City of Burnaby

# Combined Sewer Separation and I&I Management

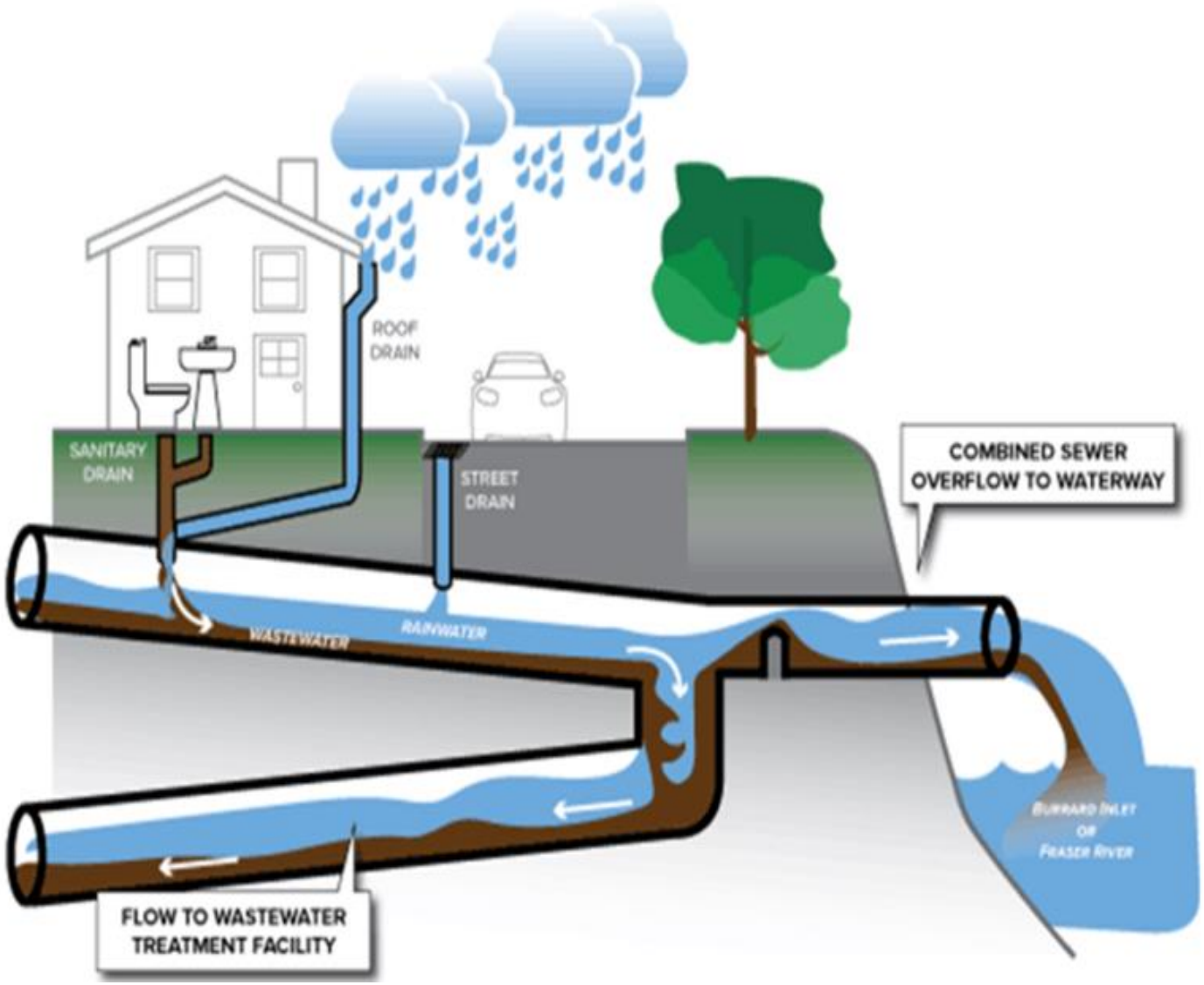
## An Overview of Systems and Practices

2025.03.24

# Agenda

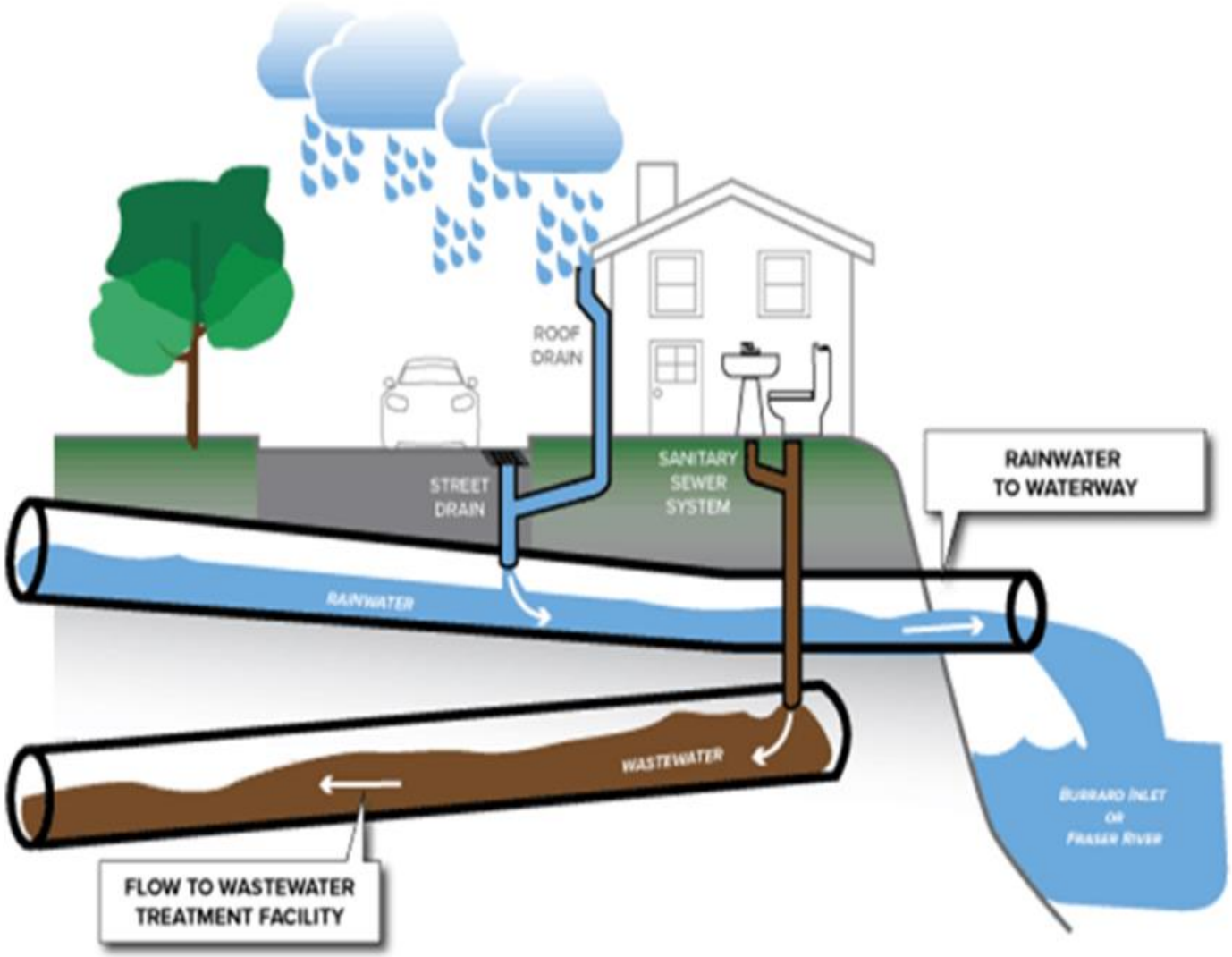
- **Combined Sewer Separation**
  - What is a combined sewer?
  - Inventory, Strategies and Progress
  - Sewer services (private connections)
- **Sewer System I&I Management**
  - I&I Management; definition, status, and strategies
  - LWMP requirements
- **Summary**
- **Q&A**

# Combined Sewer Systems



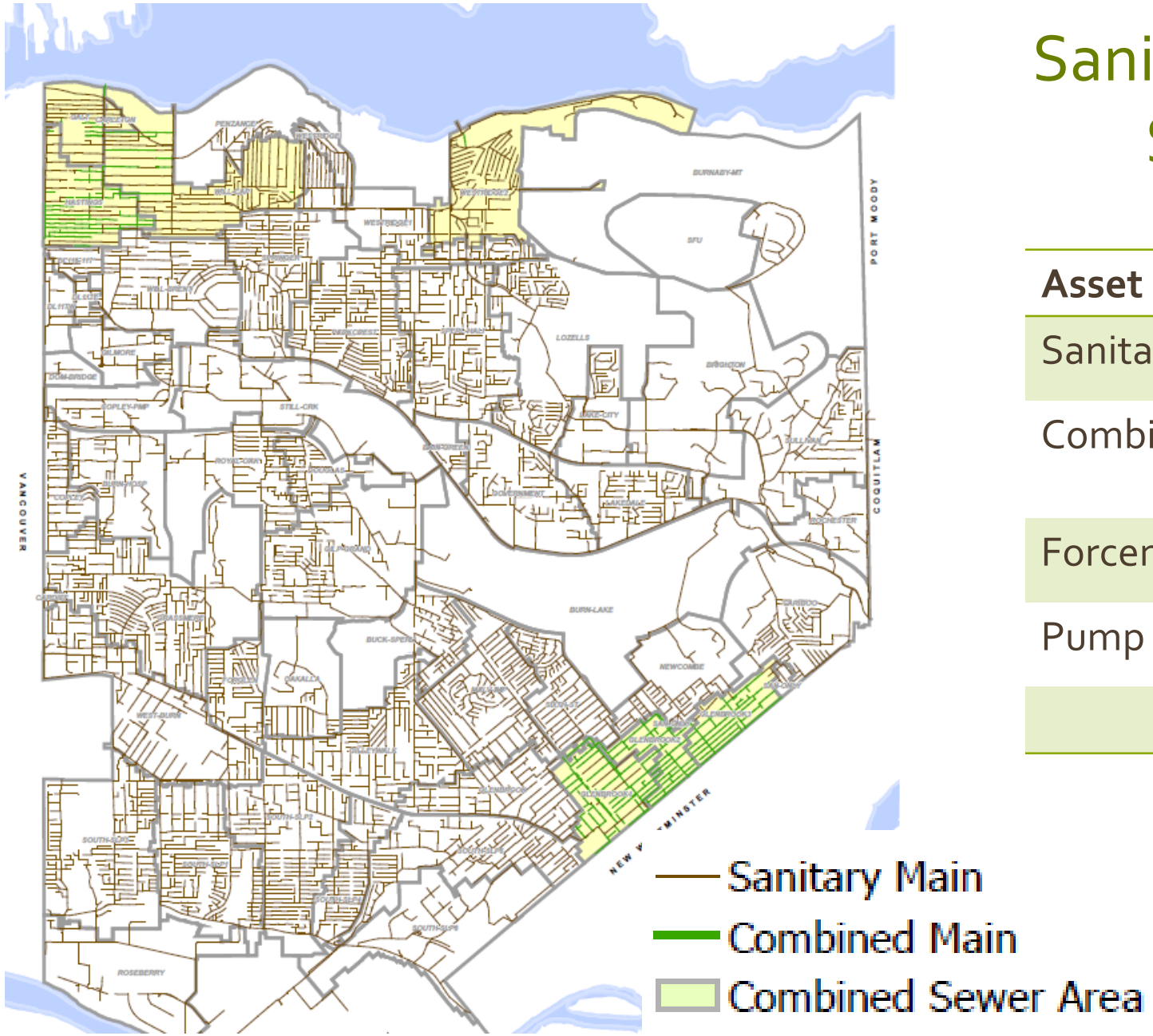

- Legacy **combined sewer** systems collect sanitary sewage and rainwater runoff within a **single-pipe** sewer network. During storm events, rainwater is collected until the combined sewers are filled to capacity.
- The excess flows will overflow (spill) to local waterways at designated outfalls (Burrard Inlet or the Fraser River).
- As part of its LWMP requirements, Burnaby is committed to elimination of combined sewer overflows (CSO's) and separation of legacy combined sewer systems.

# Separated Sewer Systems




- **Separated sewer systems** convey sanitary and rainwater flows separately, thereby reducing the chance of spilling sanitary flows to the environment.
- A separated sanitary sewer network, with regional treatment, represents the least impact to the receiving environment and public health.

# Sanitary & Combined Sewer Assets




| Asset | Inventory |
|---|---|
| Sanitary Mains | 710 km |
| Combined Mains | 36 km |
| Forcemains | 22 km |
| Pump Stations | 22 |
| | |

# Status of Combined Sewer Separation - Glenbrook Catchment

**Glenbrook Sewer Areas (FSA):**


**Glenbrook, FSA:**

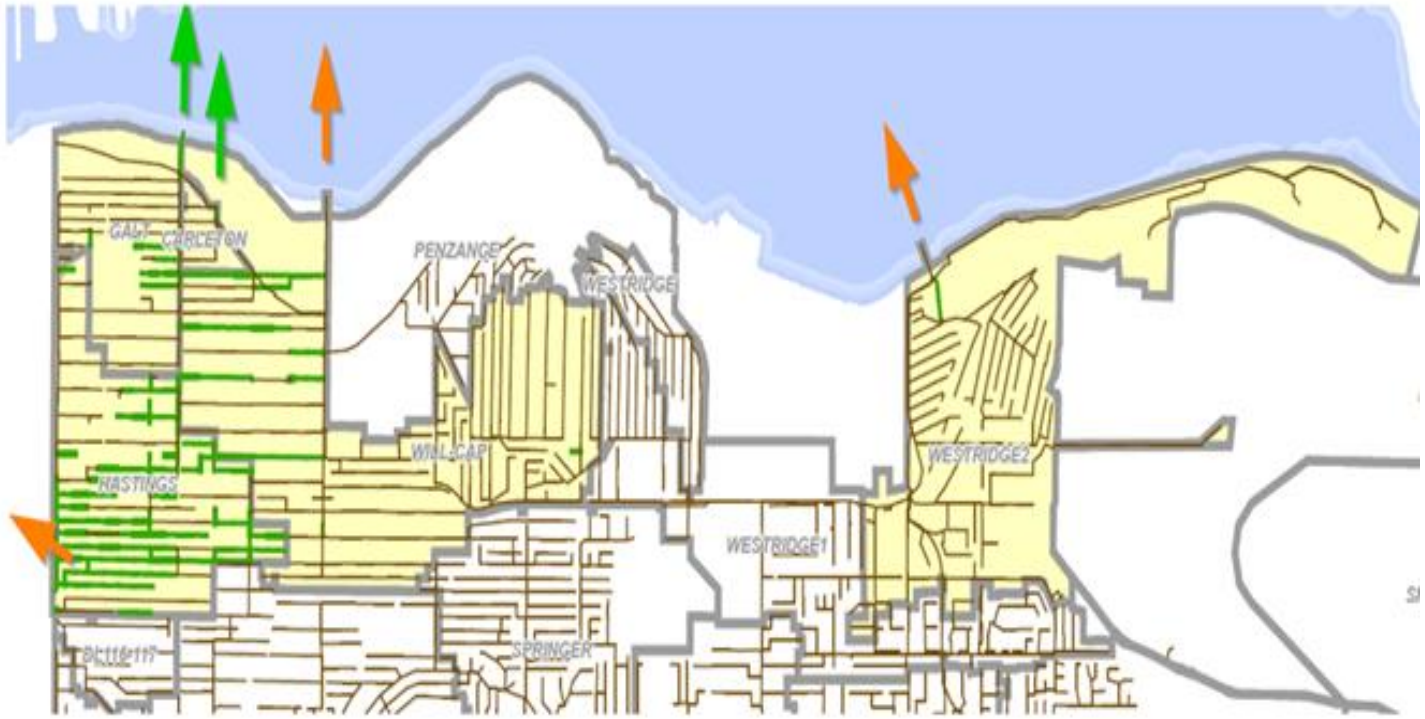
- Combined sewer flows discharge to regional sewers located within New Westminster.
- Low (dry) sewer flows are conveyed to the Annacis Treatment Plant, in Delta, while peak (wet-weather) flows overflow to the Fraser River.

**Progress:** Less than <5% separated.

**Target Completion:** 2075

# Status of Combined Sewer Separation North Burnaby

**North Burnaby Sewer Areas (VSA and FSA):**



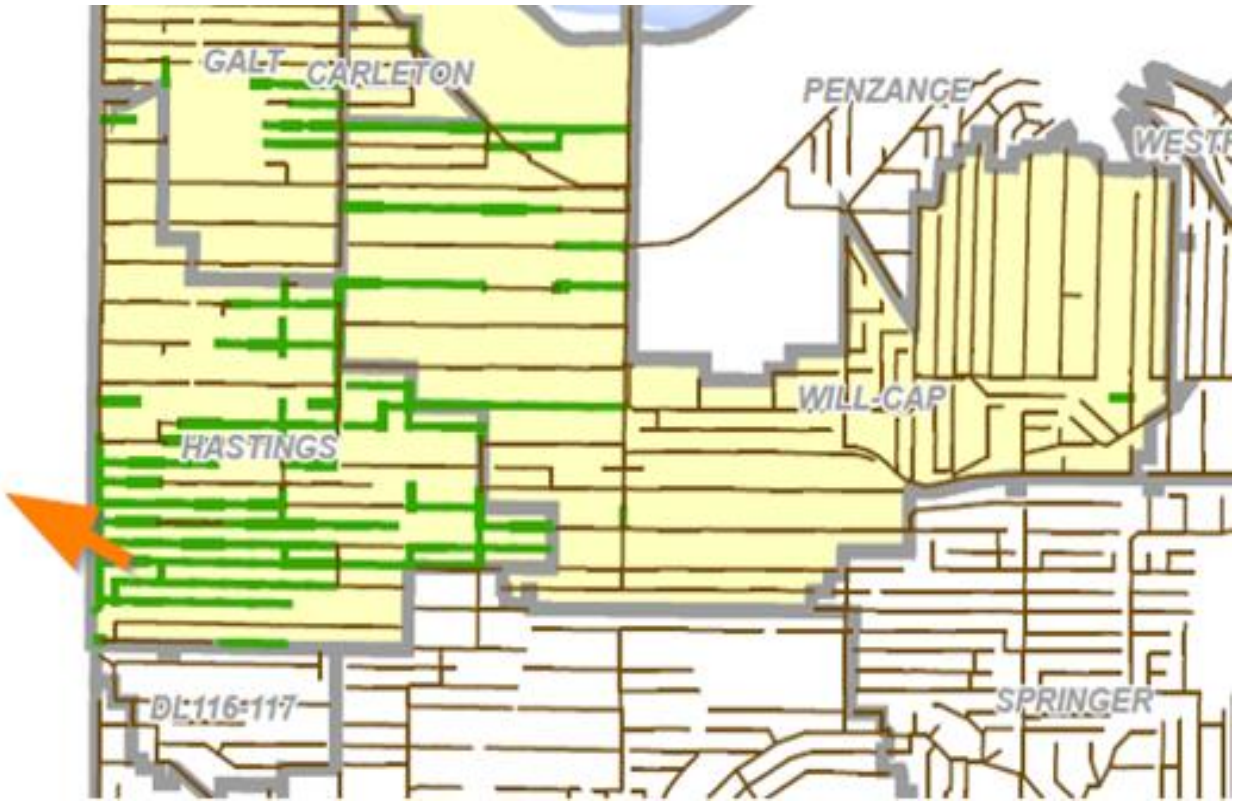

**Westridge, FSA:**

- City sewer mains are separated however, substantial private-side (onsite) combined service connections remain.
- Overflows (CSO's) are discharged into Burrard Inlet.
- Target completion, 2075.

**Willingdon, Carleton & Gilmore, VSA:**

- Separation of City mains are at least 80% complete, except for the private-side service connections.
- CSO's are discharged into Burrard Inlet
- Target completion, 2050.

# Status of Combined Sewer Separation Hastings




**Hastings, VSA:**

- Combined flows from Willingdon Heights, north of Venables, lead to a MV Trunk Sewer west of Boundary Road.
- Flows originating in Vancouver remain substantially combined with overflows at Clark Dr and other outfalls. Discharge of sanitary flows is at the Iona Treatment Plant.
- Separation within Willingdon Hts is nearly 30% complete however, will require completion of substantial portions of the City of Vancouver sewer system.
- Target for separation, 2050.

# Status of Combined Sewer Separation – Private-side (onsite) services

**Combined Private-side (onsite) services:**

- Include cross-connections to roof leaders, foundation drains, etc.
- Onsite separation is currently achieved only through the building permit process. Combined sanitary and storm flows outlet through to the City's (separated) sanitary or combined system.
- New sanitary and storm connections are provided at the time of separation.
- Less than 15% of onsite services have been separated, to date.
- Burnaby has incentivized onsite separation through a residential grant (cost-sharing) program.

# Agenda

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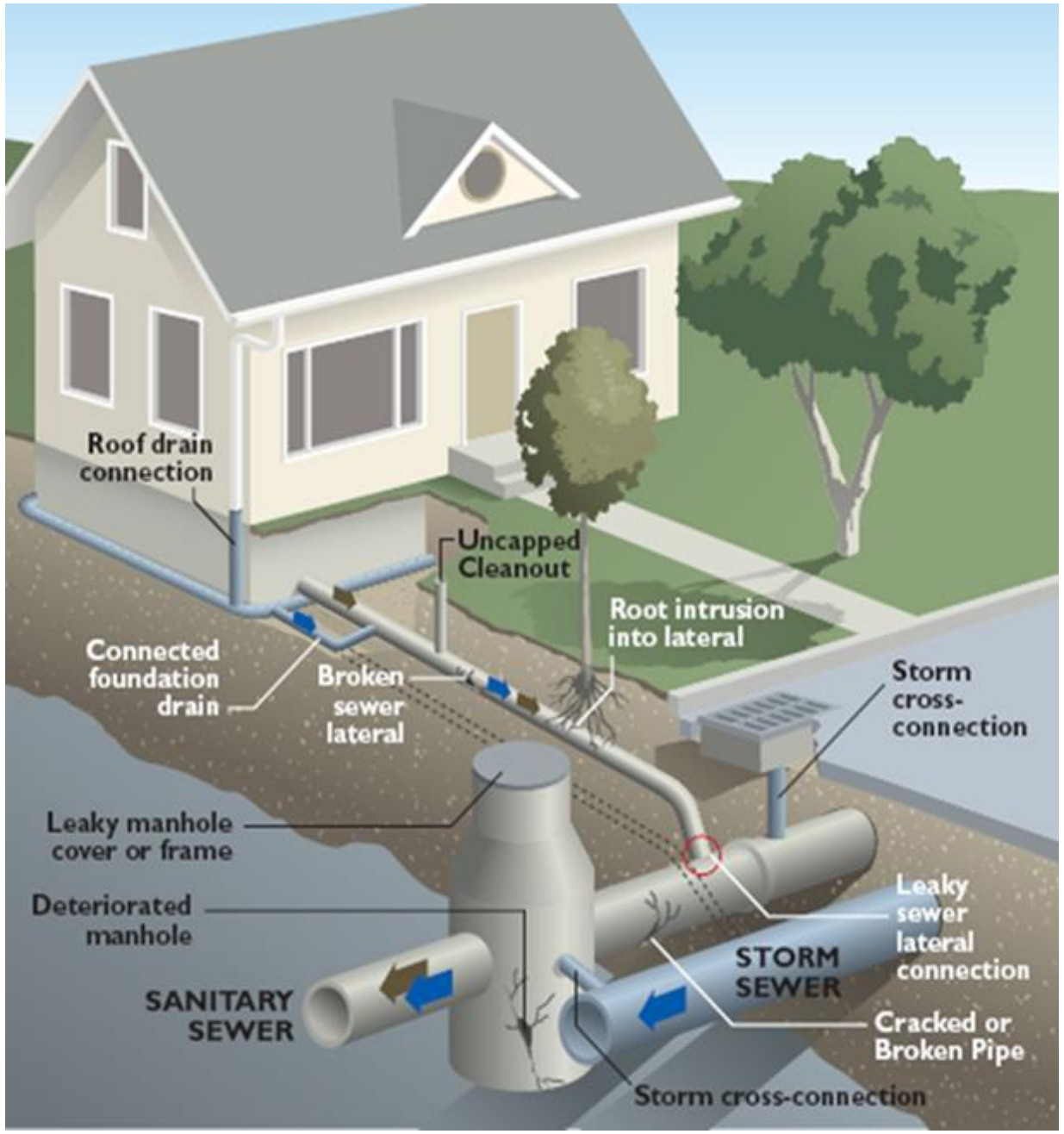
  - I&I Management - definition, status and strategy
  - LWMP requirements
- **Summary**
- **Q&A**

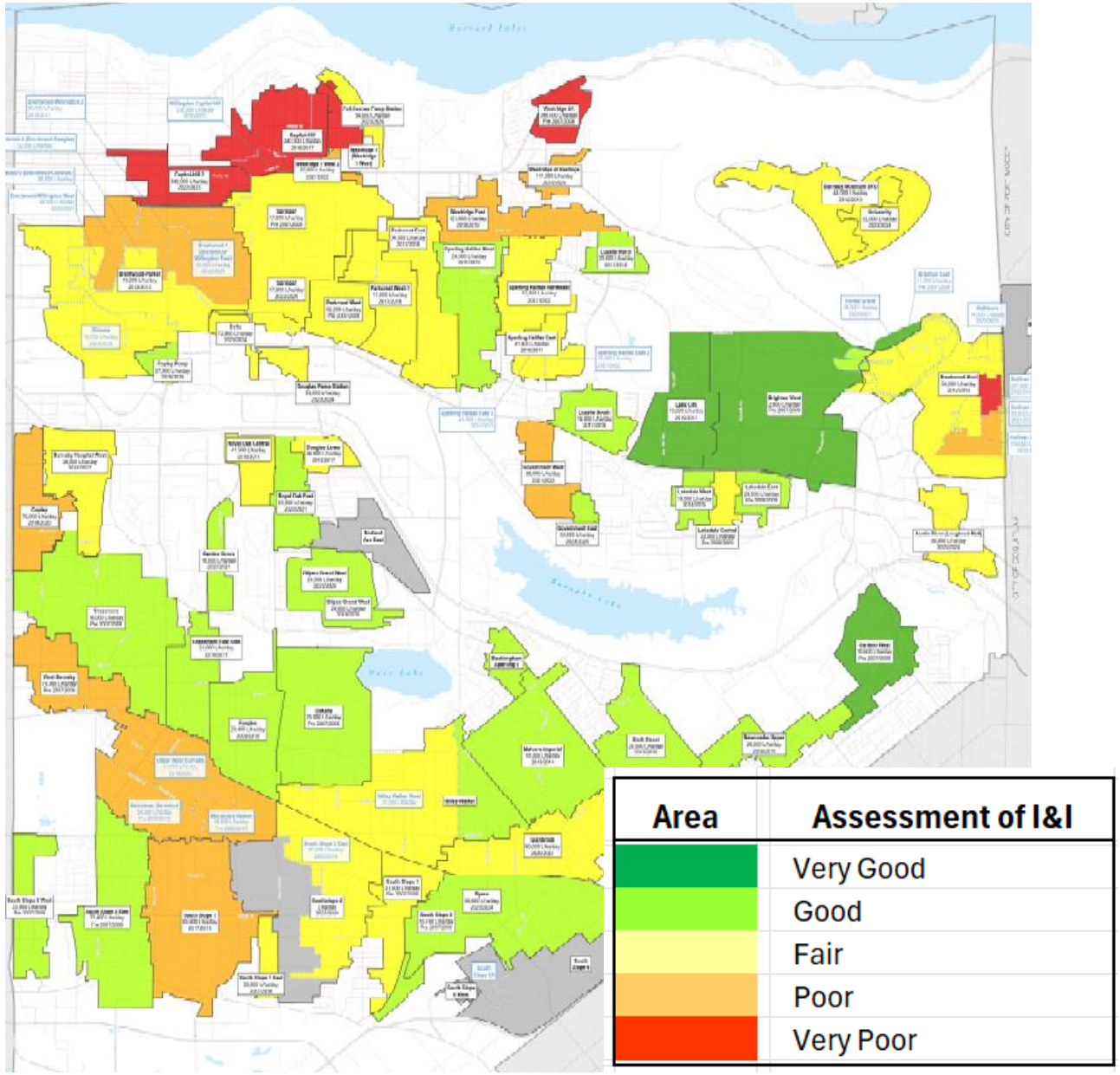



# I&I – Definition & Sources

**I&I** - is defined as **inflow and infiltration** of rainwater or groundwater into a sewer system.

- **Public side sources:**
  - defective or leaky main lines, service leads and interfaces.
  - cross connections to storm
  - leaky manholes.
  - Responsibility of the City
- **Private side sources:**
  - un-capped cleanouts,
  - defective (leaky) service laterals,
  - cross-connections,
  - illegal connections to roof leaders, foundation drains or other cross-connections
  - Responsibility of the homeowners

# I&I Reduction - Status




- The City of Burnaby is committed to providing reliable sewer collection services at minimal cost, consistent with applicable environmental and health regulations as set out in the regional Liquid Waste Management Plan (LWMP).
- I&I leads to peak sanitary flows that take away from system capacity that otherwise accommodates growth or, may lead to increased treatment costs.
- I&I may contribute to sewer overflows (SSO's) directly impacting the receiving environment and public health.

# I&I Reduction Strategy

- The regional LWMP stipulates an allowance for I&I of 11,200 L/ha/day. This stringent requirement is a challenge for most local municipalities to meet.
- I&I reduction can be reasonably effective and affordable if managed appropriately. Actual level of effort is based on priority, risk tolerance and funding availability.
- To reduce I&I, the City follows a network inspection program and then employs both conventional and trenchless technologies to rehabilitate, repair and maintain its sewer system.
- Rehabilitation includes grouting of both mains and services to slow leakage into the sewer system.

# Summary

- Combined sewer separation requires intensive effort to create both separate sanitary and rainwater systems
- I&I reduction can be achieved through system rehabilitation, repair or replacement.
- Tackling both service connections and mainlines is necessary for both sewer separation and I&I management (rehabilitation).
- I&I increases with pipe age and the effects of climate change (rainfall intensity).
- **Combined sewer separation** and **I&I management** should be included as a part of an overall Asset Management planning process, and feed into the development of operating and capital budgets.

# Q&A