“Using Highway Economic Requirements System: Telling the Story”

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Project: Evaluate system performance associated with a proposed roadway widening on US 101 through Seaside Oregon.

US 101 Corridor (Seaside Oregon)

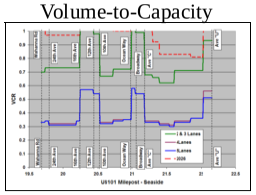
Scenarios:
1) 2Lanes - Existing Condition,
2) 3Lanes* - Widen entire length to 3 Lanes, where the 3rd lane is a continuous center turn lane (CCTL),
3) 4Lanes - Widen entire length to 4 Lanes,
4) 5Lanes - Widen entire length to 5 Lanes, where the 5th lane is a continuous center turn lane,
5) 2026 - Future No-Build Condition for the 2Lane Scenario - Assumes only pavement improvements are made over a twenty year period.

**Most of the existing alignment is already 3 lanes so only 5 segments were adjusted for the 3Lane Scenario.*

Data Development and Analysis:
1) Began with 18 "Universe" Segments from 2005 HPMS Dataset,
2) Used state database, video log and aerial imagery, such as Google Earth and Bing, to filled in missing "sample" data,
3) As a default, Pavement Condition was assumed to be Good and was not considered a factor in this analysis.
4) Ran all scenarios as Existing Condition: utilized only SCEN00.OUT data and disregarded all other HERS-ST output,
5) In the case of Scenario #5 (2026), the AADT was edited to reflect the year 2026, so as to be able to run the future as an Existing Condition (Pavement Condition was assumed to be a non factor).

Peak Volume-to-Capacity (VCR):
1) A general observation, as expected, the VCR increases substantially for segments directly associated with a signalized intersection, suggesting some level of congestion,
2) VCR for the 2Lanes and 3Lanes are identical, which suggests the additional lane on the 6 segments will not contribute to overall system improvement**,
3) VCR is halved when two through lanes are added to the system (i.e., 4Lanes and 5Lanes),
4) VCR varies slightly between 4Lanes and 5Lanes,
5) Future VCR (2026) is substantially greater as the system demand increases while the system capacity remains the same.

Volume-to-Capacity



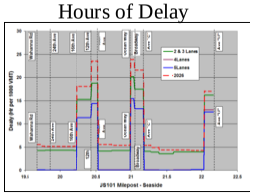
***This is not to imply that CCTL will not contribute to general system improvements, it simply means that this addition did not seem to make a difference in the overall VCR analysis for this scenario. .*

NUM	Description	BMP	EMP
1	AVENUE A - 2ND AVE	18.68	19.74
2	2ND AVE - 12TH AVE	19.74	19.79
3	12TH AVE - 16TH AVE	19.79	20.19
4	16TH AVE - 19TH AVE	20.19	20.24
5	19TH AVE - 12TH AVE	20.24	20.44
6	12TH AVE - 11TH AVE	20.44	20.53
7	11TH AVE - 8TH AVE	20.53	20.73
8	8TH AVE - 3RD AVE	20.73	20.87
9	3RD AVE - SPRUCE WAY	20.87	21.00
10	SPRUCE WAY - BEACH WAY	21.00	21.06
11	BEACH WAY - 2ND AVE	21.06	21.18
12	2ND AVE - 2ND AVE	21.18	21.20
13	2ND AVE - 2ND AVE	21.20	21.40
14	2ND AVE - 2ND AVE	21.40	21.54
15	2ND AVE - HIGH WAY 26	21.54	21.61
16	HIGH WAY 26 - 2ND AVE	21.61	21.80
17	2ND AVE - 2ND AVE (EB)	21.80	21.90
18	2ND AVE - 2ND AVE	21.90	22.17

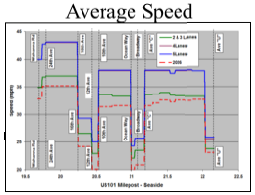
Sectional Improvement Feature!!!

Average Peak Delay:
1) The delay discussion follows similar aspects for the VCR discussion,
2) The difference between 2Lanes and 2026 does not seem as significant for Delay as for VCR, which would suggest that though the VCR increases substantially for the future no-build, the change does not equate to as great an increase in Delay.
3) The Delay for non-signalized segments is almost non-existent for the 4Lanes and 5Lane scenarios.

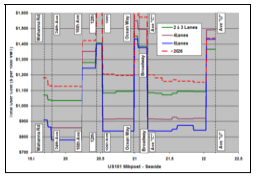
Hours of Delay



Average Speed



Average Speed:
1) In general, as expected, the speed decreases around the signalized intersections; which corresponds with observations with the VCR and Delay analysis
2) The speed increases under the multi-lane scenarios, but only by 10-15%,
3) As expected, the 2026 speed decreases when nothing is done to improve the capacity.

Total User Costs (TUC):
1) The Total User Cost is a summation of:
- Travel Time Cost (TTC), which includes the value of travel time per person for personal/business travel,
- Operating Costs (OC), which includes the cost of fuel, oil consumption, tire wear, vehicle maintenance and repair, and mileage related depreciation and
- Safety Costs (SC), which is the value associated with the estimated number of crashes and severity,
2) TUC are identical for the 2Lanes and 3Lanes: not shown, 60% of TUC is associated with TTC, 21% of TUC is defined as OC, and 19% is categorized as SC,
3) The cost split for 4Lanes are 57%, 25% and 19%, for TTC, OC and SC, respectively,
4) The cost split for 5Lanes are 62%, 26% and 13%, for TTC, OC and SC, respectively
5) The percentage of Travel Time Costs and Operation Costs are relatively similar for all scenarios, but the Safety Costs decrease for the 5Lanes Scenario. This would seem to be due to the influence of CCTL.

Total User Costs