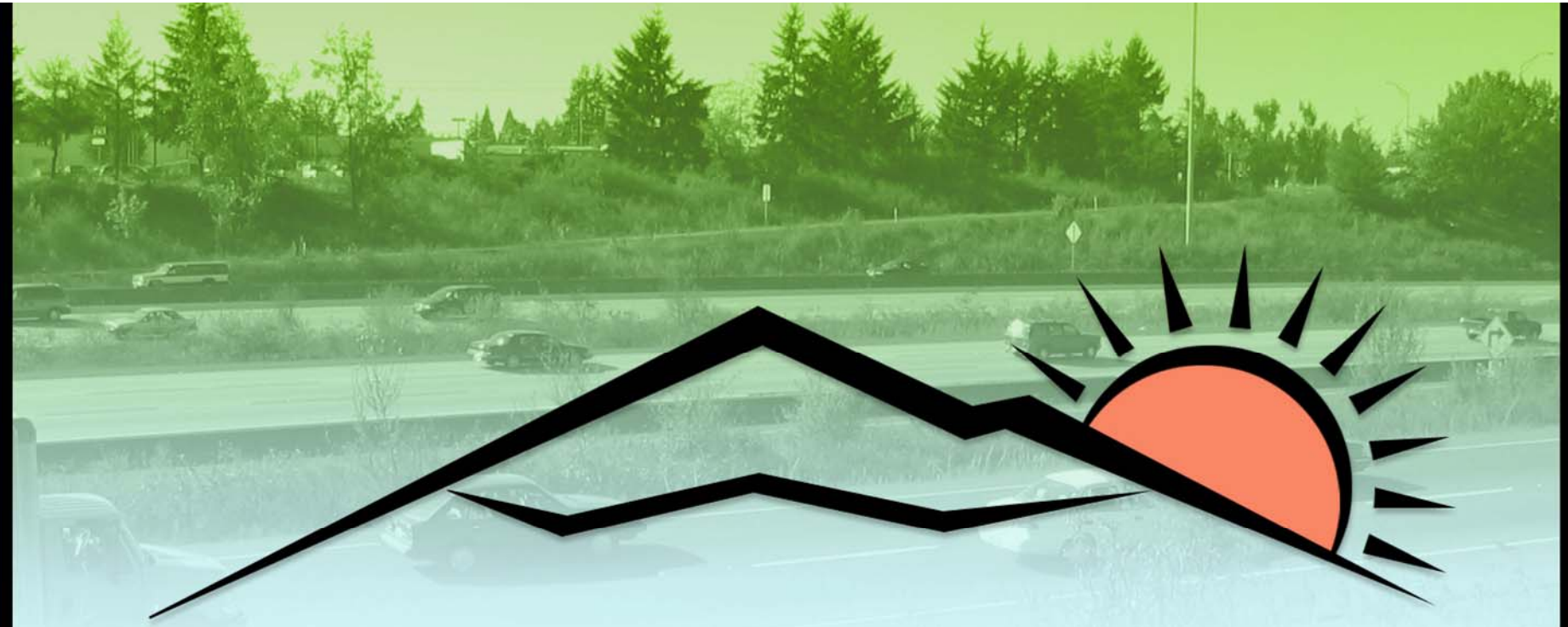


Sunrise Project, I-205 to Rock Creek Junction

OR 212 / 224 and 82nd Drive Intersection

Making a Preferred Alternative Recommendation

Policy Review Committee

July 29, 2009

CLACKAMAS COUNTY

Oregon Department of Transportation

Presentation Purpose

- Support PRC recommendation on OR 212/82nd Drive improvements to include in Sunrise Preferred Alternative
- Provide deeper understanding of traffic and non-traffic impacts associated with two (2) remaining OR 212/82nd Dr. options
  - 8-lane 82nd Drive corridor with U-turns via signals
  - 5-lane 82nd Drive corridor with U-turns via roundabouts
- *Results shown for year 2030 with full Sunrise buildout only*

Agenda

- Key Findings
- Overview of options
- Traffic operational results
  - Intersection operations
  - Travel time comparison
  - Truck considerations
  - Bicycle/pedestrian considerations
- Property impacts

Key Findings

An 8-lane 82nd Drive corridor with U-turns via signals:

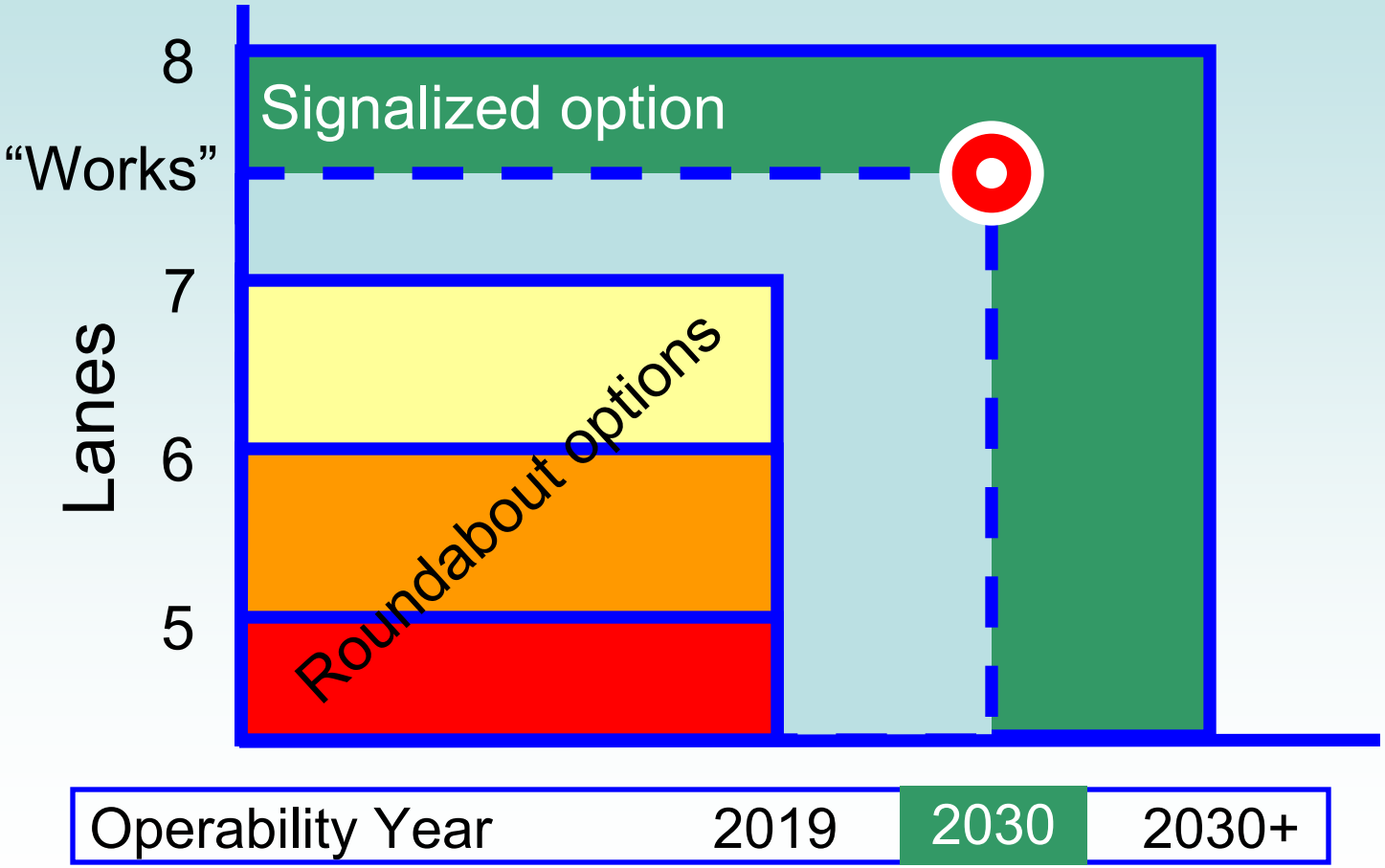
- \+ Meets established mobility standards through 2030
- \+ Integrates & functions well within larger transportation system
- \- 23 business impacts

A 5-lane 82nd Drive corridor with U-turns via roundabouts:

- \- Does not meet established mobility standards beginning in 2020
- \- Integrates but does not function well within larger transportation system (e.g., adversely affects I-205 access)
- \+ 18 business impacts

* *Both options accommodate large trucks*

Key Findings cont.



** Assumes full buildout of Sunrise Project by 2020*

OR 212/82nd Drive Intersection
Overview of Options

Options designed to balance trade-offs among the following considerations:

- Meet established mobility standards through year 2030
- Accommodate large trucks (WB 67)
- Integrate and function with surrounding transportation system (e.g., no adverse influence on I-205)
- Minimize/avoid property impacts where possible

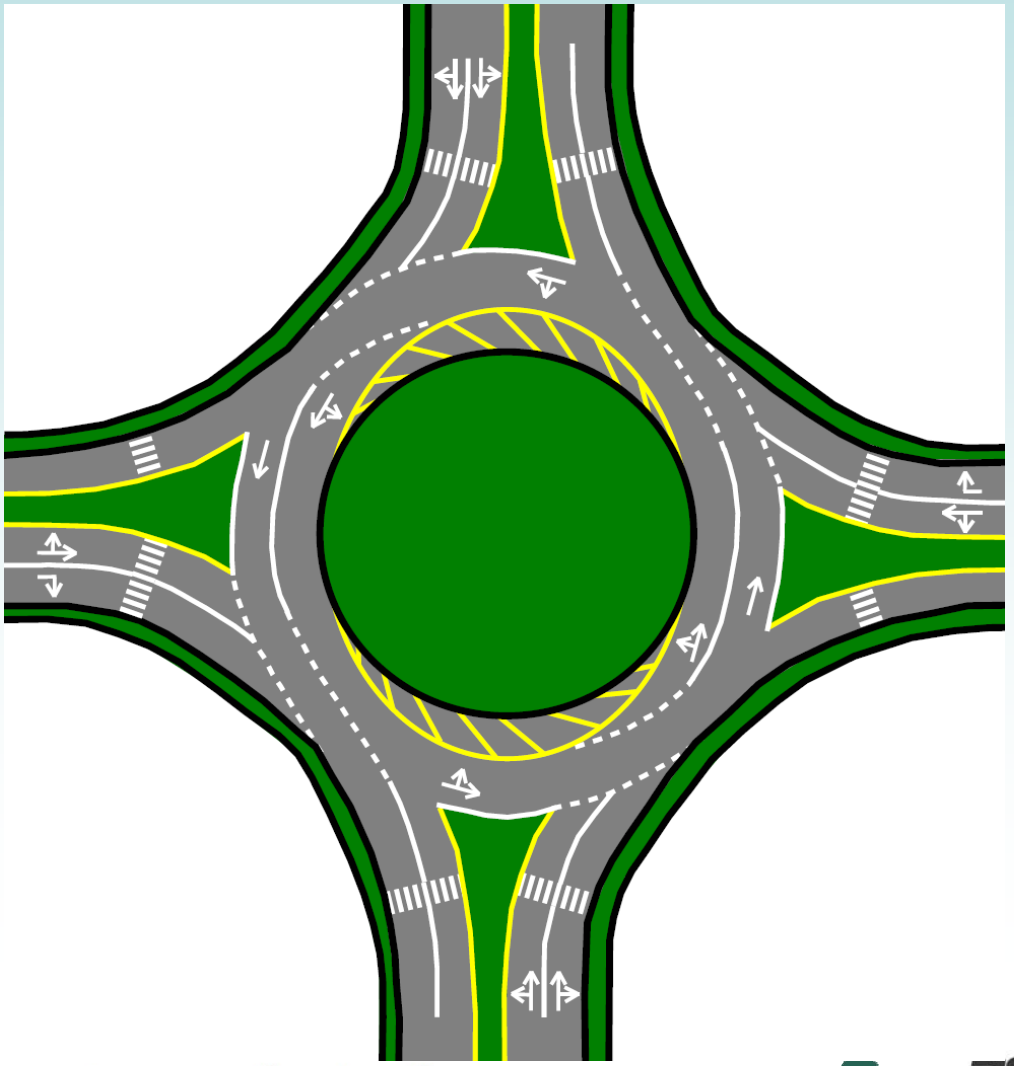
PDF #1- side-by-side lane configurations

PDF#2- side-by-side ROW

PDF #3- side-by-side 6 & 7-lane

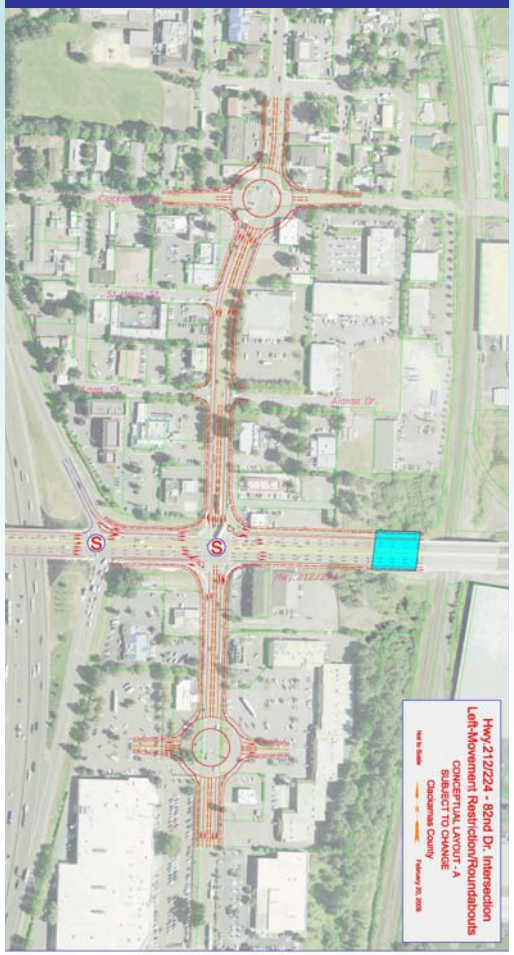
Roundabout Lane Configurations

Roundabout Configurations for both Clackamas Road and the northern Fred Meyer Access intersections are the same.



Traffic Operational Results
Factors Considered

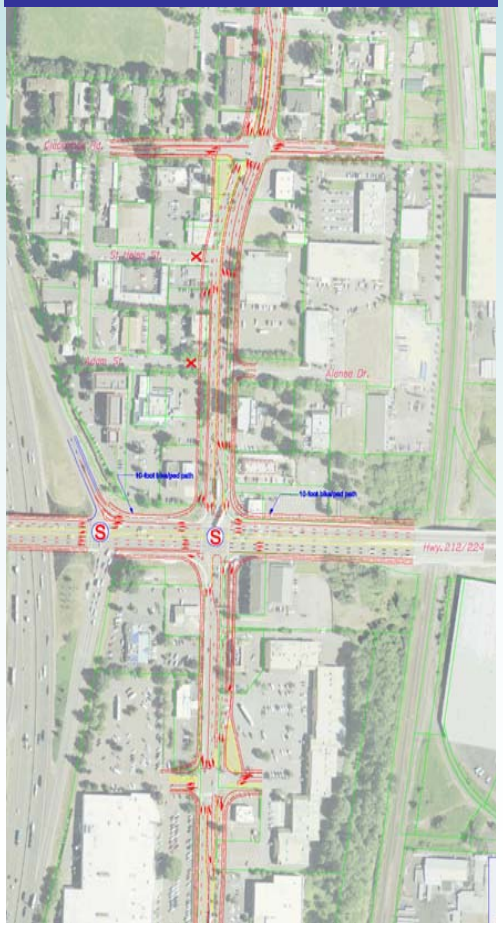
Roundabouts



Factors

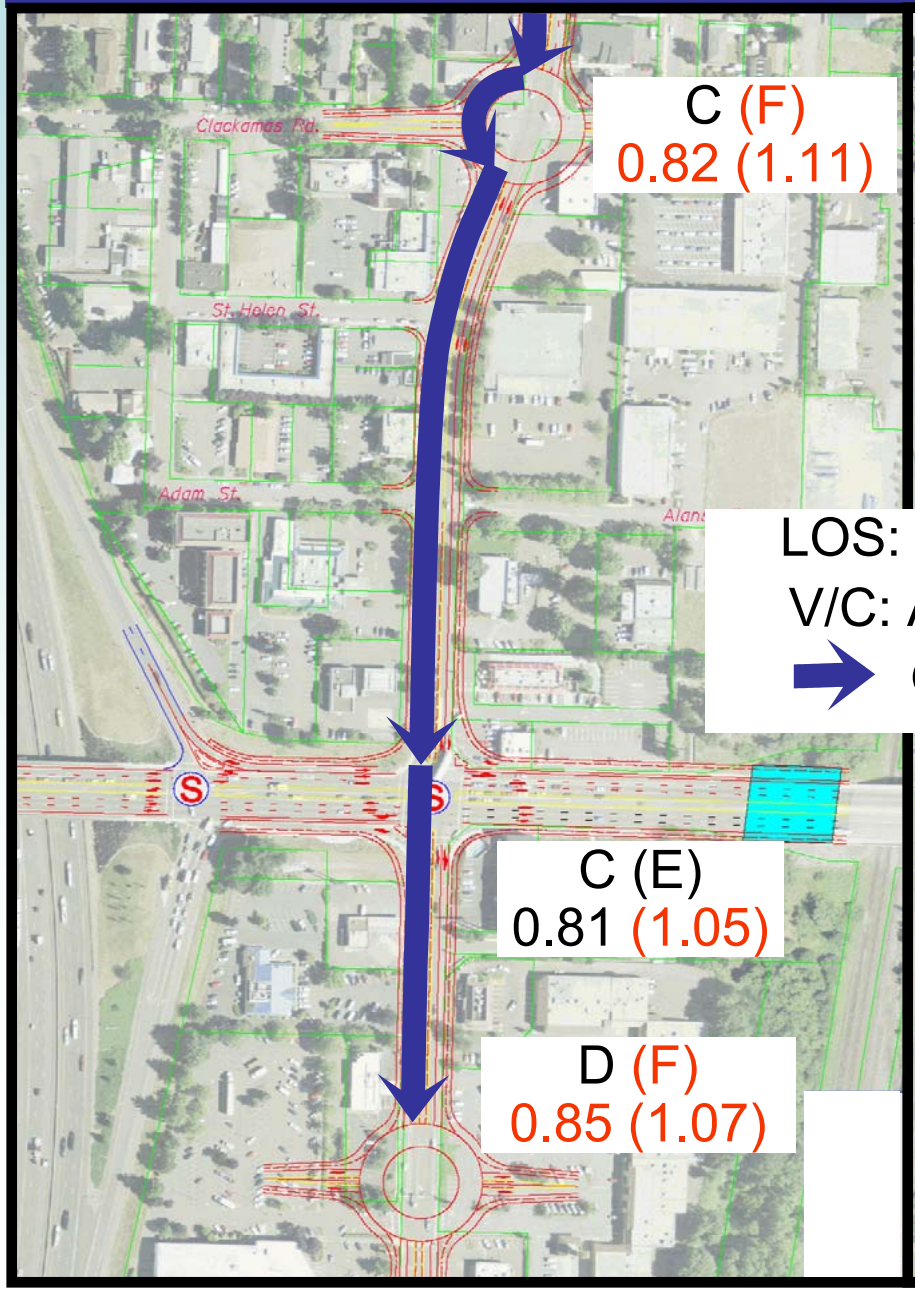
- Queuing results
- Volume/capacity
- Intersection LOS
- Truck accommodation
- Bike/pedestrian accommodation
- Corridor management strategies

Signals

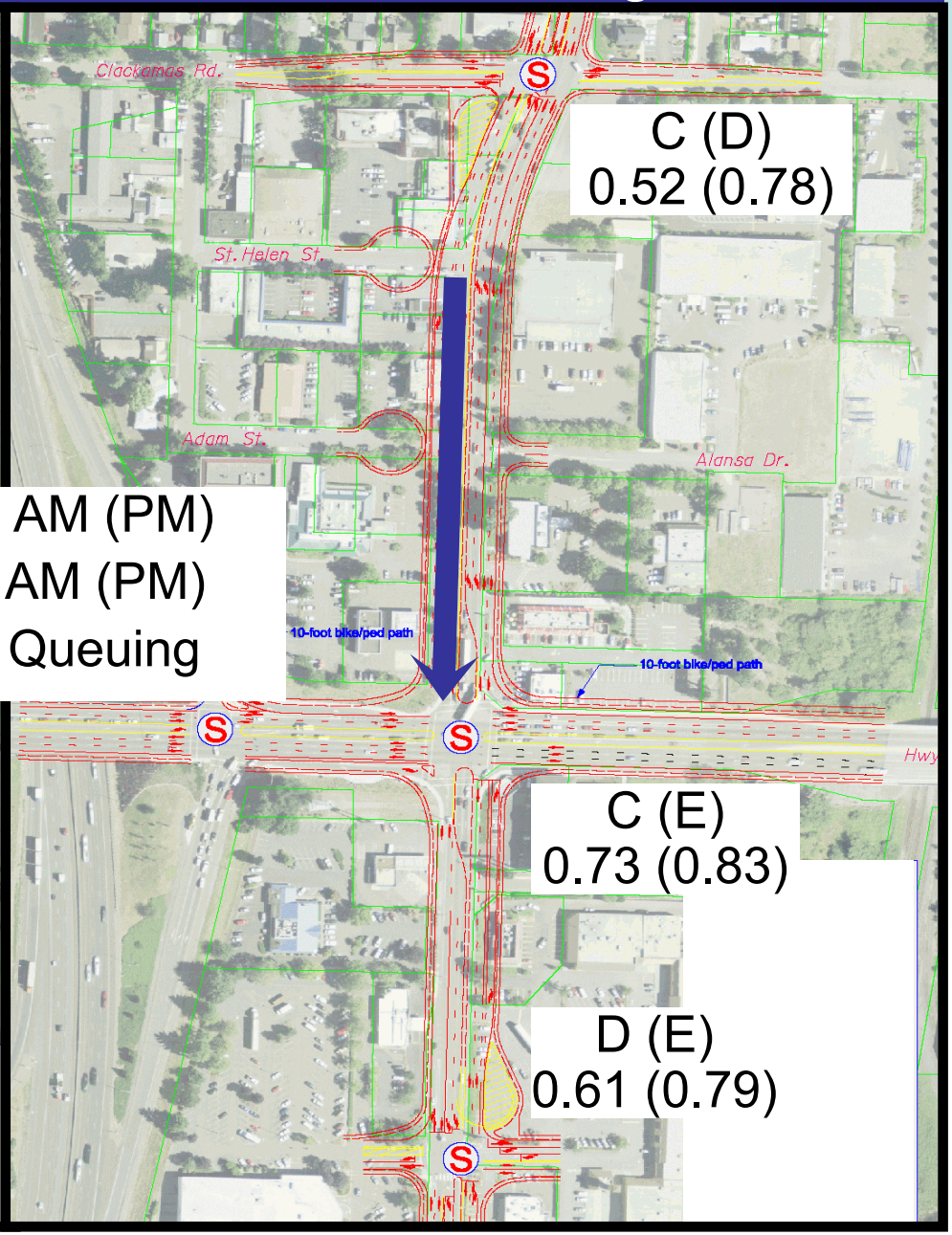


YEAR 2030

5-Lane with Roundabouts



8-Lane with Signals



LOS: AM (PM)
V/C: AM (PM)
→ Queuing

No Left Turns Permitted @ OR 212/82nd Dr. Operational Performance Results

Performance Measure	Intersection	Roundabouts AM (PM)	Signals AM (PM)
Intersection LOS	Clackamas Rd	C (F)	C (D)
	Clackamas Hwy	C (E)	C (E)
	N. Fred Meyer	D (F)	D (E)
v/c Ratio	Clackamas Rd	0.82 (1.11*)	0.52 (0.78)
	Clackamas Hwy	0.81 (1.05*)	0.73 (0.83)
	N. Fred Meyer	0.85 (1.07*)	0.61 (0.79)
Queuing Results (Does queuing affect upstream intersections?)	Clackamas Rd	No (Yes)	No (No)
	Clackamas Hwy	Yes (Yes)	No (Yes)
	N. Fred Meyer	Yes (Yes)	No (No)

Source: Signalized intersection results from DEA's Synchro/SimTraffic Model.
Isolated roundabout operational results based on ODOT's APM methodology.

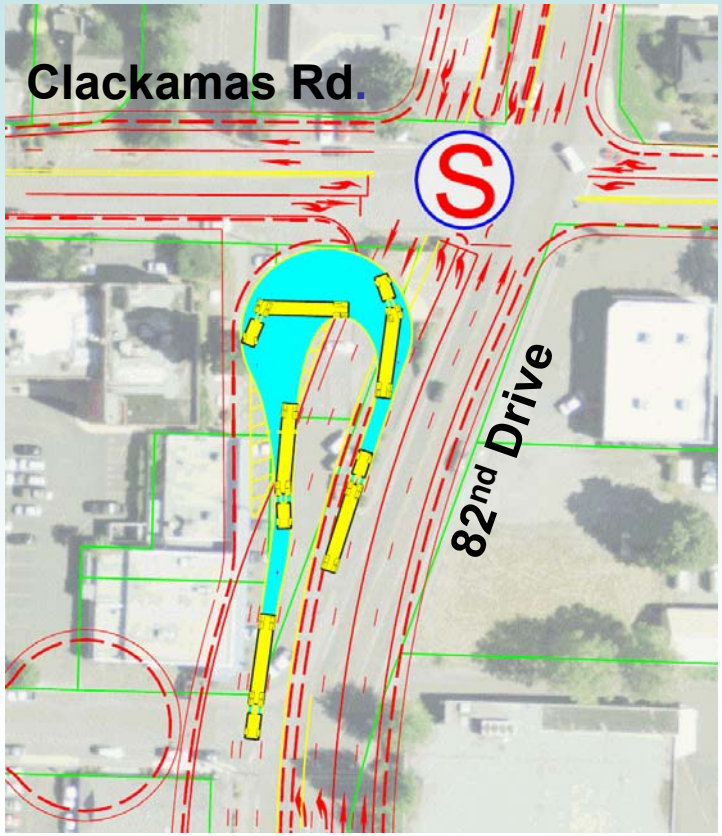
ODOT's Roundabout Siting Criteria

Criteria	Met?
Should have no more than four approach legs.	Met
Should meet acceptable v/c ratios for the proposed design life.	Not Met
Should have approach roadway posted speeds of 35 MPH or less.	Met
Should have normal circulating geometry.	Met
Should have similar or balanced volumes on all approach legs.	Not Met
Should be at an intersection of two highways with roughly the same functional classification or no more than one level of difference.	N/A
Should be mostly commuter and local traffic (not freight).	Met
Should not have high pedestrian volumes.	Met
Should not have high volumes of large trucks.	May meet
Should not be located within an interconnected signal system.	Not Met
Should not be locations where exiting vehicles would be interrupted by queues from signals… or by operational problems by left turns, accesses, etc.	Not Met
Should not be located where grades or topography limit visibility or greatly complicate construction.	Met

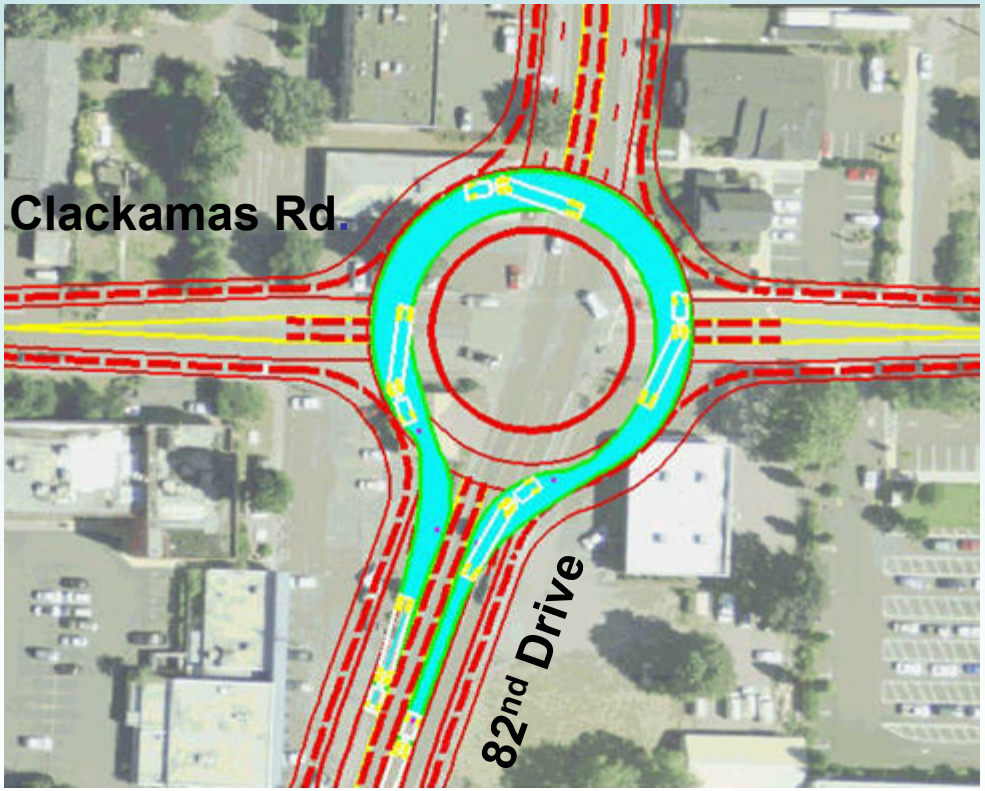
Source: ODOT Analysis and Procedures Manual

Truck Accommodations

Via Signals



Via Roundabouts



Bicycle/Pedestrian Considerations

- Project team convened a bicycle/pedestrian work session to review options
- Agreement that multi-lane roundabouts are not bicycle and pedestrian friendly and present safety and efficiency issues
- Similar concerns for large signalized intersections
- Complex navigation of intersections for bicyclists that choose to travel with the vehicle stream

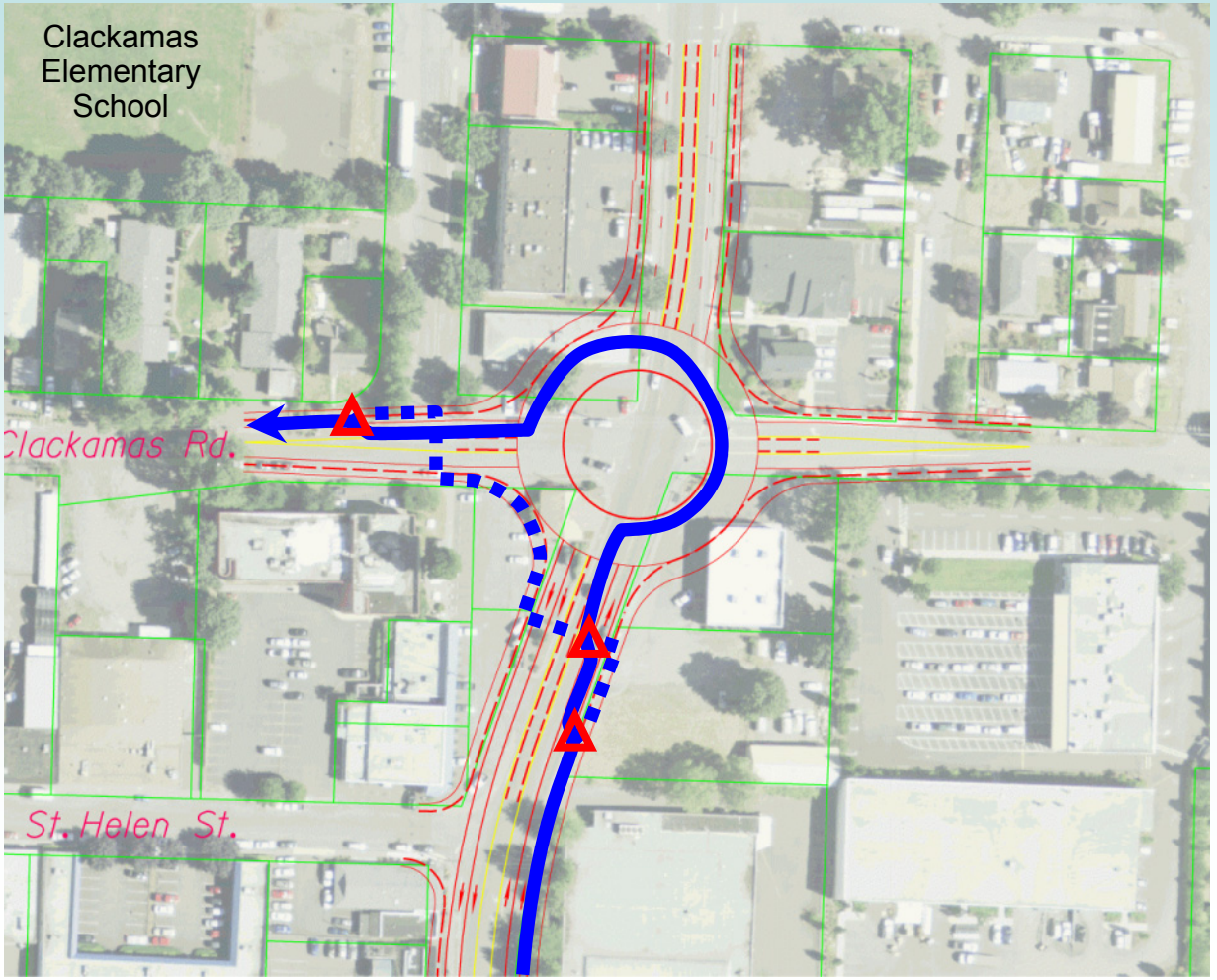
Roundabout - Cyclist

Northbound Left – Cyclist as Pedestrian

Vehicular Cyclist

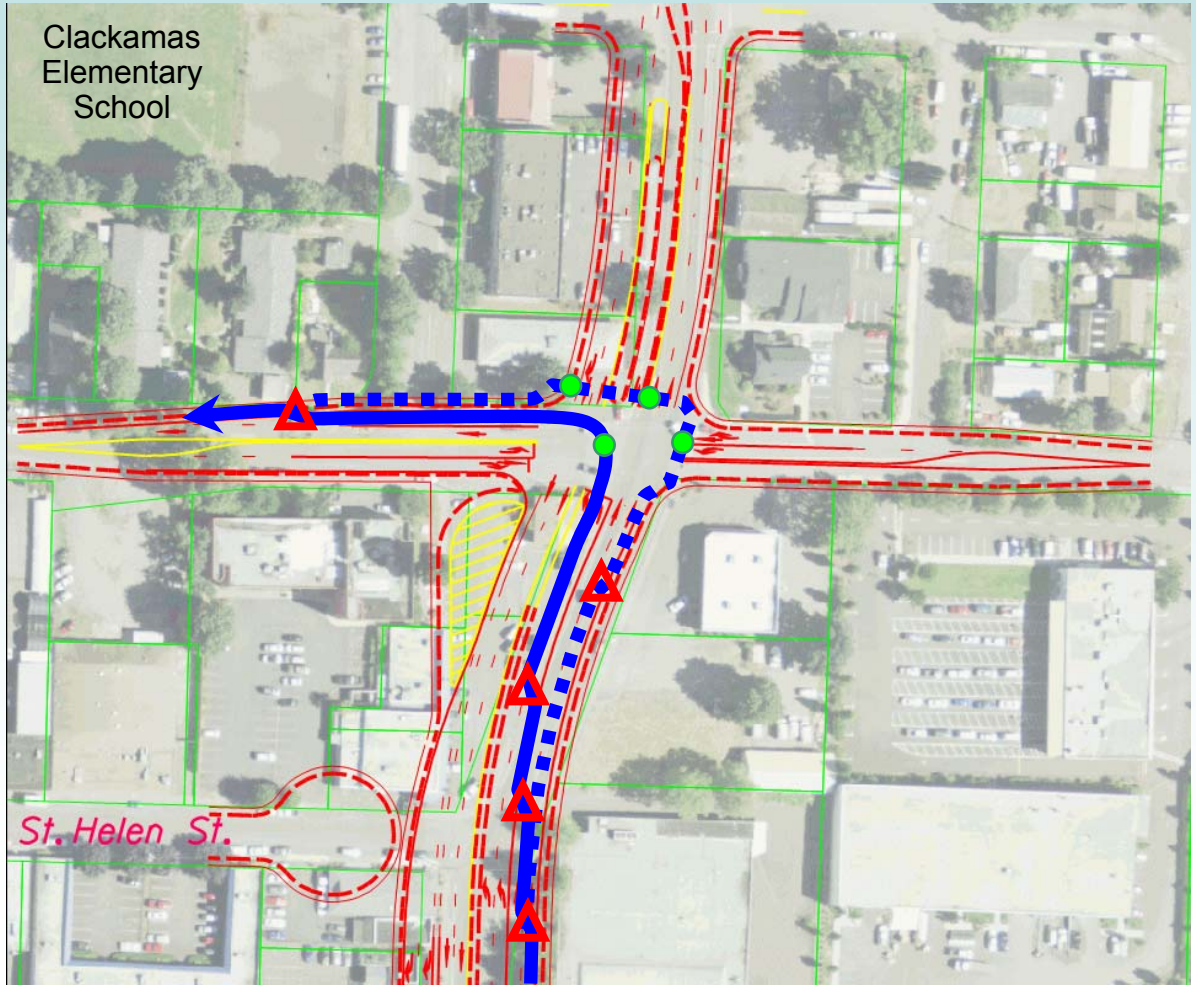
Walking Cyclist

Change to Either
Auto Route or
Pedestrian Route



Signalized - Cyclist

Northbound Left – Cyclist as Pedestrian



Vehicular Cyclist

Walking Cyclist

Change to Either
Auto Route or
Pedestrian Route

Signal Phase

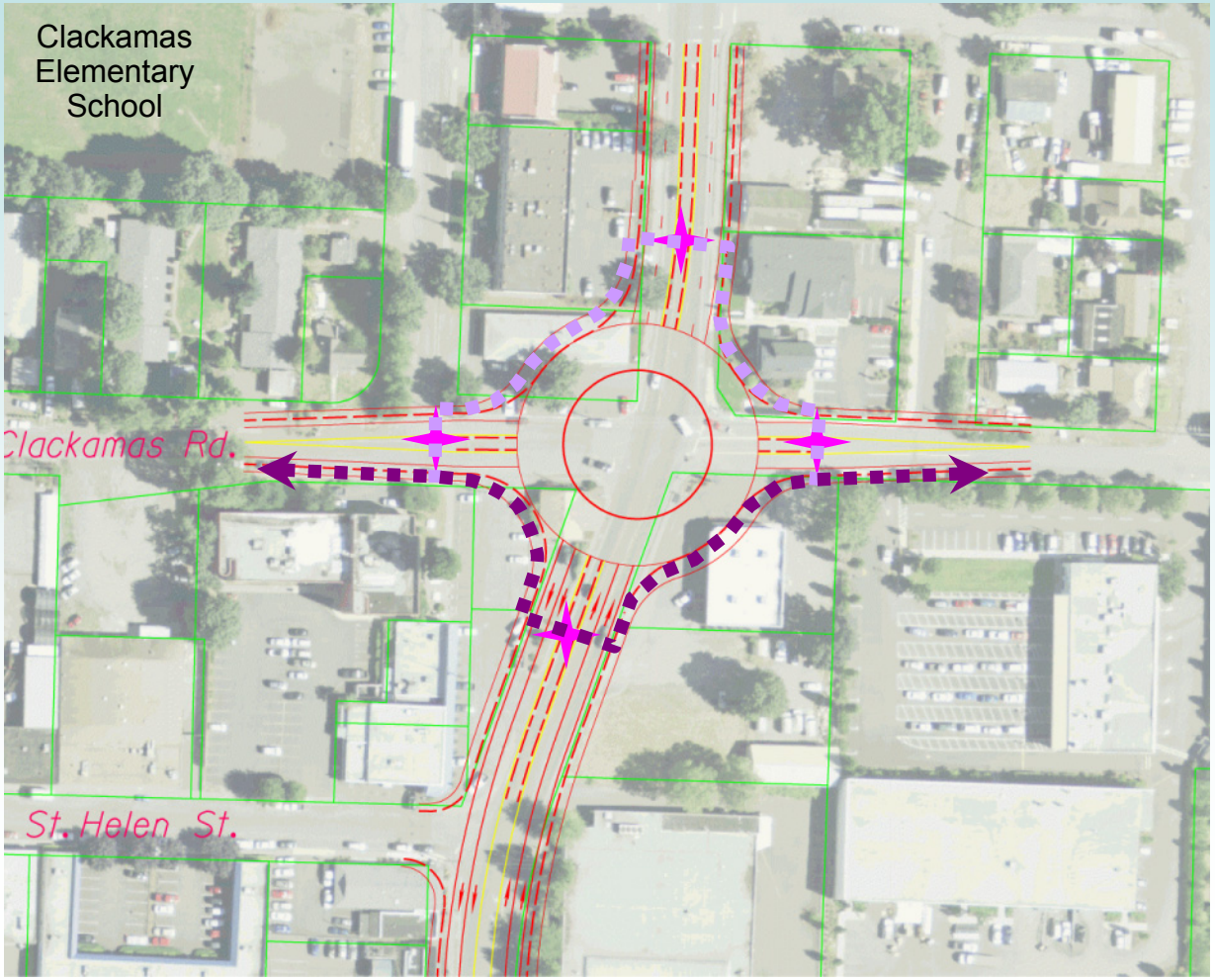
Roundabout - Pedestrian

Southwest to/from Southeast Pedestrian Crossing

Primary Pedestrian pattern

Secondary Pedestrian pattern

Automobiles must yield to pedestrians

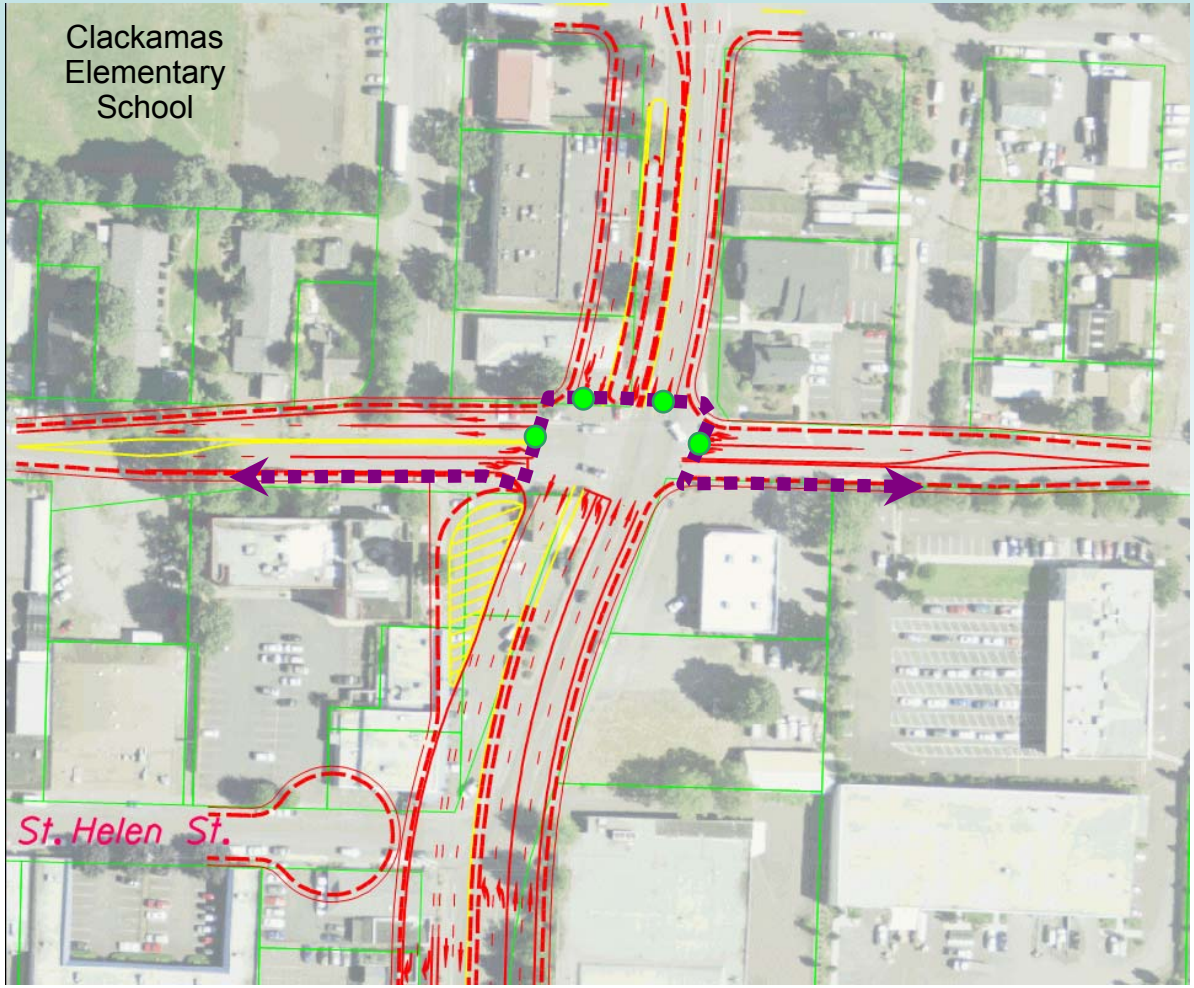


Signalized - Pedestrian

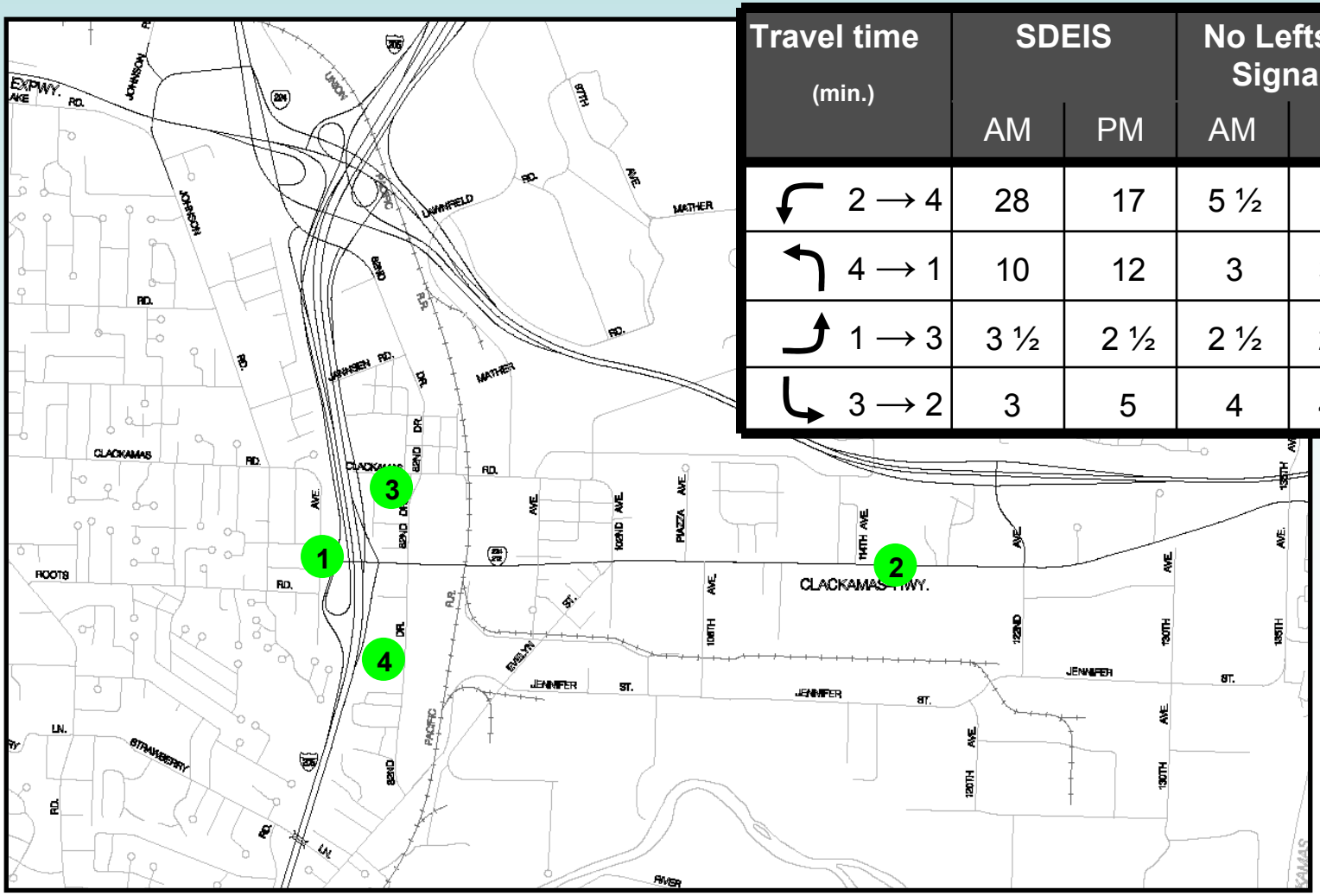
Southwest to/from Southeast Pedestrian Crossing

Pedestrian pattern

Signal Phase



Origin and Destination Travel Times



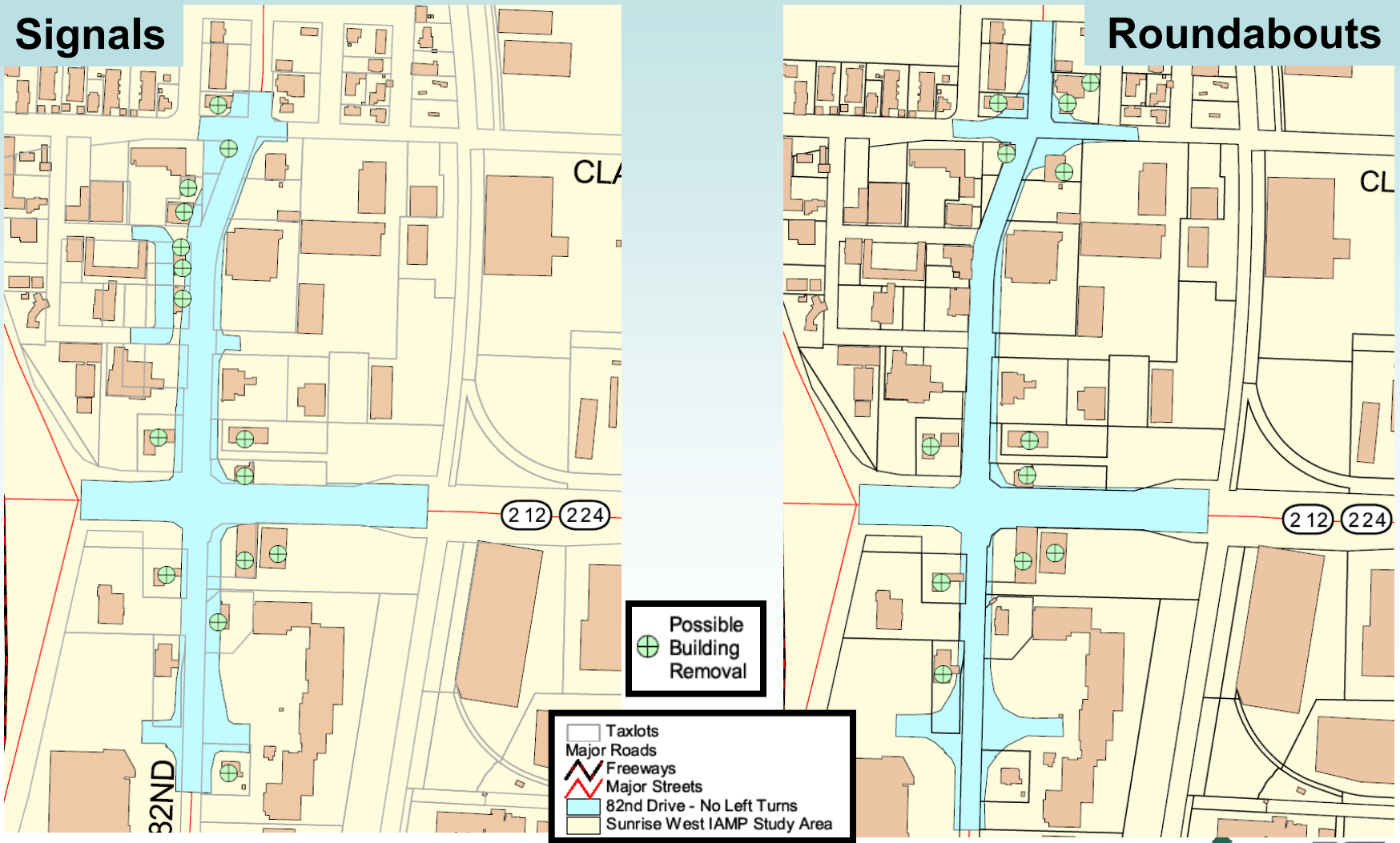
Travel time (min.)	SDEIS		No Lefts w/ Signals		No Lefts w/ Roundabouts	
	AM	PM	AM	PM	AM	PM
2 → 4	28	17	5 ½	7	5	8 ½
4 → 1	10	12	3	3 ½	4	4 ½
1 → 3	3 ½	2 ½	2 ½	2 ½	3	3
3 → 2	3	5	4	4 ½	4 ½	7

Property Impacts Associated with 82nd Drive New Refinement Options

Non-Traffic impacts among the refinement options:

Estimated Impacts	SDEIS Build – Expanded intersection	No Left Turns With Roundabouts			No Left Turns With Signals
	8 – Lane	5 – Lane	6 – Lane	7 – Lane	8 – Lane
Buildings Removed	11	12	17	18	15
Business Relocated (2004 data)	17	18	24	26	23
Employees Relocated (2004 Data)	139	120	152	158	193
Payroll 2004 Impacted	$2.9 Million	$1.8 Million	$3.2 Million	$3.3 Million	$2.6 Million

Right-of-Way and Possible Building Removal Comparison



Questions