

West End Substation Project

Underground power lines

November 2025



Virtual meeting etiquette



- We're not recording and kindly ask that others do not record
- During the presentation, please put questions in the chat
- Remember to mute your microphone if you're not speaking to the group
- Avoid using virtual backgrounds - this saves bandwidth
- Share air space so that everyone can participate
- Challenge ideas, not people



Agenda

- Introductions
- An overview of how we deliver electricity to our customers
- The West End Substation Project background
- How we'll power the West End Substation – new underground power lines
- How underground power lines are constructed
- How we're planning to mitigate impacts
- Community engagement and communication
- Questions and answers



Our electrical system

In B.C., most electricity is generated in the north and east, and transported to customers in the south and west.



Power lingo

Keep these in mind as we discuss new power lines

Transmission system



A network of high-voltage power lines and equipment that transport electricity from dams to substations across long distances

Duct banks



Underground housing used to protect electrical wires, made of plastic pipes encased in concrete

Civil works



Construction tasks like digging trenches, pouring concrete, or building structures.

Distribution system



Lower-voltage power lines and equipment that deliver electricity from substations directly to homes and businesses

Maintenance vaults



Underground chambers used to access, inspect and maintain power lines safely

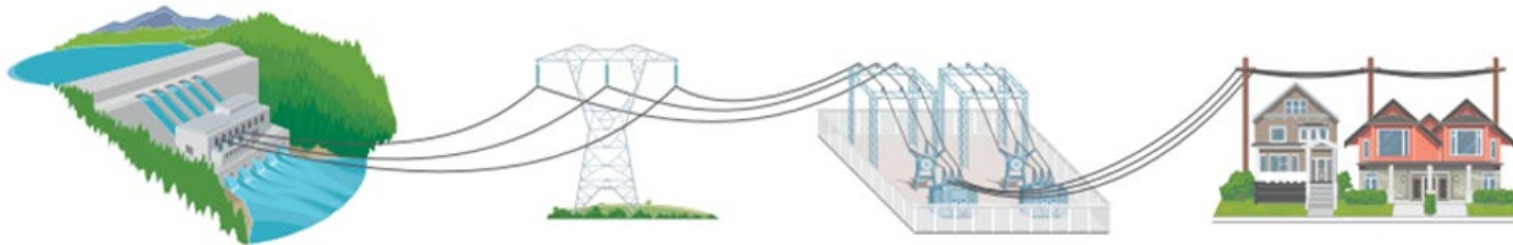
Cable pulling



The process of threading or pulling electrical cables through duct banks to connect power lines



Delivering electricity to our customers



Generation

Electricity is generated by BC Hydro and independent power producers.

Transmission

Electricity is moved from where it's produced to where it's used.

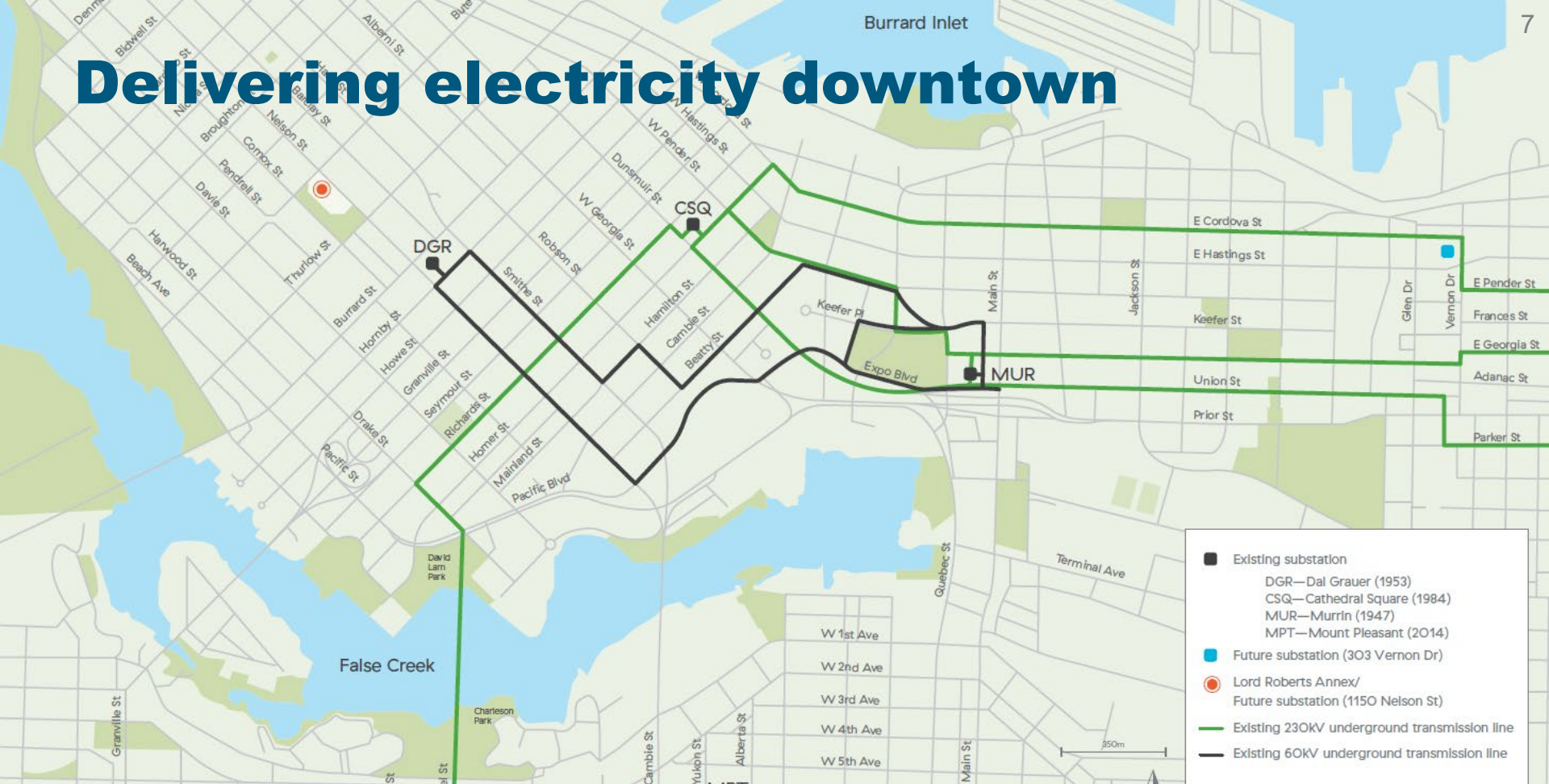
Substations

Voltage is reduced at substations to provide power suitable for use in your home or business.

Distribution

Low voltage electricity is provided to neighbourhoods and businesses.

Delivering electricity downtown



- Existing substation
 - DGR—Dal Grauer (1953)
 - CSQ—Cathedral Square (1984)
 - MUR—Murrin (1947)
 - MPT—Mount Pleasant (2014)
- Future substation (303 Vernon Dr)
- Lord Roberts Annex/
Future substation (1150 Nelson St)
- Existing 230KV underground transmission line
- Existing 60KV underground transmission line

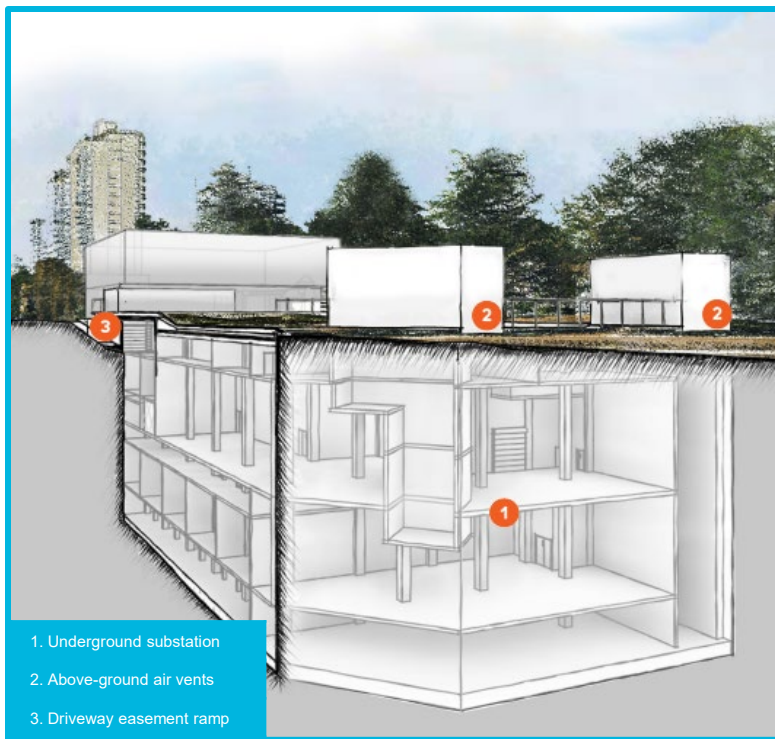


The West End Substation Project

We've been planning for a new substation to serve downtown Vancouver communities since 2017.



The West End Substation



- Located at the Vancouver School Board's Lord Roberts Annex property
- Replaces the Dal Grauer Substation, on Burrard Street, which is ageing and can't be rebuilt where it is
- New substation will operate safely out-of-sight, except for above-ground air vents and a street-level entrance on Nelson Street
- We expect to start construction in late 2026 and to complete construction within five years



Benefits delivered by this approach



Building underground, at public property, in a mixed-use development will deliver:

- A safe, modern substation to support reliable electrical service,
- Protection of local housing stock,
- Investment in local public schools, and
- Support to refresh local parks.



How we select power line routes

We consider technical requirements and construction impacts to select routes.



Considerations for routing - technical

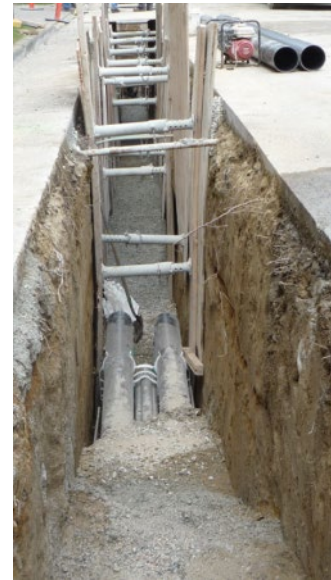
We need to deliver electricity to the new substation safely and reliably

We'll install underground power lines to connect West End Substation to other existing substations.

The power lines will be pulled into plastic conduits (pipes) that are encased with concrete.

To ensure these power lines can work safely and reliably for decades, we've identified routes that:

- **Minimize distance** – so the system is efficient,
- **Limit the number of splices** – or places where we join two power lines together, and
- **Limit conflicts with other utilities.**



Example of a duct bank under construction



Considerations for routing - space

There is limited space underground in downtown Vancouver

We have to work around the many utilities that operate under downtown Vancouver streets, including:

- Water mains
- Storm sewers
- Sanitary sewers
- District heat (steam)
- Natural gas
- Telecommunication cables
- Abandoned utilities

Each of these utilities has important safety clearances.

We've looked for routes that limit utility crossings and avoid utility relocations, because these increase construction duration.



Constructing an underground duct bank, and crossing other utilities, in downtown Vancouver



Considerations for routing - limiting impacts

We've considered the construction impacts of these routes



Pender St at Howe St, looking west

We've considered the impacts to people who live, work and commute in the area and tried to minimize them.

Factors we've considered include:

- Construction duration,
- Locations of residences,
- Location of businesses and their access points,
- Bus lanes, bike lanes, truck routes and parking, and
- Environmental impacts.



Transmission routes

This is where we'll build new high-voltage power lines to supply electricity to the West End Substation.



Transmission routing



Route 1 – approximate alignment



This route starts under Cordova Street, joining a new power line to an existing power line.

Cordova St

- south-side travel lane

Homer St

- east-side travel lane

Hastings St

- east-bound travel lane

Richards St

- bike lane

	power line
	maintenance vault



Route 1 – approximate alignment



Richards St

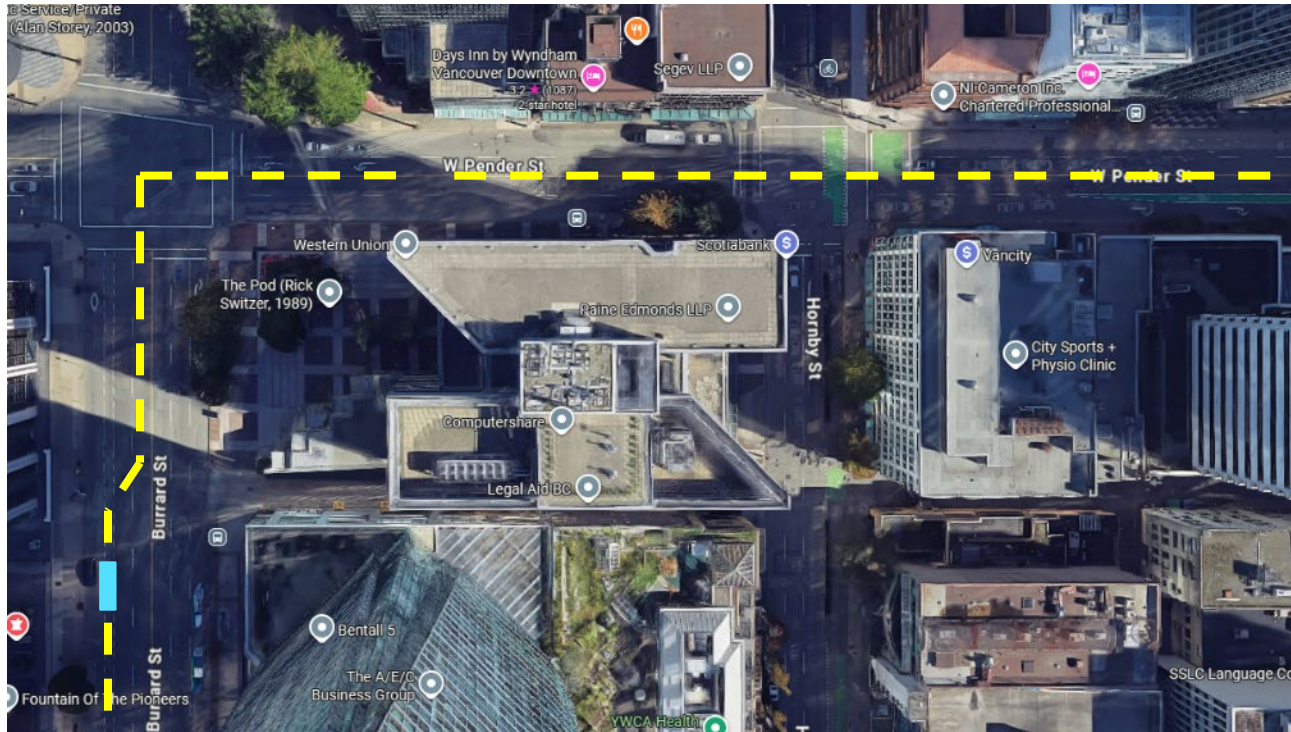
- bike lane

Pender St

- centre of the road



Route 1 – approximate alignment



Pender St

- centre of the road

Burrard St

- south-bound lane
- after ~25 meters, jogs into south-bound bike lane

	power line
	maintenance vault

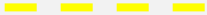


Route 1 – approximate alignment



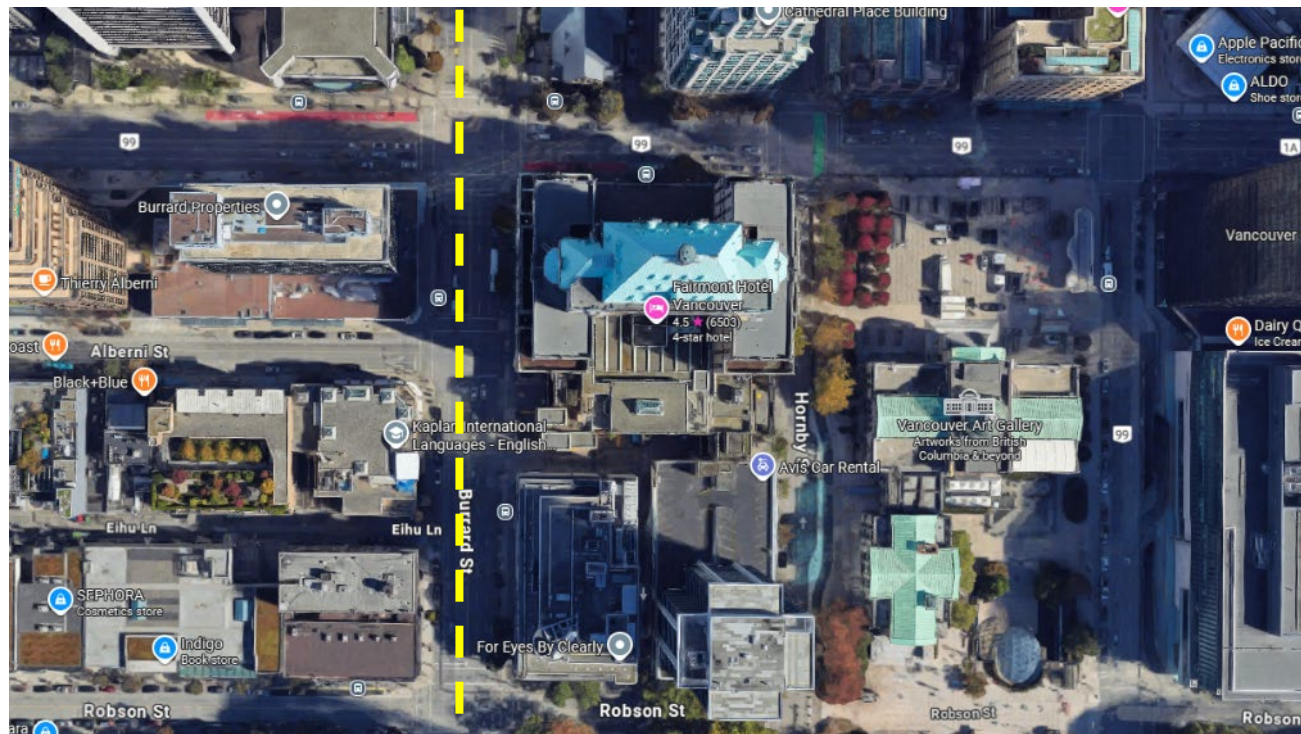
Burrard St

- jogs into south-bound travel lane outside Burrard St SkyTrain Station

	power line
	maintenance vault



Route 1 – approximate alignment



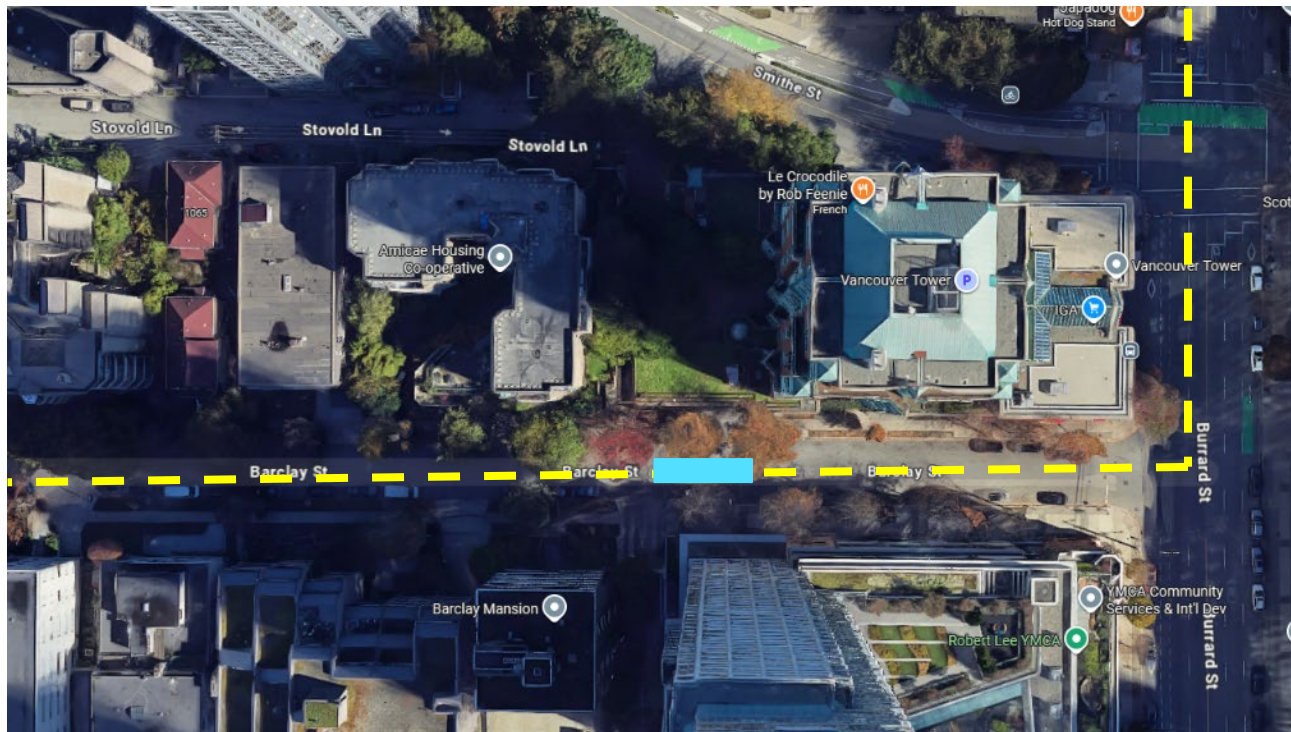
Burrard St

- south-bound travel lane

— — — —	power line
■	maintenance vault



Route 1 – approximate alignment



Burrard St

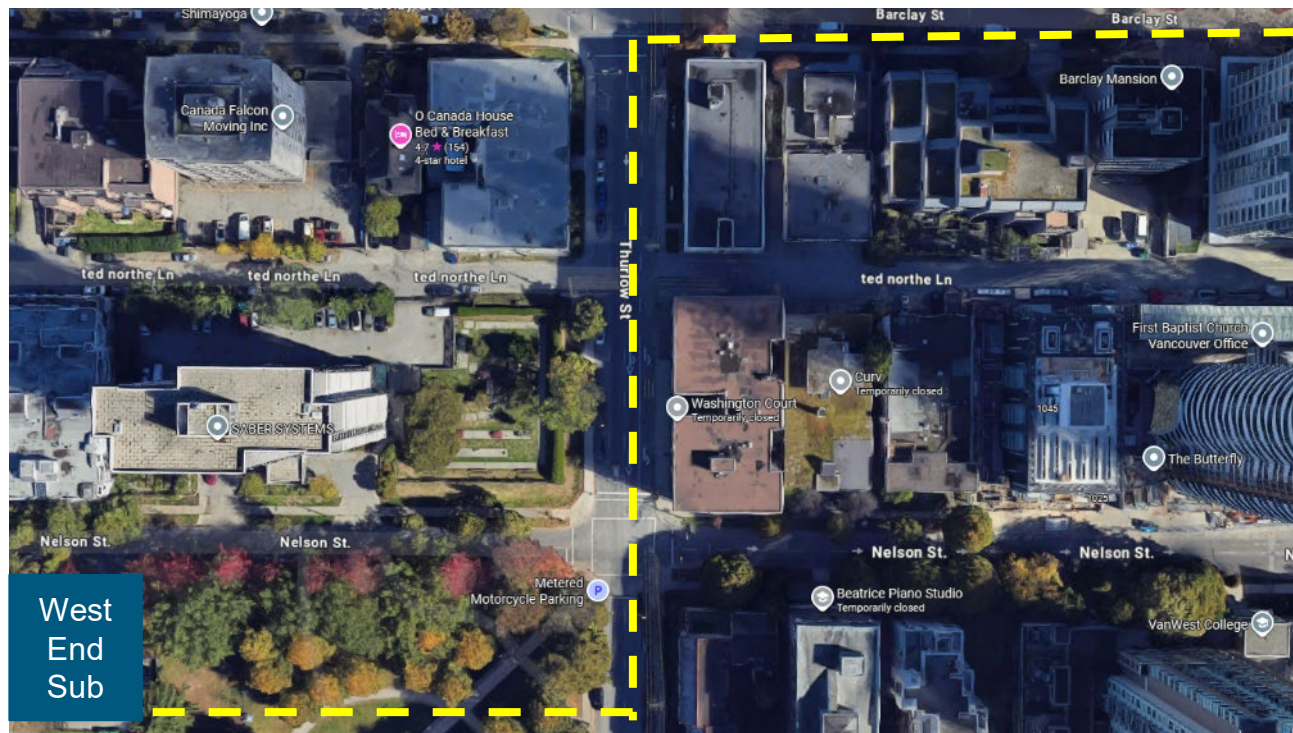
- south-bound travel lane

Barclay St

- east-bound travel lane



Route 1 – approximate alignment



Barclay St

- east-bound travel lane

Thurlow St

- south-bound travel lane (east side of road)

Nelson Park

- within rights-of-way agreed with the Vancouver Park Board

— — — —	power line
■	maintenance vault



Route 2 – approximate alignment



This route starts at our Cathedral Square Substation.

Dunsmuir St

- crossing just outside the crosswalk

Richards St

- in parking lane

	power line
	maintenance vault

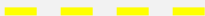


Route 2 – approximate alignment



Richards St

- in parking lane

	power line
	maintenance vault



Route 2 – approximate alignment

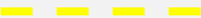


Richards St

- in parking lane

Davie St

- west-bound lane

	power line
	maintenance vault



Route 2 – approximate alignment



Davie St

- west-bound lane

— — — —	power line
■	maintenance vault



Route 2 – approximate alignment



Davie St

- west-bound lane

Burrard St

- south-bound lane

— — — —	power line
■	maintenance vault



Route 2 – approximate alignment



Burrard St

- south-bound lane

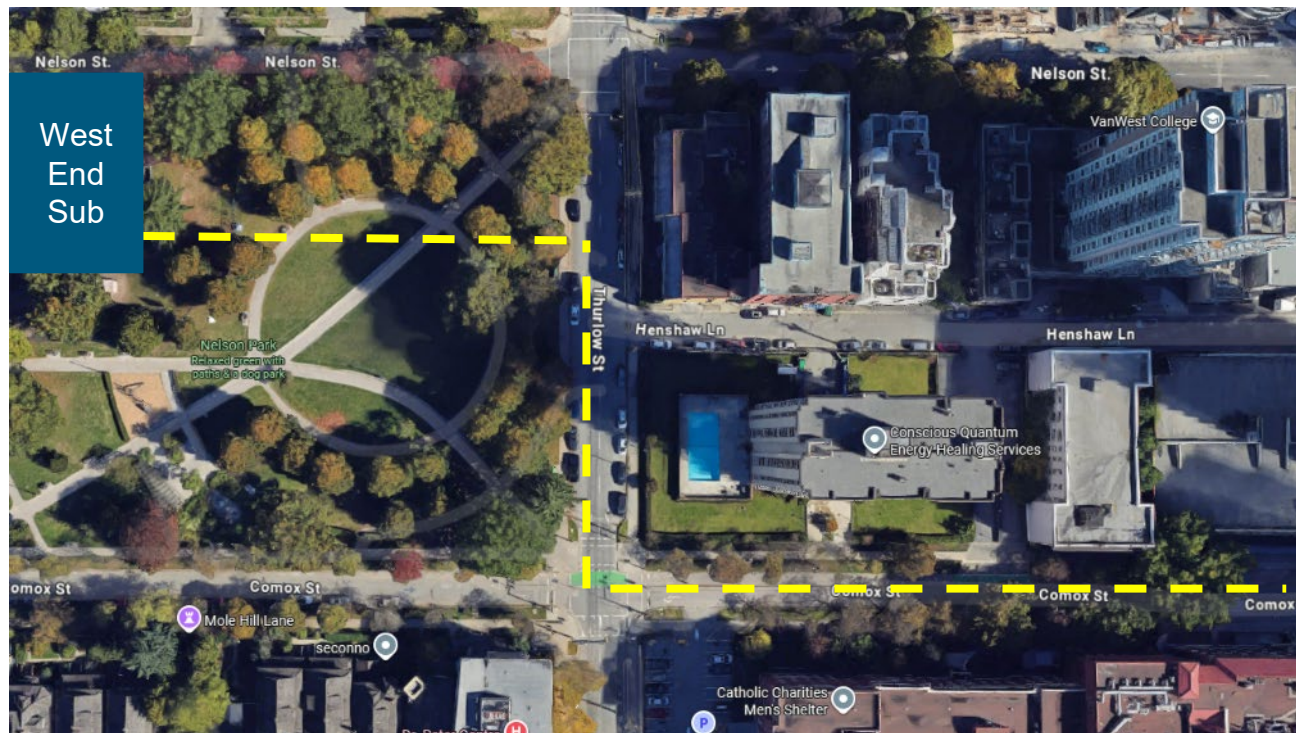
Comox St

- adjacent to bike lane

---	power line
■	maintenance vault



Route 2 – approximate alignment



Thurlow St

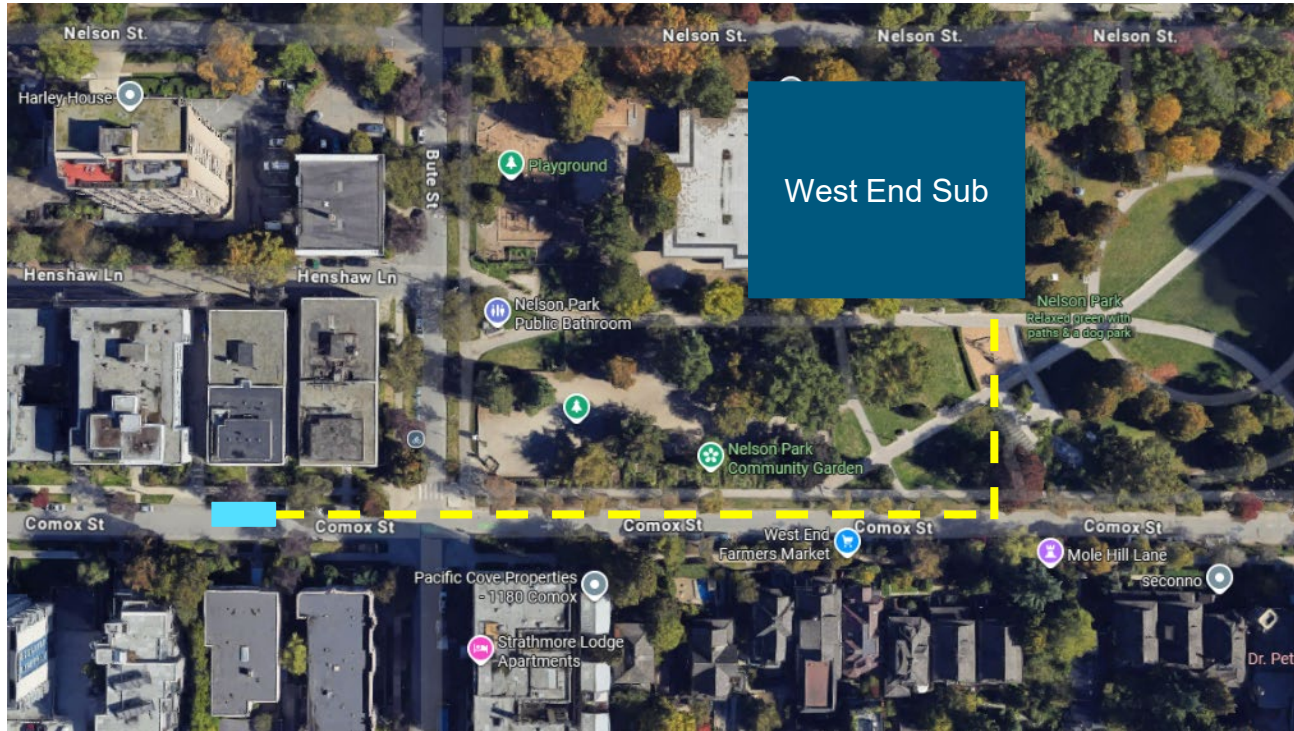
- adjacent to parking lane

Nelson Park

- within rights-of-way agreed with the Vancouver Park Board



Route 3 – approximate alignment



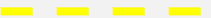
Nelson Park

- within rights-of-way agreed with the Vancouver Park Board

Comox St

- north-curb lane

NB – although we will build this duct bank and vault, we are not installing a power line at this time.

	power line
	maintenance vault

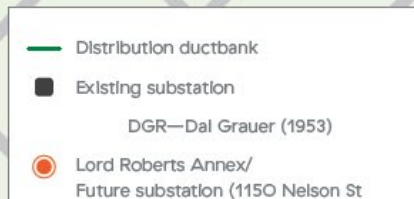


Distribution routes

We'll build new low-voltage power lines to deliver electricity to local homes and businesses.



Distribution routing

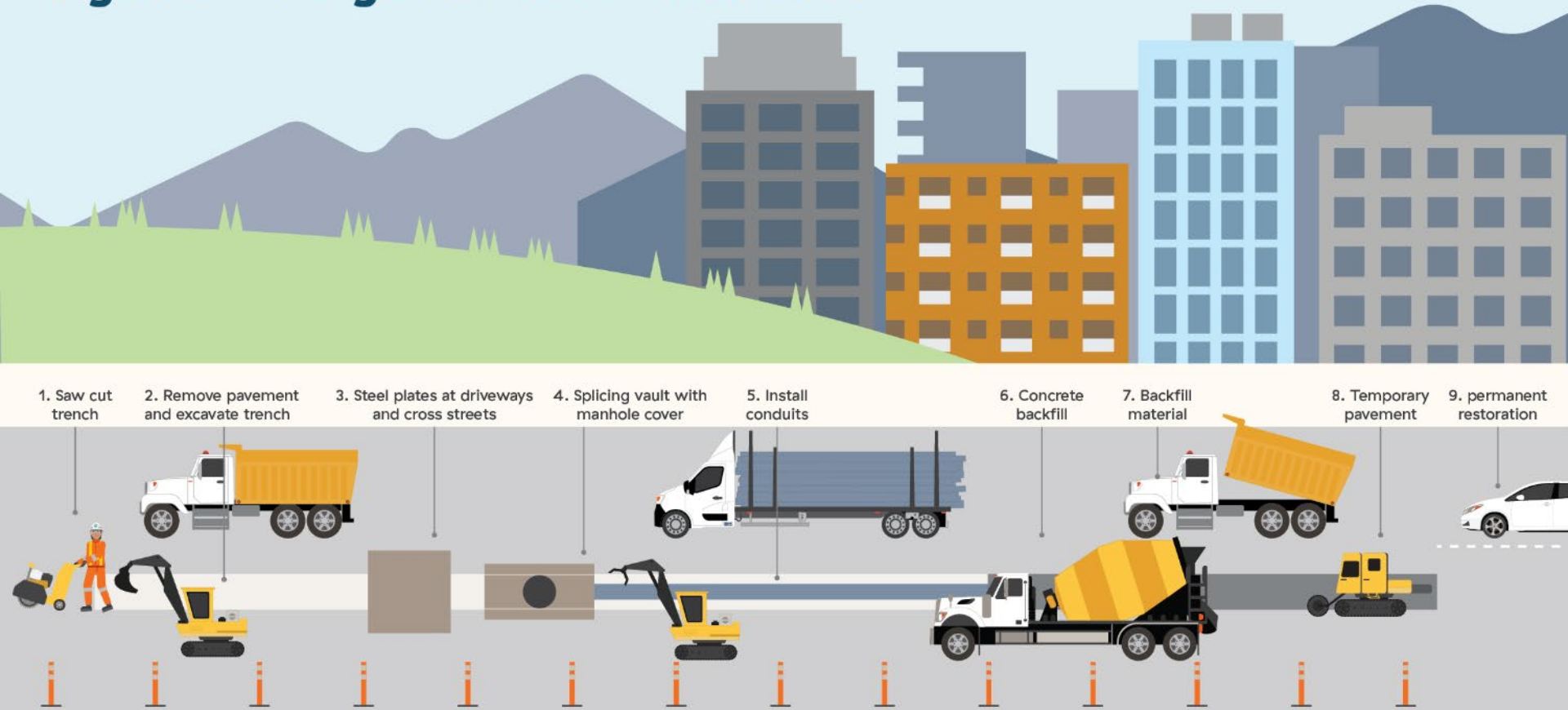


Power line construction

We have experience constructing underground power lines in downtown Vancouver.



Stages of underground cable installation



This image is for illustrative purposes only and does not represent any actual streets.



Duct bank construction



Constructing a transmission power line on Gorge Road, Victoria

We expect to:

- Start civil work in late 2027 and finish in fall 2029,
- Work on Route 1 and Route 2 simultaneously,
- Work block-by-block, completing 10-35 meters of duct bank per day,
- For transmission power lines: excavate trenches approximately 3 meters wide and 2.5 meters deep,
- For distribution power lines: excavate trenches approximately 1 meter wide and 2 meters deep,
- Work during daytime hours, six days per week, and
- Close as few traffic lanes as possible to complete our work safely.



Maintenance vault construction

- We'll construct the maintenance vaults at the same time as the duct banks.
- Most vaults will be 'pre-fabricated' – this means they are built elsewhere, transported to site, and lifted into place by crane.
- This approach has a shorter duration than other vault construction methods.



Pre-fabricated vault installation in Victoria, BC



Cordova Street maintenance vault

- In Cordova Street we'll connect to an existing power line, so we need to construct a 'cast-in-place' vault.
- This will involve digging down to the existing power line, building a wooden form (or mould) to shape the new vault, then pouring concrete around the form to construct the vault.
- This approach takes longer than constructing pre-fabricated vaults because it takes time to build the form and for the concrete to set.



Vault form in Metro Vancouver



Cable pulling



Example of pulling cable into underground vault and duct bank

We expect to:

- Start cable pulling in late 2029 and finish in spring 2030,
- Work on Route 1 and Route 2 simultaneously and work block-by-block,
- Pull approximately 600 meters of cable each day,
- Work during daytime hours, 5-7 days per week, and
- Close as few traffic lanes as possible to complete our work safely.



Anticipated impacts and mitigations



Safety

- The safety of the public and our workers is always our top priority.
- We'll follow all relevant safe work procedures at our work sites.
- We'll make sure that signs and traffic management personnel keep people moving around and through our work zones safely.



Traffic impacts

- We've avoided bus lanes, bike lanes and truck routes as far as possible.
- We're completing traffic studies to understand the impacts of our work.
- Our contractors will propose detours and other traffic management methods to minimize impacts, and these will be reviewed by the City of Vancouver.
- We'd appreciate hearing from businesses and groups with specific concerns so we can ask the contractor to consider these.



Anticipated impacts and mitigations



Noise

- We'll complete our work in daytime hours as much as possible to avoid noise disruption.
- Our contractors will muffle their equipment when possible and turn it off when it's not in use.



Environment

- Before we start work, we'll complete an environmental management plan that details how we will limit our impact on the environment.
- We'll need to remove about 20 of the 500+ trees along our power line routes to complete our work safely: our arborist found that almost all of these are 'danger trees' or in poor health.
- We'll fund the replacement of every tree we remove at a minimum of a 1:1 ratio.



Other?

- If you can identify other impacts or have examples of helpful mitigations, please let us know in our online survey.

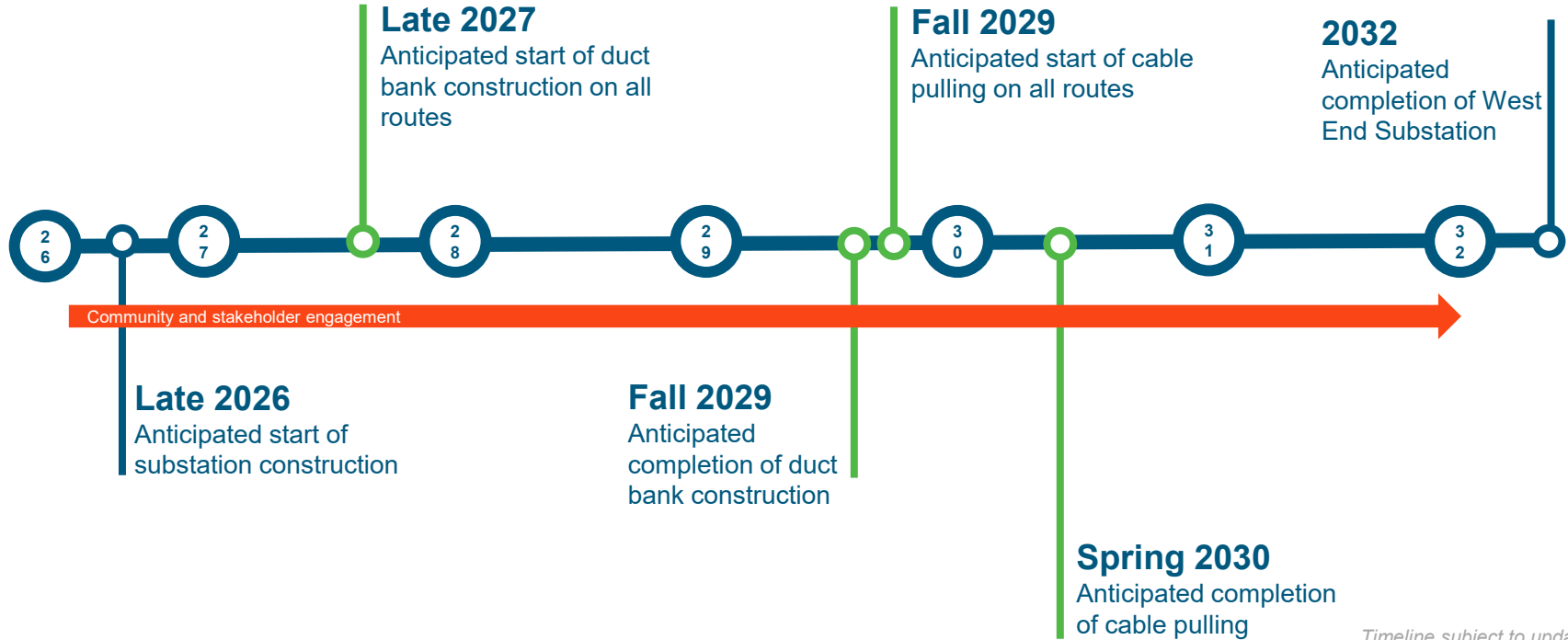


Power line construction schedule

Construction will take place at the same time as substation construction.



Power line construction schedule



Ongoing engagement

We'll keep you informed about our plans,
especially as we get closer to construction.



Ongoing community engagement



Booth at the West End Farmers Market

- Please complete our online survey - your comments will be used to help identify mitigations.
- Before construction starts, we'll share more information about schedule and methodologies.
- We'll send letters to addresses along construction routes explaining:
 - When we'll be working in the area,
 - What people can expect to see and hear,
 - Anticipated impacts and how we'll mitigate them, and
 - How to contact us with questions and concerns.
- You can also sign-up for email notifications about our work, by power line route.
- You can also find us at the West End Farmers Market and online at **bchydro.com/westendsub**.



Questions and comments

Please:

- **Type your comment or question in the chat box.**
- **Use the 'raise hand' function at the top of the screen to speak.**
- **Keep your microphone muted except when asking your question.**



Thank-you and next steps



Share your comments using the survey by **November 25**.



Sign-up for project emails – available by route.



Reach out with questions to **westendsub@bchydro.com**.



Visit our webpage for more information **bchydro.com/westendsub**.



