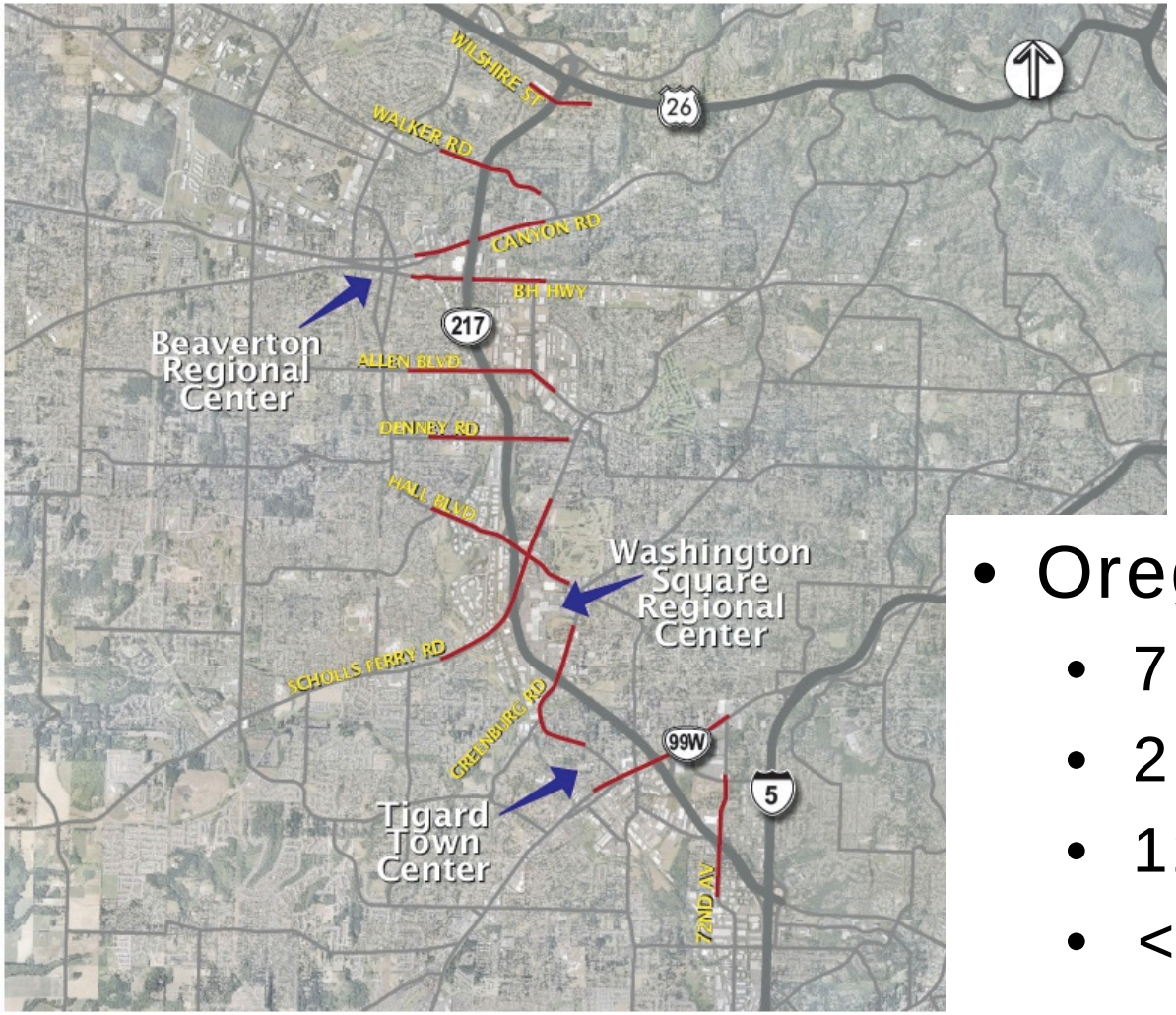
OR 217 ATM Project

Galen McGill

RWM Stakeholder Meeting

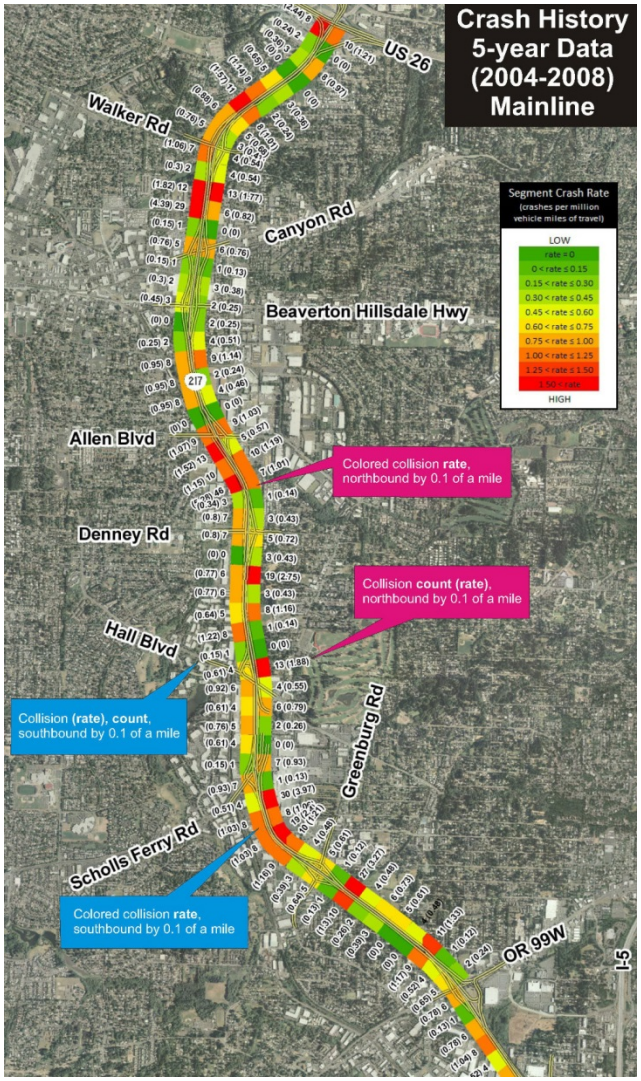
July 2013

OR217 Overview



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

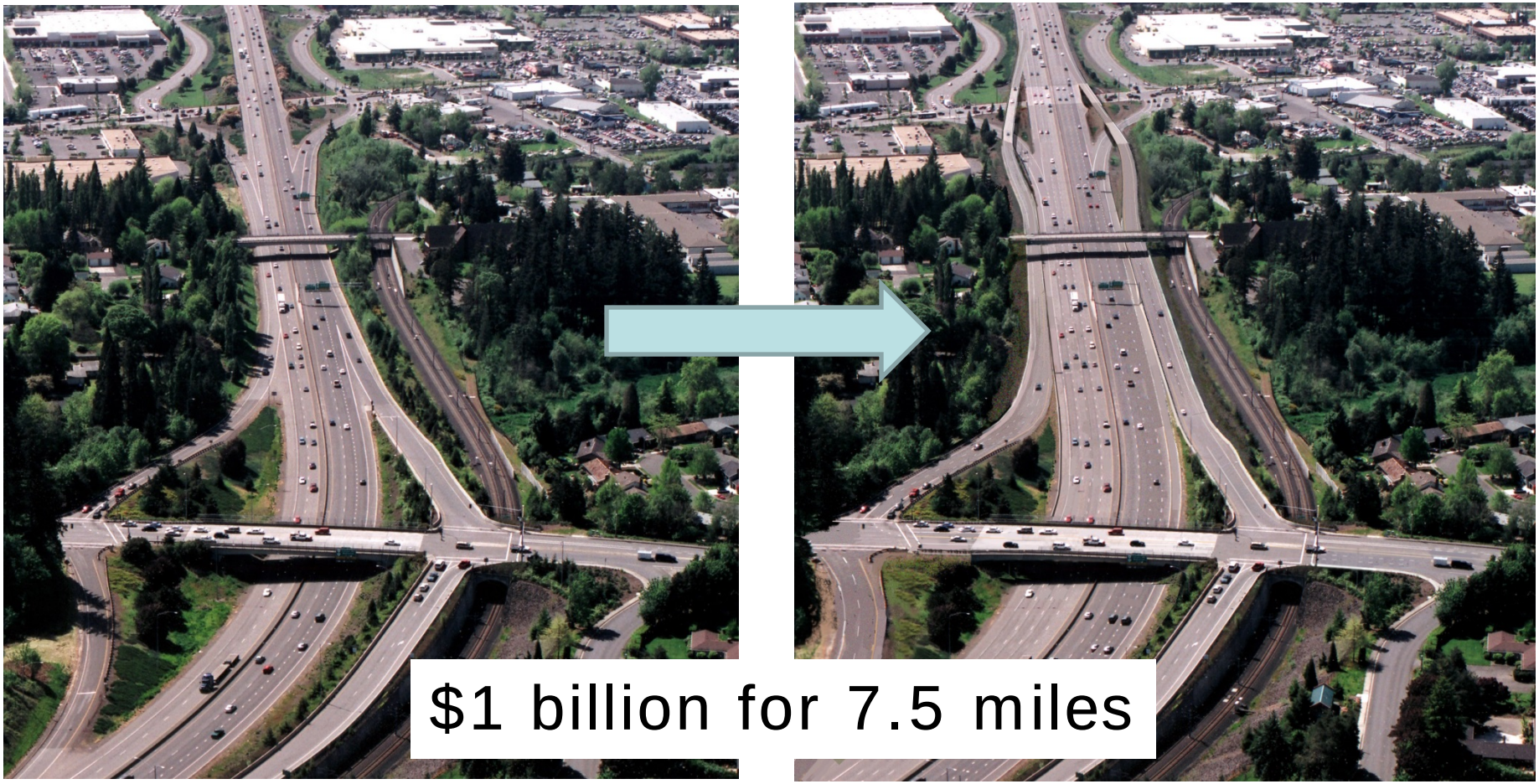
High Crash Frequency on OR217



- 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

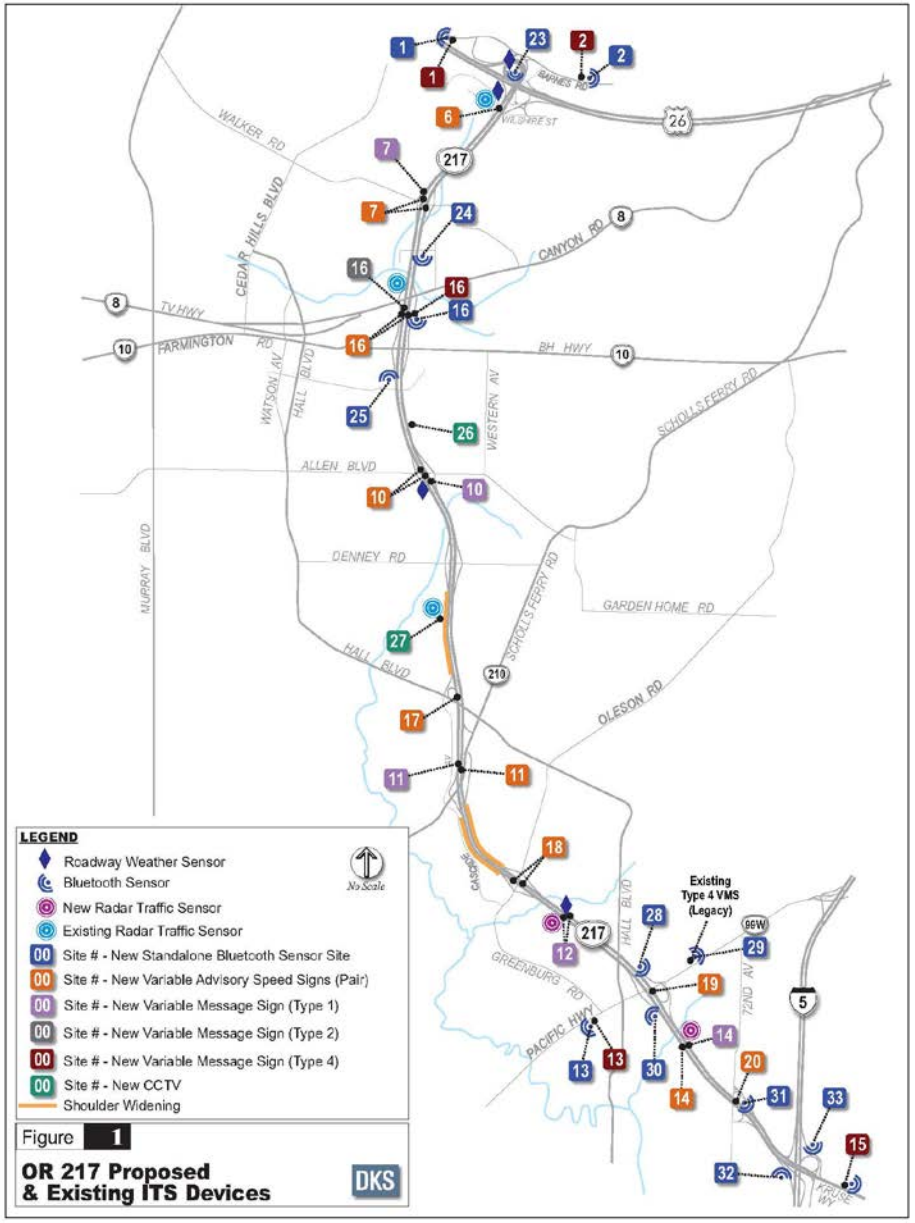
Affordable improvements we can build today, with immediate driver benefits:

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

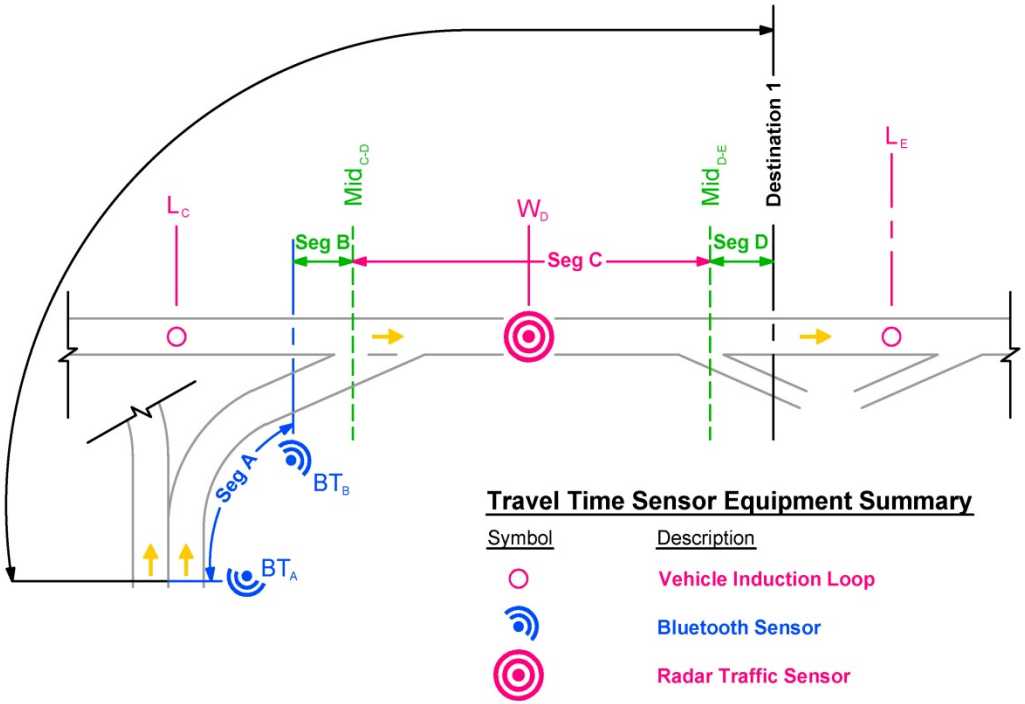
Total Cost: 1% of $1 Billion

ITS Equipment

- 28 variable advisory speed signs
- Six 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



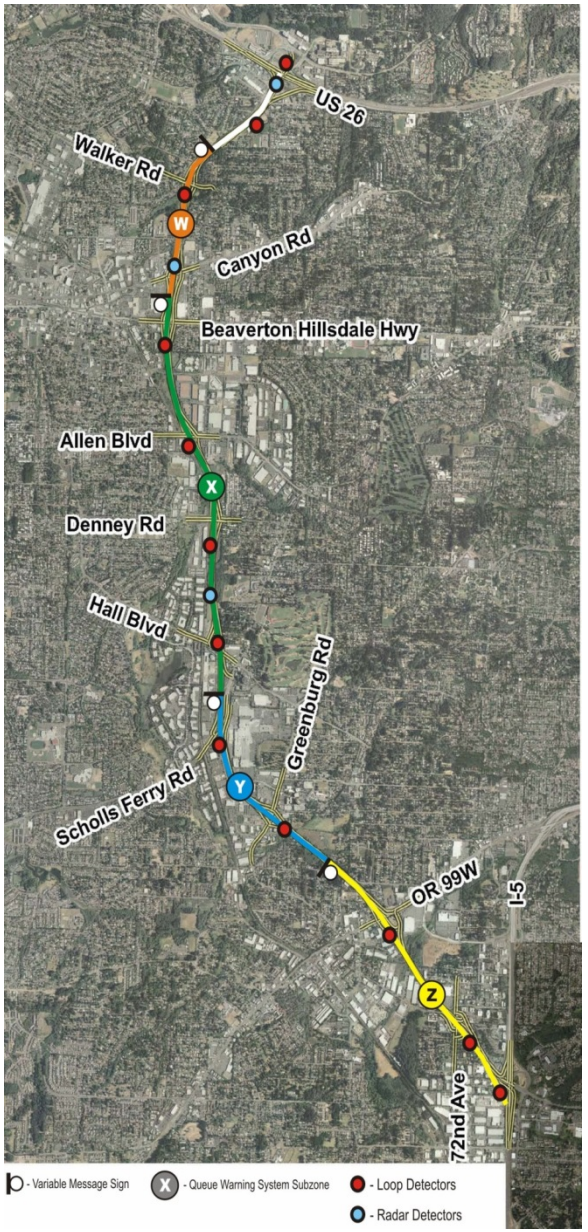
Traveler Information System



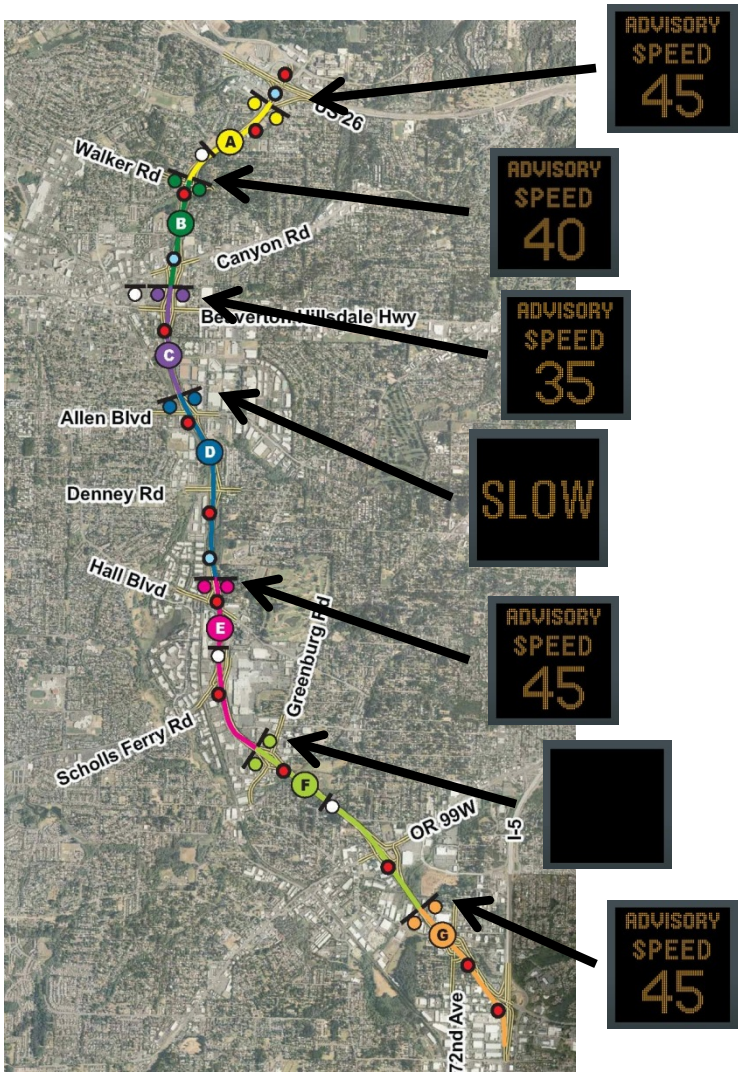
- Travel Information System combines data from vehicle induction loops, radar traffic sensors, and Bluetooth sensors
- Travel times will be displayed during peak times

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 Responsive



- Each subzone's speed determined by the lower of:
  - Local 85th 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

Visibility \ Grip Factor	> 0.70	0.70 > X > 0.30	< 0.30	Chain Requirement
> 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

Visibility	Classification \ 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

Operator Control

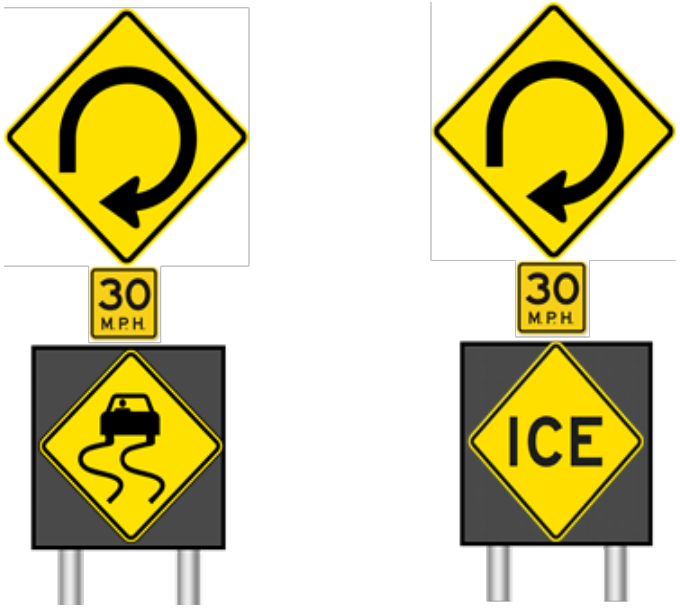
- Control either “Absolute” or “Recommended”
  - Absolute speeds ignore all other speeds being generated by other subsystems
  - Recommended speeds display the slowest speed from any of the subsystems
- Messages include duration and location
- Guidance being developed for different scenarios/conditions

Manual Activation

Condition	Speed
Crash/Lanes closed	Posted speed - 10 MPH
Standing water/spots of ice	Posted speed - 10 MPH
Level 1 -Black Ice/Packed snow w/significant traction problems	Posted speed - 20 MPH
Level 2 – Black Ice/Packed snow w/significant traction problems not resolved by Level 1	Minimum slow speed
Ice/Packed snow plus low visibility	Minimum slow speed
Condition B or B1 Chain Requirement in effect	45 MPH
Condition C Chain Requirement in effect	35 MPH
Visibility less than 500 feet	Posted speed – 10 MPH
Work Zone	Specified in temporary speed zone order
Sensor Failure	Posted speed

Curve Warning System

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



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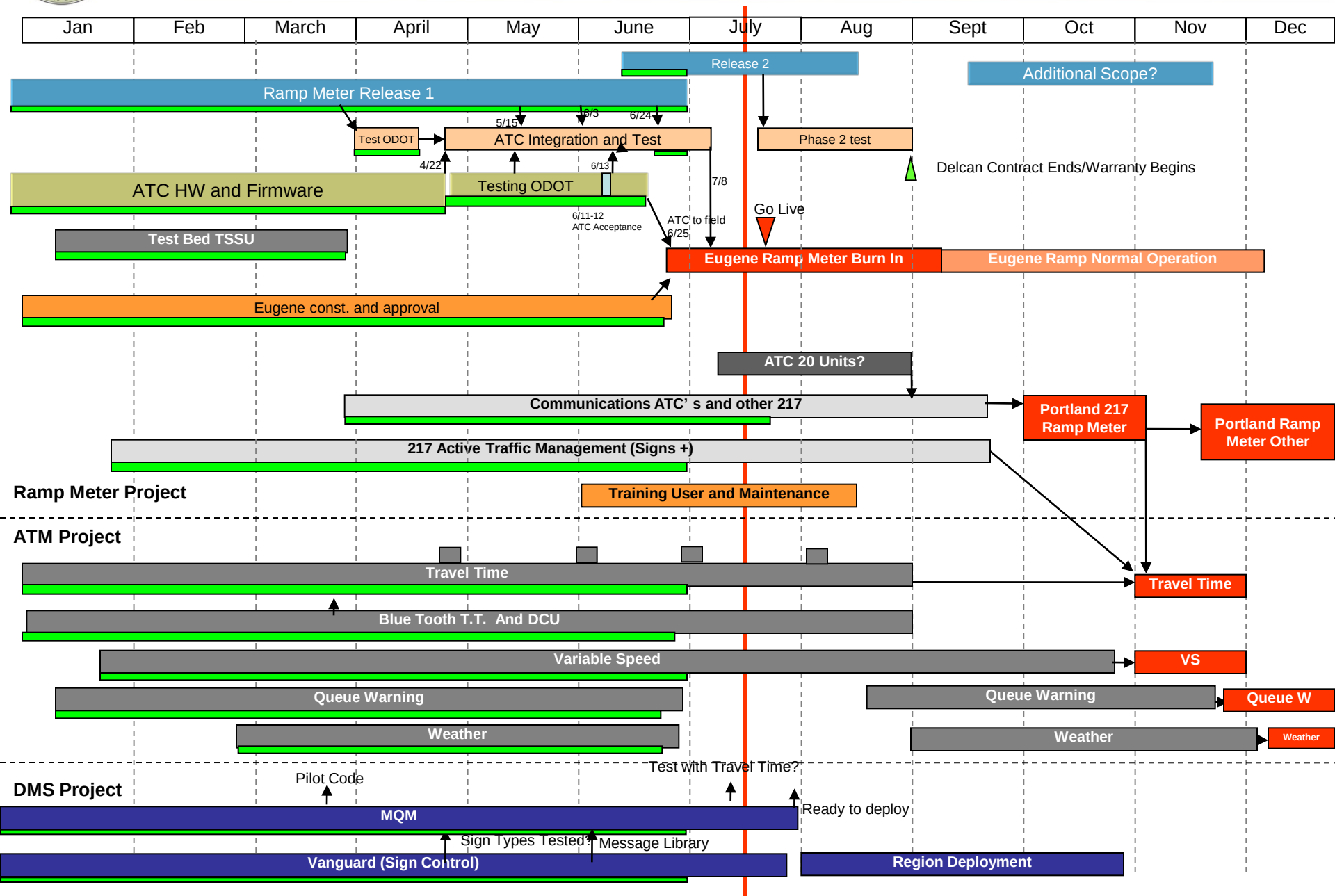

Weather Responsive Evaluation Plan

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