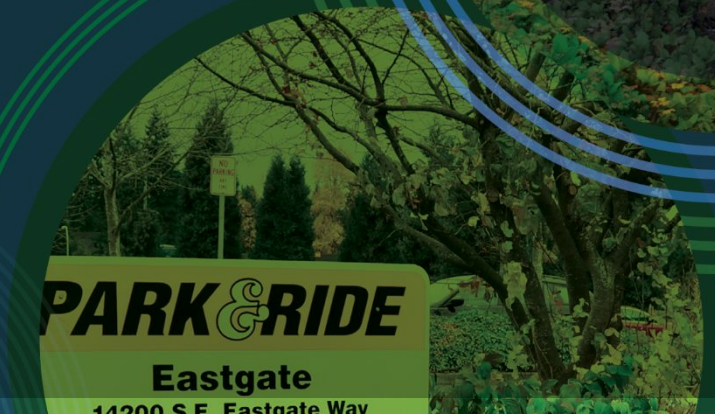


Eastgate Transportation Study

Policies, Project Concept Development, Evaluation Framework, Initial Modeling

12/13/2018

Transportation Commission

Introductions

Planning Lead

Chris Breiland, Fehr & Peers

- Project Concept Development
- Project Evaluation

Modeling Lead

Tony Woody, Concord Engineering

- Land use and Transportation Assumptions
- Model Development
- Model Calibration
- 2035 Forecast

Project Management Staff

- Jeremy Chin
- Kevin McDonald

Presentation/Discussion Outline

Presentation Overview

Planning Section

- Policy Guidance
- Project Concepts
- Project Evaluation
- Hypothetical application

Modeling Section

- 2035 Assumptions
- Initial Modeling Outputs

Project Schedule Overview

Staff Request

Transportation Commission concurrence or direction on Project Concept Development and Evaluation Framework

Planning: Council Direction

Explore project concepts that may help to relieve morning and afternoon congestion in the Eastgate/Factoria area.
Transportation Commission is advisory body

Test different approaches to traffic congestion relief; and also look for ways to make walking, bicycling and riding transit better mobility options.

Transportation Commission

Planning: Policies

Transportation Element

Adopted in 2015 as part of the 10-year update

- Policy direction:
  - TR-2. …reduce congestion and improve mobility
  - Multimodal Level-of-Service
  - Complete Streets
  - Vision Zero

CITY OF BELLEVUE, WASHINGTON

ORDINANCE NO. 6308

AN ORDINANCE adopting a Complete Streets policy

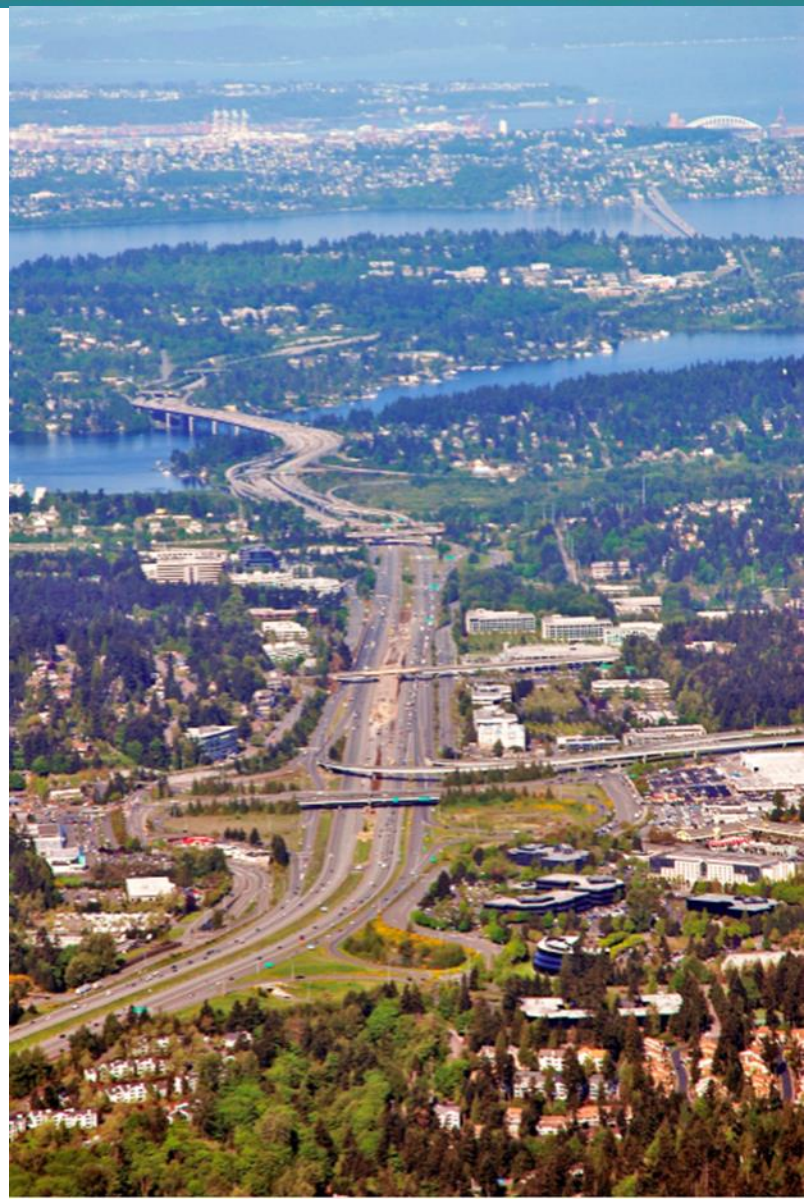
Planning: Transportation Projects

2019 Projects within Study Area

Project	Status
Newport Way Sidewalk (Somerset to 150th Ave SE)	Begin construction in 2019
150th Ave SE/SE37 St/I-90 Off-ramp	In Design
150th Ave SE/south of SE 38th St to Newport Way	Begin construction in 2019
150th Avenue SE/Eastgate Way SE (TFP-253)	Study roundabout design option
MTSG Trail I-405 to 132nd Ave SE	Begin construction in 2019
WSDOT I-90/Eastgate to SR900 Corridor Improvements	Anticipated construction in 2019
WSDOT I-405 Express Toll Lanes Bellevue-to-Renton	Design-build to begin in 2019

Planning: Project Concept Development

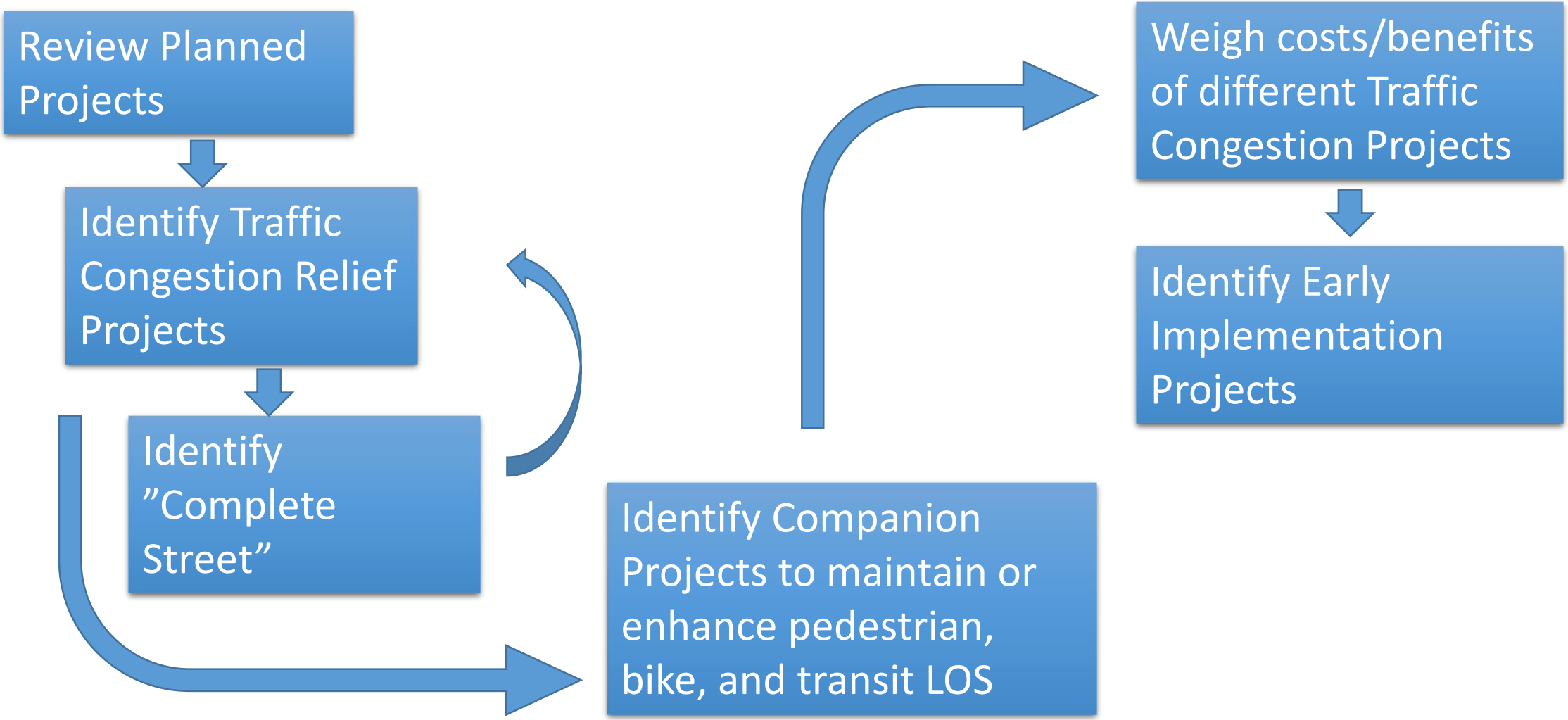
- Study area is Eastgate and Factoria
- Look at intersections and arterial corridors
- Consider AM peak and PM peak conditions, in 2024 and 2035
- Identify and evaluate **traffic congestion relief projects** to meet vehicle level-of-service standards and guidelines
- Employ a multimodal mobility and a Complete Streets lens



Planning: Project Development and Evaluation

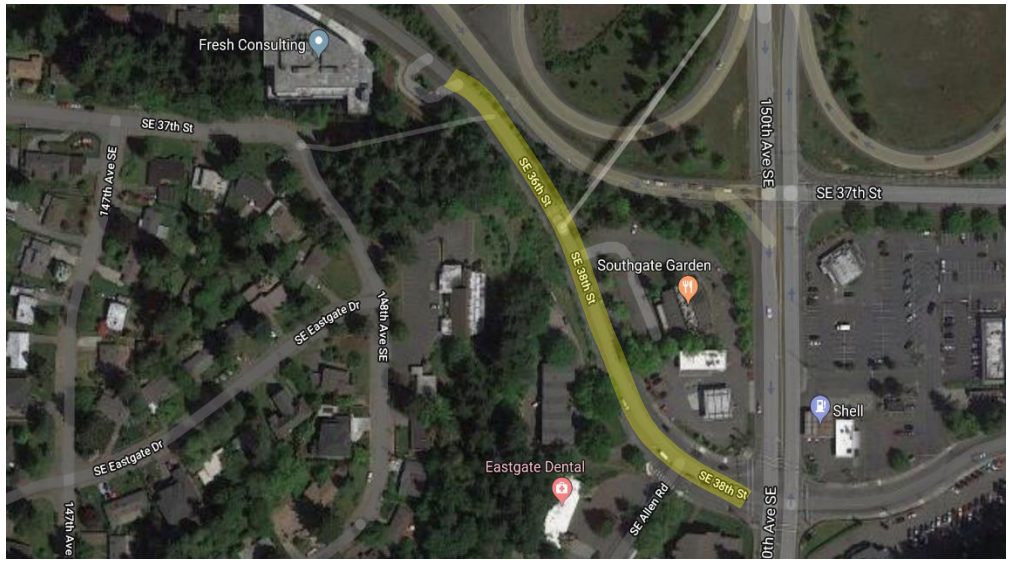
- Identify congestion relief project concepts and document costs and benefits
- Summarize MMLOS costs and benefits – feasibility and effectiveness for all modes
- Evaluate overall project costs versus benefits to mobility
- Consider:
  - Shifting impact from one location to another
  - Right-of-way available
  - Environment – natural and built
  - Readiness – early implementation
- Recommend prioritization and phasing
  - Immediate congestion relief (2024)
  - Sustainable multimodal mobility over time (2035)
  - Sequencing/Synergy

Planning: Evaluation Framework Flowchart

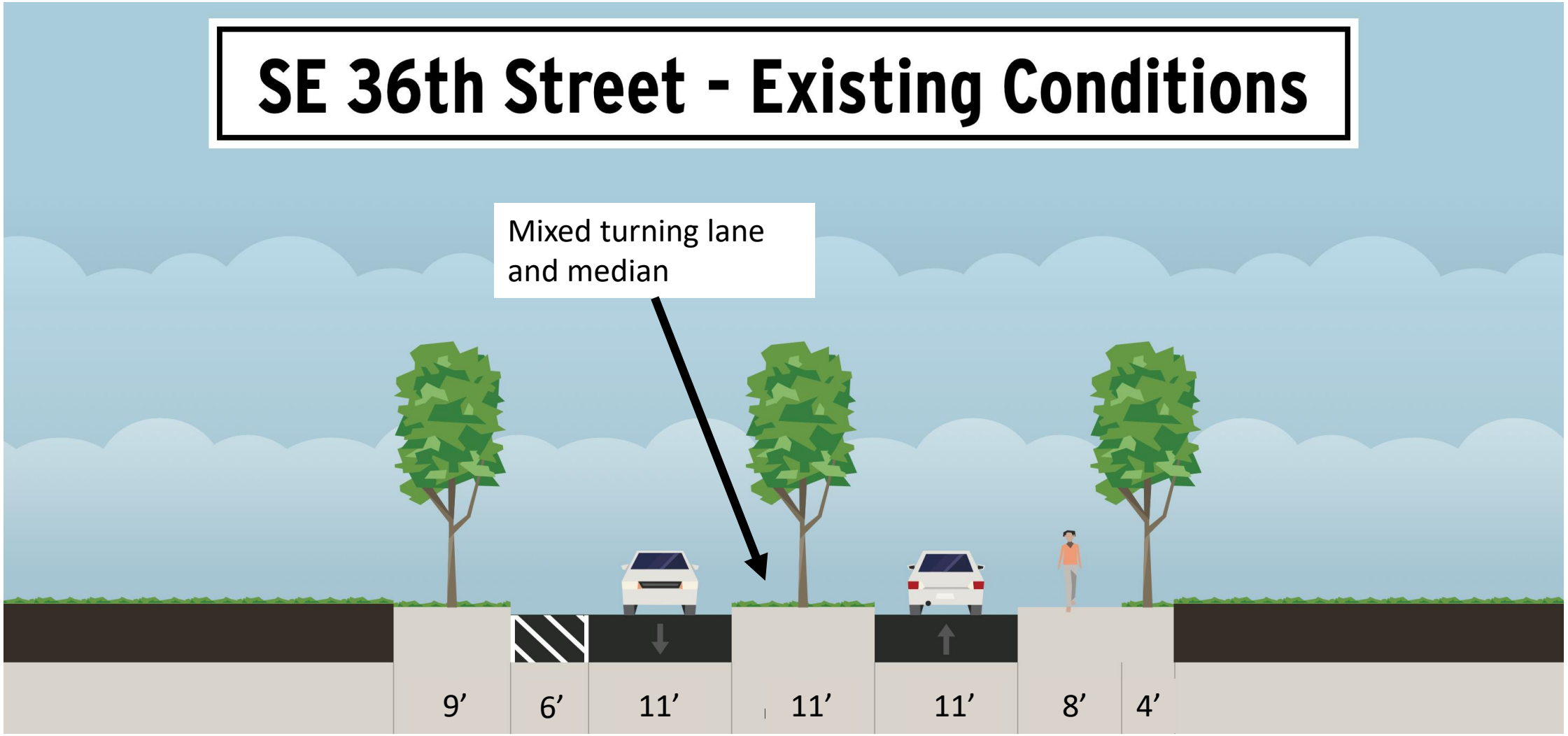


Hypothetical Example – SE 36th Street

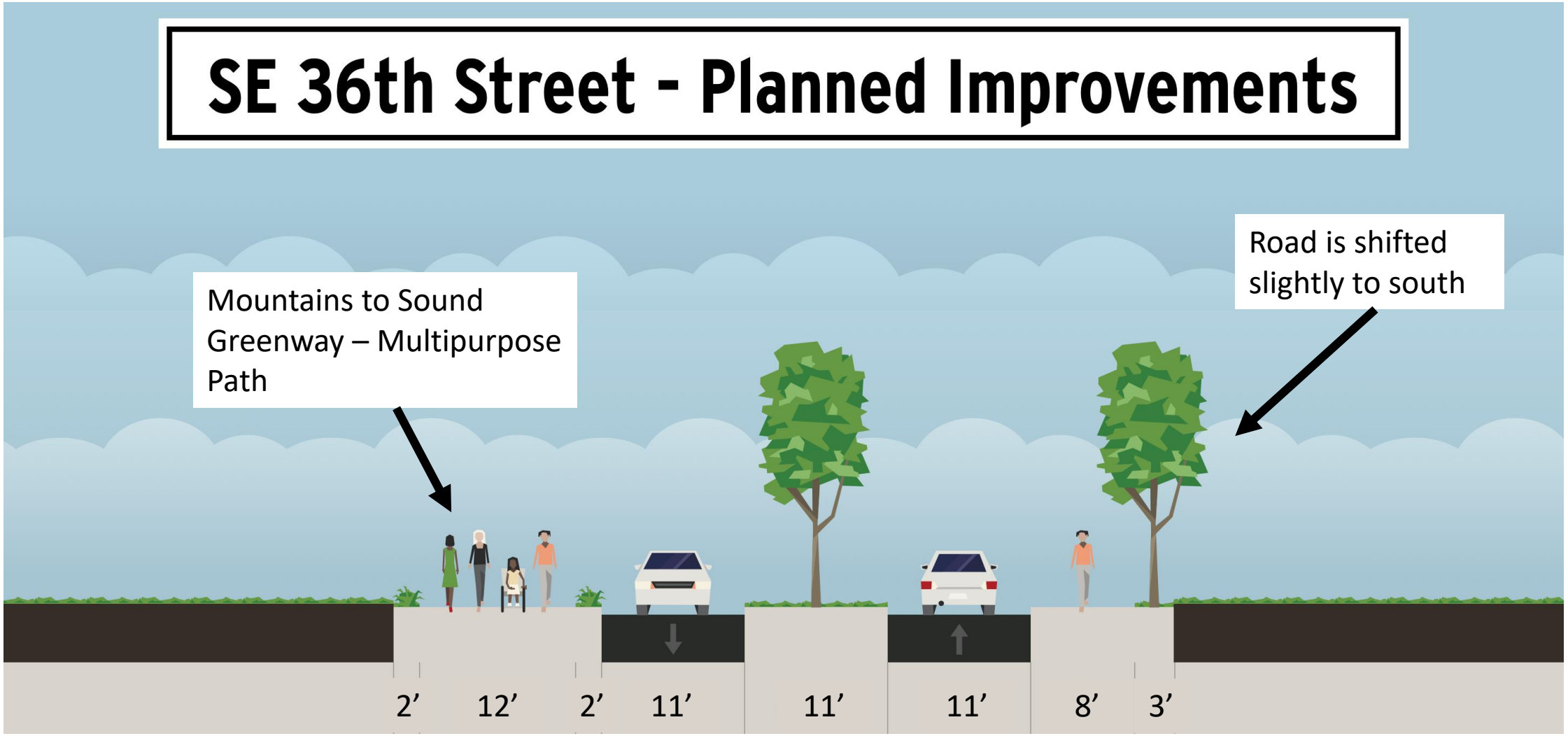
- Assume that the analysis suggest the need for an additional eastbound lane to provide congestion relief and vehicle capacity
- Account for planned transportation projects
- Account for MMLOS standards and guidelines



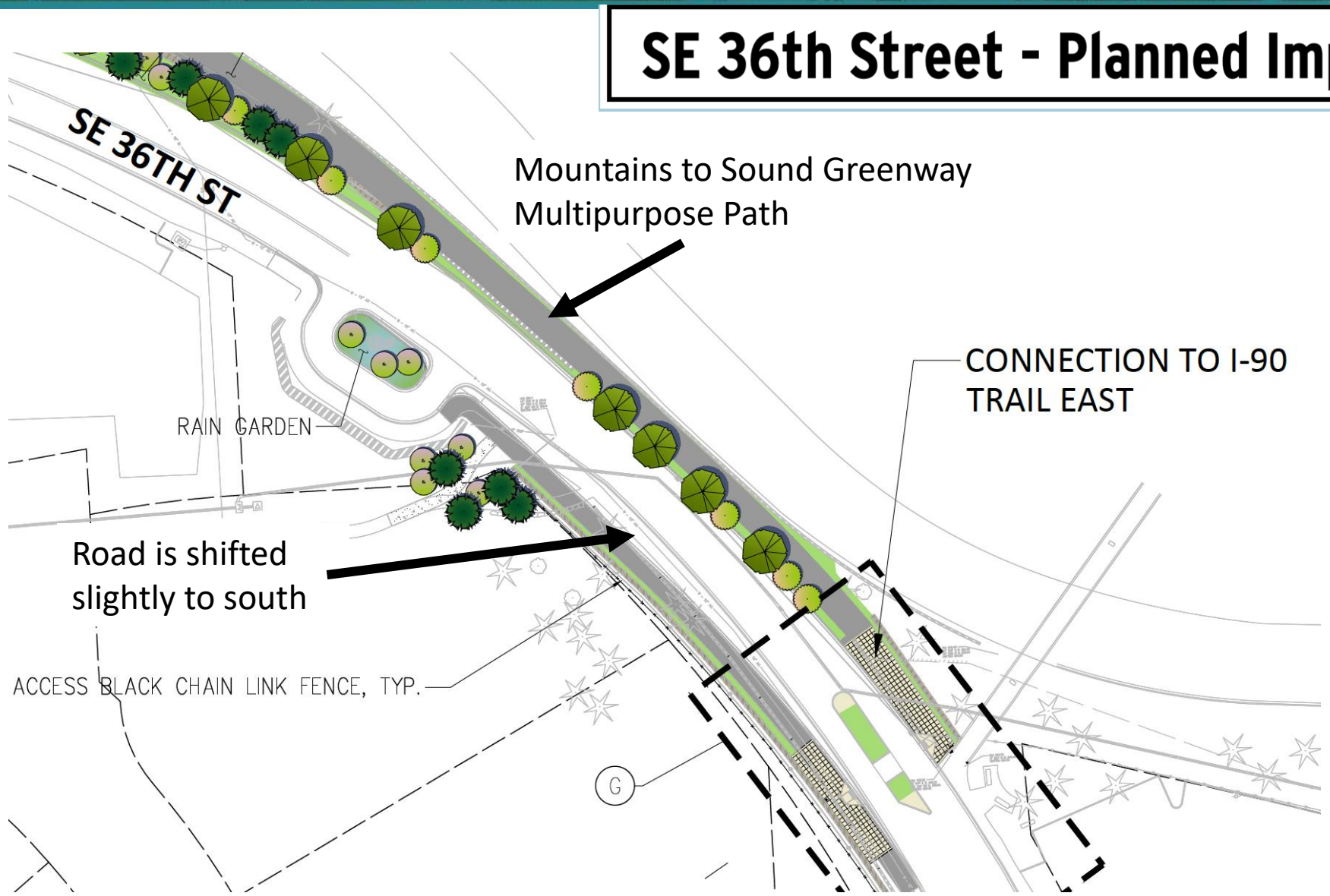
Hypothetical Example - SE 36th Street



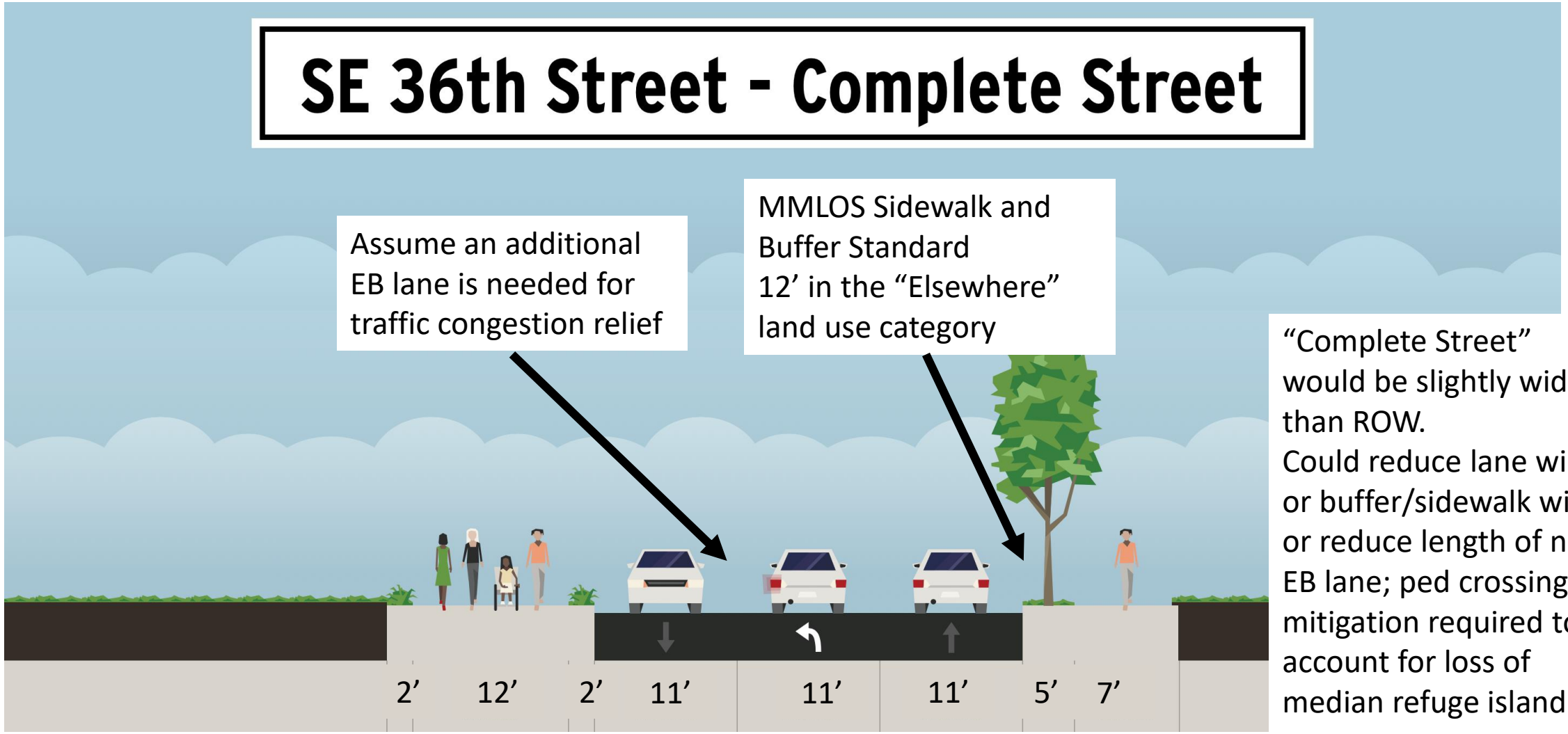
Hypothetical Example - SE 36th Street



Hypothetical Example – SE 36th Street



Hypothetical Example - SE 36th Street



“Complete Street” would be slightly wider than ROW.
Could reduce lane width or buffer/sidewalk width or reduce length of new EB lane; ped crossing mitigation required to account for loss of median refuge island

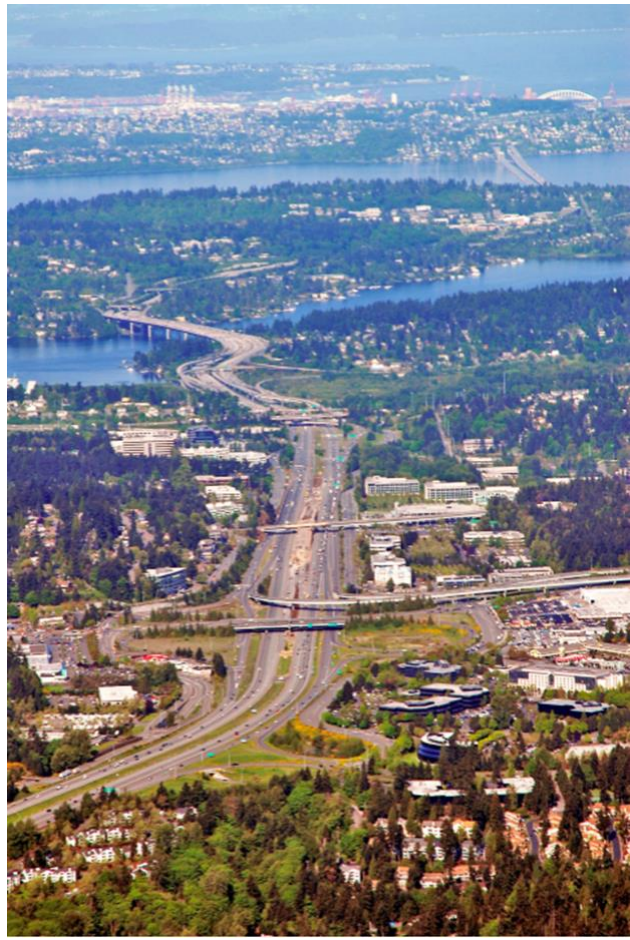
Project Concept Development and Evaluation

Questions/Discussion

Staff seeks Transportation Commission concurrence with proposed Project Concept Development and Evaluation Framework

Modeling: Assumptions

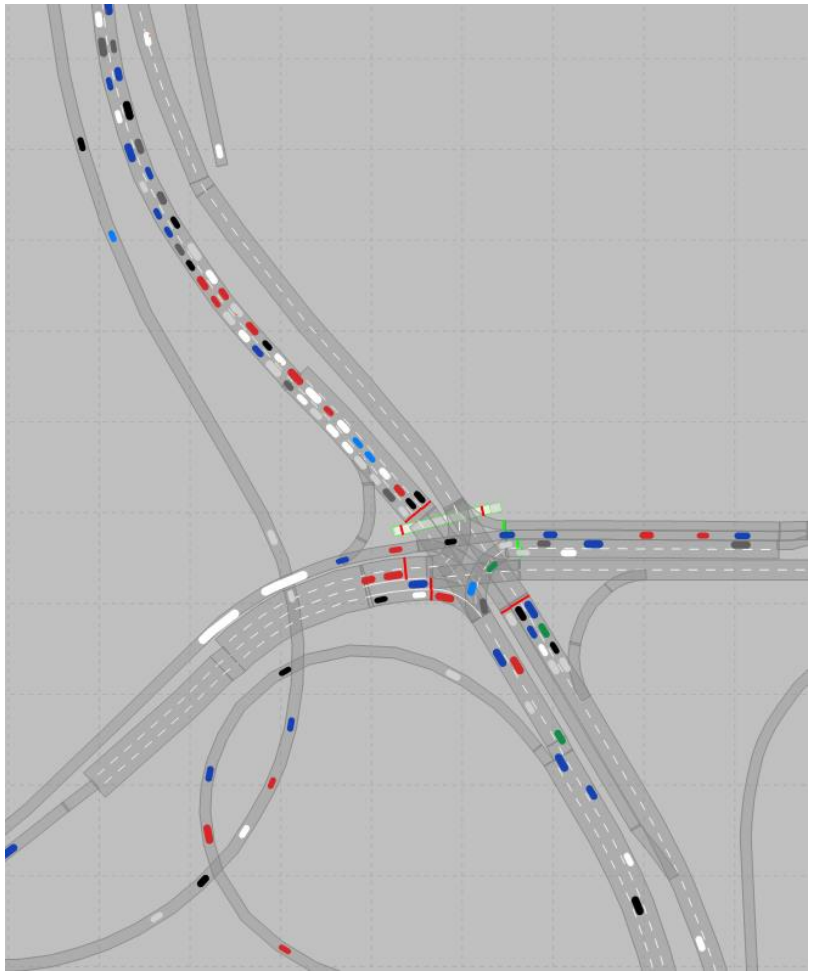
- **Land Use and Transportation**
  - Development Forecast to 2035 – existing zoning
  - Vehicle Trip Generation
- **Transportation Network**
  - Bellevue CIP vehicle capacity projects
  - Mountains to Sound Greenway Trail
  - Washington State Department of Transportation
  - King County Metro
  - Sound Transit



Eastgate/I-90 Land Use & Transportation Project

Modeling: Forecasting and Analysis Tools

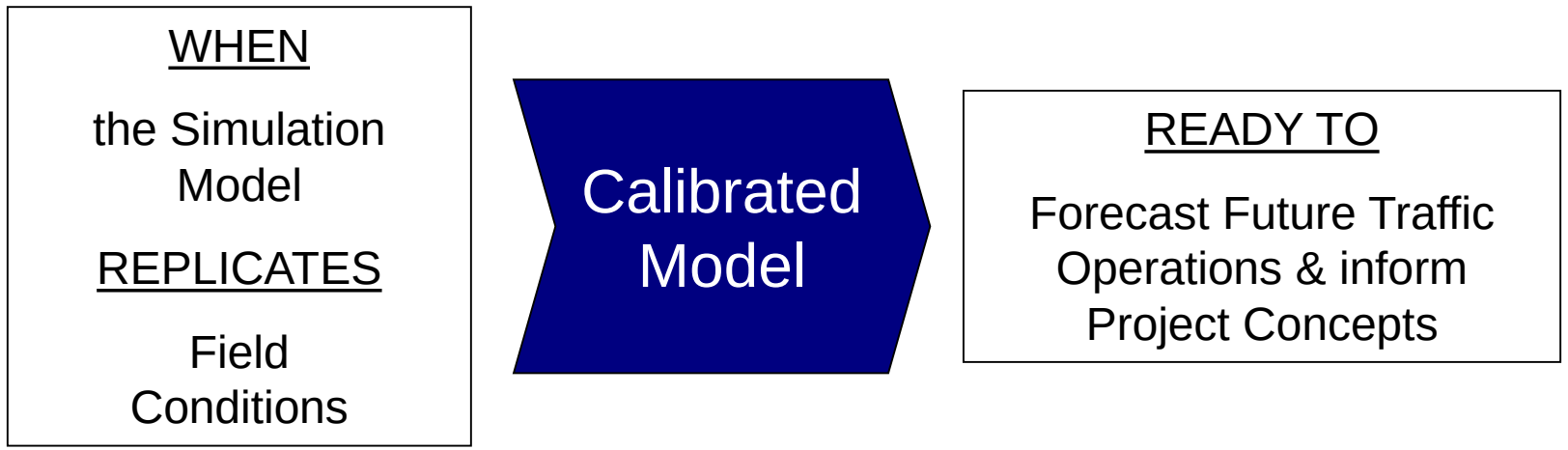
- Travel Demand Forecasting
  - BKR Travel Demand Model
  - Forecast based on land use and network
- Intersection Vehicle Capacity Analysis
  - Synchro Analysis Tool
  - Performance at intersections: v/c ratio
- Traffic Microsimulation
  - VISSIM software tools
  - Robust, system-wide analysis
  - Performance at corridors: Segment speeds



148th-150th Avenue SE & Eastgate Way VISSIM Modeling Example

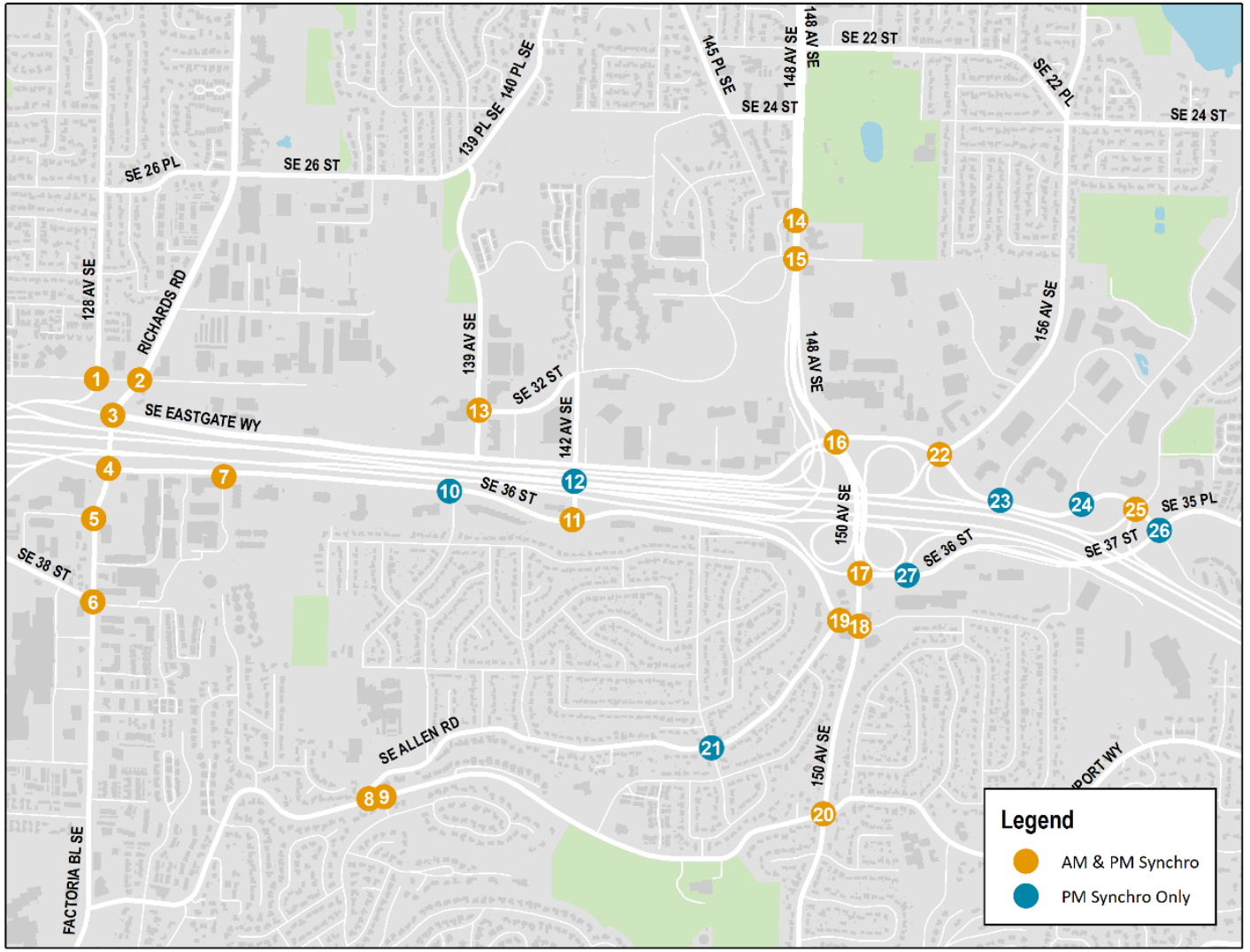
Modeling: Microsimulation Model Calibration

- Goal: Identify model parameters that replicate existing field conditions
  - Bottleneck and Congested Locations
  - Queuing Impacts
  - Low Travel Speeds
- Validation of model occurs when model data = field data to industry standard guidelines (State and Federal)
- Once calibrated – parameters are carried forward for future analysis.

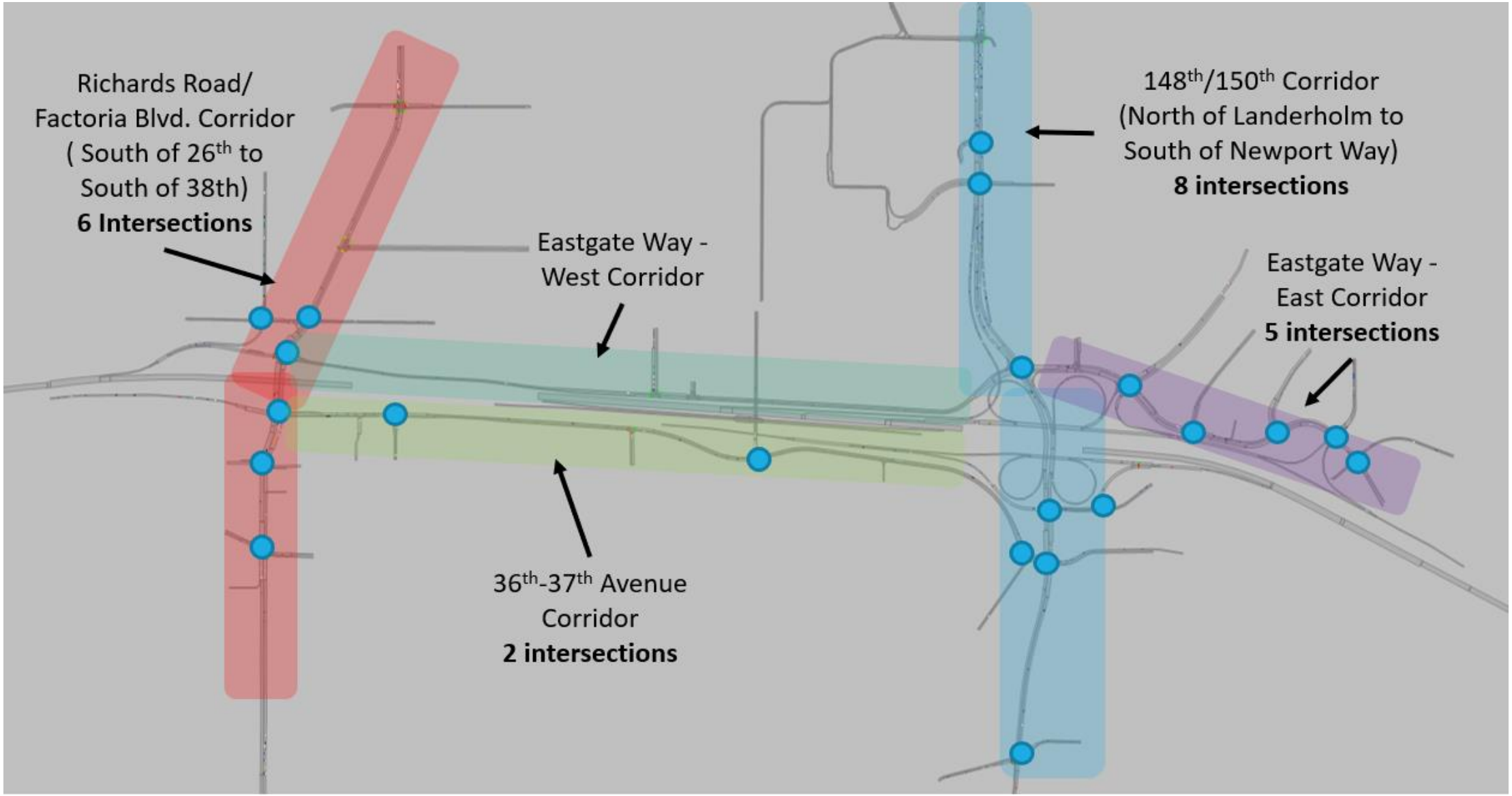


Modeling: Intersection Analysis

- 27 Total Intersections
- 15 MMA system intersections
- Focused on Key Corridors
  - Richards Rd./Factoria Blvd.
  - 148th-150th Avenues SE
  - SE 36th Street
  - Eastgate Way
- AM and PM Peaks Analyzed
  - 8:00-9:00 AM (20 intersections)
  - 4:30-5:30 PM (27 intersections)



Modeling: Corridor Analysis

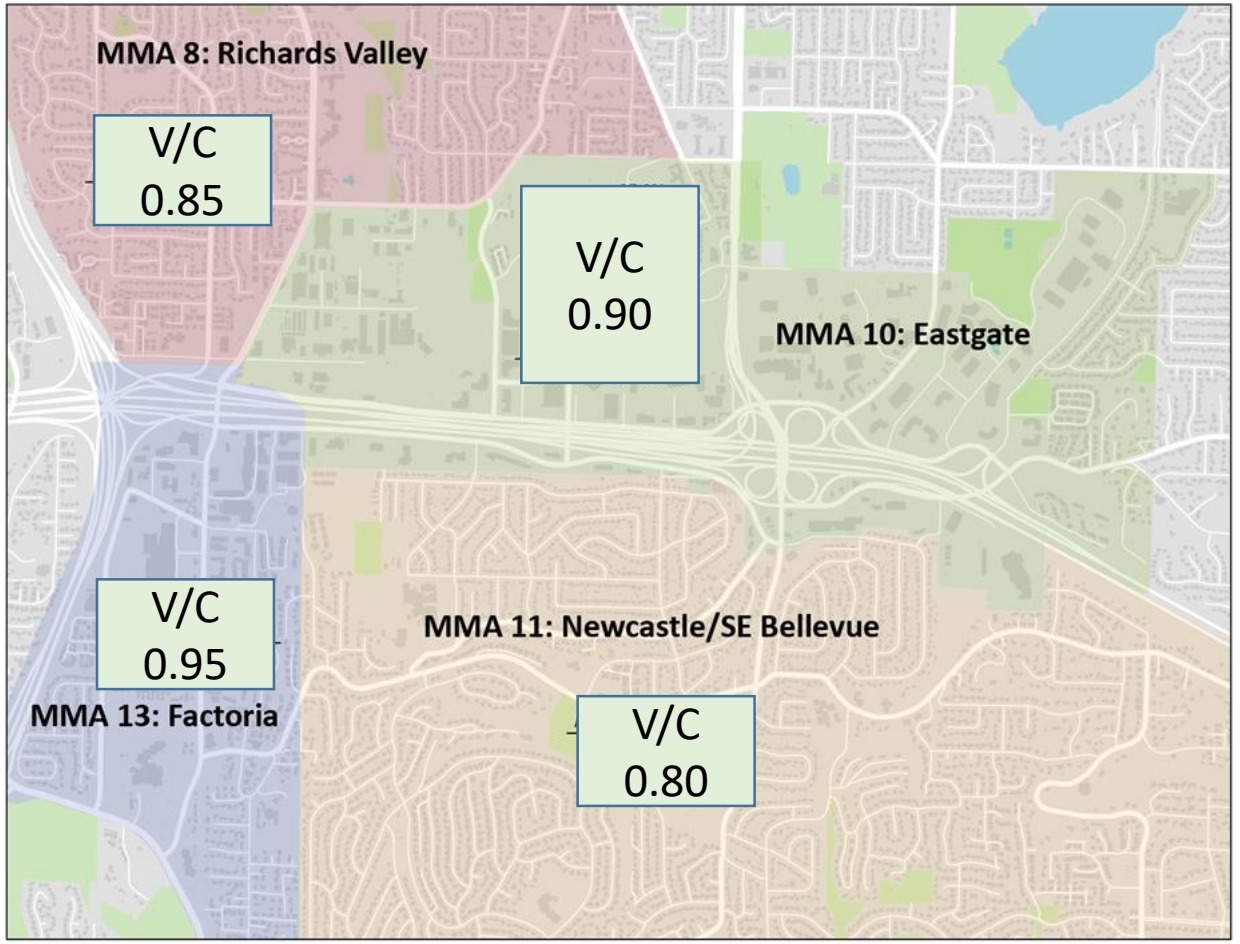


Modeling: V/C- Intersection Standards

Volume to capacity ratio (V/C) standards for Mobility Management Areas (MMAs) are established by the Comprehensive Plan and are codified in the Traffic Standards Code (BCC 14.10.030)

V/C is calculated as the AVERAGE of all approaches to the intersection in the PM peak period

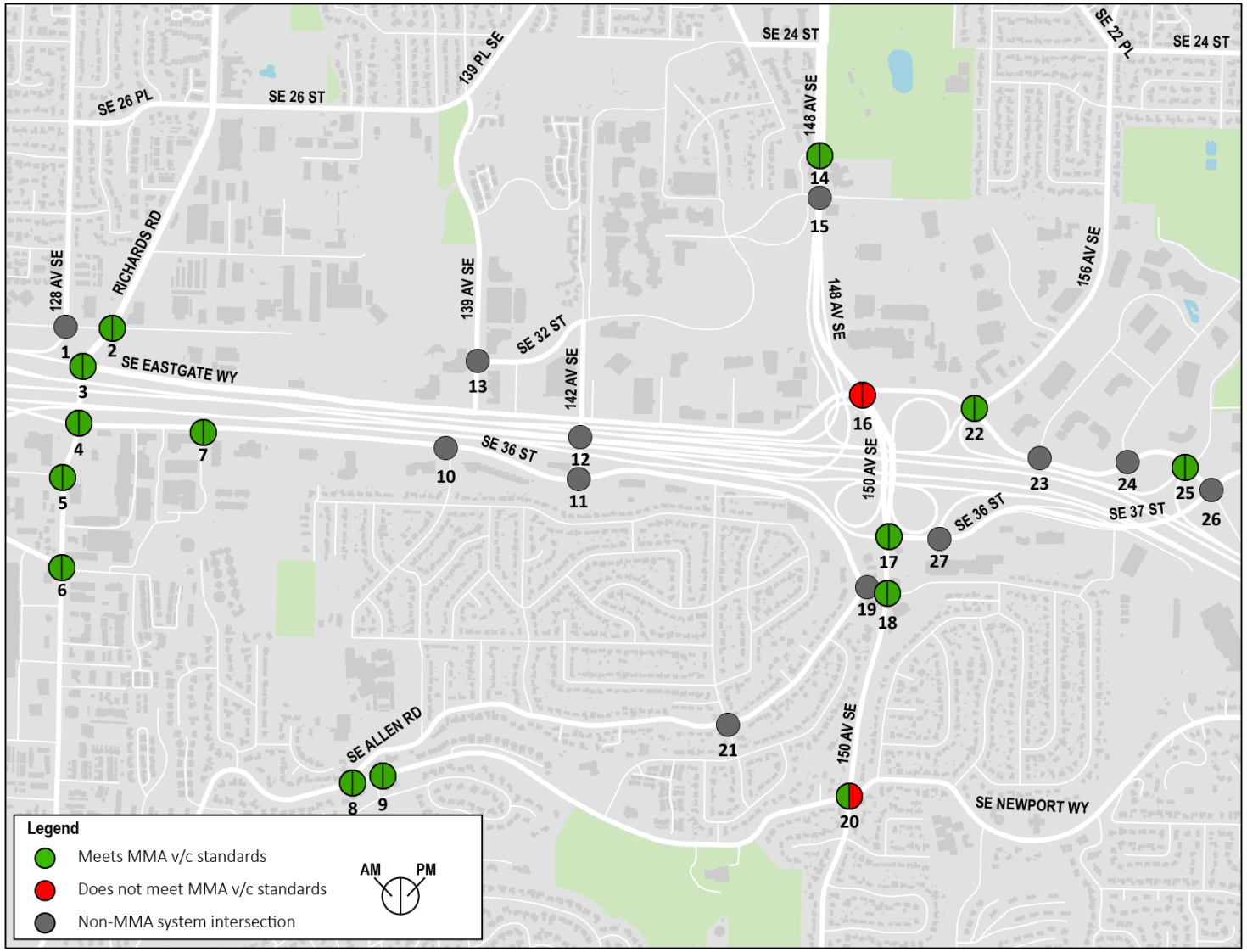
V/C is not a metric intended to represent a driver's experience



Modeling: 2018 Existing V/C- Intersections

- Per MMA V/C Standards:
  - AM: 14 of 15 meet standard
  - PM: 13 of 15 meet standard
- AM Peak – exceeds standard
  - Eastgate Way/148th Ave. SE
- PM Peak – exceeds standard
  - Eastgate Way/148th Ave. SE
  - Newport Way/150th Ave. SE

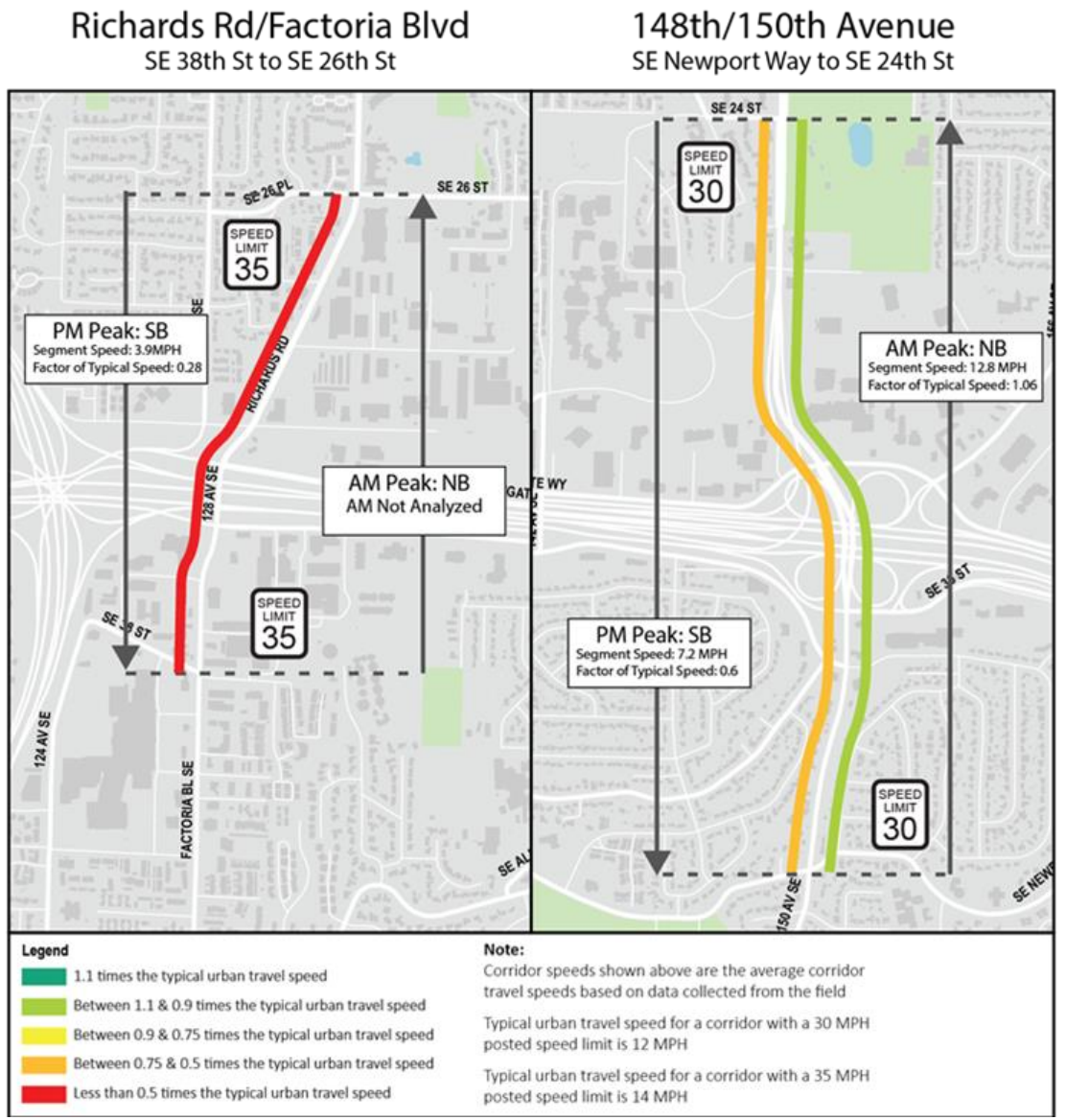
Note: intersection v/c either meets the standard or it exceeds the standard – unlike the corridor travel speed guideline that has a gradient



Modeling: 2018 Existing Travel Speed - Corridors

Per MMLOS Travel Speed Guideline

- Richards Rd/Factoria Blvd. Corridor
  - *Posted Speed = 35 mph*
  - *Typical Urban Speed = 14 mph*
  - Southbound, PM Peak = 3.9 mph
- 148th/150th Ave. SE Corridor
  - *Posted Speed = 30 mph*
  - *Typical Urban Speed = 12 mph*
  - Northbound, AM Peak = 12.8 mph
  - Southbound, PM Peak = 7.2 mph



Modeling: Corridor Travel Speed

PM Peak Period Corridor Travel Speed as shown by bus progression

Elapsed time: 00:00

Elapsed time: 01:00

Elapsed time: 02:00

Elapsed time: 03:00

Wait time for northbound vehicles (cars & buses) on 150 Ave SE.

Photo sequence courtesy of: Bellevue Transit Master Plan

Modeling: VISSIM Existing (2018) Animation

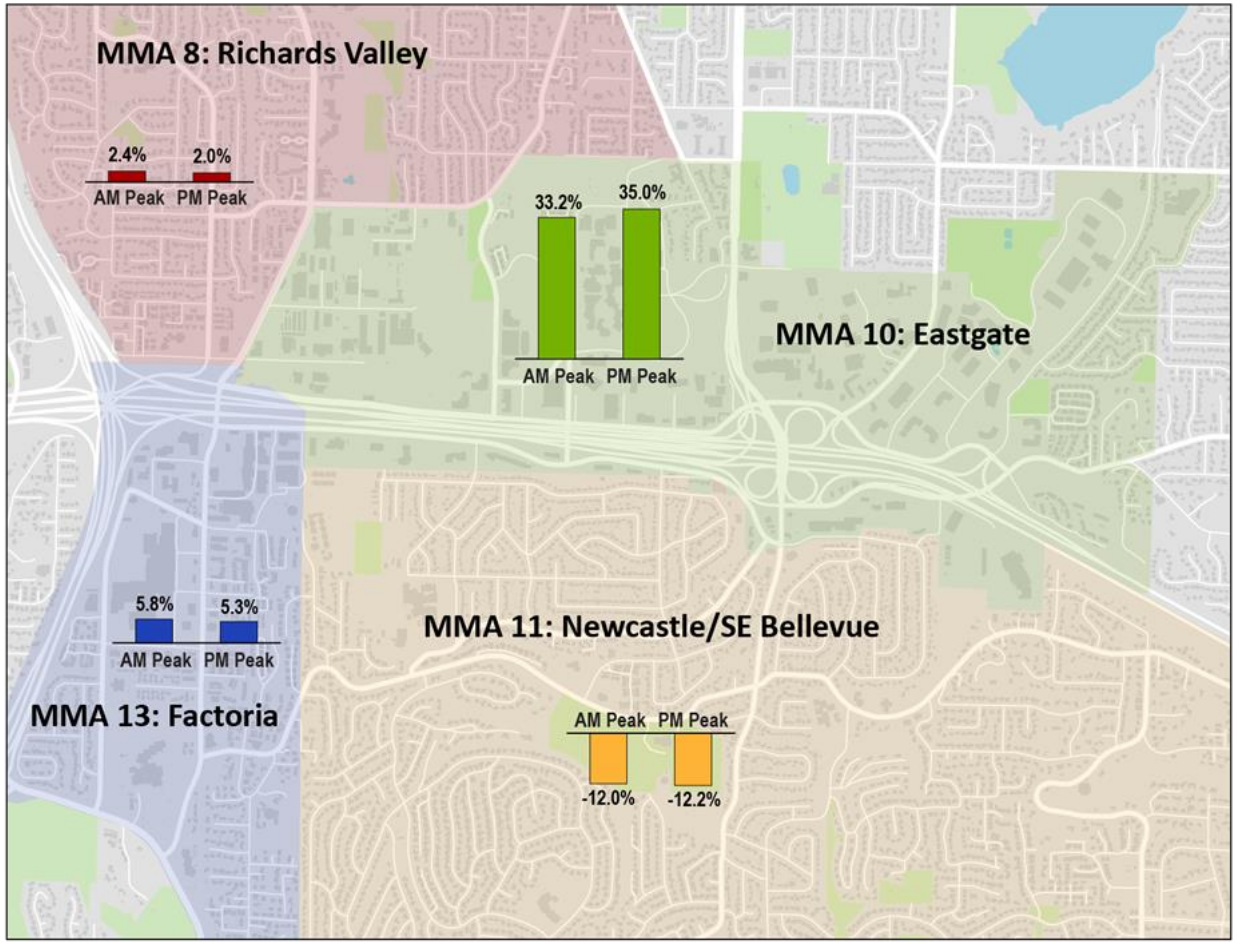
150th/148th Ave SE

Modeling: VISSIM Existing (2018) Animation

Factoria Boulevard
Richards Road

Modeling: BKR Forecasting Summary

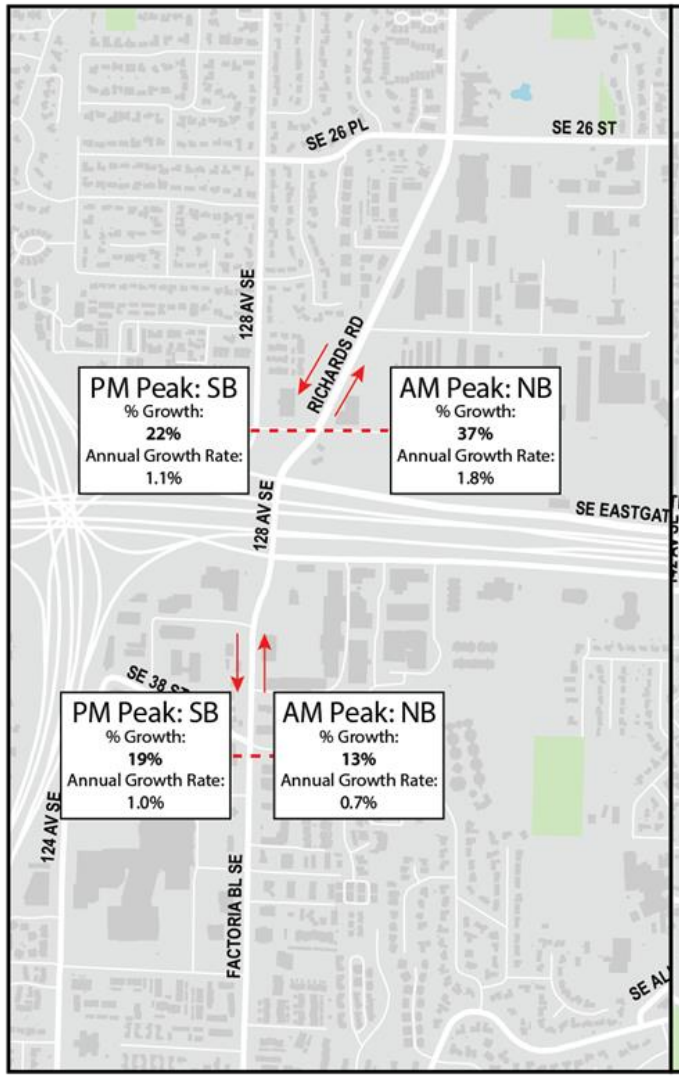
- Forecast Years
  - 2035 – Long Term Horizon
  - 2024 – Intermediate Horizon
- Land Use & Network Assumptions
  - Adopted land use plan forecast for 2035
  - Growth highest in Eastgate (MMA 10)
  - CIP Projects included in future network
- Vehicle Trip Growth, 2017-2035
  - Highest in MMA 10 (Eastgate), >33%
  - MMAs 8 & 13 – Low growth; 2%-5%
  - MMA 11 – negative trip growth in AM and PM peaks due to reduction in office space.



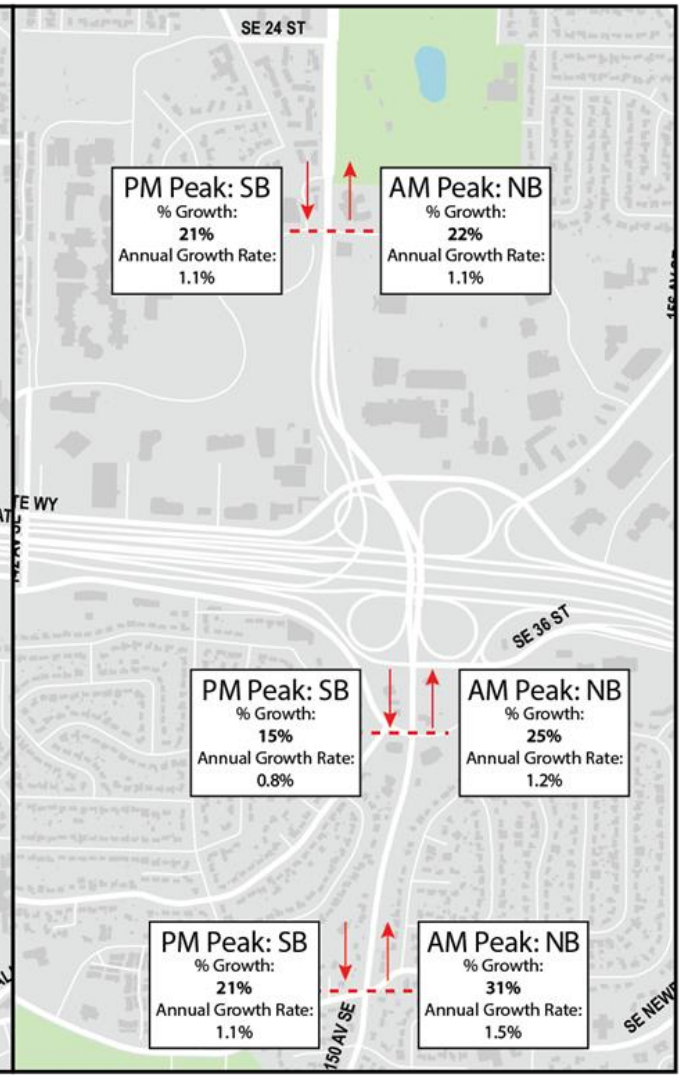
Modeling: Corridor Travel Demand (2017-2035)

- Richards Rd/Factoria Corridor
  - Northbound, AM Peak
    13%-37% growth
  - Southbound, PM Peak
    19%-22% growth
- 148th-150th Avenues SE Corridor
  - Northbound, AM Peak
    22%-31% growth
  - Southbound, PM Peak
    15%-21% growth

Richards Rd/Factoria Blvd



148th/150th Avenue



Modeling Summary

Discussion/Questions

Eastgate Transportation Study: Next Steps

Preparations for the January 24, 2019 Transportation Commission study session include the following:

- Revise Project Concepts Development per Transportation Commission
- Revise Evaluation Framework per Transportation Commission
- Continue Model Development – Forecasts for 2035
- Identify Congestion Relief Project Concepts
- Explore MMLOS benefits

Schedule

January 24 Study Session (South Bellevue Community Center)

- Planning, Modeling (2035 base year results)

February 14 Study Session

- Project Concepts

March 14 Study Session

- Preliminary project concepts and evaluation

March-April: Project concept development, evaluation and Commissioner briefings

May 9 Study Session

- Staff recommendation of project concepts

June 13 Study Session

- TC Recommendation of project concepts

Thank You

Jeremy Chin

jchin@bellevuewa.gov

Kevin McDonald

kmcdonald@bellevuewa.gov

Tony Woody, Concord Engineering

tsw@cetransportation.com

Chris Breiland, Fehr & Peers

cbreiland@fehrandpeers.com