



DAVID EVANS
AND ASSOCIATES INC.

ITE Western District

Session 3B



Bell Road-BNSF Railway Grade Separation

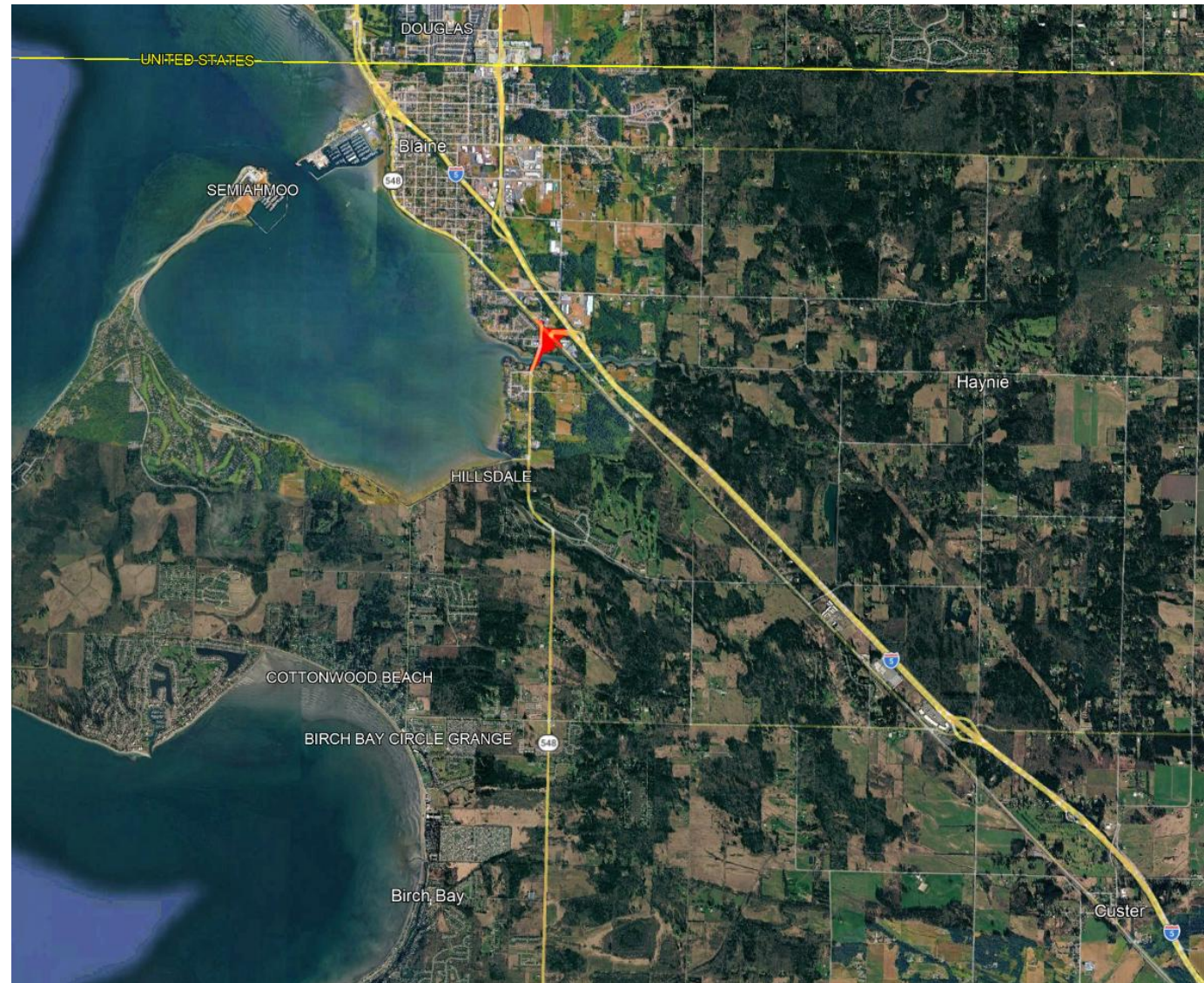
Lead Agency - **City of Blaine, Washington**

Lead Consultant – **David Evans and Associates, Inc.**

I. Context

Project Location

- In the City of Blaine, WA
- ~20 miles north of Bellingham
- ~2 miles south of the Canadian border
- Connects suburban areas to Blaine



Project Constraints/

- Critical link for emergency services
- Connects suburban areas to Blaine
- At grade crossing of the NBSF Railway
 - Rail Vehicle and Cargo Inspection System (R-VACIS) check point is just south of the crossing.
 - Trains must slow to walking speed for inspection
 - Excessive “gate down” times



Critical Areas

- Wetlands present in study area
- Dakota Creek
 - Tidally influenced
 - Critical habitat (ESA)
 - Habitat for Chinook Salmon, steelhead, bull trout
 - Jurisdictional agencies: NMFS and USFWS



II. Existing Conditions

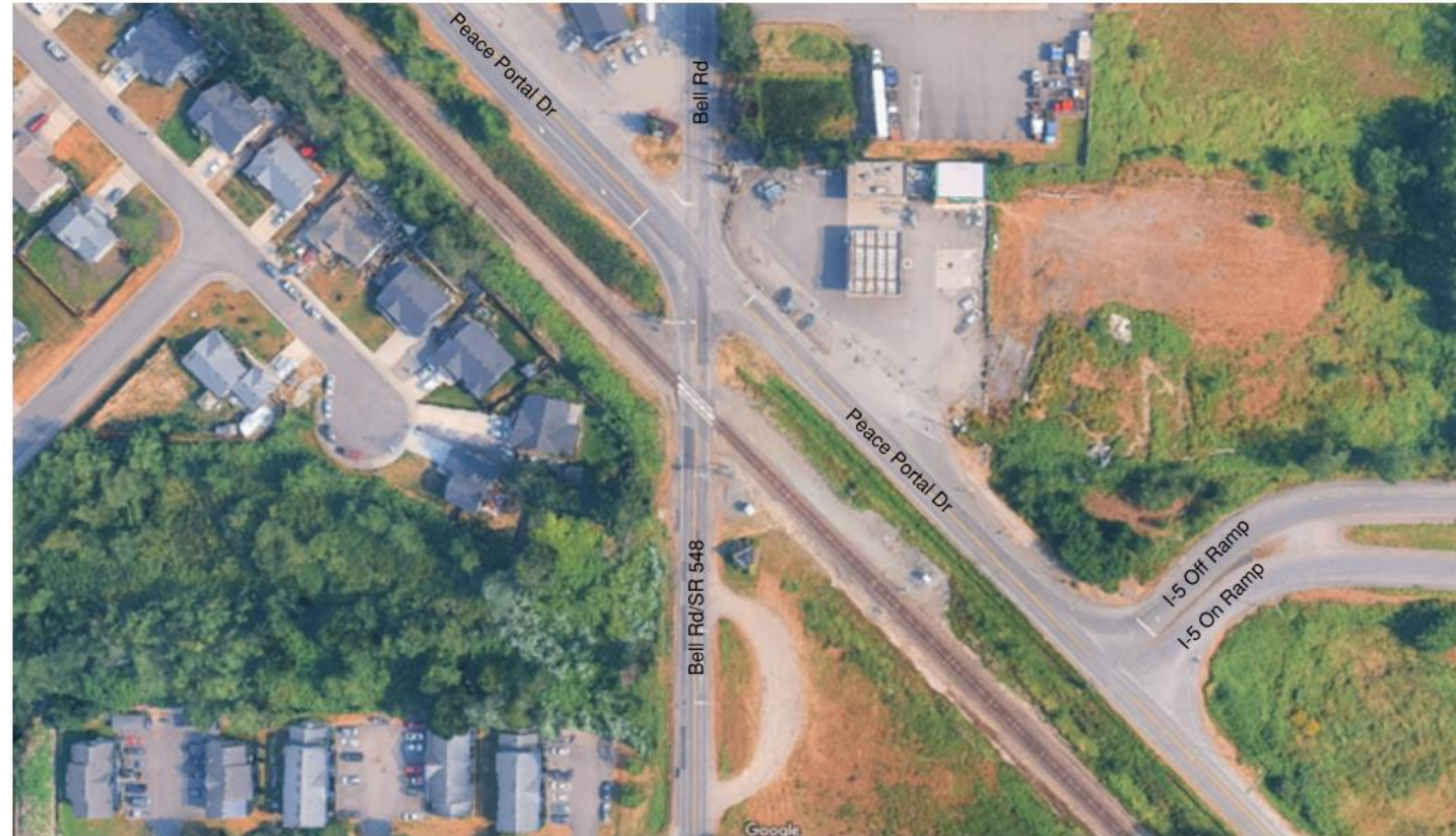
Bell Road/Peace Portal Drive and I-5 Ramps

Bell Road/Peace Portal Drive Intersection

- Four-way, stop control
- Single-lane approaches
- Current operations: LOS E
 - Below City of Blaine standard

I-5 Ramp Terminals

- Three-leg, side-street stop control
- Backups from Bell Rd/Peace Portal affect ramp operations
 - 20-30 minutes
- Queuing spills back onto I-5 mainline



Dakota Creek Bridge

- Built 1930, reconstructed 1951
- Two-lane, undivided structure
- No shoulders, pedestrian, or bicycle facilities
- Structurally deficient/functionally obsolete



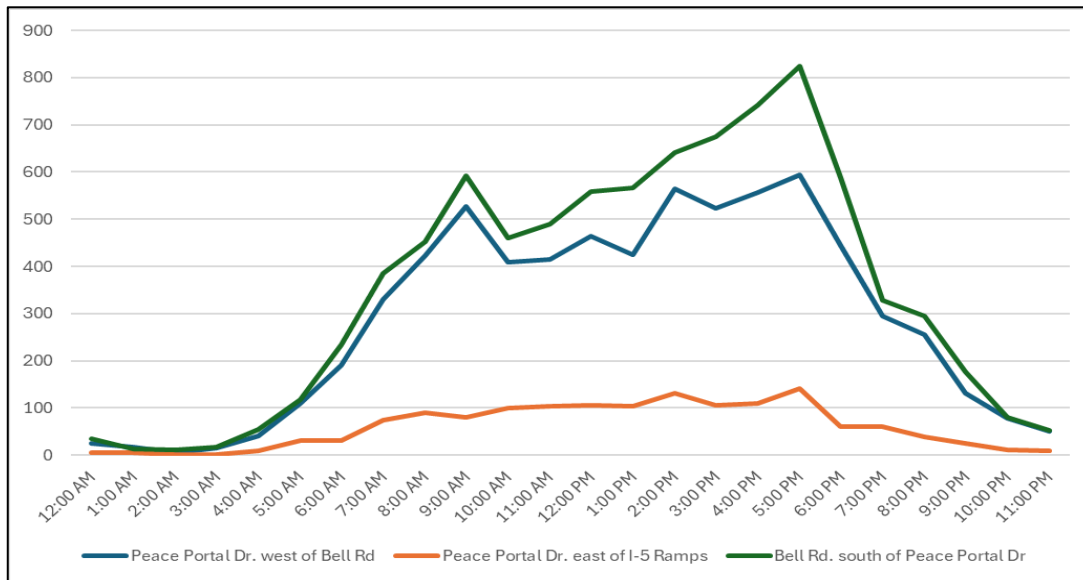
III. Existing Traffic Operations

Observations

Ped and Bike Counts

- 5 pedestrian crossings in AM
- 8 pedestrian crossings in PM
- 0 cyclists in AM
- 1 cyclist in PM

24-Hour Counts



Queuing

- Morning
 - Minor queuing: Peace Portal @ Bell
 - ~100 ft NB and SB
- Afternoon
 - Significant queuing: Peace Portal @ Bell
 - ~ 400 ft NWB to the ramp terminal and ~ 250 ft on I-5 exit ramp
 - ~ 400 ft NB

NOTE: No train impacts

Volume Projections

Intersection	Total Entering Volume (Vehicles)							
	AM				PM			
	2031 No-Build	2031 Build	2051 No-Build	2051 Build	2031 No-Build	2031 Build	2051 No-Build	2051 Build
1 – Peace Portal Drive / Hughes Avenue	669		1,005		895		1,375	
2 – Peace Portal Drive / Bell Road	900		1,380		1,531		2,347	
3 – Peace Portal Drive / I-5 Ramps	450		755		720		1,175	
4 – Runge Avenue / Bell Road	612		902		1,134		1,684	
5 – Washington Avenue / Bell Road	568		853		1,082		1,507	

Existing Operations Summary

Level of Service (LOS) Failures

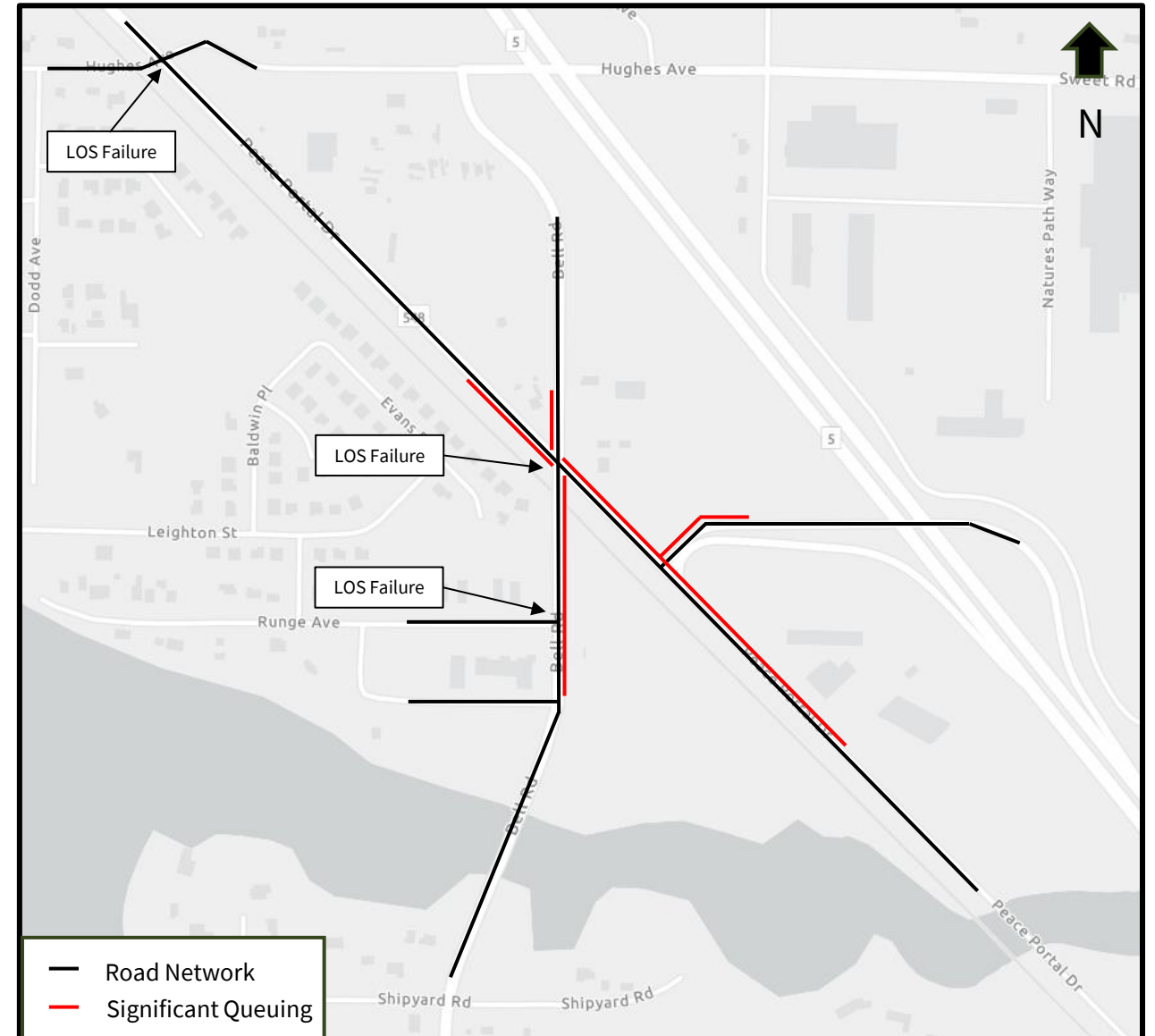
- Peace Portal @ Bell (PM)
 - LOS E / Delay: 48.6s



2051 No Build Operations

Level of Service (LOS) Failures

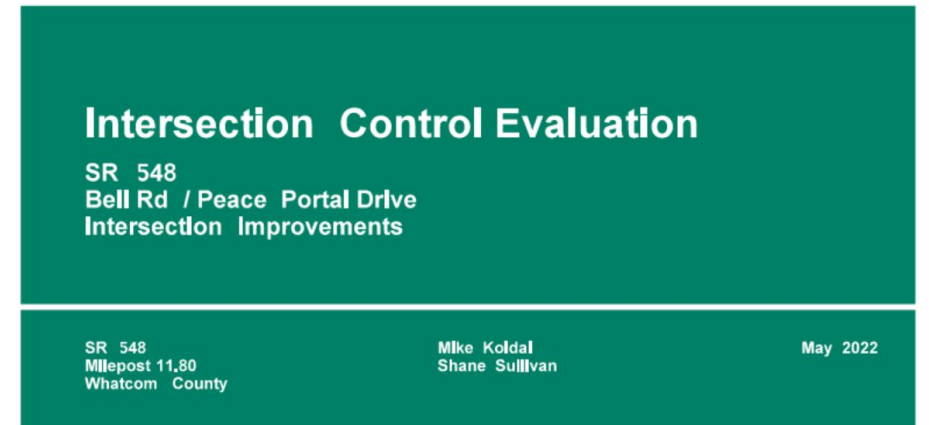
- Peace Portal @ Hughes (PM)
 - EBLTR: LOS E / Delay: 46.6s
- Peace Portal @ Bell (PM)
 - Overall: LOS F / Delay: **>240s**
- Bell @ Runge (PM)
 - EBLTR: LOS F / Delay: 76.0s



Prior Assessment

- WSDOT completed ICE in May 2022
- Executive Summary

“In 2016, a multi-agency practical solutions workshop initially determined that a **grade-separated crossing over the tracks was the ideal solution**; however, this strategy is no longer supported by the project budget, and an at-grade alternative is the current preferred solution.”
- Recommendation: Keep RR Crossing at-grade – Signalize the intersection.
 - LOS C operations
 - Recovery would take ~45min after train crossing

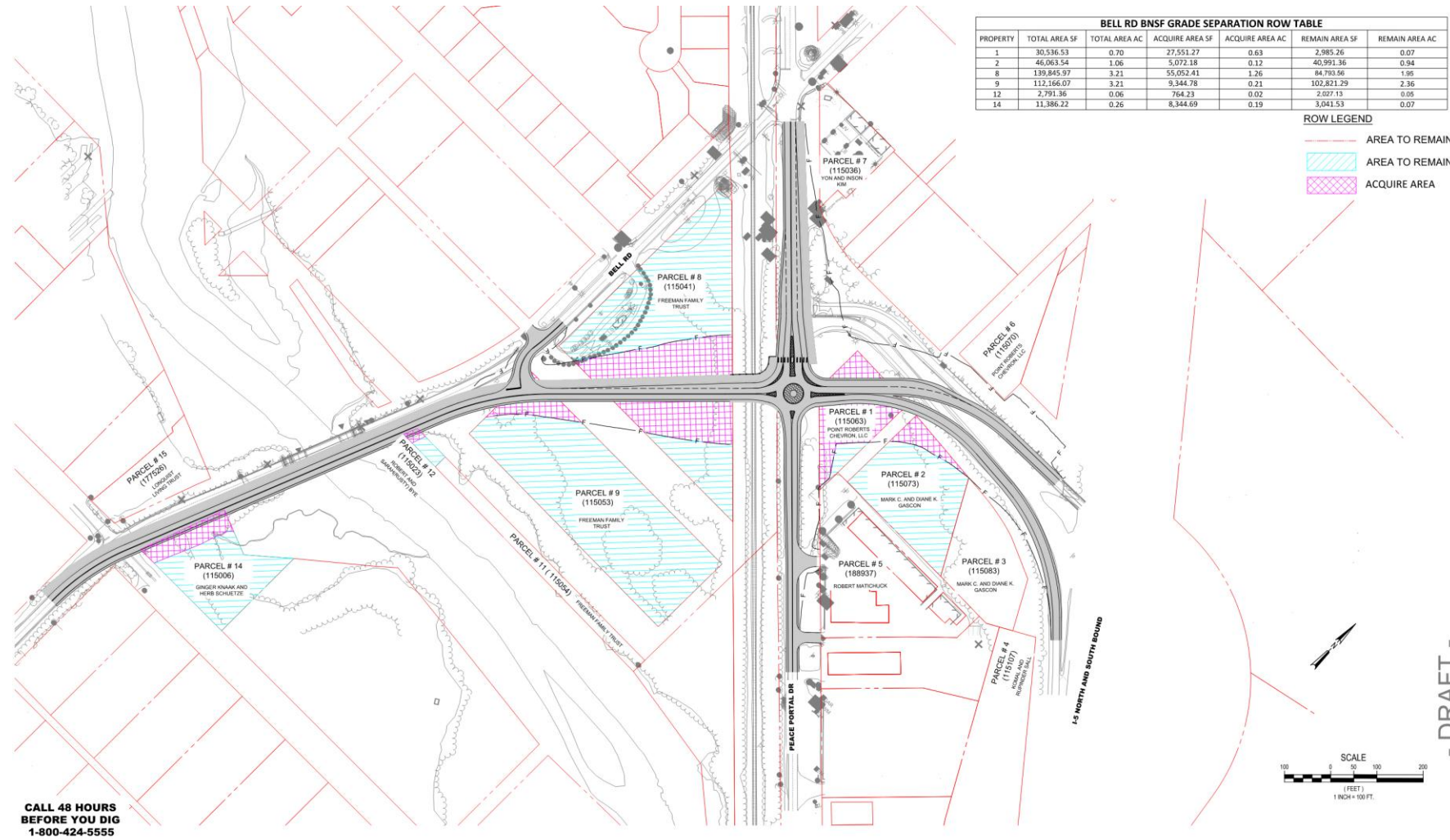


IV. Alternatives Overview

Grade Separated Alternative

Alternative 2

- ~6 parcels impacted, 2 full acquisitions
- Retains Steamers Espresso and Washington Ave access
- Fewer overall ROW impacts



Structures

BNSF Bridge

- New bridge constructed over existing tracks
- 2 – 12' roadway lanes, 4 ft shoulders
- 12' Shared Use Path that is Barrier Separated



Structures

Dakota Creek Bridge

- Restores approximately 5,500 square feet of Dakota Creek's historical floodplain
- Relocating bridge piers away from Dakota Creek main channel reduces scour risk
- 2 – 12' roadway lanes, 4 ft shoulders
- 12' Shared Use Path that is Barrier Separated



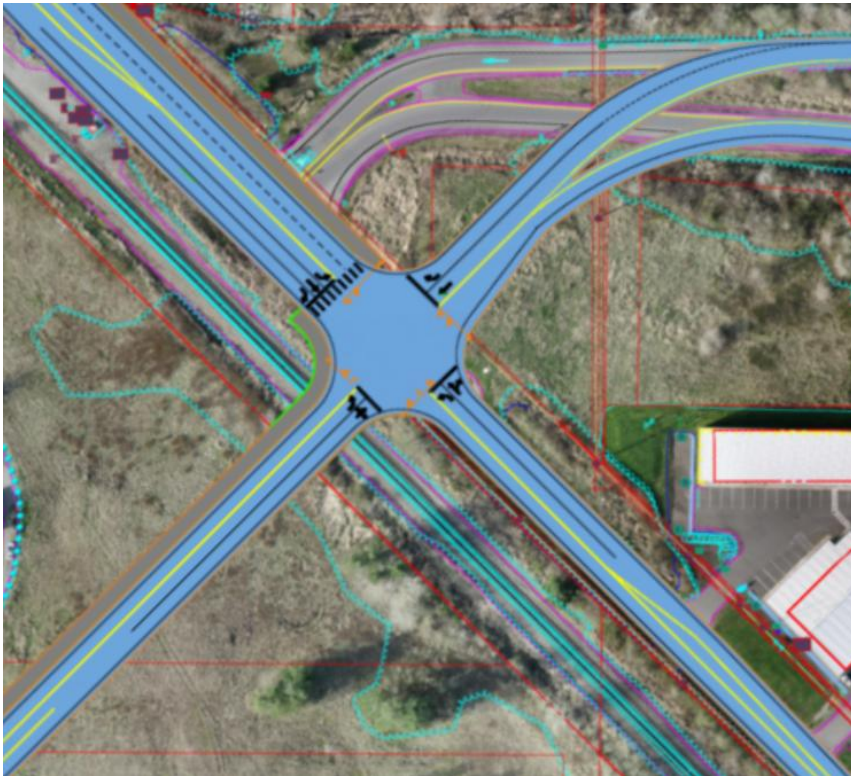
Volume Projections for Build

Intersection	Total Entering Volume (Vehicles)							
	AM				PM			
	2031 No-Build	2031 Build	2051 No-Build	2051 Build	2031 No-Build	2031 Build	2051 No-Build	2051 Build
1 – Peace Portal Drive / Hughes Avenue	669	669	1,005	1,005	895	895	1,375	1,375
2 – Peace Portal Drive / Bell Road	900	775	1,380	1,190	1,531	1,256	2,347	1,937
3 – Peace Portal Drive / I-5 Ramps	450	945	755	1,475	720	1,575	1,175	2,440
4 – Runge Avenue / Bell Road	612	85	902	90	1,134	114	1,684	119
5 – Washington Avenue / Bell Road	568	106	853	111	1,082	126	1,507	131
NEW – WA 548 / Bell Rd	N/A	640	N/A	935	N/A	1,110	N/A	1,690

Traffic Control Options for Build

Originally Screened Out: Uncontrolled, 2-way stop, and 4-way stop

Analyzed: Signal



Compact Traversable Roundabout



Roundabout Geometry

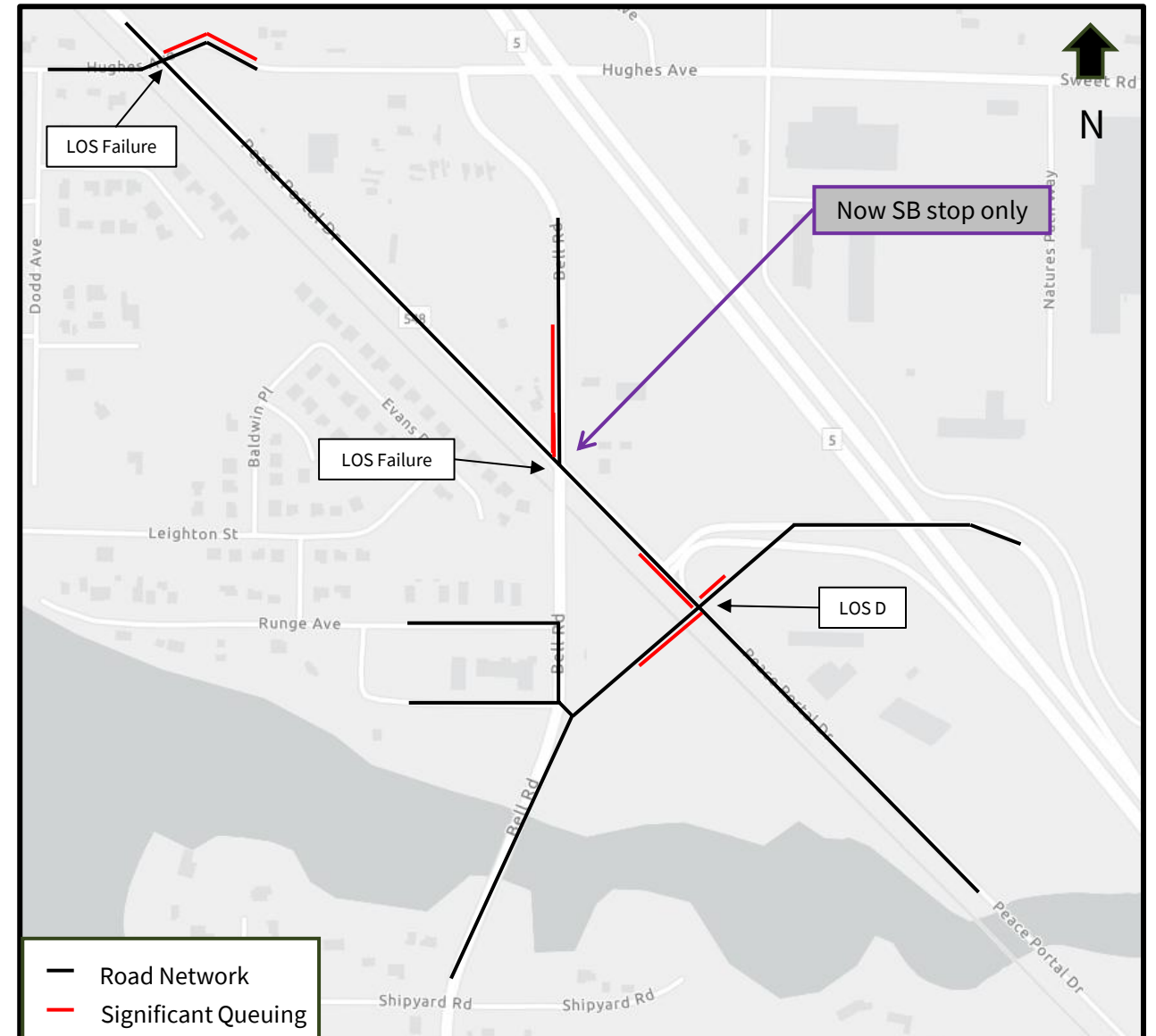
45' Compact Traversable - Center and Islands

All roadway geometrics designed to WSDOT Guidelines

2051 Signal Build Operations

Level of Service (LOS) Failures

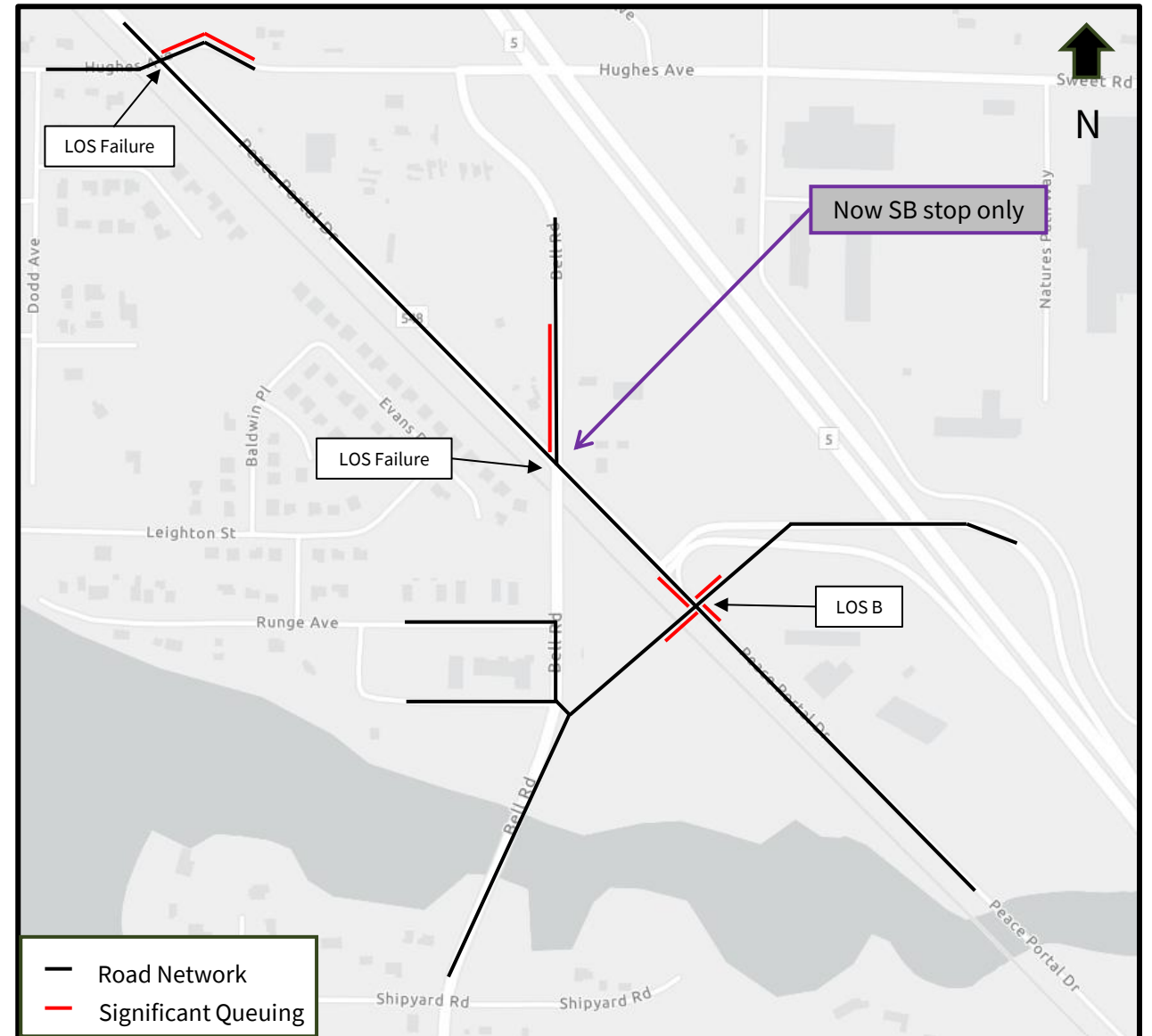
- Peace Portal @ Hughes (PM)
 - WBLTR: LOS F / Delay: >240s
- Peace Portal @ Bell (PM)
 - SBLR: LOS F / Delay: >240s
- Peace Portal @ I-5 Ramps (PM)
 - LOS D / Delay: 38.7s



2051 Roundabout Build Operations

Level of Service (LOS) Failures

- Peace Portal @ Hughes (PM)
 - WBLTR: LOS F / Delay: >240s
- Peace Portal @ Bell (PM)
 - SBLR: LOS F / Delay: >240s
- Peace Portal @ I-5 Ramps (PM)
 - LOS B / Delay: 11.1s



Predicted Safety Summary (2031 No-Build vs Build)

Intersection	2031 No-Build Crashes / Yr			2031 Signal Crashes / Yr			2031 Roundabout Crashes / Yr		
	PDO	F&S	Total	PDO	F&S	Total	PDO	F&S	Total
Intersections	4.5	2.7	7.2	4.5	2.5	7.0	3.5	1.8	5.3
Segments	6.2	3.4	9.6	6.2	3.2	9.3	5.2	2.5	7.6
TOTAL	10.7	6.1	16.8	10.7	5.7	16.3	8.7	4.3	13.0

Predicted Safety Summary (2051 No-Build vs Build)

Intersection	2051 No-Build Crashes / Yr			2051 Signal Crashes / Yr			2051 Roundabout Crashes / Yr		
	PDO	F&S	Total	PDO	F&S	Total	PDO	F&S	Total
Intersections	6.7	4.1	10.8	7.0	3.9	10.9	5.4	2.7	8.1
Segments	9.6	5.2	14.7	9.9	5.0	14.9	8.3	3.9	12.2
TOTAL	16.3	9.3	25.5	16.9	8.9	25.8	13.7	6.6	20.3

Recommendations

- Re-align Bell Road as southwest leg of I-5 Ramp Terminal
 - **BENEFIT:** Reduces ROW impacts and project cost
- Grade separate Bell Road over BNSF Tracks
 - **BENEFIT:** Removes excessive crossing delays associated with R-VACIS check point
- Construct compact traversable roundabout
 - **BENEFIT:** Lowest delay per vehicle – Lowest predicted crash rate
- Extend shared use path through study area
 - **BENEFIT:** Reduced multi-modal exposure and promote alternative modes
- Further investigation into traffic control changes at:
 - Peace Portal/Hughes
 - Peace Portal/Bell

V. Questions?

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