

Traffic Control Evaluation Summary

December 2012 -Modified

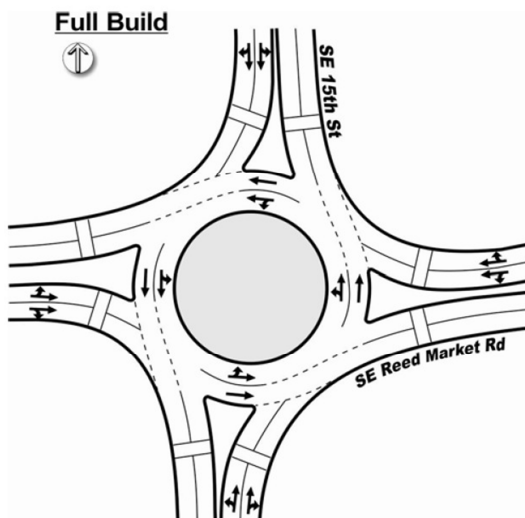
SE Reed Market Road/SE 15th Street

Roundabouts Preferred Intersection Control --- Policy Context

The City of Bend has a "roundabouts first" policy when selecting traffic control for intersection improvements that is outlined in the Transportation System Plan (TSP) Implementation Guidelines (2001). However, roundabouts are not always the best solution for a given location. To provide guidance as to when other types of traffic control (e.g., a traffic signal) should be selected, the City has evaluation criteria for topics such as safety, operations, users, and benefit/cost. Tier 1 criteria are identified for all evaluations. Additional Tier 2 criteria are identified for more complex situations where Tier 1 criteria alone are not adequate to distinguish between alternatives. If a non-roundabout alternative is found to perform better against the evaluation criteria (or if a fatal flaw is found with a roundabout alternative), than that alternative may be recommended.

Evaluation Summary

The intersection of SE Reed Market Road/SE 15th Street was evaluated to determine the intersection form that would be required to meet City standards under the forecasted 20-year traffic demands. Previous corridor studies (Reed Market Corridor Study, 2005) and 30% project designs in 2007 planned for a multi-lane roundabout at 15th and Reed Market. The Transportation GO Bond program validated the corridor study and 30% designs and conducted an intersection analysis consistent with approved roundabout design guidelines. Due to complexities with capacity needs competing against physical constraints at this location, a range of options was explored that included variations of a roundabout, a standard traffic signal, a quadrant road configuration, and a continuous flow intersection configuration (CFI). Through a screening-level analysis, a multi-lane roundabout and a standard traffic signal configuration (shown below) were selected for formal evaluation through the City's Intersection Form Evaluation Framework.



Multi-lane Roundabout



Standard Traffic Signal

To help distinguish between the alternatives at this location, several Tier 2 evaluation criteria (detailed safety analysis, additional pedestrian/bicycle considerations, and access management) were considered in addition to all Tier 1 criteria. The comparison between the two alternatives using these criteria is summarized in the following table. In addition, further data was collected and analyzed concerning how to mitigate for possible congestion impacts at the intersection due to train crossings. Consequently, the following Tier 2 evaluation criteria (Design Vehicle Needs and Adjacent Control Compatibility) was updated and noted below in the recommendation table.

Criteria	Round -about	Signal	Evaluation Highlights
Safety (Conflict Points)	X		Roundabout has fewer and lower speed conflicts
Safety (Ped/Bike)	-	-	Roundabout has fewer and lower speed conflicts, but a signal provides protected crossings.
Safety (No. of Crashes)	X		Roundabout estimated to have 50+ fewer crashes over a 20-year period.
Peak Hour Operations	X		Roundabout would have less delay and shorter queues.
Design Vehicle Needs		X	Signals with preemption are preferred by Bend Fire Department.
Special User Needs	-	-	Both can be designed to accommodate special user needs.
Pedestrian Crossing Distances	X		Roundabout would have shorter crossing distances with the splitter medians.
Bicycle System Compatibility	-	-	Bicyclists can be accommodated by both design alternatives.
Adjacent Control Compatibility		X	Signal would be more adaptive to queuing from the railroad crossing.
Land Use Compatibility	-	-	Roundabout could be more compatible with the surrounding neighborhood, while industrial uses may prefer a signal.
Emergency Response Needs		X	Signal with preemption and ability for emergency vehicles to travel through opposing lanes minimizes response delay.
Access Impacts	X		Roundabout facilitates U-turns to manage access restrictions within the influence area.
Intersection Footprint	-	-	Both require widening in the intersection area for multiple travel lanes.
Approach Width	-	-	Both require multi-lane approaches and departures.
Cost	-	-	Due to the intersection area widening required for either alternative, preliminary cost estimates are approximately equal.

Notes:

- (neutral performance between alternatives)

X (highest performing alternative)

Highlighted – Additional information available since report was published, see below

Recommendation

Based on the comparison to the evaluation criteria, and updated information from the train mitigation analysis, a roundabout configuration was found to perform better than a traffic signal configuration. Therefore, a multi-lane roundabout is recommended at this location. In particular, a roundabout will provide safer operations and more efficient peak hour operation than the traffic signal alternative.

Updated criteria from train crossings analysis:

Criteria	Round -about	Signal	Re - Evaluation Results based on train crossing information
Design Vehicle Needs	-	-	Since the construction of the roundabouts using the new Roundabout Design Guidelines, there is adequate space for emergency vehicles to maneuver through the round about in the event the roundabout has stopped traffic in it due to train crossing. The scoring becomes neutral.
Adjacent Control Compatibility	-	-	Based on the data and research gathered, project recommendations for: <ul style="list-style-type: none"> • Additional northbound entry and circulating lane • Advance warning signs that activate when train is present; “train ahead” • Restrictive signs that activate when train is present; “do not block intersection” <p>Due to the interconnection with the railroad and advanced warning signs, the scoring becomes neutral.</p>