Bus Service Types in the RTM

Capturing Differentiated Operating Characteristics

Gaby Monagan, McElhanney

McElhanney

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Today's Presentation

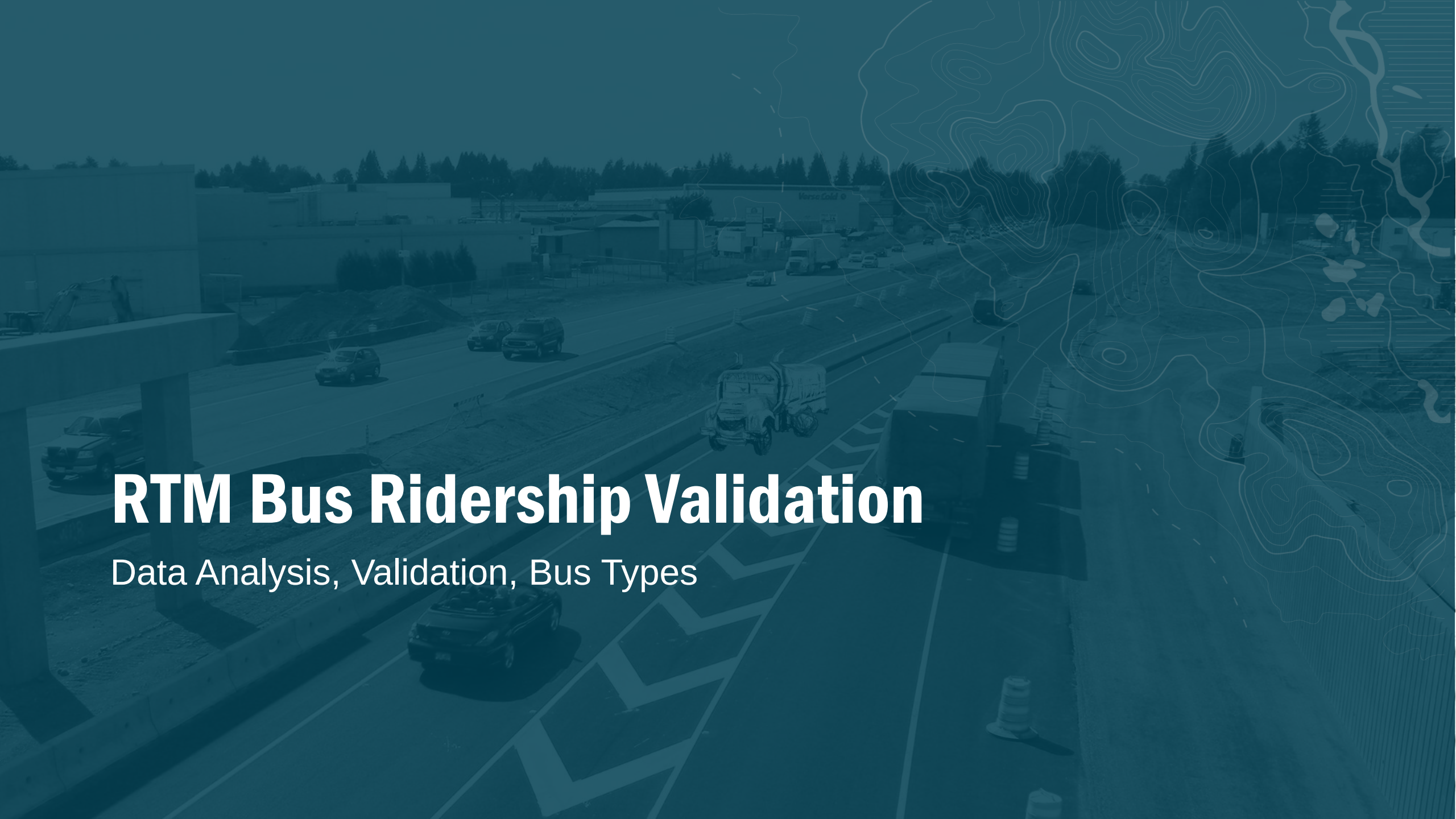
1. Background and Objectives
2. Bus Ridership Validation
3. RTM Refinements
4. Practical Application Guide

Background and Objectives

What and why did we do this?

Background and Objectives

- TransLink's10-year priorities plan focuses on improvements to bus services
  - RapidBus services, intra-regional services, bus speed and reliability, doubling bus service
- Increased demand and scrutiny on RTM's bus ridership forecasts
- **Objectives:**
  - Add new "**levers**" to the RTM to evaluate transit services
  - Allow modellers to adjust service characteristics not accounted for in the RTM
  - Consistency of service types
  - Increase reliability of RTM's bus forecasts

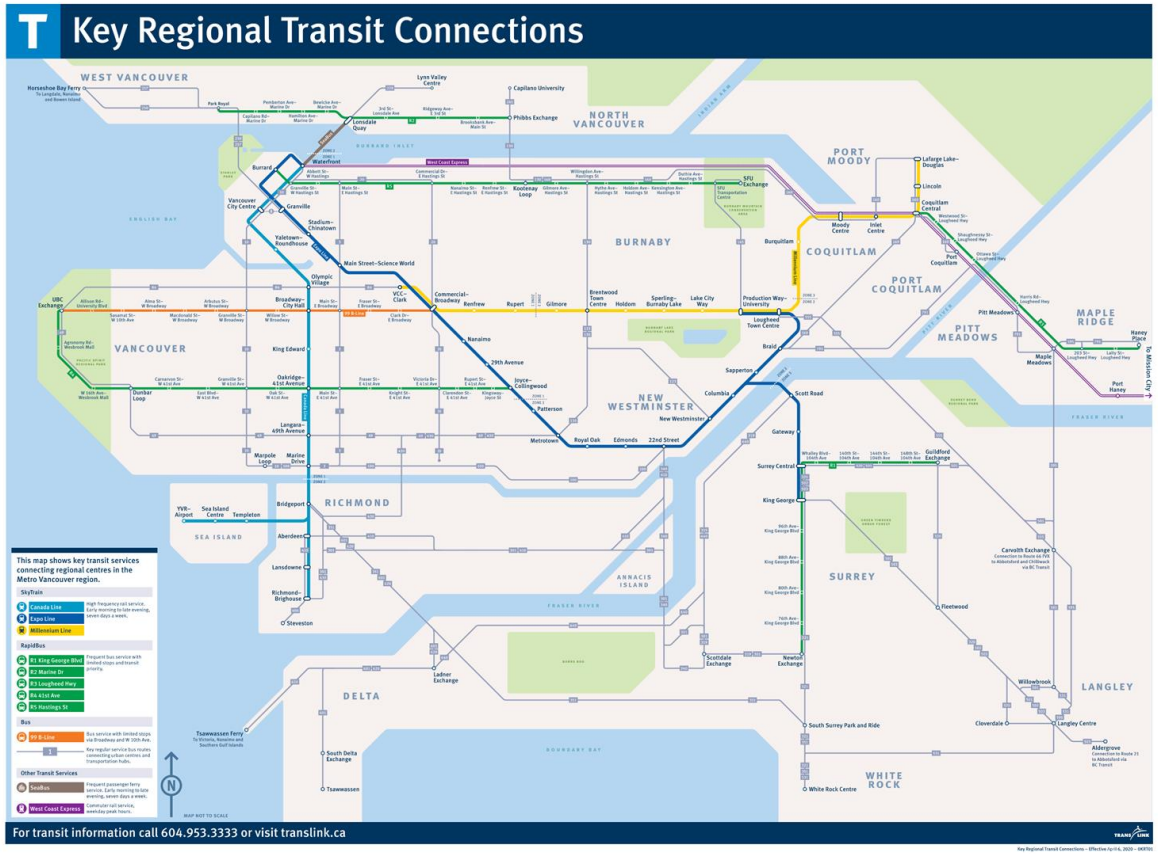


RTM Bus Ridership Validation

Data Analysis, Validation, Bus Types

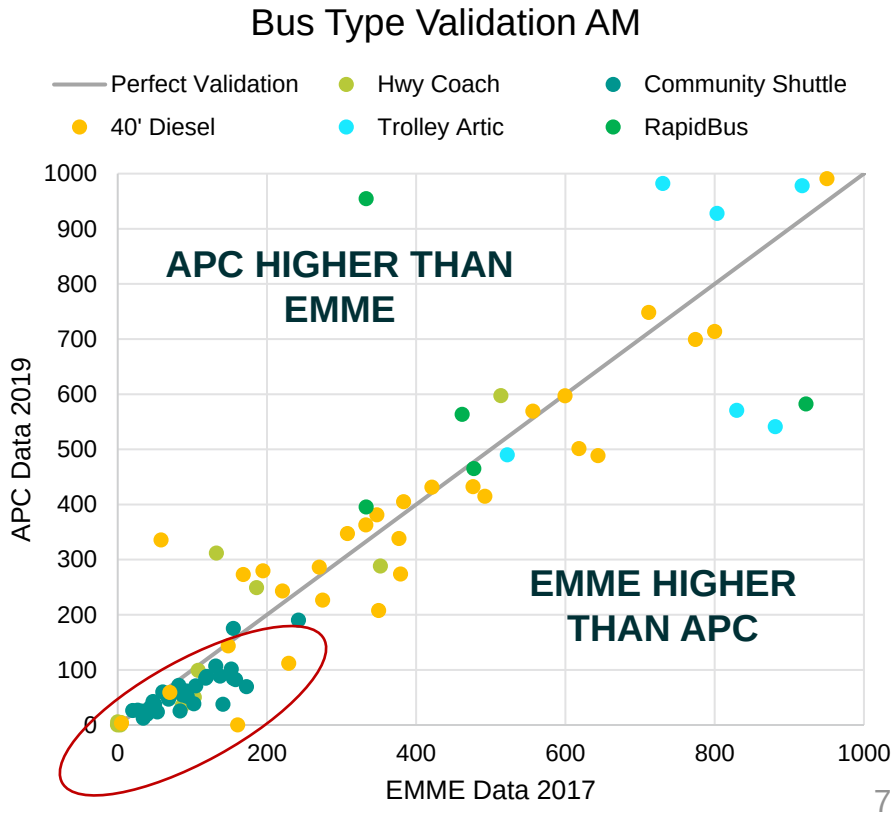
RTM Bus Ridership Validation

- RTM base year ridership vs. 2019 APC data, 2020/2022 RapidBus APC data
  - Which routes did we decide to validate and why?
    - Key regional transit connections, RapidBus, top routes by asset type
    - Identify patterns in ridership variance
    - Variance linked to service type? Asset type? Boarding type?



Validation Conclusions

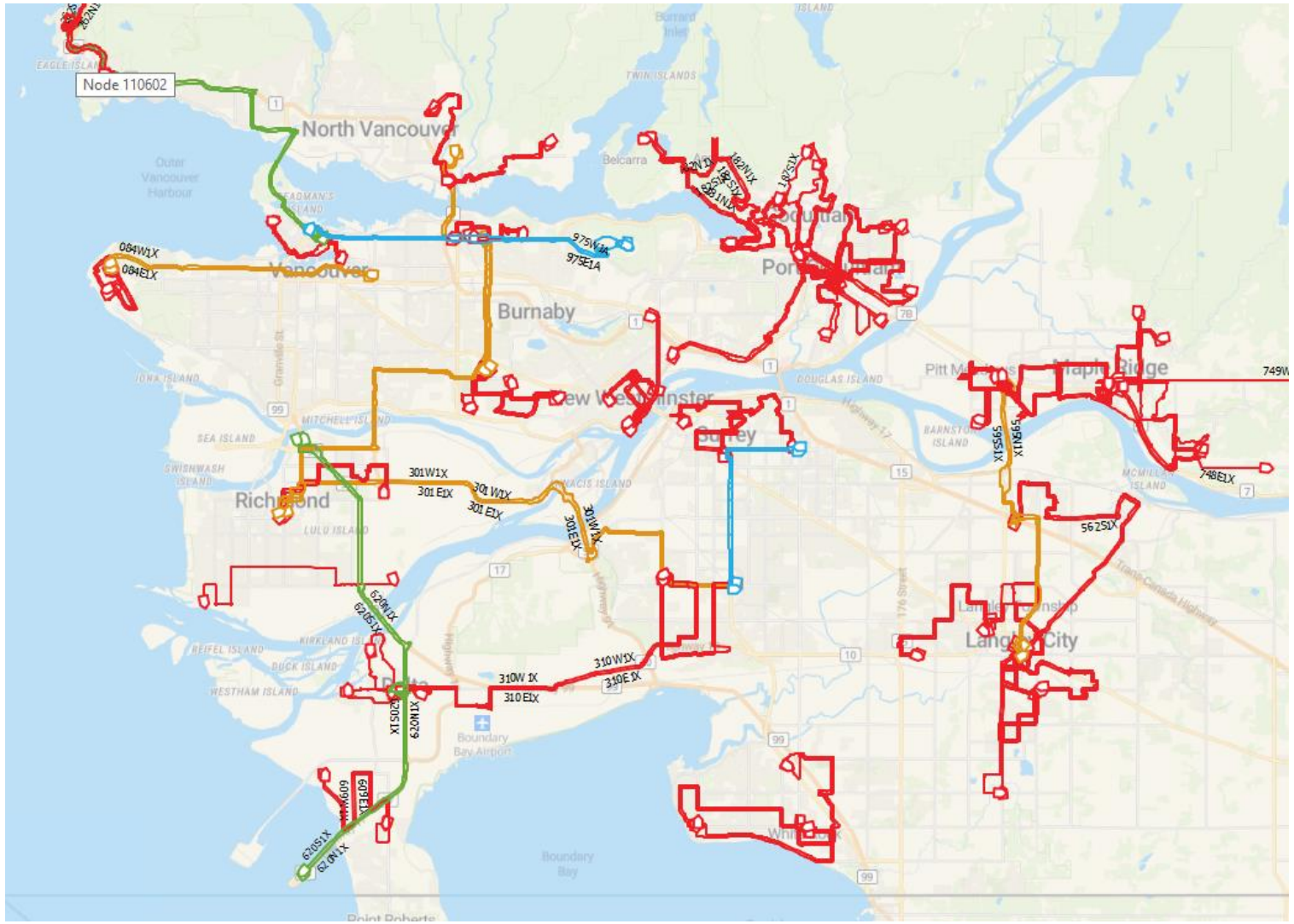
- Validation by asset type:
  - Community shuttle ridership overestimated in RTM
  - Low RapidBus ridership in RTM (43/R4 interesting case study!)
  - Some variance has no correlation
- **The new bus sub-modes:**
  - **RapidBus**: permit all door boarding, real time information, high frequency
  - **Community Shuttle:** different boarding and alighting and customer experience
  - **ELSIR (Express Limited Stop Intra-Regional Service):** connect key destinations, limited stops, fast and frequent



RTM Refinements

Changes to the code, and new code! New bus types, ASC, IVT, TTF, Boarding dwell time, and more!

New Vehicle Types – The Bus Sub-Modes

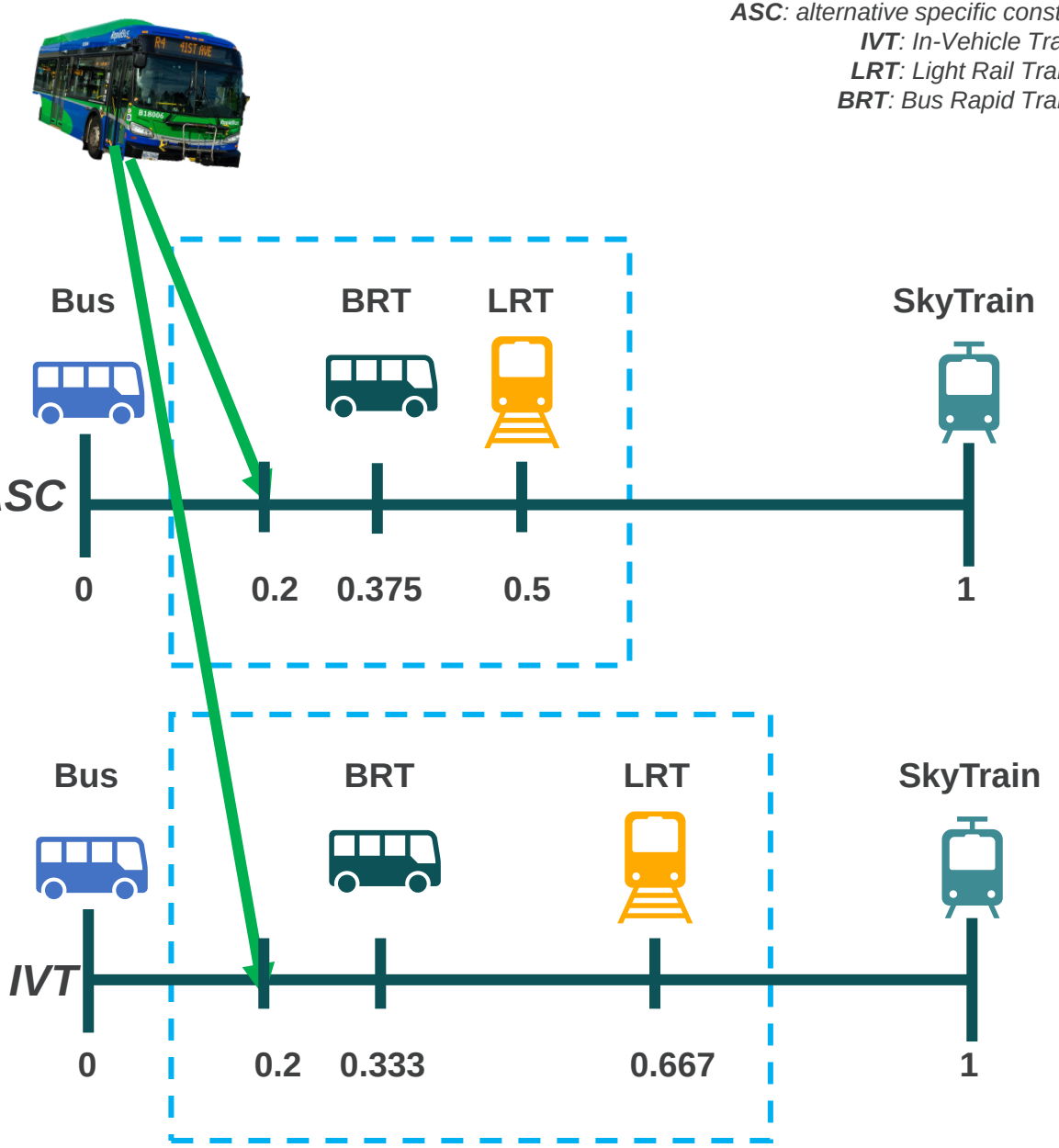


Line	Old Bus Type	New Bus Type
All Community Shuttles	13 Minibus	**60 Com Shuttle**
971, 975	Mot Artic	**61: Rapid Bus**
84, 130, 301, 430, 595	Mot Bus	**62: ELSIR Motor Bus**
257, 620	Mot Artic	**63: ELSIR Artic**
	2D	**64: ELSIR 2D**

Mode Choice Factors

- New scaling factors applied at network level for each sub-mode
- Implemented by vehicle type, route number, or transit segment
- Provides mechanism so certain bus services are more attractive than a conventional bus, but less attractive than BRT

Acronyms:
***ASC**: alternative specific constant*
***IVT**: In-Vehicle Travel*
***LRT**: Light Rail Transit*
***BRT**: Bus Rapid Transit*



Boarding Alighting Procedure

- RTM models boarding and alighting activities occurring in parallel
- Different services offer different boarding/alighting experiences
  - **Community Shuttles:** single door boarding occurring ***sequentially***
  - **RapidBus:** all-door boarding policy providing additional boarding/alighting capacity
- Note: currently not coded into the RTM
  - Future implementation examples provided in scripts

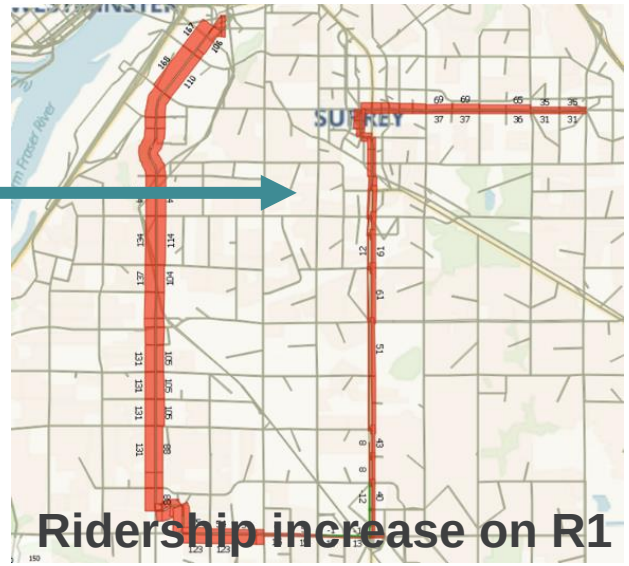
Transit Only Lanes

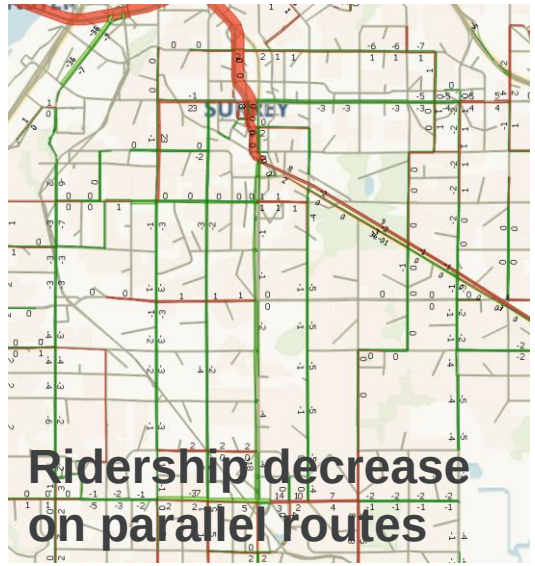
- Currently, transit only lanes are coded as separate links in parallel to the existing links, which has challenges, especially pedestrian access
- Created a new **TTF=2** (transit-time-function) to represent a bus only lane condition for that transit segment
- Implementation: code the ***transit itinerary*** with **TTF=2** for bus-only lanes
  - No change needed to VDF coding
  - TTF coding removes background transit volume
- Room to implement other bus priority measures, e.g. queue jumpers

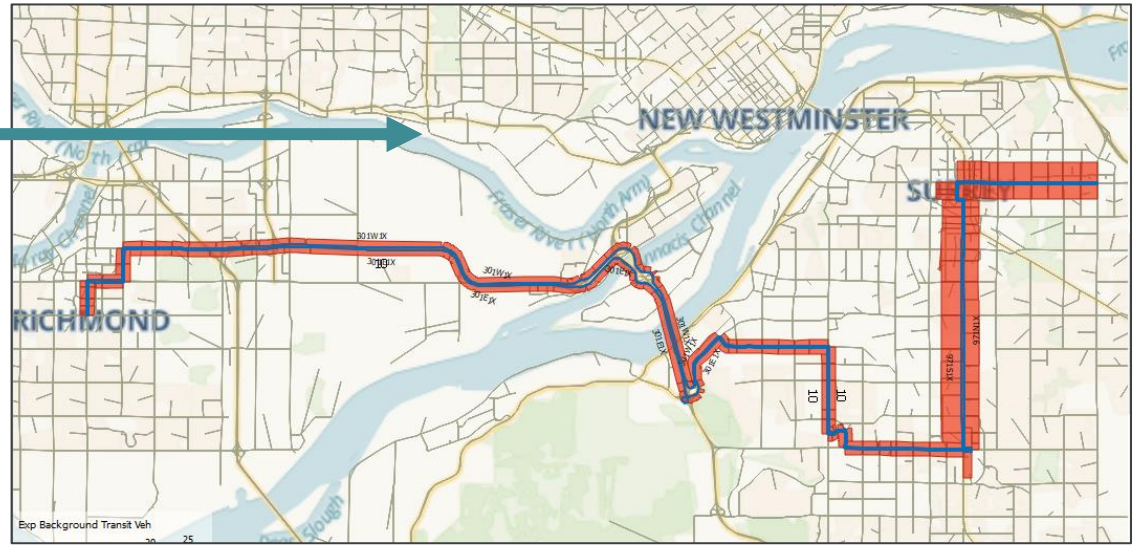
Acronyms:
***ASC**: alternative specific constant*
***IVT**: In-Vehicle Travel*
***TTF**: Transit-Time Function*

Sensitivity Tests

- **ASC adjustment on R1**
  - Adjusted ASC for R1
  - Plot is for 0.5 adjustment scenario
  - Ridership increase on R1, decrease on parallel routes
- **Transit Only Lanes R1, 301**
  - Applied TTF=2 on 301 and R1
  - Increase to ridership, especially since by-passing congestion







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Summary of Changes

New Bus Sub-Modes:


RapidBus


Community Shuttle


ELSIR

New Vehicle Types

- Community Shuttle
- RapidBus
- Lim Stop DD, Motor, Artic

- Boarding alighting procedure
- 1-door vs all door boarding can be implemented in calculate dwell delay

- New ASC/IVT scaling factors to represent different route characteristics

Transit Only Lanes:

- Code in transit itinerary
- Use TTF=2

Practical Application Guide

What do we do now? How do we do it?

Acronyms:
***ASC**: alternative specific constant*
***IVT**: In-Vehicle Travel*
***TTF**: Transit-Time Function*

Coding a New RapidBus

1

STEP 1: Code as normal paying attention to **segments** with **bus only lanes**

- For any segments that have dedicated bus lanes, code the segment with **TTF=2**

2

STEP 2: Specify bus type

- Use Veh number **61**

3

STEP 3: Adjust ASC and/or IVT for RapidBus type in scripts/text file inputs

- by route number, vehicle type, or transit segment

Thank-you

Gaby Monagan
gmonagan@mcelhanney.com

McElhanney

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