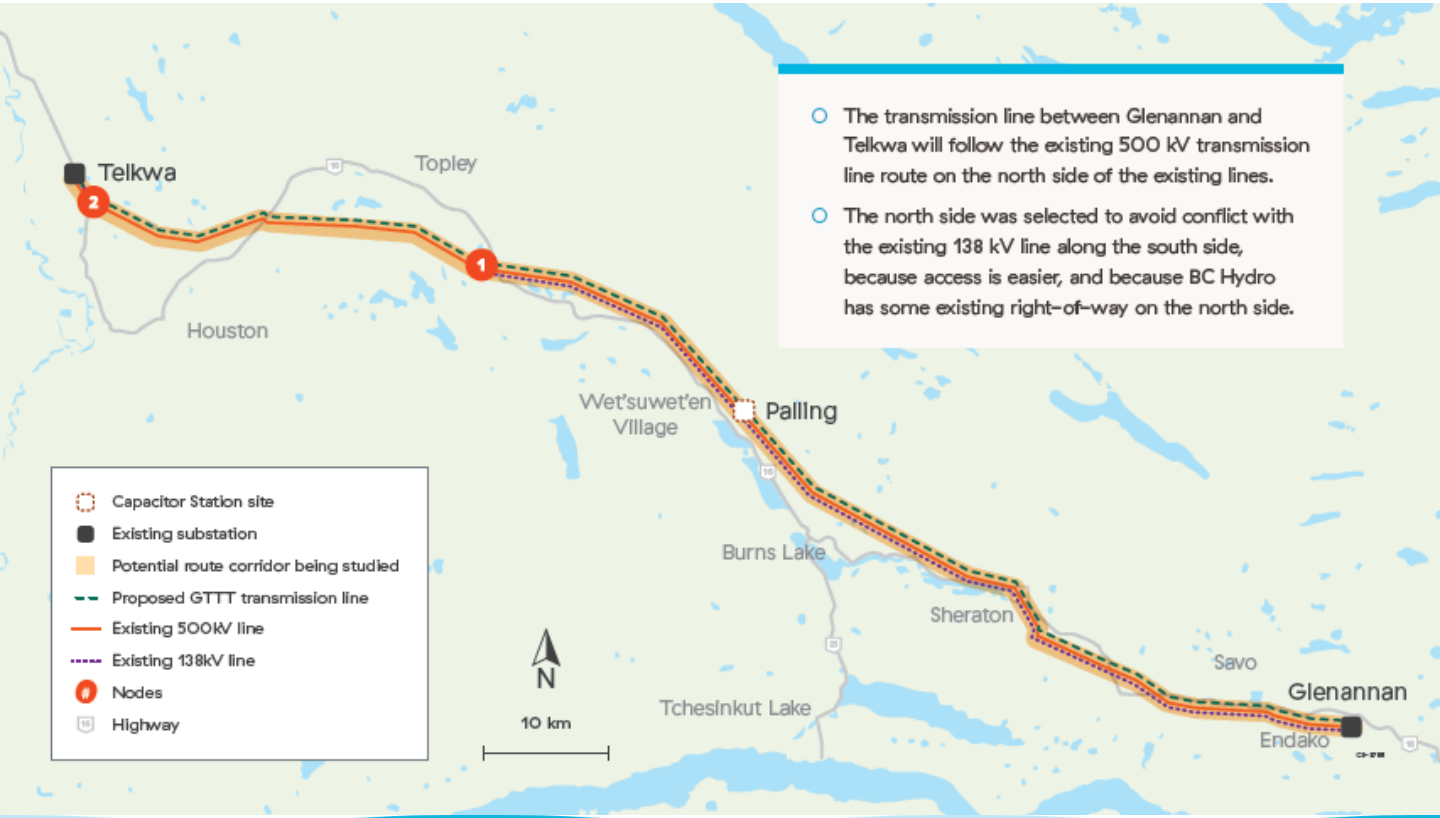
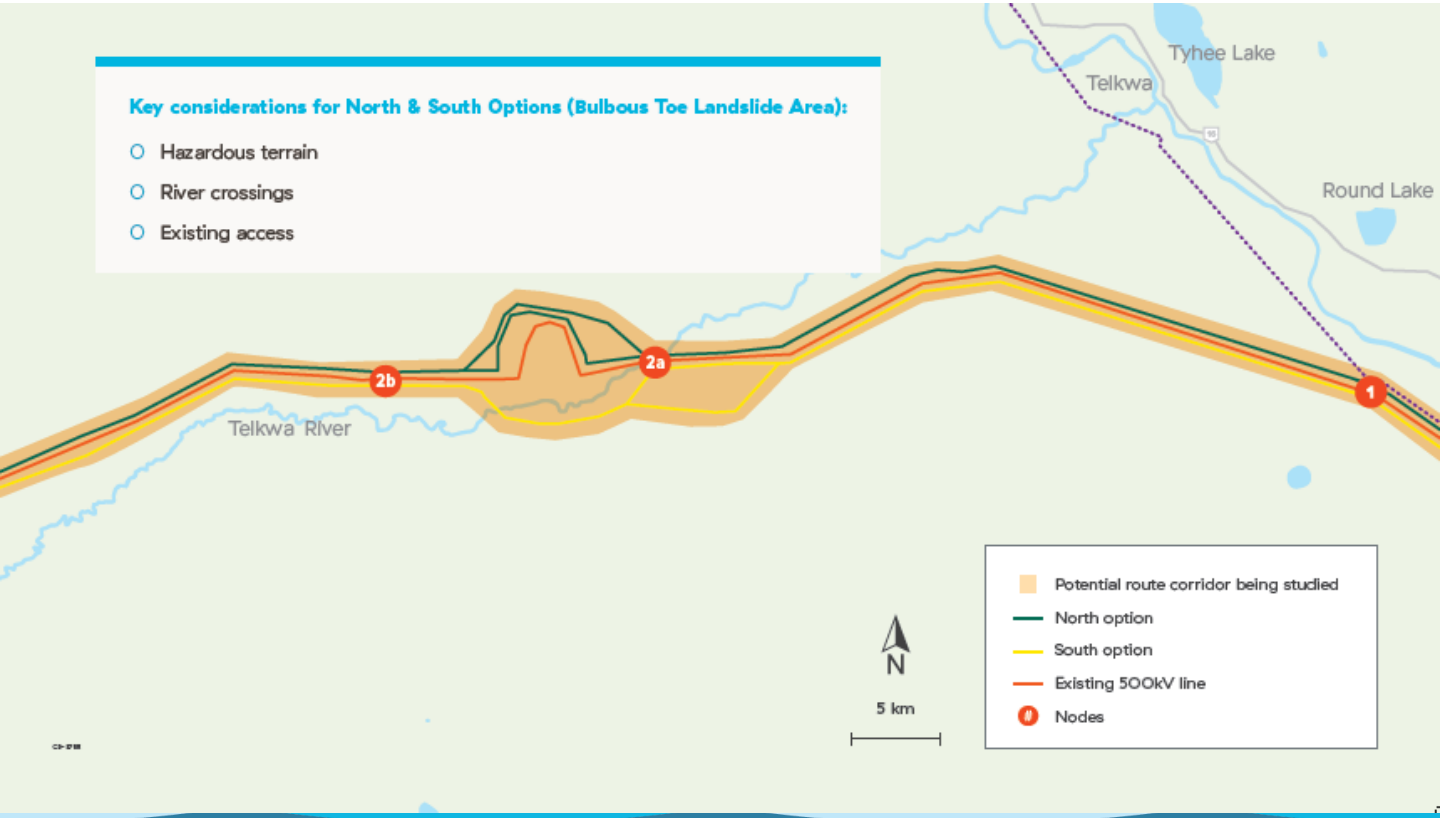
GTTT Route and Corridor: Glenannan to Telkwa

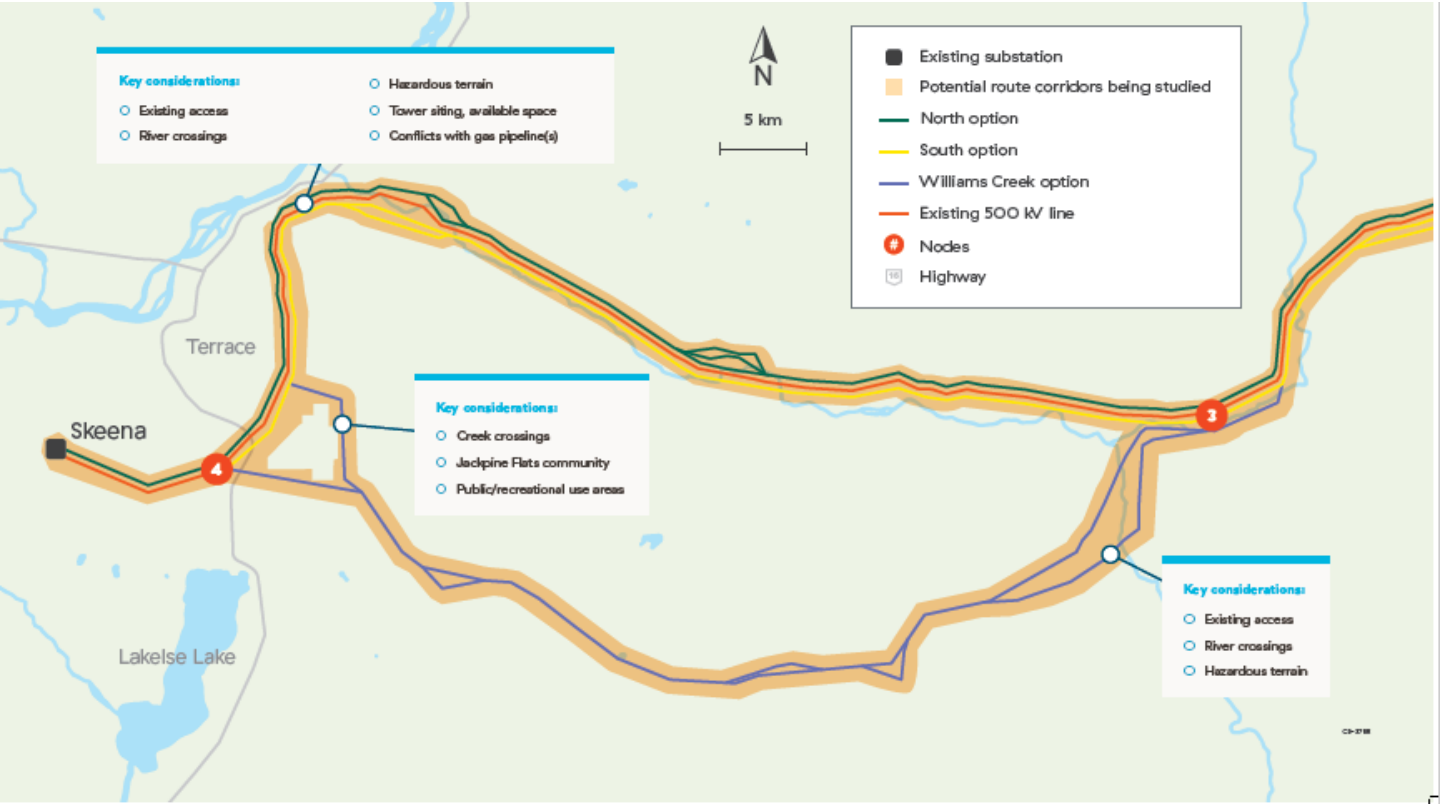


GTTT Corridor and Route Options: Telkwa to Skeena

Telkwa to Skeena Route Options: Node 1 to 2b



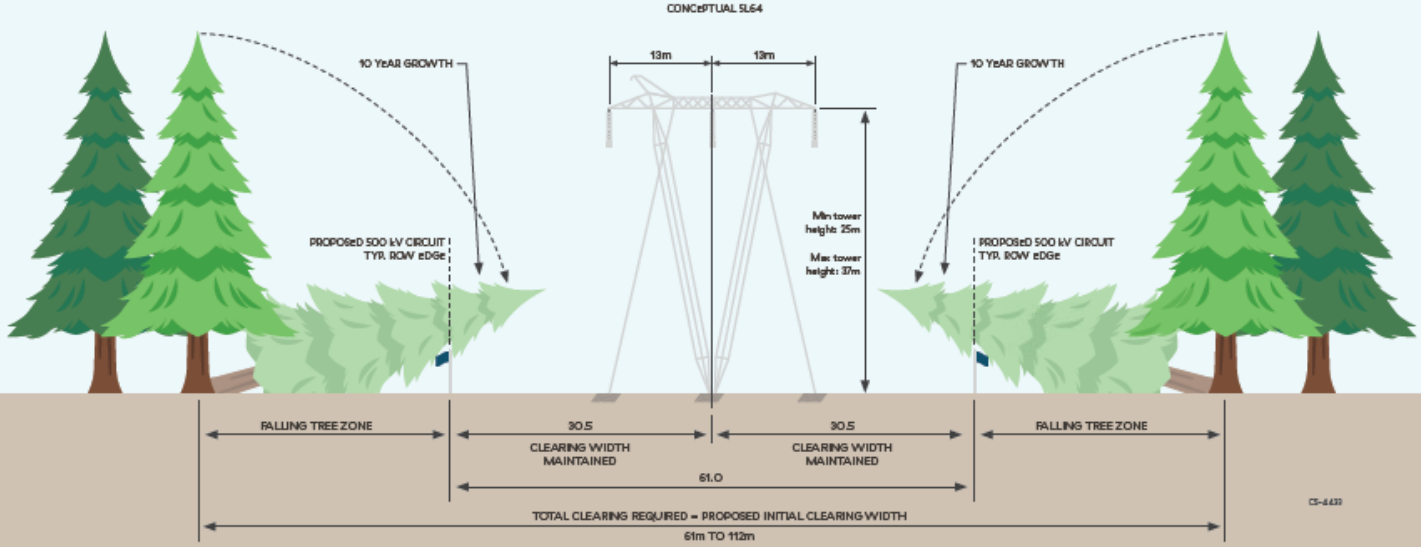
Telkwa to Skeena Route Options: Node 3 to 4



Right-of-way with proposed new transmission lines

NOTES

1. Drawing not to scale.
2. Values shown (heights, widths, clearance) are typical values and may vary along the line based on items including distance between towers, types of towers, maintenance needs, adjacent infrastructure such as pipelines and railways, adjacent vegetation, and other land uses.
3. The falling tree zone cleared when the line is built varies with tree height and ground slope. In the area beyond the ROW most vegetation can re-grow to mature height. Trees may have to be removed if they become hazardous to the circuit.



Proposed new structure next to existing right-of-way

NOTES

1. Drawing not to scale.
2. Values shown (heights, widths, clearance) are typical values representing 90% of the line and may vary along the line based on items including distance between towers, types of towers, maintenance needs, adjacent infrastructure such as pipelines and railways, adjacent vegetation, and other land uses.
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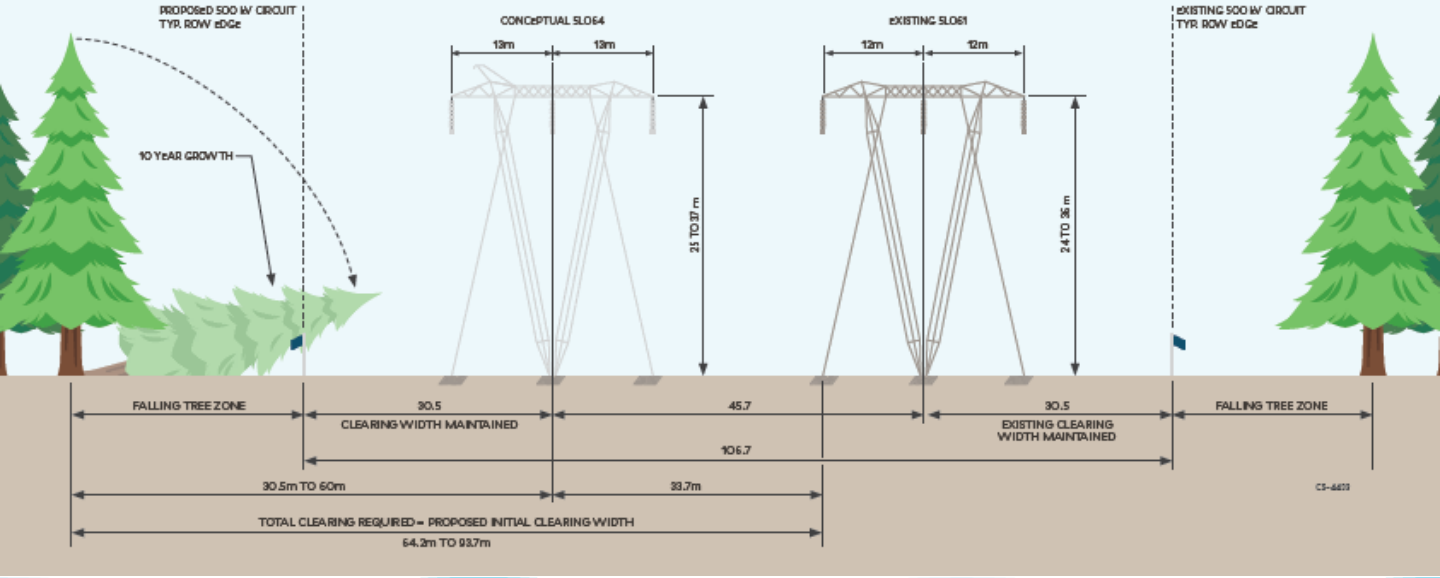

Studies

- Environmental field studies to start spring/summer 2024
  - Wildlife—amphibians, bats, birds, wildlife habitat, remote cameras
  - Fish—stream assessments
  - Vegetation—Terrestrial Ecosystem Mapping, rare plants
- Archaeology
- First Nations Traditional Use Studies
- Study areas will vary by study and project activity
- We'll use the findings to complete the assessments and help us develop mitigation measures and monitoring programs
- Preliminary engineering and survey studies started spring 2023




Proposed Schedule

Key Dates	Activity
Fall 2022 to Fall 2024	• Start desktop and field studies • Assess and select route and station locations
2023 to 2028	• Complete studies and design work • Seek required regulatory approvals • Acquire property rights
2026	• Start construction PGGT
2028	• Start construction GTTT
Fall 2030	• Target in-service date PGGT
Fall 2032	• Target in-service date GTTT

We're working to identify ways to shorten the schedule.

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Procurement

- We're developing our procurement strategy in partnership with First Nations
- Partnerships with First Nations will be a key consideration in the strategy
- All BC Hydro public procurement opportunities are published on BC Bid and we issue Notice to Vendors in BC Bid informing the public of upcoming procurement opportunities
- We'll also provide information about opportunities and the bidding process at public events and on our project website at www.bchydro.com/ncelectrification
- We're currently working to hire an engineering services provider who will work with us to design the proposed transmission lines
    - This is for design only, a company to construct the lines will be hired later

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Employment

- We’re several years away from hiring for the project
- We will develop a hiring strategy as the projects advance
- We anticipate hiring transmission line construction contractors who will, in turn, hire workers for the job
- When we’re at this stage, we’ll provide information about the hiring process and/or Contractors to contact on our website, at public events and through other means.
    - As noted on the Schedule, we anticipate construction on PGGT and GTTT starting in 2026 and 2028, respectively

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Thermal Upgrades

- Thermal upgrades will enable the existing lines to carry the same amount of electricity as the new lines and this will enable us to deliver electricity to the North Coast even if one line is out of service.
- Transmission lines heat up and sag when they carry current and there are areas where there won't be enough clearance between the lines and the ground to operate safely when the lines are carrying more current.
- We can increase the clearance by:
  - raising the lines by "tightening" them or adding mid-span towers
  - removing high spots on the ground
  - moving infrastructure (e.g., roads) to areas with more clearance,
  - raising the towers, or
  - rebuilding the towers.

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Thermal Upgrades

- Once we've identified where more clearance is needed, we'll determine the best way to address each site.
- Some of the proposed upgrades may take place as part of regular transmission line maintenance over the coming years.
- Most work would occur after the proposed transmission lines are in service.

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Beyond Terrace

- Considering the level and location of potential demand identified in the Expression of Interest and the existing infrastructure, the following new infrastructure is needed; however, the exact requirements will depend on which customer projects advance:
    - South: a new line to Kitimat built to 500 kV standards but initially operated at 287 kV and a new substation.
    - North: a new 500 kV line to Gitlaxt'aamiks (formerly New Aiyansh) and a new substation.
    - West: a new 287 kV substation and new line from Prince Rupert to the port.
- The process for how to advance any infrastructure beyond Terrace needs further discussion with First Nations, governments, and stakeholders.

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Discussion

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Thank you!

- We'll continue to keep you informed as the project advances
- For more information, please visit bchydro.com/ncelectrification
- Please contact us at 1 866 647 3334 or projects@bchydro.com if you have any additional questions or comments

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