

EXECUTIVE SUMMARY

The St. Johns Bridge corridor is a critical commuting and trucking route connecting US 30 and the industrial areas on the west side of the Willamette River with I-5, the Port of Portland, and the St. Johns neighborhood. The Oregon Department of Transportation (ODOT) is scheduled to begin a major rehabilitation of the 70-year-old St. Johns Bridge in early 2003. The purpose of this traffic report is to help ODOT determine the striping plan that will "best" serve the varying needs of pedestrians, bicyclist, trucks, and cars that use the St. Johns Bridge.

In this report, David Evans and Associates, Inc. (DEA) addresses the key traffic operation issues associated with the striping of the St. Johns Bridge. DEA built and applied a Synchro/SimTraffic model calibrated to existing AM, Midday, and PM peak period traffic conditions to analyze four striping scenarios.

- Four-Lane Cross Section
- Three-Lane Cross Section (Two-Lanes Eastbound)
- Three-Lane Cross Section (Two-Lanes Westbound)
- Two-Lane Cross Section

For this analysis, the St. Johns Bridge study area is bounded by Ivanhoe Street on the east and Bridge Avenue on the west. Directional travel on the bridge (Philadelphia Avenue) is identified as eastbound when traveling towards Ivanhoe Street and westbound when traveling towards Bridge Avenue. The final striping plan for the bridge will be determined by ODOT.

Result of the traffic operations analysis in 2002 indicates no capacity constraints or operational flaws on the bridge that would prohibit the implementation of any of the striping options. Traffic operations at the two signalized intersections are identical under all striping options and flow across the bridge is similar with an arterial Level of Service (LOS) of C or better in both directions under all striping options. LOS C operations indicate that drivers crossing the bridge experience only occasional slowing with no stopping on the bridge and generally do not wait more than one cycle at a traffic signal. When a given direction is reduced from two lanes to one lane there is an increase in travel time and control delay across the bridge. However, at no time do vehicles stop on the bridge due to a reduction in travel lanes.

Comparison of the four striping options in 2020 indicates no capacity constraints or operational flaws on the bridge that would prohibit the implementation of any of the striping options. The two signalized intersections at each end of the bridge would be operating at or near capacity during the AM and PM peak hours. As a result, the intersections are effectively limiting traffic flow onto the bridge, which may hide capacity constraints not evident in this analysis. Traffic flow across the bridge varies depending on which direction of flow is reduced to one lane. When the eastbound direction is reduced to one lane, traffic flow on the bridge remains at LOS C in the AM and Midday peak hours but drops to LOS D in the PM peak hour. In the westbound direction the bridge LOS remains at LOS C in the Midday and PM peak hours but drops to LOS E in the AM peak hour when traffic flow is reduced to one lane. During the AM peak hour traffic may come to a stop on the bridge for short periods of time in 2020.

In conclusion, when you drop a lane in either direction, travel time across the bridge will increase due to slightly slower speeds on the bridge but drivers will not experience additional stops with the exception of the AM peak hour, which would experience stop and go traffic in 2020.

CONCLUSION

Comparison of the four striping options in 2002 indicates no capacity constraints or operational flaws that would prohibit the implementation of any of the striping options. Traffic operations at the signalized intersections are identical under all striping options and flow across the bridge is similar with an arterial LOS of C or better in both directions in all striping options. When a given direction is reduced from two lanes to one lane, there is an increase in travel time and control delay across the bridge. However, as indicated by the bridge LOS, at no time do vehicles stop on the bridge due to the single travel lane. In general, when you drop a lane in either direction on the bridge, travel time will increase due to slightly slower speeds across the bridge but drivers will not experience additional stops.

Comparison of the four striping options in 2020 indicates no capacity constraints or operational flaws that would prohibit the implementation of any of the striping options. However, the signalized intersections at each end of the bridge are operating at or near capacity during the AM and PM peak hours. The intersections are effectively limiting traffic flow onto the bridge, which may hide capacity constraints not evident in this analysis. Traffic flow across the bridge varies depending on which direction of flow is reduced to one lane. When the eastbound direction is reduced to one lane, traffic flow on the bridge remains at LOS C in the AM and Midday peak hours but drops to LOS D in the PM peak hour. At no time do vehicles stop on the bridge due to the single travel lane. In the westbound direction the bridge LOS remains at LOS C in the Midday and PM peak hours but drops to LOS E in the AM peak hour when traffic flow is reduced to one lane. During the AM peak hour traffic may come to a stop on the bridge for short periods of time. Assuming the signal timing generated by Synchro is implemented in 2020, extending the two lanes of westbound queue storage at Bridge Avenue an additional 200 feet could eliminate the stop and go traffic. However, year 2020 queuing and safety concerns at the north and south approaches on Bridge Avenue may mandate changes to the signal timing that could increase westbound queue lengths on the bridge.

In conclusion, when you drop a lane in either direction, travel time across the bridge will increase due to slightly slower speeds on the bridge but drivers will not experience additional stops with the exception of the AM peak hour, which would experience stop and go traffic in 2020.