



# ***OR 217 ATM Project***

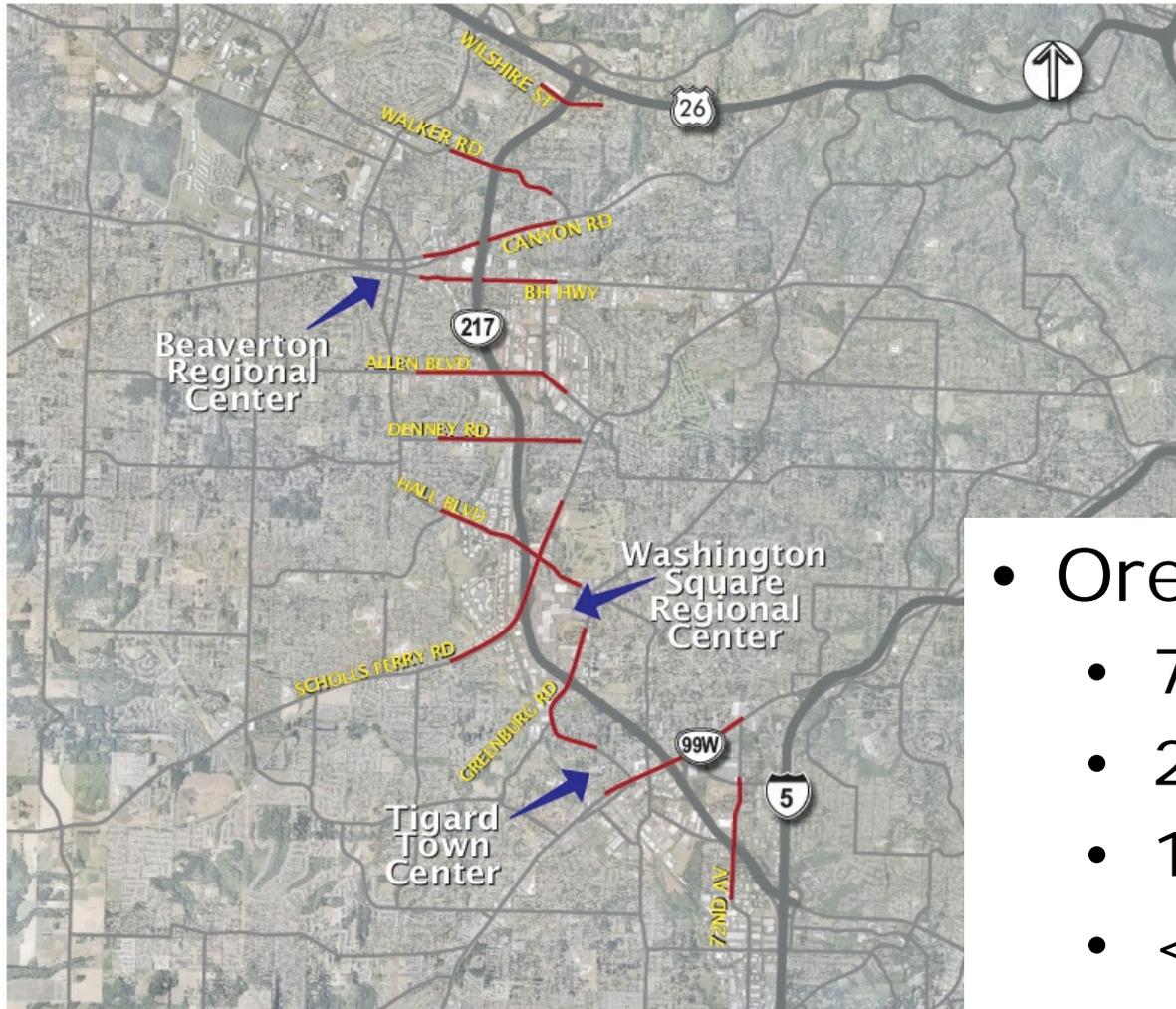
Dennis Mitchell

Transportation Engineering Conference

September 2013

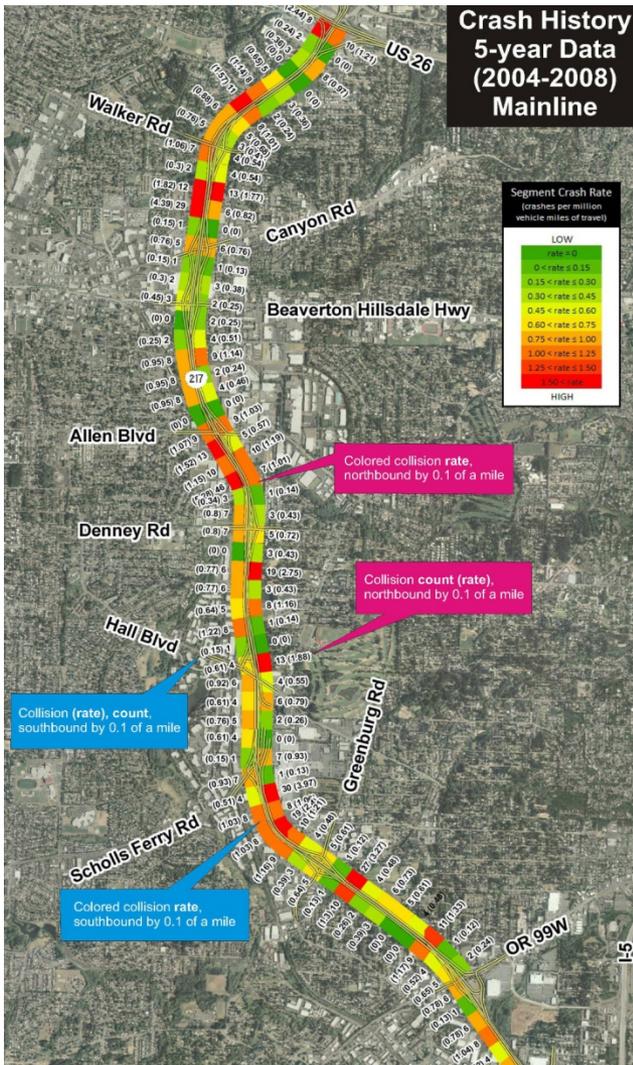


# OR217 Overview



- Oregon Route 217:
  - 7.52 miles
  - 2-3 lane freeway
  - 122,000 ADT
  - <5% heavy vehicles

# High Crash Frequency on OR217



- 200 crashes per year
- 70% rear-end crashes
- Most during peak periods



# ***Planned Solution (2004)***

Add lanes, braid ramps



\$1 billion for 7.5 miles



## ***New Planning Goals (2011)***

- Find a lower cost strategy to improve conditions now
- Not replace the previously established long term needs of the corridor
- Be consistent with the long term corridor plan



## ***Targeted Safety Improvements***

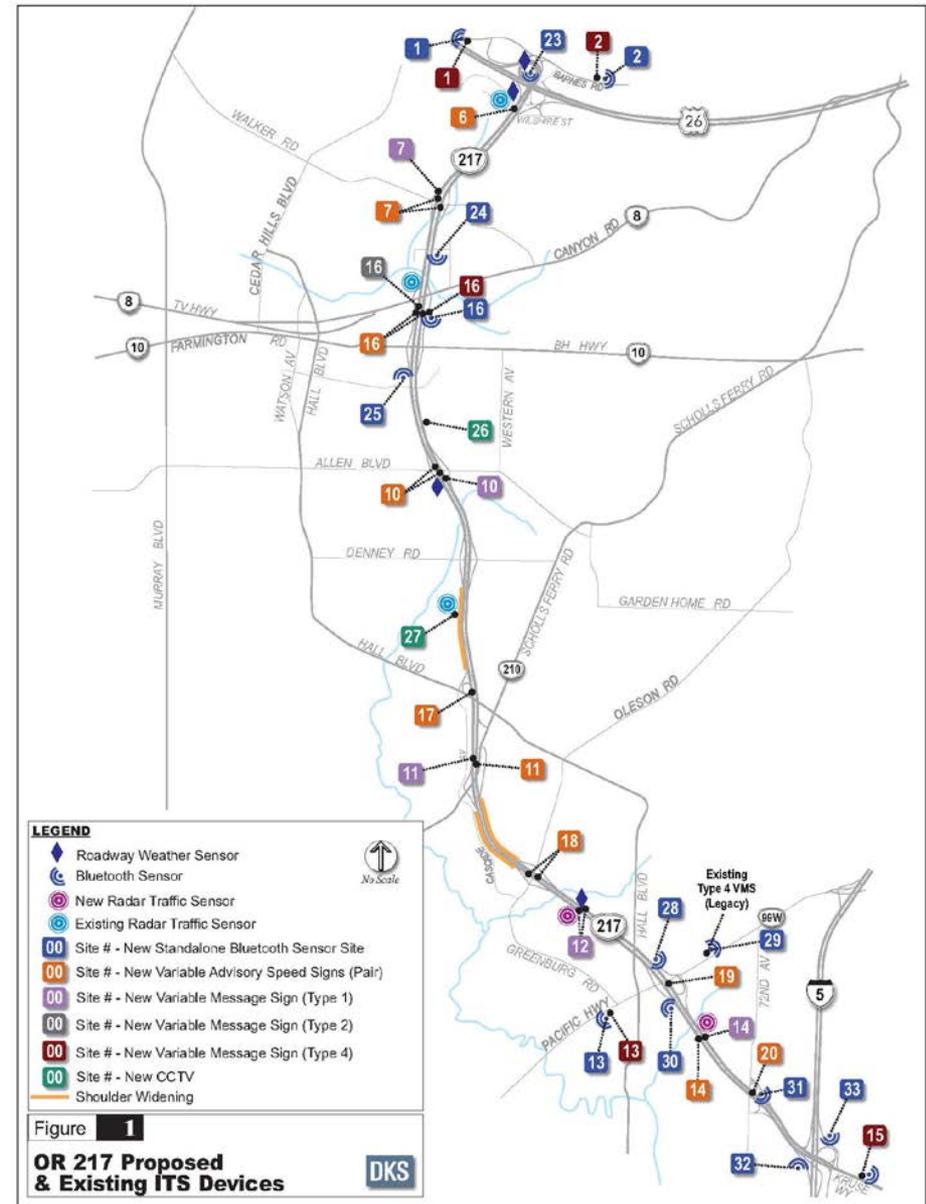
Affordable improvements we can build today, with immediate driver benefits:

- Traveler information system
- Queue warning system
- Variable advisory speeds
- Curve warning system
- Updated adaptive ramp metering
- Shoulder Widening

Total Cost: 1% of \$1 Billion

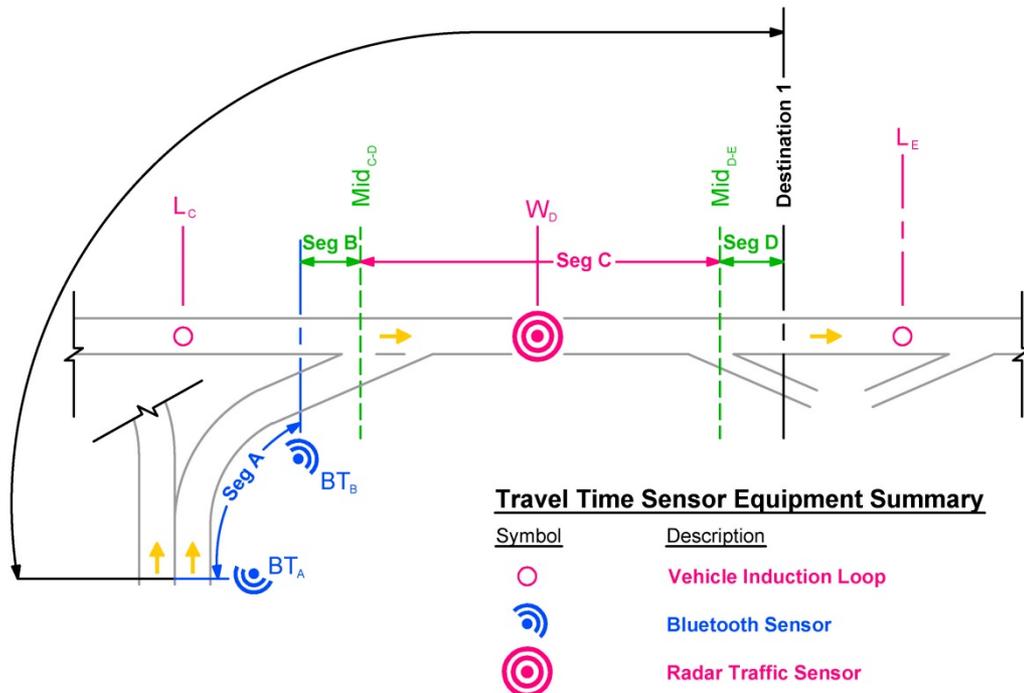
## ***ITS Equipment***

- 28 variable advisory speed signs
- Seven mainline VMS
- Six arterial VMS (one existing)
- Four RWIS grip factor sensors
- Five radar traffic sensors (three existing)
- 12 Bluetooth sensors
- 20 mainline dual-loop stations



# Traveler Information System

Travel Time:  
 US 26 / 185th Ave 8 Min  
 Downtown Portland 12 Min

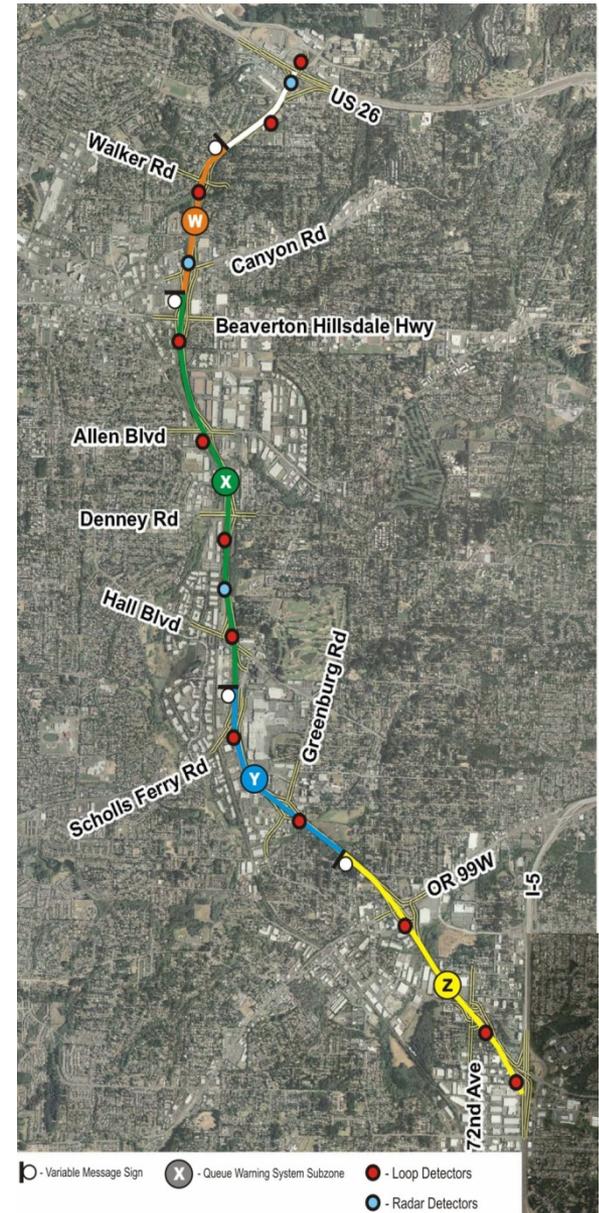


- Travel Information System combines data from vehicle induction loops, radar traffic sensors, and Bluetooth sensors
- Travel times will be displayed during peak times

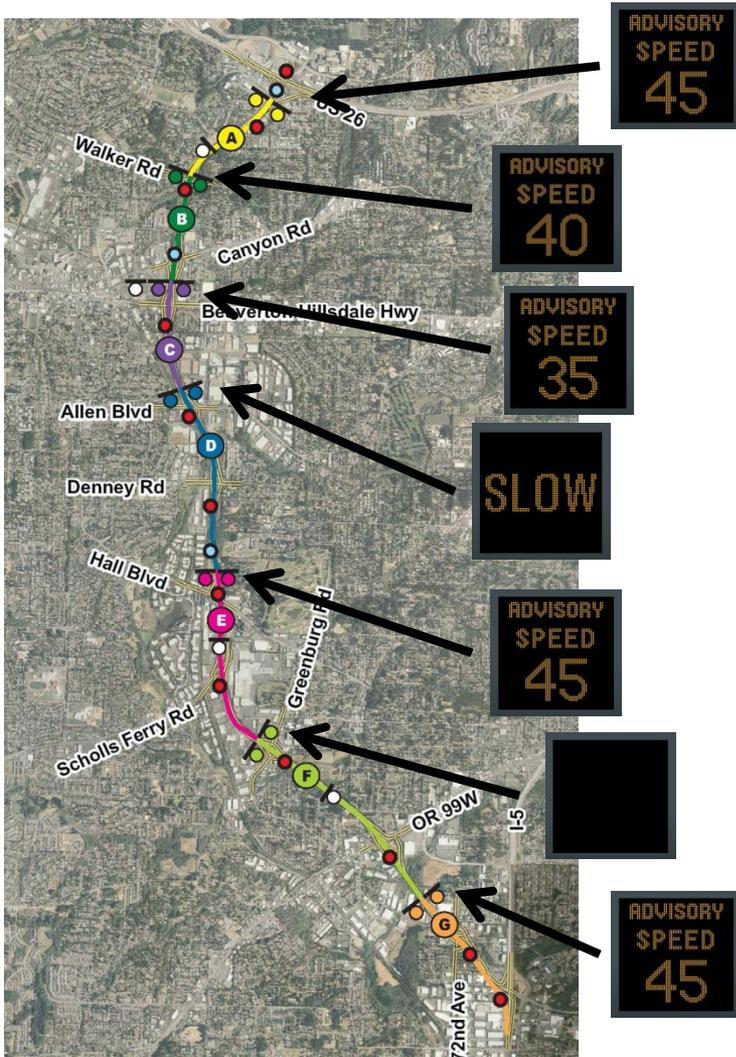
# Queue Warning System

- Aim to reduce sudden braking and rear-end collisions
- Provide details on distance to queue, and if applicable, location
- No message if already congested

**CONGESTION AHEAD**  
**1/2 MILE RIGHT LANE**  
**PREPARE TO SLOW**



# Congestion Responsive



- Each subzone's speed determined by the lower of:
  - Local 85<sup>th</sup> percentile speed
  - Downstream speed + step (5-10 mph)
- Speeds measured by dual loops and radar
- Speeds < 30 mph display "SLOW"



## ***Weather Responsive***

- Goal is to notify drivers of adverse weather conditions by:
  - Providing advised speeds for different adverse weather events (including visibility)
  - Using applicable messages on VMS during adverse weather events
- Four RWIS grip factor sensors installed in corridor
- Worst weather condition will control whole corridor



# Weather Responsive

Weather Speed Lookup Table

Grip Factor		> 0.70	0.70 > X > 0.30	< 0.30	Chain Requirement
Visibility	> 500'	Speed Limit	Speed Limit - 10 MPH	Speed Limit - 20 MPH	Chain Speed
	< 500'	Speed Limit - 10 MPH	Speed Limit - 20 MPH	Minimum Speed	Chain Speed

Weather VMS Message Lookup Table

Grip Factor		> 0.70	0.70 > X > 0.30	< 0.30	Chain Requirement
> 500'	Moist or Wet	(None)	 USE CAUTION	 USE CAUTION	(None)*
	Frosty, Snowy, Icy, or Slushy	N/A	ICE USE CAUTION	ICE USE CAUTION	(None)*
< 500'	Moist or Wet	LOW VISIBILITY USE CAUTION	 USE CAUTION	 USE CAUTION	(None)*
	Frosty, Snowy, Icy, or Slushy	LOW VISIBILITY USE CAUTION	ICE USE CAUTION	ICE USE CAUTION	(None)*

\*Snow zone chain requirement messages for VMS will come from ATMS/TOCS



# Curve Warning System

US26 / OR217  
Interchange



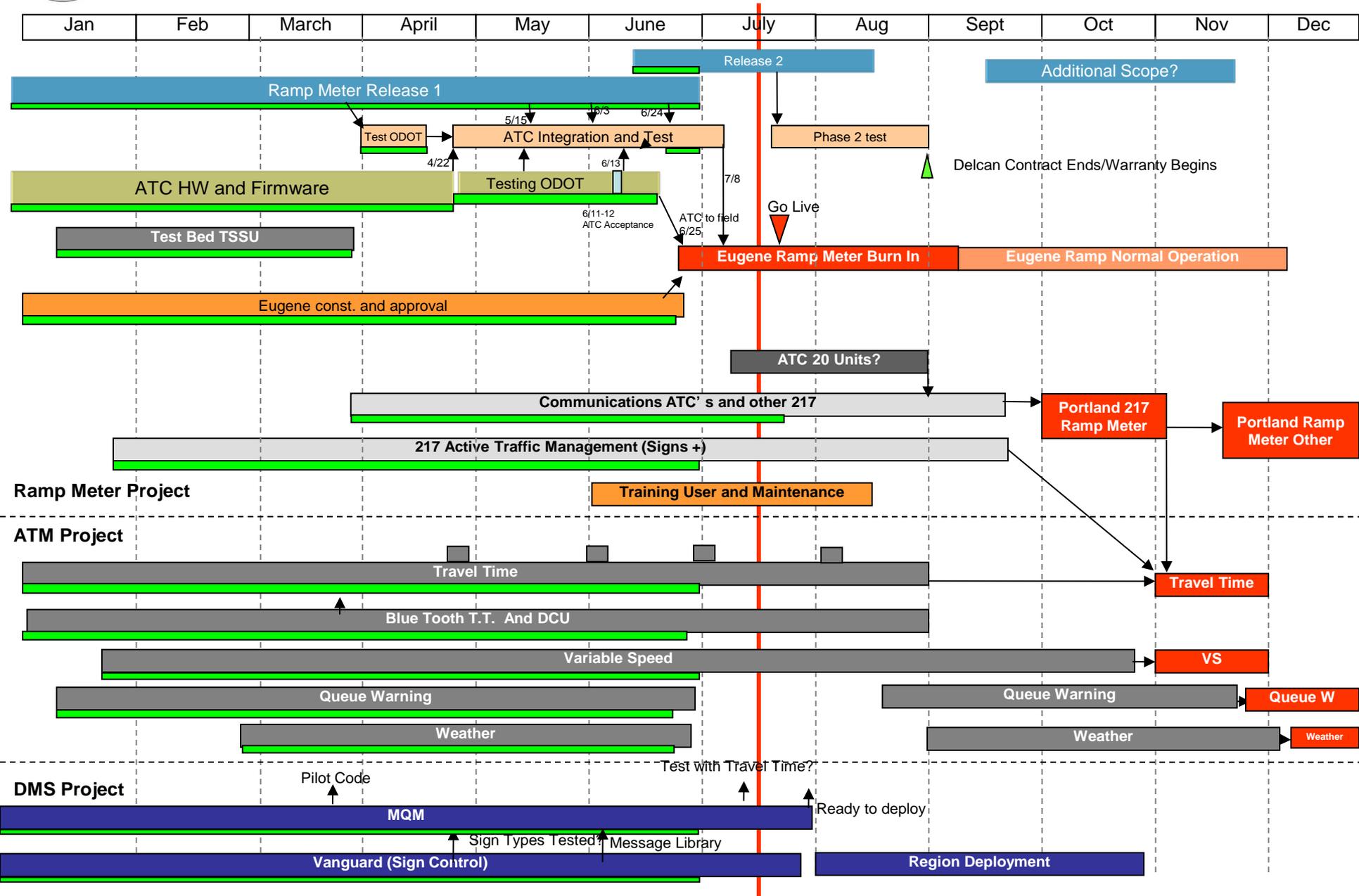
# ***Curve Warning System***

- Activates at similar grip factor thresholds as the weather responsive variable speed system





# Oregon Department of Transportation: A Century of Service





# ***Weather Responsive Evaluation Plan***

## Evaluation Objectives:

1. Measure impact on mean speeds and speed distribution
2. Measure impact on incident rates
3. Measure driver compliance
4. Compare weather based speeds to congestion based recommended speeds
5. Measure impact on reliability
6. Document lessons learned