Highway 213 and Beavercreek Road Alternative Mobility Targets

CAG Meeting #1

January 5, 2017

Project Background

- Oregon City 2013 Transportation System Plan (TSP) determined the intersection of OR213 and Beavercreek Road will not meet mobility standards in 2035
- Oregon Highway Plan (OHP): defines policies and investment strategies for Oregon's state highway system for the next 20 years
  - Leaves responsibility for identifying projects and modal alternatives to the corridor and transportation system plans
  - 1F: Highway Mobility Policy
    - Maintain acceptable and reliable levels of mobility
    - "Mobility targets will be the initial tool to identify deficiencies and consider solutions for vehicular mobility"

Project Background

- Mobility Targets:
  - Measure by which the State assesses existing of forecasted operational conditions of a facility
  - Impact land use, transportation planning, and development review
  - Guide operations decisions
- Existing Target:
  - Set forth in the 2013 TSP for the OR 213/Beavercreek Road intersection
  - Volume-to-capacity ratio (v/c) compares demand (volumes) to supply (capacity)
  - During the highest one-hour period of the day, a maximum v/c ratio of 0.99 shall be maintained

Project Objectives

1. Identify if there are any feasible improvements to meet current standards
2. Identify whether an alternative mobility target is necessary

Project Schedule and CAG Role

Schedule:

- CAG Meeting #2 - Feb. 2
  - Review Memo #2
- CAG Joint Meeting - April 20
  - Review Draft Report
- Final Report: May 2017

CAG Role:

- Provide review of technical memorandums
- Help the City assess the feasibility and practicality of the improvement alternatives
- Provide input on potential alternative mobility targets

Existing Conditions

- OR213
  - 4-lane section
  - 55 mph
  - Expressway to north
  - District highway to south
  - ODOT
  - Local Truck Route
  - Multiuse Path on east side south of Beavercreek Road
- Beavercreek Road
  - 4/5-lane section
  - 35 mph
  - Major Arterial
  - West leg: Oregon City
  - East leg: Clackamas County
  - Bus Route
  - Local Truck Route
  - Sidewalks
  - Bicycle lanes

Existing Conditions

- Stream under north leg
- Wetlands
- Geological hazards:
  - Steep slopes
  - Landslides
- Impacts may require:
  - Earthwork
  - Culvert extensions
  - Wetland mitigation

Existing Conditions

Existing Conditions

Operations:

- 2% Growth Rate
- Mobility Standard: v/c 0.99
- TSP shows v/c of 0.83 under 2011 existing conditions

Safety:

- High collision intersection
- Crashes from 2010-2014
- ODOT Safety Priority Index System (SPIS): top 5%
- Lack of driver expectation of southbound queues

Crash Type				Severity			Total	Critical Crash Rate by Intersection Type	Critical Crash Rate by Volume	Observed Crash Rate at Intersection	Observed Crash Rate>Critical Crash Rate?
Rear-End	Turning	Angle	Other	PDO	Injury	Fatal					
116	7	5	5	58	74	1	133	0.59	0.50	1.20	Yes

Planned Area Improvements

- Southbound OR 213 advanced warning system
- Lengthen dual left-turn lanes on eastbound approach of Beavercreek Road
- Roundabouts
- Road extensions
- Parallel routes
- Road widenings

Alternative Intersection Configurations

At-Grade:

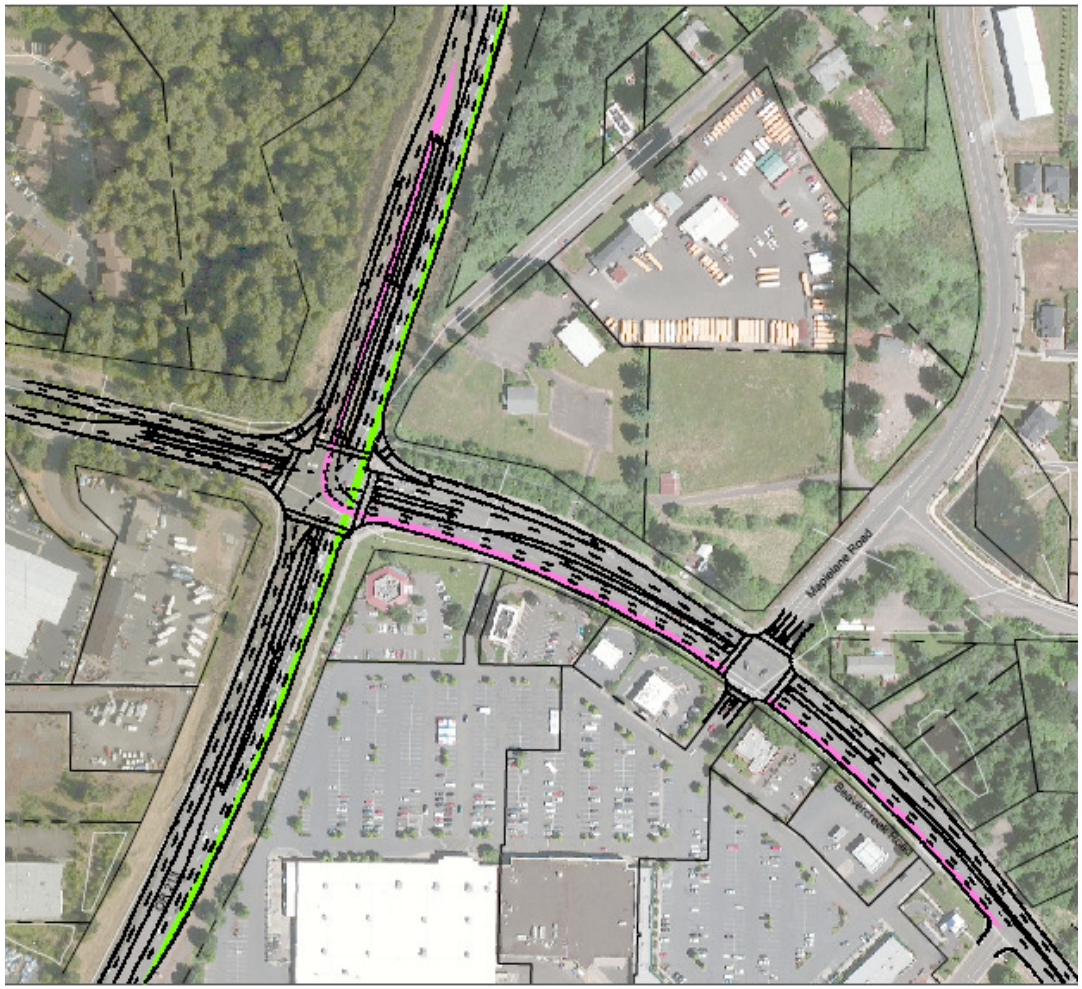
- 1 - Triple Left-Turns
- 2 - Quadrant Road
- 3 - Southbound Displaced Left-Turns
- 4 - Southbound and Eastbound Displaced Left-Turns

Interchanges:

- 5 - Full Diamond
- 6 - Half Diamond
- 7 - Single Point

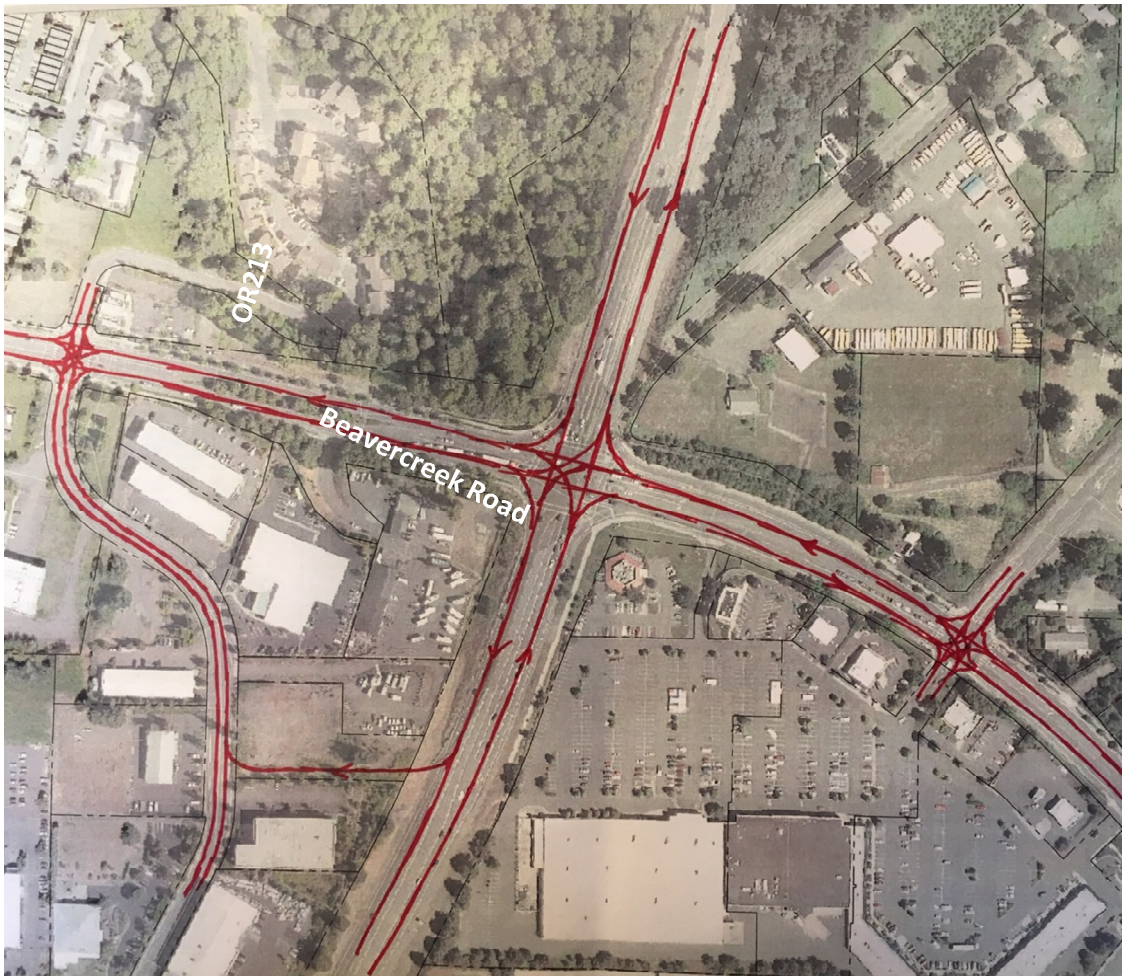
Alternative 1 - Triple Left Turns

- Maintains existing intersection control
- Third southbound left-turn lane and third northbound through lane
- v/c = 0.90 (may not provide benefit commensurate with costs)
- Likely will NOT impact the northwest and northeast corners
- Increase intersection crossing distances for pedestrians/bikes
- $5-$10M



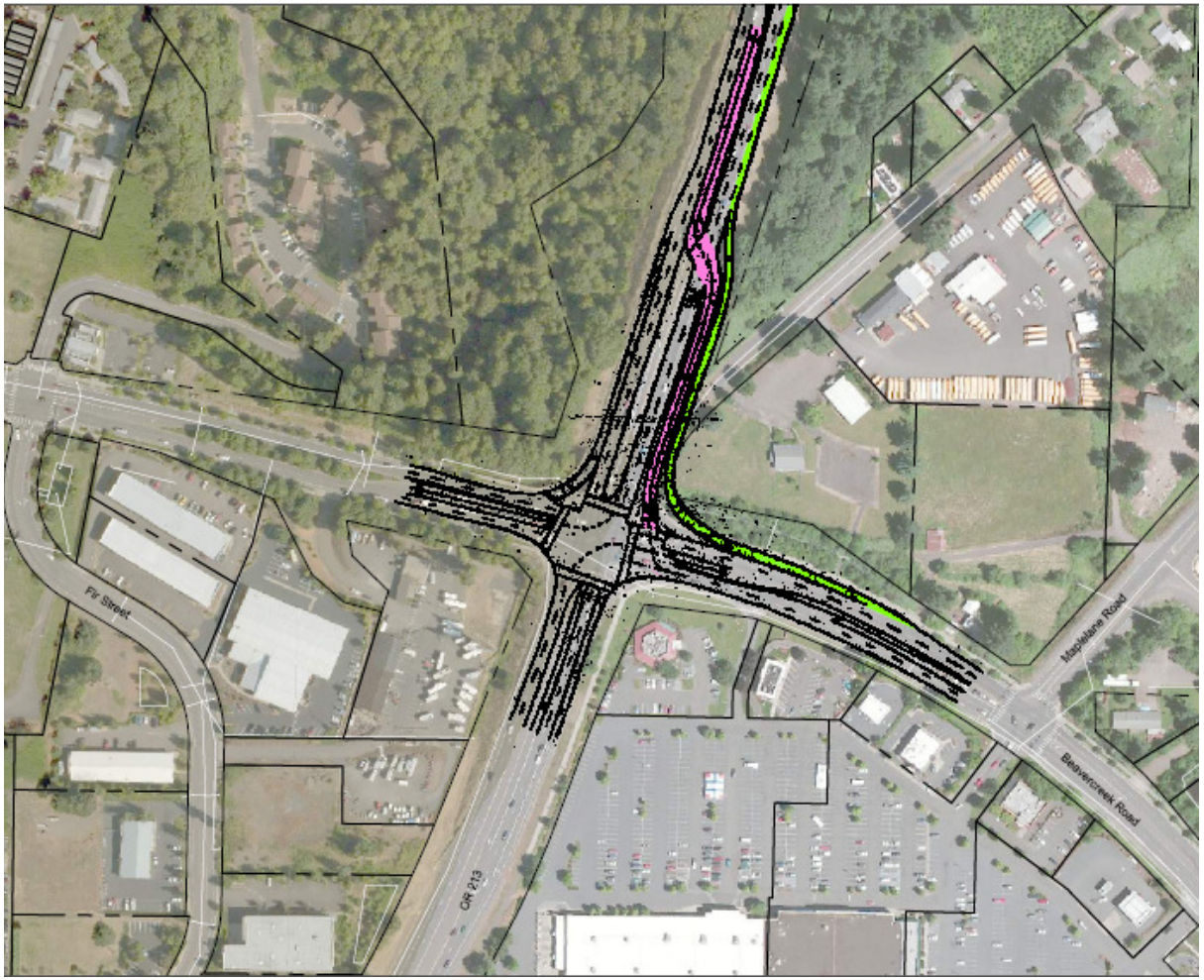
Alternative 2 - Quadrant Road

- Indirect left-turn
- Requires new roadway connection and third eastbound through lane
- Increased travel time
- v/c = 0.94 (may not provide benefit commensurate with costs)
- Widening likely to impact culvert and retaining walls in northwest and northeast corners
- Requires right-of-way to connect OR213 to Fir Street
- Increase intersection crossing distances for pedestrians/bikes
- $5-$8M



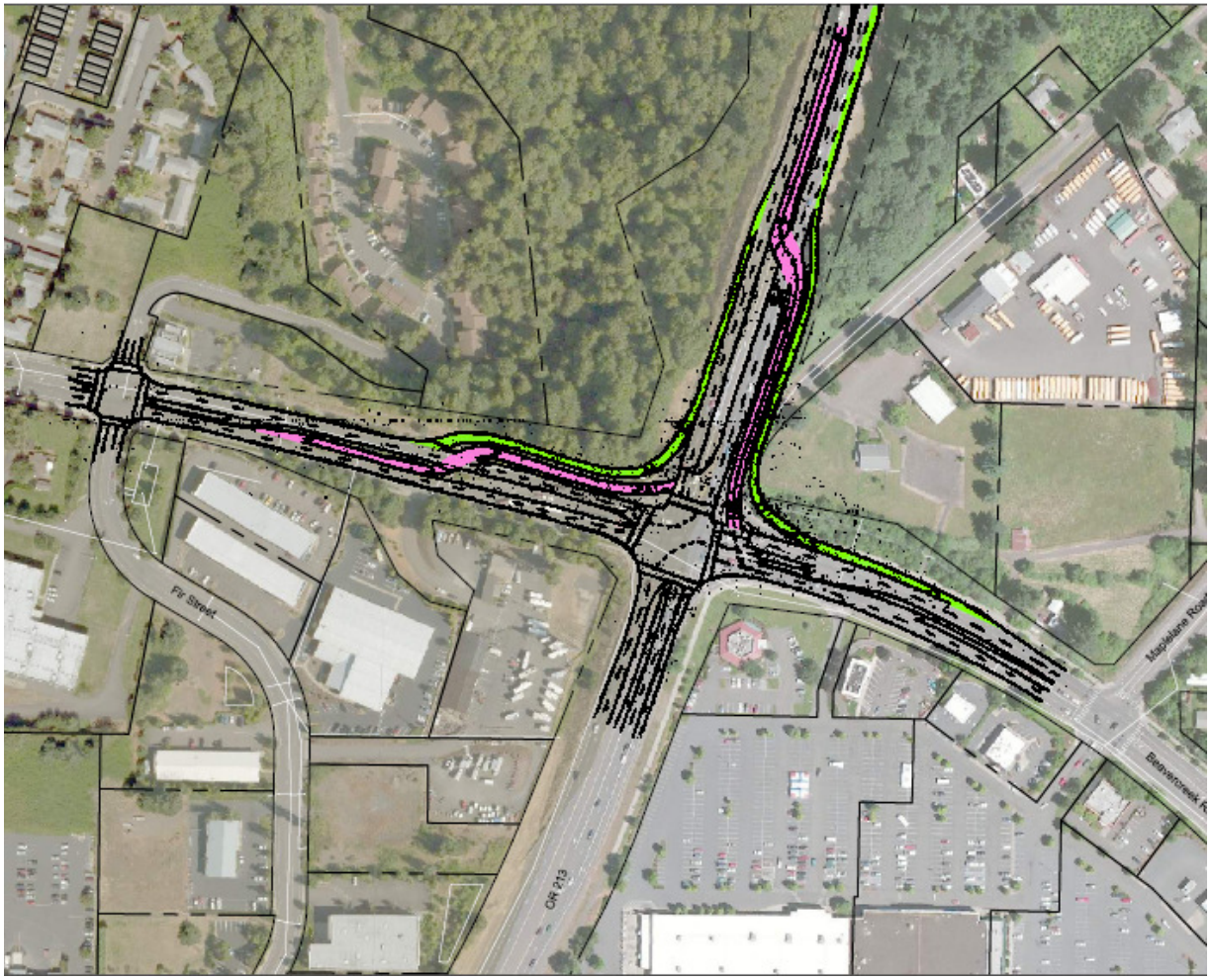
Alternative 3 - Southbound Displaced Left-Turn

- Continuous flow intersection
- Requires upstream signal
- Consider prohibiting northbound left-turns
- v/c = 0.86
- Impacts to culvert and retaining walls in northeast corner
- Reduces crossing distances but creates two-stage crossing
- $5-$10M



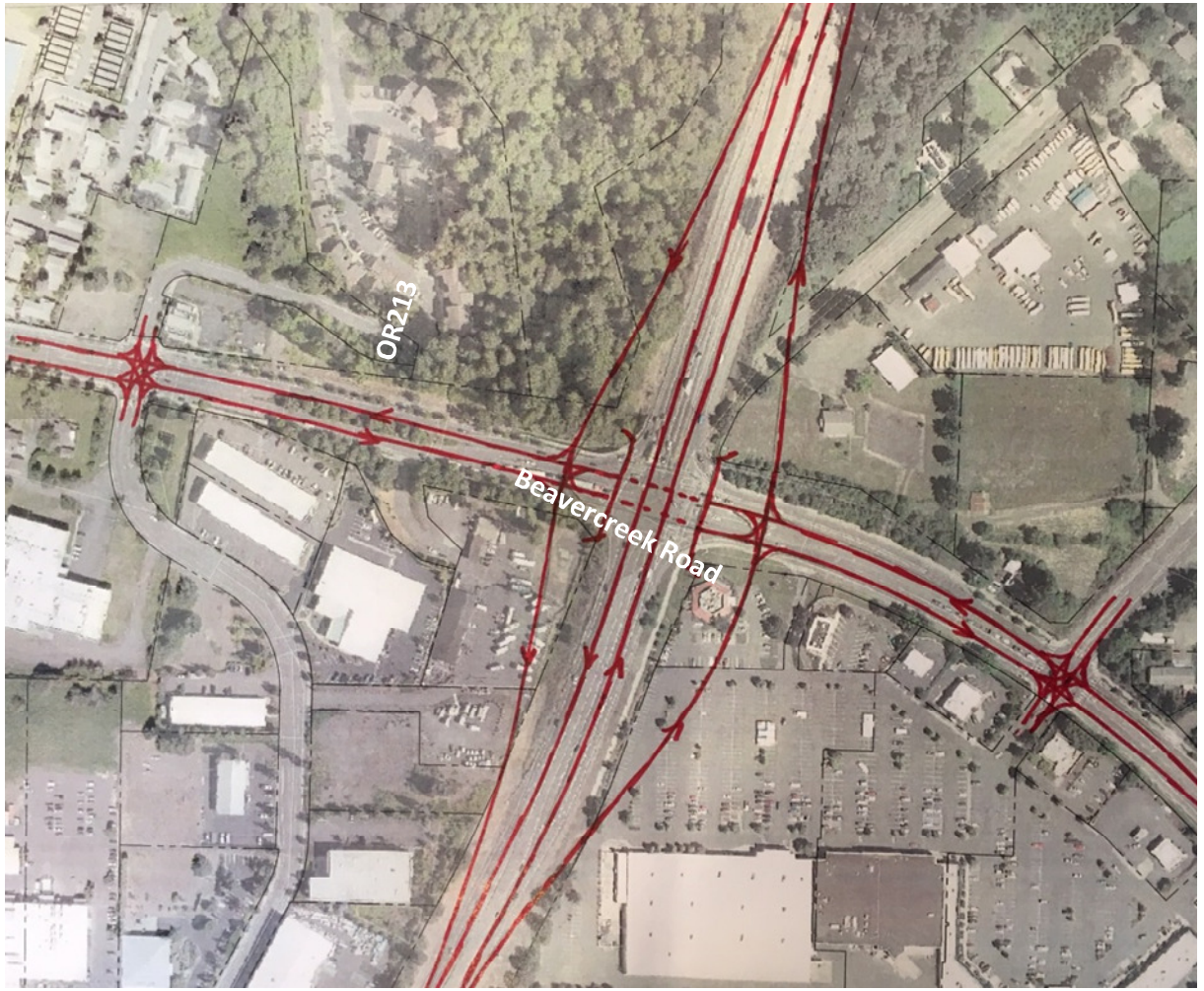
Alternative 4 - Southbound and Eastbound Displaced Left-Turns

- Continuous flow intersection
- Requires upstream signals
- Consider prohibiting northbound and westbound left-turns
- v/c = 0.81
- Impacts to culvert and retaining walls in northwest and northeast corners
- Reduces crossing distances but creates two-stage crossing
- $8-$12M



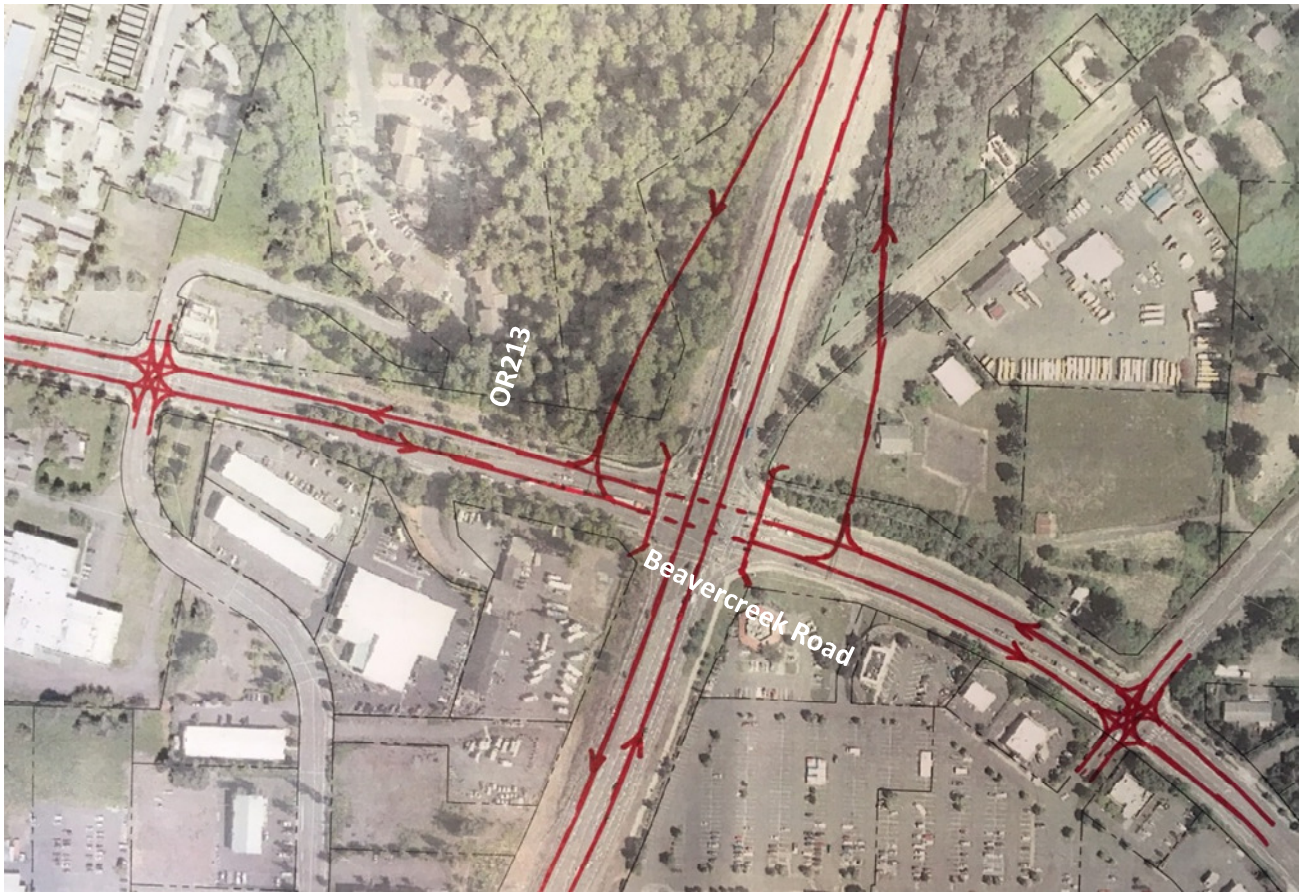
Alternative 5 - Full Diamond Interchange

- Ramps impact surrounding land uses
- v/c = 0.82
- Right-of-way impacts
- Creates two major intersections for pedestrians/bikes to navigate
- >$25M



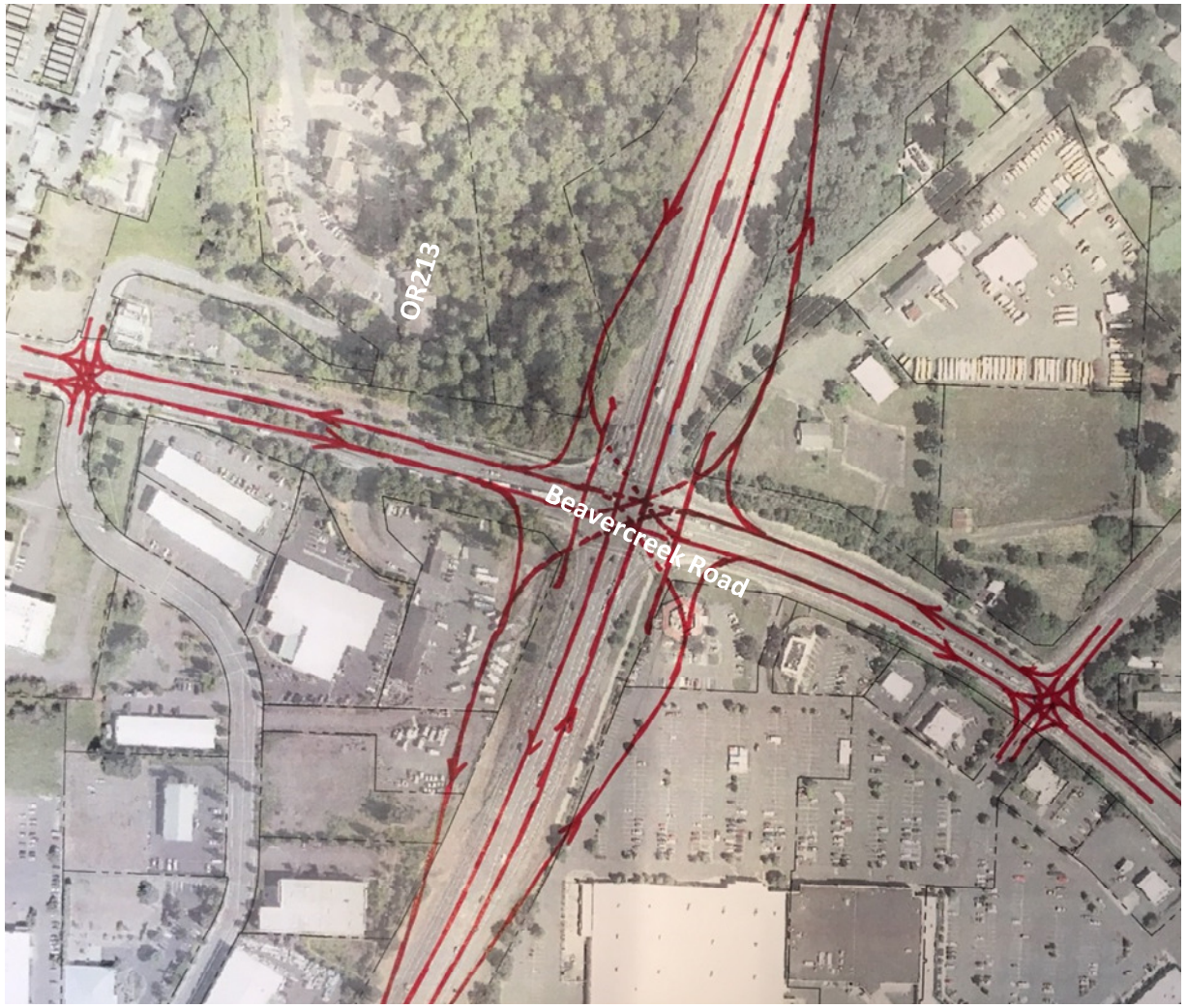
Alternative 6 - Half Diamond Interchange

- Southbound off-ramp and northbound on-ramp only
- Ramps impact surrounding land uses
- v/c = 0.79
- Right-of-way impacts
- Creates two major intersections for pedestrians/bikes to navigate
- >$25M



Alternative 7 - Single Point Interchange

- Ramps impact surrounding land uses
- v/c = 0.80
- Right-of-way impacts
- Creates two major intersections for pedestrians/bikes to navigate
- >$25M



CAP-X Alternatives Operations Analysis Summary (Year 2035)

Alternative		v/c	Figure/Exhibit
1	Lane Additions: Triple Southbound Left-Turn Lanes and Three Northbound Thru Lanes	0.90	Figure 2
2	Indirect Left (S/W Quadrant Road) with Three Southbound and Eastbound Thru Lanes	0.94	Exhibit 2
3	Southbound Displaced Left-Turn	0.86	Figure 3
4	Southbound and Eastbound Displaced Left-Turns	0.81	Figure 4
5	Full Diamond Interchange with Dual Eastbound and Westbound Left-Turn Lanes	0.82	Exhibit 3
6	Half Diamond Interchange with Dual Eastbound Left-Turn Lanes	0.79	Exhibit 4
7	Single Point Interchange with Dual Eastbound and Westbound Left-Turn Lanes	0.80	Exhibit 5

Alternatives Assessment

- Capacity
- Right-of-Way Impacts
- Environmental Impacts
- Bicycle and Pedestrian Impacts
- Cost
- Provision of Traffic Movements

Alternative		Additional Capacity	Right-of-Way Impacts	Environmental Impact	Bike/Ped Impacts	Cost	Eliminates Movements?
	Existing	None	None	None	No Improvement	NA	No
1	Triple Southbound Left / Three Northbound Thru	Some v/c = 0.90	None to Minimal	None to Minimal	Increased Crossing Distances	Medium ($5-$10M)	No
2	Indirect Left (S/W Quadrant Road)	Some v/c = 0.94	New Connection on Industrial Land	NW and NE Corners	Increased Crossing Distances	Medium ($5-$8M)	No
3	Southbound Displaced Left-Turn	Significant v/c = 0.86	None to Minimal	NE Corner	Reduced Crossing Distances	Medium ($5-$10M)	Would provide additional benefit
4	Southbound and Eastbound Displaced Left-Turns	Significant v/c = 0.81	None to Minimal	NW and NE Corners	Reduced Crossing Distances	Medium ($8-$12M)	Would provide additional benefit
5	Full Diamond Interchange	Significant v/c = 0.82	High	NW and NE Quadrants	Two intersections	High (>$25M)	Yes
6	Half Diamond Interchange	Significant v/c = 0.79	High	NW and NE Quadrants	Two intersections	High (>$25M)	No
7	Single Point Interchange	Significant v/c = 0.80	High	NW and NE Quadrants	Two intersections	High (>$25M)	No

Summary

- Comments?
- Further Investigation of any of the alternatives?
- Investigate alternative mobility targets?

Next Steps

- Reviewed alternatives with TAG and CAG
  - Explore in more detail or pursue alternative mobility target?
- Future meetings with TAG and CAG
  - Select alternative mobility target and/or preferred improvement(s) to be adopted into TSP
- Recommendations need to be approved by Planning Commission and City Council to amend the TSP
- Alternative mobility targets need to be approved by the Oregon Transportation Commission and recommended by ODOT.

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING

Conceptual Planned Area Improvements