



City Council Study Session

Agenda

October 11, 2018

6:00 p.m.

City Hall, Medford Room

411 W. 8th Street, Medford, Oregon

1. Business-Education Partnership (Informational)
2. Intersection at Crater Lake Avenue and Owen Drive



MEMORANDUM

Date For the October 11 City Council Study Session
To Mayor and Council
From Karl MacNair, PE, Transportation Manager
Subject Crater Lake Avenue & Owen Drive Intersection Improvements (T-291) – Intersection Design

Alternatives Analysis Results

On March 1, 2018, Council approved a consultant contract for alternatives analysis and design of intersection improvements at Crater Lake Avenue and Owen Drive. Kittelson & Associates has completed the alternatives analysis, including operational parameters, conceptual design, and planning-level cost estimates.

The analysis studied the operations of existing conditions, all-way stop control, a traffic signal, and five roundabout configurations. From those eight alternatives, the traffic signal and one roundabout configuration were brought forward for conceptual design and cost estimating. The conceptual designs are attached (Figures 11 and 12). The results for these two alternatives are summarized below for 2038 traffic volumes:

Traffic Signal Operational Analysis Results:

- Eastbound right turn only lane needed
- Average Delay: 27.2 seconds
- Level-of-Service (LOS): C
- Anticipated construction costs*: \$700,000 to \$1,000,000
- 20-year Life Cycle Cost: \$5,453,473

Roundabout Operational Analysis Results:

- Two lane approaches needed northbound, and east/west bound
- Average Delay: 15.1 seconds
- Level-of-Service: C
- Anticipated construction costs*: \$2,700,000 to \$3,400,000
- 20-year Life Cycle Cost: \$5,613,402

*Anticipated construction costs include right-of-way purchases.

Public Works intends to move forward with the design and construction of a traffic signal at this intersection.

Additional Considerations

Interaction with the signal at Highway 62 and Owen

Eastbound queues will be mitigated by the addition of a right-turn lane at Owen Drive & Crater Lake Avenue as well as by installation of an adaptive signal controller that will have the capability of coordinating the new signal with the existing signal at Highway 62. The analysis shows that the worst eastbound queue length for the signal and roundabout are projected to be

300 feet and 175 feet, respectively; there is 425 feet available. These queue lengths fit well within the available space and do not account for the effect of the adaptive signal controller. It is therefore anticipated that queues will not back up to Highway 62.

Budget

\$1.2 million is budgeted for construction, which will cover the cost of a traffic signal. The roundabout will cost as much as \$2.2 million more. This will necessitate removing \$2.2M of non-LOS projects from the Transportation System Plan (TSP) due specifically to building a roundabout.

Capacity

This project will support current zoning and anticipated development for the next 20 years. The analysis was performed based on the 2038 build-out traffic volumes from the Urban Growth Boundary (UGB) expansion and TSP update. Trip caps will only be necessary if property owners apply for zone changes inconsistent with the current General Land Use Plan (GLUP) designations.

The roundabout is predicted to have less delay and lower volume/capacity ratios with projected future year volumes. However, the roundabout may not operate as efficiently as predicted because of driver unfamiliarity with two lane roundabouts. Both the signal and roundabout are projected to operate below capacity in 2038, so the need for trip caps because of this intersection is unlikely regardless of which intersection control is built.

Life Cycle Cost Analysis Details

The life cycle cost analysis for each alternative included "hard" costs incurred by the City (construction, right-of-way, operations & maintenance) and "soft" costs incurred by users (cost of vehicular delay, fuel, and the economic costs of crashes over the projected 20-year life of the intersection improvements). The delay costs and post-opening operations and maintenance costs applied a discount rate of 4% to calculate the net present value of the costs. The delay costs were based on value of user time from the 2015 TTI Urban Mobility Report. The safety costs are identified in the ODOT Highway Safety Program Guide and are comprehensive economic values per crash type calculated by ODOT. Operations & maintenance costs are assumed costs based on national averages.

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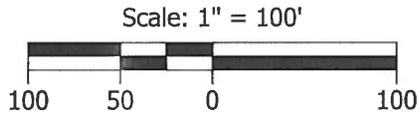
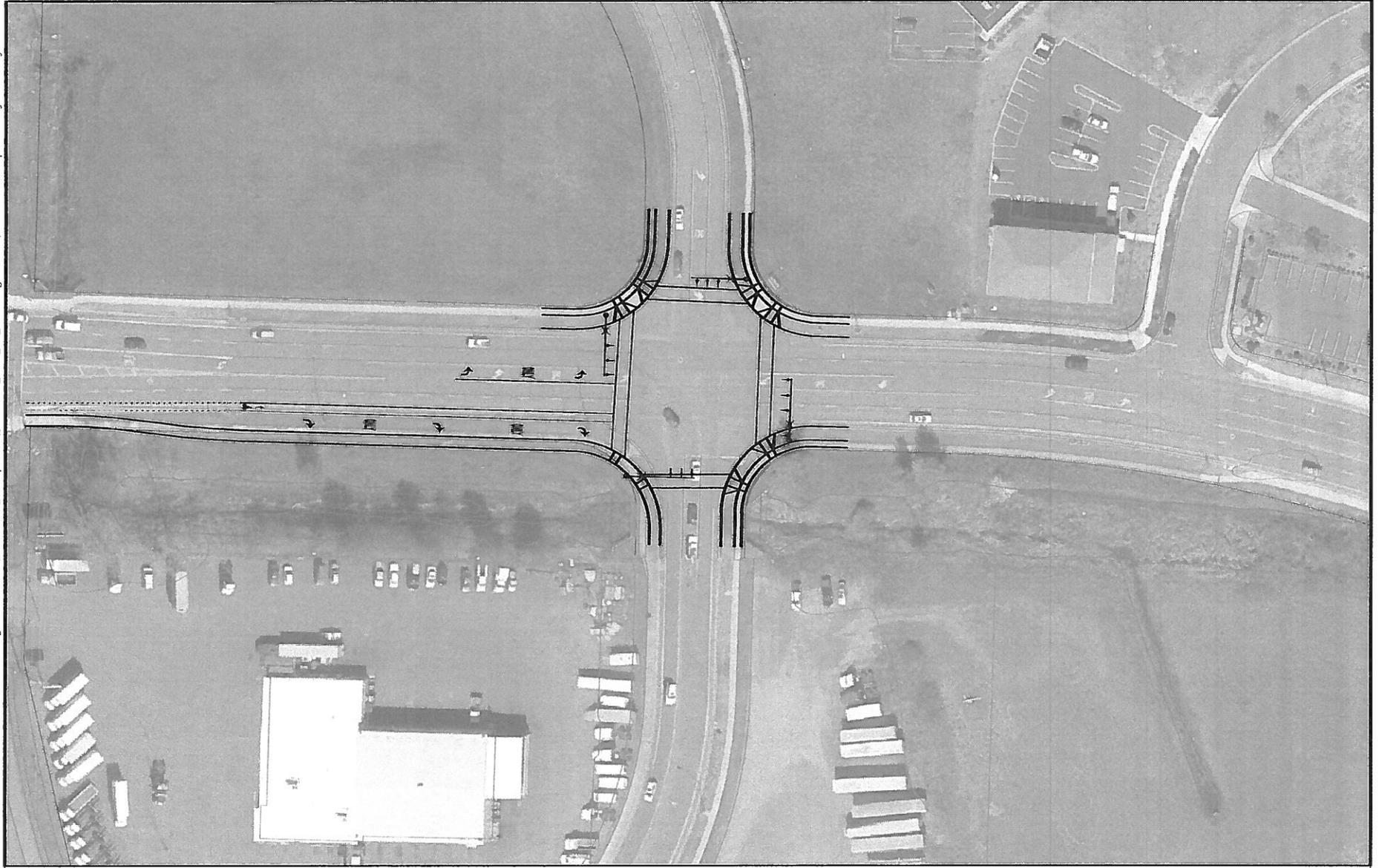
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Roundabout Concept
Medford, Oregon

Figure
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Signal Concept
Medford, Oregon

Figure
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