



# EXECUTIVE SUMMARY

## STATE ROUTE 3/LOG YARD ROAD INTERSECTION CONTROL ANALYSIS

### BACKGROUND AND PURPOSE

In 2016, Mason Transit Authority (MTA) received Regional Mobility and Multimodal grant funds to enhance their existing park-and-ride program. The Belfair/North Mason service area was a priority for the program. In 2016 and 2017, MTA went through a park-and-ride site selection process with a group of stakeholders ([MTA Park and Ride Documentation](#)). The stakeholder group supported the selection of an undeveloped parcel east of the State Route 3/Log Yard Road intersection. MTA purchased this lot in July 2017.

The intersection of State Route 3 (SR 3) and Log Yard Road is a three-leg intersection with stop control on Log Yard Road. Development of the MTA Belfair park and ride will add an east leg, making the intersection a four-leg intersection.

An Intersection Control Analysis is required per WSDOT policy to evaluate several intersection control methods (i.e. stop sign, traffic signal, roundabout, etc.) and ensure the optimal intersection control is selected. The analysis considers several performance measures including:

- Traffic Operations
- Safety
- Cost
- Context and Sustainability
- Community Engagement

### TRAFFIC VOLUME FORECAST

SCJ prepared forecasts for 2020 (Opening Year) and 2025. Both AM and PM peak hours were evaluated for three intersection control alternatives:

- Two-way Stop Control (with left-turn lanes and acceleration lanes on SR 3)
- Single-lane Roundabout
- Traffic Signal

SCJ prepared other forecasts to test sensitivity: (1) 2025 with adjustments for summer traffic plus peak truck traffic and (2) 2040 forecast that assumes completion of the Belfair Bypass.

The 2020 forecast includes historic growth along SR 3 plus traffic from the proposed park and ride and traffic from the anticipated gas station/convenience store.

The 2025 forecast adds historic growth plus more commercial development, feeding the east leg of the intersection (new Log Yard Road).



## TRAFFIC OPERATIONS

The following is a summary of the modeled traffic operation for each of the intersection control methods evaluated. Capacity analysis results are described in terms of Level of Service (LOS). LOS is a qualitative term describing operating conditions a driver will experience while traveling on a particular street or highway during a specific time interval. It ranges from A (very little delay) to F (long delays and congestion).

### Two-way Stop Control (with left-turn lanes and acceleration lanes on SR 3)

This method provides northbound and southbound left-turn lanes on SR 3 as well as acceleration lanes for vehicles turning left from Log Yard Road onto SR 3 in both directions. For 2020 (Opening Year), the intersection operates at LOS D in the AM peak hour and LOS C in the PM peak hour.

By 2025 the intersection operates at LOS D in the AM peak hour and LOS F in the PM peak hour. This method is not viable as a long-range solution.

### Single-lane Roundabout

A single-lane roundabout operates at LOS A in the AM and PM peak hours in both 2020 (Opening Year) and 2025. The roundabout continues to operate at LOS A for 2025, adjusted for summer traffic plus peak truck traffic. For 2040 the roundabout operates at LOS A in the AM peak hour and LOS C in the PM peak hour.

### Traffic Signal

The traffic signal operates at LOS B in the AM and PM peak hours for both 2020 (Opening Year) and 2025. The traffic signal operates at LOS B for 2025 adjusted for summer traffic and LOS C for 2025 adjusted for summer traffic plus peak truck traffic. By 2040 the traffic signal operates at LOS C in the AM peak hour and LOS F in the PM peak hour.

## SAFETY

SCJ prepared a predictive crash analysis to compare the safety of each method. The results are shown in **Table 1**.

**Table 1. Predictive Crash Summary (2025)**

	Two-way Stop Control	Single-lane Roundabout	Traffic Signal
Property Damage Crashes	4.3	2.1	2.0
Fatal/Injury Crashes	6.5	0.7	1.8
Total Crashes	10.9	2.8	3.8

The two-way stop control method has the most predicted crashes. The roundabout has the fewest predicted crashes with 90% fewer fatal/injury crashes than two-way stop control and 60% fewer fatal/injury crashes than the traffic signal. Using WSDOT Societal Costs for crashes, a roundabout saves \$1.7 million from 2020 through 2025.



## COST

Cost comparisons of the methods are shown in **Table 2** with planning-level cost estimates for design/construction and operations/maintenance.

**Table 2. Planning-Level Cost Estimates**

CONTROL METHOD	DESIGN/CONSTRUCTION	ANNUAL OPERATIONS/MAINTENANCE
Two-way Stop Control	\$1,000,000 - 1,500,000	\$2,500
Single-lane Roundabout	\$1,300,000 - 1,600,000	\$2,500
Traffic Signal	\$500,000 - \$750,000	\$8,000

## CONTEXT AND SUSTAINABILITY

The intersection of State Route 3 and Log Yard Road is in unincorporated Mason County within the Belfair Urban Growth Area (UGA). The current zoning of the proposed park and ride is General Commercial. West of SR 3 is zoned for General Commercial and Business Industrial uses. The proposed intersection improvement is consistent with the planned growth of commercial and industrial uses and supports proposed community development plans and economic vitality activities. The park and ride will enhance the multimodal transportation system in the area. A roundabout is safer for pedestrians and bicycles.

Construction of intersection improvements will be disruptive to existing traffic on State Route 3. A Traffic Management Plan will be developed before construction to minimize impacts to commuters, freight, and nearby businesses.

## COMMUNITY ENGAGEMENT

A public open house was held on March 7, 2018. Attendees shared concerns about the potential intersection methods. SCJ/MTA received additional concerns via email subsequent to the open house. These concerns are summarized as follows:

### *Won't this Make Congestion Worse Along State Route 3?*

State Route 3 experiences heavy congestion, especially in the PM peak hour traveling southbound. The construction of a controlled intersection at State Route 3 and Log Yard Road will not improve nor degrade this regional congestion.

### *Isn't a Roundabout or a Traffic Signal Dangerous on this Corridor?*

A predictive safety analysis shows a roundabout intersection is the safest method of intersection control.

### *Won't the Project Waste Money if Built Before the Bypass?*

WSDOT plans to begin design of the Belfair Bypass/Freight Mobility Corridor in 2019. In a 2007 Alternatives Analysis for that project, every north end alternative ended with a traffic signal or roundabout intersection with State Route 3. A traffic signal or roundabout at Log Yard Road is forward compatible with the Bypass, regardless of the terminus location selected for the Bypass.



### *Why Spend Money Here Instead of at Other Priority Locations in the County?*

This project and the funding for this project are specific to MTA and their mission to provide transit services to the community. MTA has coordinated with Mason County to ensure the park and ride and the intersection improvements fit with County comprehensive planning and WSDOT transportation planning. However, MTA is not in a position to establish priorities for the County or WSDOT, nor is MTA afforded the flexibility to spend the grant dollars on priorities unrelated to park-and-ride development.

### *There Are Many Trucks on State Route 3 and Log Yard Road*

Each of the methods considered is designed for the truck/freight traffic using the intersections. Traffic signals and roundabouts can both be designed for large trucks.

### *Can the Park and Ride Wait until the Bypass Is Built?*

Based on grant requirements, the park and ride is scheduled for construction in 2019. The Bypass is scheduled for completion in 2025. Both the traffic signal and the roundabout move traffic well with or without the Bypass; however two-way stop control is considerably less safe than a traffic signal or roundabout. Waiting to improve the intersection is not a viable option considering safety.

### *What is WSDOT's Role?*

WSDOT is the owner of State Route 3. As the owner, WSDOT reviews and approves the Intersection Control Analysis to select a preferred method. WSDOT is not involved in site selection to locate the park and ride. WSDOT representatives will be at the April 24 open house to answer questions related to State Route 3 and Bypass.

### *Has SCJ/MTA Spoken to Adjacent Businesses and Property Owners?*

SCJ had conversations with business owners and property owners to understand their concerns and gather their insights and perspectives.

### *Has the Decision Been Made?*

MTA has decided to locate the park and ride at Log Yard Road and property has been purchased. A decision on the best method to control the intersection has not been made. That is the purpose of this Intersection Control Analysis. WSDOT will review and comment on the draft analysis. SCJ will address WSDOT's comments and submit for approval in May.

## **RECOMMENDED INTERSECTION CONTROL METHOD**

Development of the MTA Belfair park and ride will add an east leg to the State Route 3/Log Yard Road intersection. Traffic operations will fail after 2025 with two-way stop control at the intersection.

A traffic signal and a roundabout both operate well past 2025. A roundabout operates better in 2040 in the PM peak hour (LOS C vs LOS F).

A roundabout has the fewest crashes. A roundabout costs more to construct, but is less costly when considering societal costs (from fatal/injury crashes) and long-term operations/maintenance.

A single-lane roundabout is the recommended intersection control method because it is significantly safer.