



MEMORANDUM

TO: Southwest Washington Regional Transportation Council Board of Directors
FROM: Matt Ransom, Executive Director
DATE: January 31, 2017 
SUBJECT: **Bus on Shoulder Feasibility Study - Update**

INTRODUCTION

The Bus on Shoulder (BOS) Study was initiated as a result of the I-205 Access and Operations Study recommendations, adopted by the RTC board in November 2014 which identified bus on shoulder as a possible low cost way to improve transit performance, bus service reliability, and ridership.

The Study is examining the technical, operational, geometric, and policy options regarding part-time shoulder running for transit bus operations along I-205 and SR-14. This effort will culminate in findings and recommendations in regards to the viability of this transit strategy, and if warranted, a recommended BOS concept for the corridors.

The study area encompasses the I-205 corridor from the 18th Street interchange, south to the I-84 interchange and on SR-14 from I-205 to 164th Avenue.

Board members were previously given an update about the BOS Feasibility Study in November 2016. This memo will provide additional information about the study and will update Board members about other study progress since November.

BACKGROUND

Bus on shoulder was first identified as a possible transit improvement strategy for I-205 in the Clark County High Capacity Study (HCT) recommendations adopted by the RTC Board in December 2008. The study recommended a series of transit improvements on I-205 including bus on shoulder operations on congested freeway segments.

The second phase of study for I-205 transit improvements included an evaluation of HCT recommendations during the development of the I-205 Access and Operations Study (2014). As part of that study, the project team prepared a screening assessment of bus on shoulder operations using an industry endorsed planning assessment methodology. The assessment found potential benefit to transit operations with a bus on shoulder treatment.

The third phase of work was initiated in the BOS Study. The study scope includes an overall review of the concept, best practices, legal authorities with in-depth review of roadway characteristics on I-205, SR-14, and a preliminary review of I-5. Special emphasis has also been given to a potential pilot project implementation on SR-14, in response to the corridor's confined characteristics and because of its high congestion levels and the number of buses traveling between Fisher's Landing Park and Ride facility and Portland that use the facility to access I-205.

STUDY NEED

Recent trends indicate that as the economy improves, capital investment in new roadway capacity is not keeping pace and congestion in the region continues to worsen. In response, the region is looking at innovative strategies to manage congestion more efficiently and improve system performance. Bus on shoulder operations is identified as a transit mobility strategy because of increasing freeway congestion and the amount of commuter bus service on SR-14 and I-205. Supplementing a BOS strategy, other operations evaluations and improvements have been completed or are in the planning stages. Efforts underway include:

- WSDOT has a study underway to analyze the benefits and impacts of ramp metering on Clark County freeways.
- RTC has programmed funds for a comprehensive operations study. It will incorporate the results of the ramp metering study and look at advanced traffic management techniques, such as variable speeds, queue notification, lane control, enhanced incident management strategies, and other operational and high technology approaches.
- ODOT has a project programmed for construction in 2018 to add northbound auxiliary lanes on I-205 between I-84 and Killingsworth.
- Finally, the BOS Feasibility Study is to examine a transit option that can offer improved mobility and efficiency for transit.

WORK TO DATE

The BOS Technical Advisory Committee (TAC), made up of representatives from C-TRAN, WSDOT, TriMet, ODOT, and Metro have met several times since the beginning of the Study. The first meeting, in June, focused on the study purpose and goals as well as data collection needs required to support the analysis and feasibility of BOS concepts. This included roadway geometrics, traffic volumes, traffic speeds, bus specific speeds, and crash and incident history in the corridor. The next several months were spent gathering information and creating an inventory of available data and conducting analysis. In addition, a consistent and comprehensive mapping system to display geometric conditions and operations data was created for the study area.

In September, TAC members reviewed the information compiled and mapped for the study including travel time, bus speeds, and geometric data and also identified data gaps and determined accuracy of mapping. In addition, the committee was presented with information on the national experience with bus on shoulder projects and initial guidance on minimum conditions for a BOS project, including a preliminary look at the legal, policy, and operating parameters to support the facility. There was also a review of preliminary material regarding a potential pilot project on SR-14.

The information developed by the study team over the summer and fall fed directly into a key element of the study, the December Bus on Shoulder Workshop. The last meeting of the TAC was in November to prepare for and review materials for the workshop.

BUS OPERATIONS

A BOS system is a relatively simple concept in that it allows transit vehicles to use the shoulder on a freeway during times of heavy congestion. The general operating protocol is that buses that normally operate in regular traffic lanes would move to the shoulder when mainline travel speeds drop below a predefined speed. Since buses operate on the shoulder only during specified traffic conditions, a more descriptive name for this might be “dynamic” BOS.

Assumptions for the I-205 and SR-14 are that a bus could move to the shoulder when mainline traffic speeds drop below 35 mph. In addition, buses on the shoulder would not operate more than 15 mph faster than the adjacent traffic.

These operating rules have been shown to result in safe operation for BOS and are built around the design of the shoulder, the policies for operating speeds, and the fact that the bus drivers are professional drivers trained on how to operate in constrained geometric and traffic conditions.

The bus driver’s role in safety and incident management is to maintain the safe speed and to monitor downstream conditions on the shoulder to detect any stopped vehicles, debris, and merging traffic. With these considerations, experience in other regions has shown that safety has not been an issue.

- Minnesota recorded less than 20 crashes over 10 years on a system of nearly 200 BOS lane miles.
- A 3-year evaluation in Miami showed no increase in crashes with BOS.
- I-405 BOS in the Puget Sound region has been in place since September 2015 and has reported no changes to safety in the corridor.

BUS ON SHOULDER WORKSHOP

The Bus on Shoulder Workshop was held on December 5th and 6th at the Rose Besserman room at C-TRAN’s Fisher’s Landing Facility.

Session one, on December 5th, was attended by more than fifty people comprising a wide array of stakeholders including elected officials, executive staff, as well as public safety and incident management personnel. Also participating were TAC member agencies and representatives from the Washington State Patrol, the Federal Highway Administration, and the Federal Transit Administration. The session focused on an educational overview of best practices around the country regarding policy, engineering, operational, and technical issues associated with BOS. It presented information about existing conditions, roadway geometrics, and characteristics in the study corridors and also included technical information on a potential pilot project on SR-14. RTC will present information about traffic and transit speeds (from the attached session one workshop packet) at the February RTC Board meeting.

The second session, on December 6th, had more of an engineering emphasis. It was made up of design and traffic engineers, technical and operations staff, and other stakeholders affected by

any proposed system. The key objective of session two was to develop bus on shoulder improvement concepts for the SR-14 and I-205 corridors.

SR-14 BOS IMPROVEMENT CONCEPT

The preliminary improvement concept for SR-14 is described below; however it may undergo further refinement. The I-205 BOS concept is still being reviewed by staff.

- Restripes shoulder at the east end of SR-14 to allow buses to stay out of the traffic lane and move directly onto the shoulder from the bus only onramp from 164th Avenue.
- Extends westbound BOS approximately 1,000 feet to the west by restriping collector / distributor road shoulder between the I-205 NB exit and the entrance ramps to westbound SR-14.

WSDOT and C-TRAN have cooperated on a thorough examination of SR-14 from I-205 to 164th and identified it as an excellent location for a BOS pilot project:

- It has no intermediate interchanges
- It has suitable freeway shoulders
- It has an existing WB bus only on-ramp at 164th
- Serves as a queue jump to I-205 SB
- Evaluation of pilot provides performance measurement and allows proof of concept for consideration of other corridors

RECENT BOS STUDY PRESENTATIONS

C-TRAN

The Study participated in a recent briefing with the C-TRAN Board of Directors on January 10. Nick Thompson, the project team's BOS expert, presented the briefing to the C-TRAN Board and focused on the design, operational, and policy issues associated with bus on shoulder as well as improvement concepts for a possible SR-14 pilot project. C-TRAN executive staff obtained positive feedback from Board members regarding future pilot project implementation on SR-14.

RTAC

RTC staff presented a BOS Study briefing to the Regional Transportation Advisory Committee (RTAC) on January 20 and received input regarding the work to date.

NEXT STEPS

A draft of the Bus on Shoulder Feasibility Study Report should be complete by early March after review and comment by the BOS Technical Advisory Committee. The next RTC Board briefing on this study will occur after the Study Report has been issued.