# Using Highway Economic Requirements System: Telling the Story

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**Project:** Evaluate project scenarios that could result in corridor alternatives.

Over the past decade, the northern area of the City of Bend has undergone considerable business growth and change. The area known locally as the "Cooley Triangle" has been the location of choice for many retail organizations moving into this Central Oregon community. With growth comes traffic and associated congestion and this area is a source of current congestion issues. The location makes it extremely attractive for future retail development, which will result in greater congestion in the future. Traffic analysis of this area is important for planning how the area develops, grows, and flows.

#1) Existing Intersection Scenario: Intersection scenario is the existing roadway system. This is the "no build" condition and the base case against which the "build" scenarios are compared.

#2) Interchange Scenario: Interchange scenario replaced the existing Cooley Road signalized intersection with a full interchange and removed all other signal and access points to US 97. This is an Access Management Scenario.

#3) Alt-A (Bypass) Scenario: Bypass scenario made no changes to the existing alignment, but added a "new" bypass alignment to the east of the analysis area.

Note that for the Alt-A Scenario, two alignments, the existing US 97 alignment with intersections and the US 97 Bypass, were evaluated separately within HERS-ST and the results were combined.

These are future performance measure forecasts depicting system condition at the end of the 20-year analysis period, and represent a reasonable expectation of the long-range impacts for each scenario. The purpose of this analysis is to compare relative change between performance measures.

**Average Speed**

The ALT-A Scenario has two average speed flow curves that reflect the dual alignments within the scenario. The additional of the high speed, access controlled bypass alignment attracts a large number of trips to shift onto the bypass alignment, resulting in a slight increase in speed on the existing intersection alignment. The "shifted" trips are considered "pass through" trips because they begin and end outside the study area.

**Volume-to-Capacity**

The v/c on the segments north of Robal Road is half the value for the segments located south of Robal Road. This is probably due to the traffic flow from the southern area accessing retail development in the "Cooley Triangle".

**Hours of Delay**

The analysis reflects the average delay for each segment and assumes default stop/start delay associated with a signalized intersection. Although the HERS-ST calculations assume some signalized delay, the model does not specifically evaluate signal delay and averages the effects of the delay across the entire analysis segment. A formal signal delay analysis requires a more detailed analysis approach.

**Total User Costs**

The Total User Costs reflect the travel time, operation and safety costs to the user on the system by scenario. The Total User Costs for the Existing Intersection Scenario is the datum. All costs below the datum are considered benefits, while all costs above the datum are disbenefits.

The average segment speed, delay, and volume-to-capacity ratio analyses showed that both "build" scenarios, as compared with the "no build", increased the average speed by about 50 percent, decreased the average delay by over 80 percent (varies by scenario), and improved the VCR by up to 50 percent in the analysis area. Both "build" scenarios showed significant improvements for these performance measures, and the Total User Costs decreases by as much as 45 percent, compared with the "no build" scenario.