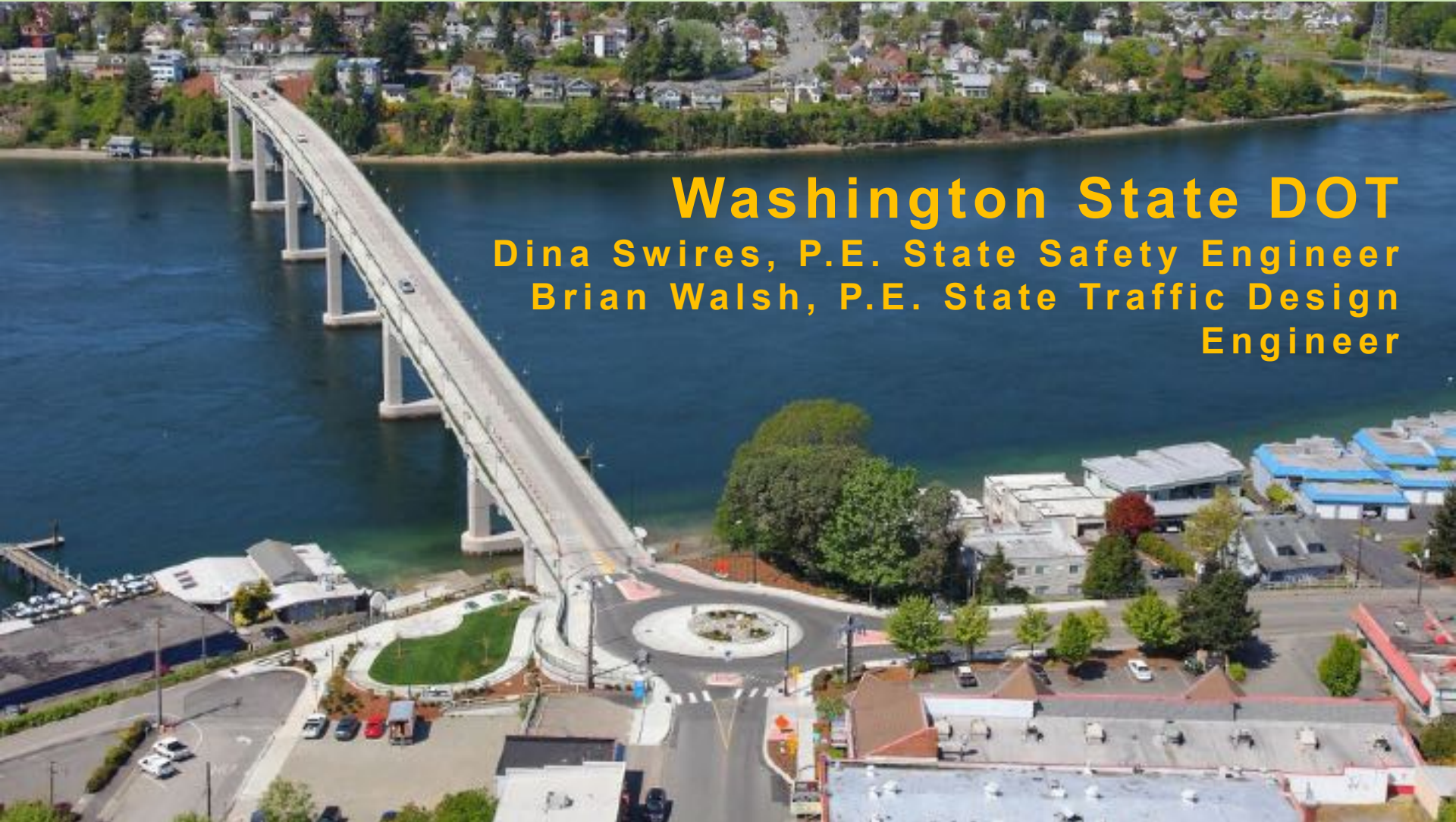
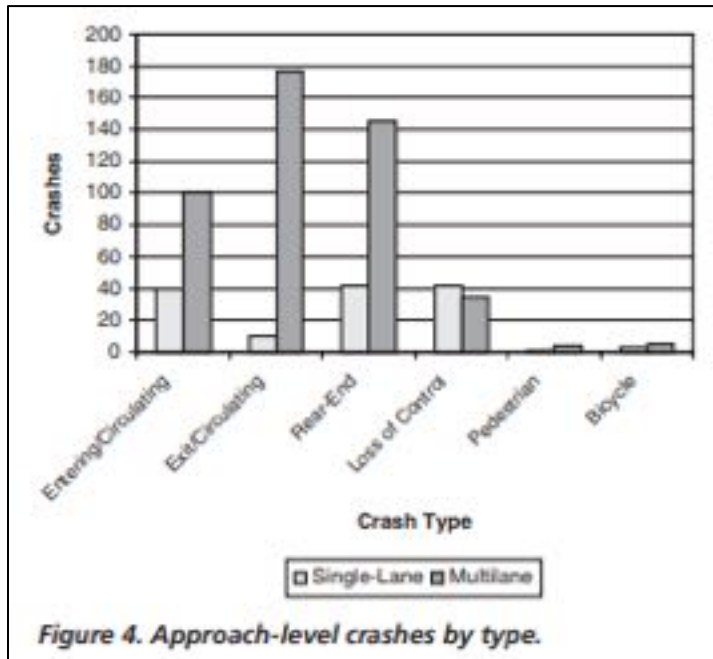


# Affordable Roundabouts

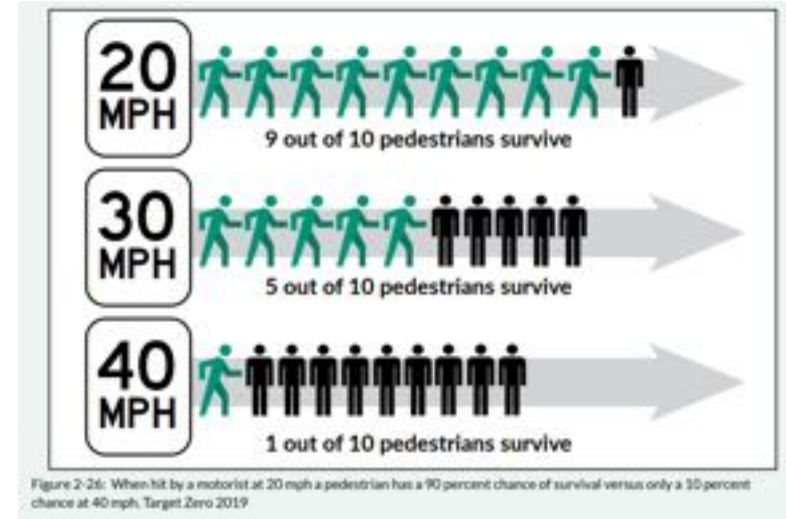


**Washington State DOT**  
**Dina Swires, P.E. State Safety Engineer**  
**Brian Walsh, P.E. State Traffic Design Engineer**

# Reprioritizing Safety over Capacity



NCHRP Report 572, 2007



WSDOT Active Transportation Plan, 2021

# Reprioritizing Affordability and applying Scalability to Standards





# Affordability – Scrutinizing Cost Estimates

- Cost Estimating is not perfect art
- Assumptions in the estimate are key
- Conventional and Compact roundabouts assumptions can vary widely
  - Planning
  - Bids
- In this presentation, we will be citing construction costs however

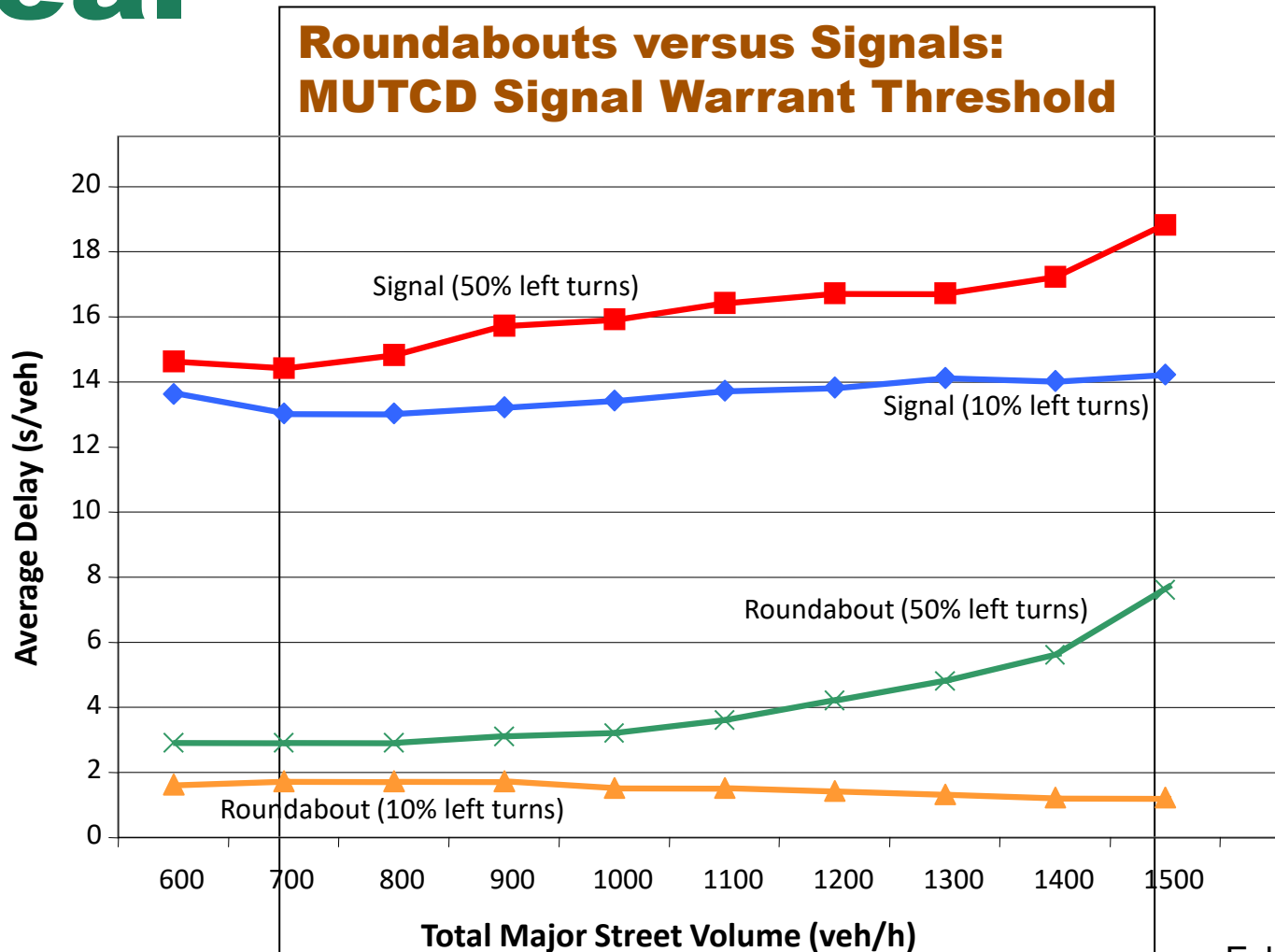
# Level of Stress

Exhibit 1510-2 Pedestrian Level of Traffic Stress (PLTS) based on Sidewalk Width (New Exhibit 2023)

Greater than Minimum Sidewalk Present (6' or greater)								
Lanes	AADT	Target Speed						
		≤20	25	30	35	40	45	50+
1 thru lane per direction (or 1 lane one-way street)	0 - 750	1	1	2	2	3	4	4
	751 - 1500	1	1	2	2	3	4	4
	1501 - 3000	1	1	2	2	3	4	4
	> 3000	2	2	2	2	3	4	4
2 thru lanes per direction	0 - 6000	2	2	2	2	3	4	4
	> 6000	2	2	2	2	3	4	4
3+ thru lanes per direction	Any ADT	2	2	2	3	3	4	4

WSDOT Design Manual, Chapter 1510, 2023

# Delay Reduction with roundabouts is Real



Based on MUTCD Warrant 3 (2000 ed.)/Warrant 11 (1988 ed.)

Exhibit 3-7, p. 63

# WSDOT Sidra Guidance

## WSDOT Sidra Policy Settings

This is a reference guide for WSDOT policy settings for completing an analysis of roundabouts using Sidra 8 for WSDOT projects or projects affecting state owned or state interest facilities. Any adjustments to either the settings or Sidra defaults (remaining parameters not discussed in this guide) should be documented in a "Method and Assumptions" document.

### Lane Geometry Dialog

Lane Configuration Tab - Unless the roundabout being analyzed already exists or there is a detailed drawing available, use the following Lane Widths:

- Single lane approach: minimum 25 ft.
- Multi-lane approach: minimum 14 ft. (each lane)



### Roundabouts Dialog

Options Tab - Use the following settings for Roundabout Model Options parameters:

- Roundabout Capacity Model - Sidra Standard
- Roundabout LOS Method - Same as Signalized Intersections
- Delay Model - uncheck both exclude Geometric Delay and HCM Delay Formula



WSDOT Sidra Policy Settings



Washington State Department of Transportation

Travel Construction & planning Business with WSDOT Engineering & standards About

Home > Engineering & standards > Design topics > Traffic Analysis

## Traffic: Analysis

Guidance and tools for traffic management, analytics, and control devices.

Manuals Standard plans & drawings Specifications Tools, templates & links Contacts

### WSDOT resources

- [WSDOT Traffic Analysis Guidebook \(PDF 151KB\)](#)
- [WSDOT Multimodal Transportation Impact Analysis Guidelines \(PDF 305KB\)](#)
- [WSDOT Transportation Data](#)
- [WSDOT GIS](#)

### WSDOT simulation protocols and policies

- [WSDOT SIDRA Policy and Settings \(PDF 292KB\)](#)
- [WSDOT Synchro and SimTraffic Protocol \(PDF 513KB\)](#)

### WSDOT VISSIM Protocol

- [Base Protocol \(PDF 2MB\)](#)
- [Appendix A - Acronyms \(PDF 376KB\)](#)
- [Appendix B - Terminology \(PDF 376KB\)](#)
- [Appendix C - Scoping Checklist \(XLS 20KB\)](#)
- [Appendix D - Seeding Period FHWA Traffic Analysis Toolbox Volume III \(PDF 78KB\)](#)
- [Appendix E - Example Model Development Flow Chart \(PDF 343KB\)](#)
- [Appendix F - Example Speed Plots \(PDF 45KB\)](#)

# Partial Myths that haven't materialized expected

- Dominant Flows....
- Volume to Capacity ratios of 0.85 (V/C)
- Posted Speed Limits to High or approach speeds that can't be managed
- Volumes that a single lane compact roundabout can handle (examples that exceed 20K total entering)
- Model defaults



# Slater Road – Exit 260 – Interstate 5 Whatcom County







# “Ultimate Restripe”





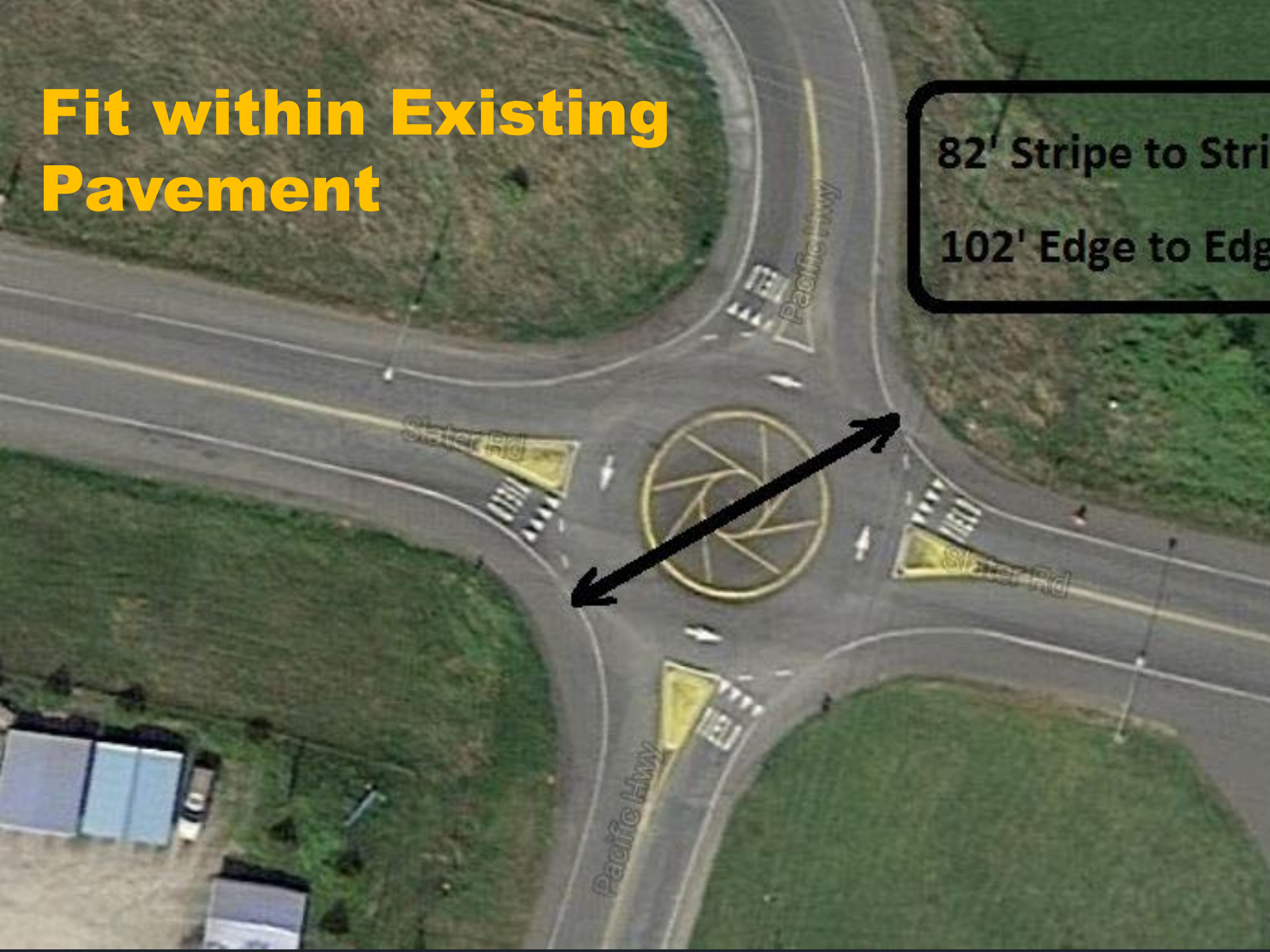






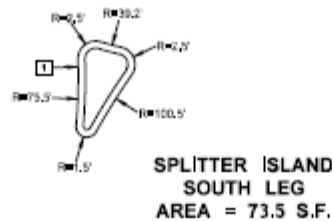
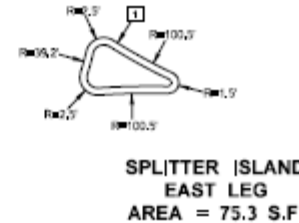
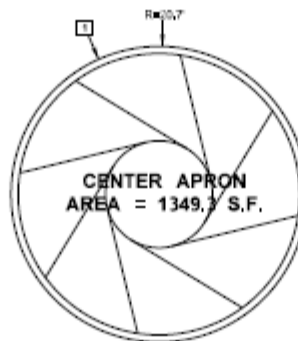
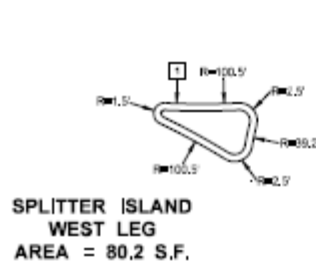
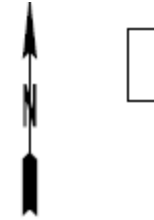
# Fit within Existing Pavement

82' Stripe to Stripe  
102' Edge to Edge



# Simple Plan Details on Island sizes

## TRAFFIC ISLANDS DETAIL











# Truck Percentages High (Interstate)

WSDOT I-5  
SLATER RD







**Inspiration was a Mini-roundabout**

# Temporary Roundabout – 6 week Detour





Ultimate Improvement Location



Temporary Roundabout







# Permanent Low Cost Scalable Roundabout – Constructed with Paver





# X Axis measurement = 120'



# Y Axis measurement = 135'





# Loon Lake Compact Roundabout - Paver

**KXLY**.COM  
SPOKANE ▶ COEUR D'ALENE

NEWS WEATHER SPORTS OBITS MORE ▾

Posted: October 3, 2022 5:09 PM

Updated: October 3, 2022 6:42 PM by Will Wixey

**395 ROUNDABOUT NOW FULLY OPEN**

**LOON LAKE, WA**





# 2<sup>nd</sup> Temporary Roundabout during Construction



# WSDOT Compact Roundabouts

SR	Compact List	Name	Crossroad
005LX03697		005LX03697 MP 0.2	<a href="#">NB offramp/Kelso Dr/Old Pacific Hwy</a>
005LX12352		005LX12352 MP 0	<a href="#">Thorne Ln/Union Ave</a>
005LX26013		005LX26013 MP 0.03	<a href="#">SB On/Off ramps/Slater Rd</a>
005LX26013		005LX26013 MP 0.22	<a href="#">NB On/Off ramps/Slater Rd</a>
005LX26346		005LX26346 MP 0.18	<a href="#">NB off/on ramps</a>
009FI01557		009FI01557 MP 0.35	<a href="#">Vernon Rd/Davies Rd</a>
090LX10936		090LX10936 MP 0.19	<a href="#">I-90 EB on/off ramps/Canyon Rd</a>
090LX27632		090LX27632 MP 0.33	<a href="#">I-90 EB on/off Ramps/Grove Rd</a>
282		282 MP 0.29	<a href="#">Dodson Rd/A St</a>
520LX00457		520LX00457 MP 0	<a href="#">30th/84th/Hunts Point Pl</a>
524		524 MP 6.71	<a href="#">Magnolia Rd/Locust Way</a>
524		524 MP 6.79	<a href="#">Larch Way</a>
546		546 MP 3.53	<a href="#">Northwood Rd</a>
902		902 MP 10.27	<a href="#">Craig Road</a>
530	Y	530 MP 19.39	<a href="#">59th Ave NE</a>
530	Y	530 MP 19.69	<a href="#">211th Pl NE</a>
027		027 MP 2.2	<a href="#">Pullman Albion Rd</a>
395		395 MP 190.58	<a href="#">SR 292 (Loon Rd)</a>
509		509 Mp 9.08	<a href="#">SW Dash Point Drive</a>



# A WSDOT Compact Roundabout Story







# Local Agency Compact Roundabout





# Another Local Agency Compact







CASHMERE CENTER  
EST. 1907

CASHMERE STATE BANK  
488

B







An aerial photograph showing a complex highway interchange with multiple lanes and a roundabout. A large, light-colored, eroded area of earth is visible on the right side of the interchange, indicating a landslide or significant erosion. The surrounding area includes some industrial or commercial buildings and parking lots on the left, and a wooded area on the right. The word "Questions" is overlaid in large, bold, green text across the center of the image.

# Questions