COV Engineering Agenda

- Development Process and Engineering Approvals
- Geotechnical Requirements and Updates
- Broadway Subway Project – Street Use Impacts

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Development Process and Engineering Approvals

Raghav Grover, P.Eng., MASc.

Senior Construction Engineer, Development and Major Projects

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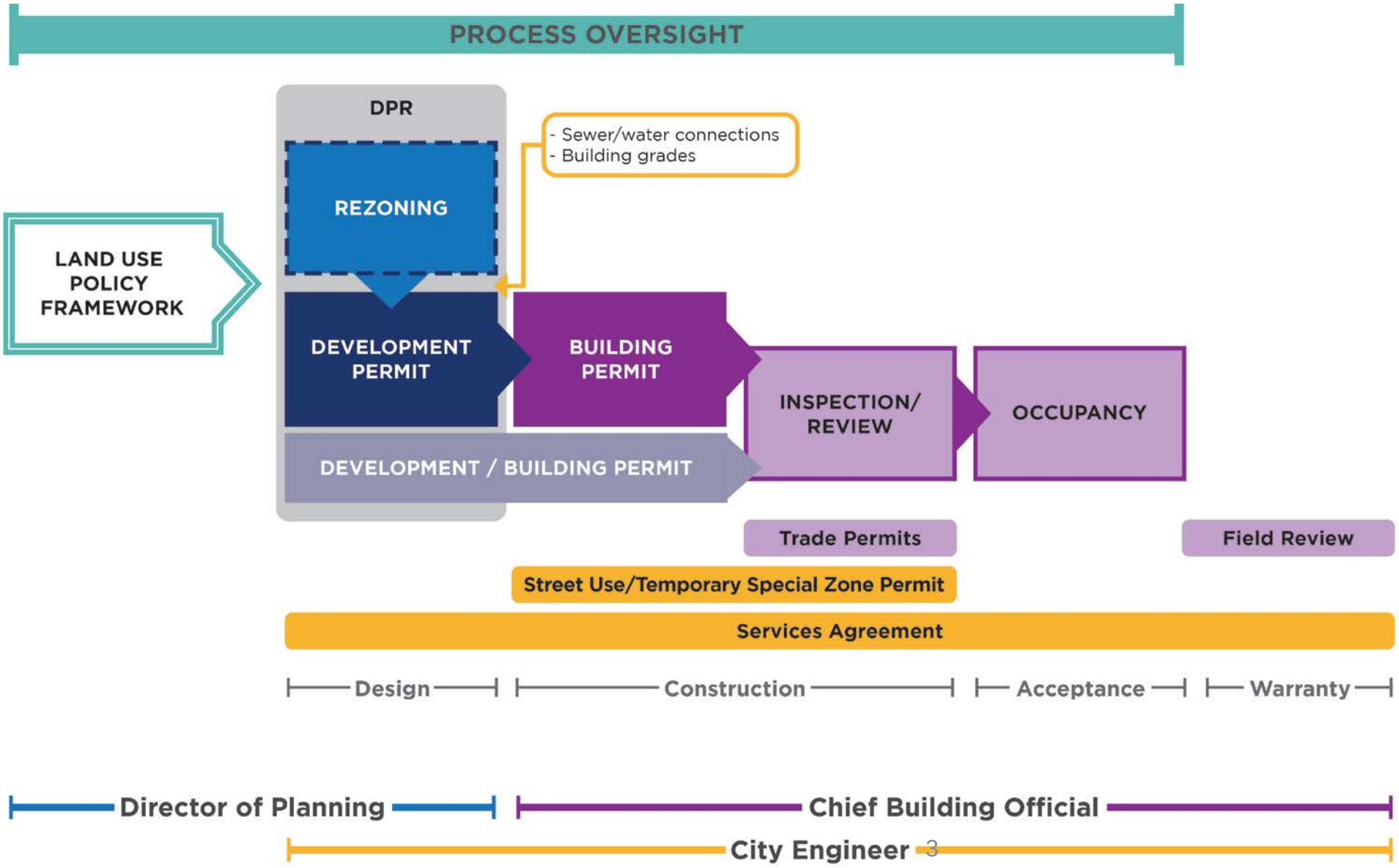
Engineering and Development Process



Engineering's Role in BP Issuance

- Fees/Deposits & Preliminary Inspections (Pre-Construction)
- Pre-Construction Meeting
- Building Permit - Demolition Review
  - Impacts to CoV Assets
  - Street Use Permitting
- Service Connections – Sewer and Water Connections
- Excavation and Shoring Review
  - Impacts to CoV assets
  - Utility Clearances
  - Insurance Forms
  - Professional Engineering Assurances
  - Sewer Connection Fee
- Legal Agreement Holds (Rainwater Management, other)

When are Engineering approvals required ?

- Services Agreement Works
  - Conditioned during Rezoning/Development Permit reviews.
  - Sidewalks, bike lanes, road/lane works, utilities, signals, street lights etc.

- Impacts to public right-of-way i.e. anything outside the property line resulting from building design/construction
  - Encroachments such as retaining wall, stairs etc.
  - Shoring/Excavation
  - Damage to City infrastructure

- Development Permit Works for Simple Projects
  - Landscape Plans to be finalized 8 weeks prior to construction. These generally include simple replacement of sidewalks, trees and curb & gutter

Who should get these Engineering approvals?

- Owner's/Consultants/Contractors require approvals and permits from Engineering prior to commencing any work on public right-of-way i.e. outside the property line.

- CP's should advise the Owner or members of Project Team on required Engineering approvals when building design/construction triggers works on public right-of-way or impacts existing CoV infrastructure.

- CP's/Owner should contact their assigned Building's Review Branch Project Coordinator/DBI and may also email engineeringclientservices@vancouver.ca for general enquiries.

COV Geotechnical Requirements & Updates

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Senior Geotechnical Engineer, Engineering Strategy & Standards

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Geotechnical Notification Requirements

Changes to the approved permit drawings

- Any changes (including shoring and excavation) should be approved the City
  - This includes installation of additional rods at haul out locations, changes in shorting design, changes in encroachment, etc.
  - Changes clearly marked out on the most recent approved drawing set with justification of design change upon submittal.
  - Changes to design should be included in the final permit drawings prior to occupancy
- Issues resulting in the field that necessitate a site instruction/emergency work with any impact on City Street or assets require <u>immediate</u> notification to the City by either the consultant or the CP.

- The CP should not be making judgement calls on whether changes that affect City assets are substantial
- CP monthly reporting should reflect any changes on site
- Sites must have pre-construction meeting

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Dormant Sites – COV ENG requirements

If excavation to become dormant, the following must be submitted:

- A monitoring plan for the duration that the site remains dormant, including:
  - Type, location, and frequency of monitoring
  - Water management on and off-site

- A communication plan, including movement/visual thresholds, remediation steps or action items, and contact information of involved parties, considering:
  - Unexpected conditions
  - Cracking, settlement, or any other damage to surrounding City or private infrastructure
  - Visual signs of failure such as shotcrete spalling, water seepage, erosion, etc.

- Provide status of any traffic control measures that are necessary for the site to remain dormant
- Geotechnical Engineer has ultimate responsibility for the shoring and needs to be proactive in monitoring and identifying any issues.

Work within City ROW

- CoV Construction Specifications Document Section 32 15 02S States:
  - *Shotcrete must be removed from excavations within 1.5m of City building grades prior to backfilling. Shotcrete in proximity to any City service shall be further removed to 1.5m around the top and sides and just below the lowest point of the connections unless otherwise approved by the City Engineer.*
  - *Letter of Assurance must be supplemented by:*
    - *Sealed as built survey confirming depth of shotcrete removal.*
    - *Date stamped construction photos showing removal of shotcrete.*
- Shoring within 1.5 m of PL on encroaching on City ROW will require a shoring removal strategy
  - If excavation is close to PL, thickness of shoring should be shown in design drawings
- The strategy must be coordinated with utility installation to ensure proper construction staging
- Any shotcrete left in City ROW may require payment under encroachment agreement

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Geotechnical Monitoring Requirements

If construction methodology has the potential to impact areas outside of the development footprint, a monitoring plan may be required.

A condition was recently added to Rezoning and DP memos that stipulates:

Submission of three (3) surveys over a period of three months prior to construction is required to assess the proposed development in a peat region with further monitoring surveys during and post construction required as necessary;

Note to Applicant: Prior to and during construction activities, the existing infrastructure at and adjacent to the development site shall be monitored to ensure the functionality of the existing infrastructure meets current City standards. The required surveys are to include survey data from the proposed development site to a distance of 100m radius, in 25m increments. Should any City infrastructure at or adjacent to the site be damaged or disturbed during construction activities, the existing infrastructure is to be replaced to current City standards at the discretion of the City Inspector or City Engineer.

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Common Comments During Geotechnical Review

1. Include section in report addressing public safety and surrounding infrastructure
   - This should include supporting data (i.e. lab testing, previous reports and as-builts, calculations/model, etc.)

2. Provide a Detailed Inspection Plan
   - This should include frequency and descriptions of key items requiring review

3. Ensure drilling goes beyond proposed foundation depth and follows published standards (or provides rationale for deviation)

Broadway Subway and Development Street Use

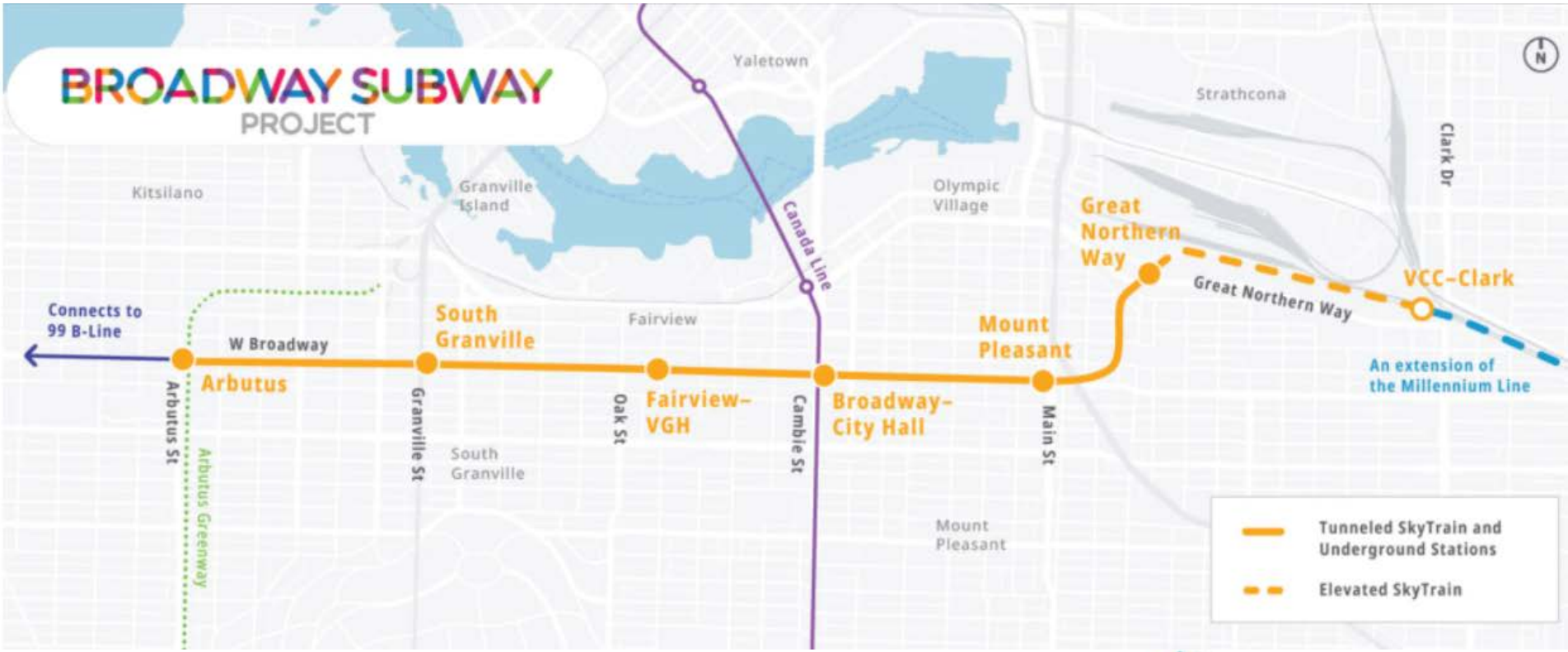
Caroline Ngan, M.A.Sc., P.Eng., PMP
Senior Project Engineer, Rapid Transit Office

Context

- Broadway is part of the Major Road Network (MRN), Frequent Transit Network (FTN) and Truck Route
  - Most heavily used bus route in N.A. with 60,000+ people/day (pre Covid)
- Broadway Subway Project (BSP) is a priority for the City of Vancouver, the Province, and TransLink.
- Construction needs and impacts related to Broadway Subway Project will receive priority throughout the construction period
- **Developers, utility companies, and contractors should not expect regular or typical street use on Broadway and the surrounding corridors during Broadway Subway construction**

The Broadway Subway Project

- 5.7 km extension of the Millennium Line, from VCC-Clark Station to Broadway and Arbutus
- 6 new stations



The Broadway Subway Project

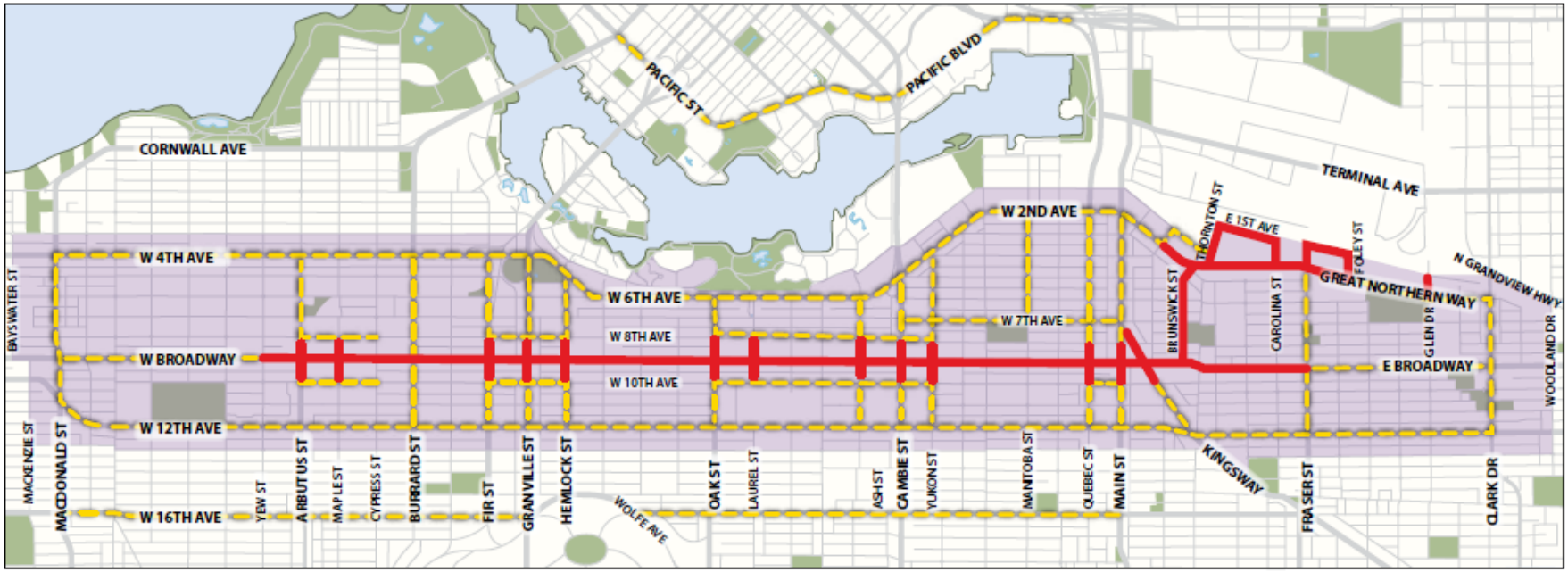
- Construction will begin in fall 2020, with the line in service in 2025. Early works to prepare the corridor began in 2019.
- The project will be mainly constructed by underground tunneling methods.
- Street-level construction and excavation can be expected in areas and blocks where stations will be constructed, and at each end of the line.
- Further information: broadwaysubway.ca

BROADWAY SUBWAY PROJECT

Broadway Subway Impacts on Street Use and Development (2020-2025)

The Broadway Subway Project will extend the Millennium Line from VCC-Clark to Broadway and Arbutus St. Construction is expected to begin in 2020, and the line is expected to be in service in 2025. Early works to prepare for construction of the subway began in fall 2019.

Street use availability along Broadway and the surrounding area may be impacted to varying degrees during the Broadway Subway construction. Developments at or near future subway stations may be subject to additional design considerations and requirements.



Legend

- Highly restricted street use availability (street use applications may not be approved) and developments may be subject to additional design considerations and requirements
- Limited street use availability (limited days or times, depending on Broadway Subway construction scheduling)
- Potential impacts to street use availability (depending on Broadway Subway construction scheduling)

For more information, please visit **vancouver.ca/broadwaysubway** or contact **rapidtransitoffice@vancouver.ca**

April 2020

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Street Use Traffic Principles

1. Traffic impacts within the project area must not conflict or compound with the Broadway Subway construction activities.

2. Transit movement is prioritized on Broadway and adjacent corridors.

3. Follow the City's Transportation priorities and general traffic management principles

Street Use Traffic Principle # 1

Traffic impacts within the project area must not conflict or compound with the Broadway Subway construction activities.

- Subway construction activities will supersede all other construction activities along the corridor
- Prioritize Subway construction truck and access traffic
- No overlapping work zones
- Direction of traffic volumes and traffic impacts will be considered

Street Use Traffic Principle # 2

Transit movement is prioritized on Broadway and adjacent corridors.

- Broadway is MRN, FTN, Truck Route
- Broadway and adjacent corridors (12th, 16th, 6th) carry significant transit volumes
- Delays incurred to transit have people moving capacity impacts and operating cost impacts
- Mitigation measures may be required to help allow development street use
- City works with TransLink under the South Coast BC Transportation Authority Act
  - Developers should engage with TL early!

Street Use Traffic Principle # 3

Follow the City's Transportation Priorities and General Traffic Management Principles.

- City's hierarchy of modes:
  - Pedestrian
  - Bicycles
  - Transit
  - Goods movement
  - General purpose traffic
- Traffic volume, peak hours, turning movement capacity/impacts
- Impact to accessibility
- Resident/business impacts

Other Competing Needs

- Utilities work: maintenance, upgrade, etc
  - BC Hydro, Telecom, Fortis, Sewers, Water, etc
- COV capital work (10th Ave Phase 2, Granville Bridge, Cambie Bridge, etc)
- COV routine / maintenance work (paving, cut repairs, etc)
- Service connections
- Public space allocation
- Move-in / move-out, building maintenance

What does it mean for Developments

- Unlikely to receive **any** street use in proximity to Subway construction sites
- Unlikely to receive full-time street use for construction work on arterial street network
- Street Use, if available at all, could be first come first serve, or context dependent – cannot distribute equitably

What does it mean for Developments

- Developments may need to explore alternative construction methodologies
- Mitigation measures may be required to help allow development street use
- May require additional project documentation (e.g. detailed Construction Management Plan, Construction Traffic Impact Assessment Reports, etc.)

Thank You & Questions

Available for questions:

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Development and Major Projects

Tonia Welch
Engineering Strategy and Standards

Caroline Ngan
Rapid Transit Office

Sherwood Plant
Traffic and Data Management

Chalys Joseph
Development and Major Projects

Services Agreement Process

Design

- Ensure the offsite works are designed as per CoV design standards and are in accordance with Rezoning/Development conditions.

Construction

- Ensure construction is as per CoV accepted designs and construction specifications, as well as meet CoV's quality (inspection and testing) requirements.

Acceptance

- Ensure as-built documentation is provided, deficiencies addressed, and financial close-out.