MEMORANDUM

TO: Southwest Washington Regional Transportation Council Board of Directors

FROM: Matt Ransom, Transportation Director

DATE: September 30, 2014

SUBJECT: **I-205 Corridor Study: Findings and Policy Recommendations**

***AT A GLANCE* - Discussion**

This agenda item provides information on the findings and policy recommendations for the I-205 Corridor Study. It addresses long and short term roadway improvements, transit operations, and operational policies for application to the I-205 corridor.

INTRODUCTION

The I-205 Corridor Study is analyzing both short (2022) and long term (2035) performance in the corridor. The Regional Transportation Plan's long term strategy along I-205 is to incrementally add capacity through system expansion and at selected interchanges. The core projects for the corridor were adopted by the RTC Board in November 2012 (Resolution 11-12-18).

To supplement the core projects, and in the interim, several traffic merging hot-spots can be addressed by implementing low cost operational improvements. Operations and system management strategies serve to make the transportation system operate more efficiently and predictably and could supplement or defer the timeline for freeway expansion.

The consideration of operational strategies is consistent with Washington State Department of Transportation "Moving Washington" principles, a three tiered approach to mitigate congestion or add capacity on their facilities. Moving Washington principles are to:

- Operate efficiently: Get the most out of existing highways by using traffic management tools to optimize the flow of traffic and maximize available capacity.
- Manage demand: Shift travel times, use public transportation, or reduce the need to travel altogether, managing demand on overburdened routes to allow the system to function better.
- Add capacity strategically: Target the worst traffic hotspots or fill critical system gaps to fix bottlenecks that constrain traffic flow.

At the May RTC Board meeting, RTC staff presented preliminary findings on the operational strategies analyzed for the I-205 Study. This memo will: describe the 2035 core projects to be included in the 2035 RTP update; findings for short-term operational strategies; an assessment of transit operational improvements; and policies for implementing operational strategies in the I-205 corridor.

ROADWAY IMPROVEMENTS

2035 Core Projects

Since the adoption of the I-205 core project list in 2012, RTC staff has worked with WSDOT to review and confirm the projects adopted by the RTC Board in 2012. The core project capacity improvements identified the most critical set of projects for funding to ensure reasonable long-term level of operation of the corridor, consistent with RTP policies. The core projects will make up the improvements listed in the 2035 RTP for the I-205 corridor. The projects have not changed; however, some have been refined based on further analysis and consultation and review between RTC and WSDOT staff.

The core projects (Attachment 1) shown below include a description of the project as well as any changes since their initial adoption:

I-205 Widening (SR-500 to Padden)
Widen I-205 to three lanes in each direction.

SR-14 Widening (I-205 to 164th)
Add one new travel lane in each direction. Reconstruct eastbound on-ramp from I-205 to SR-14, which includes widening the bridge over SR-14.

I-205 auxiliary lane from Mill Plain to SR-500
The original project was a northbound auxiliary lane. Further analysis has resulted in the addition of a southbound auxiliary lane.

Padden Interchange improvements with 72nd Avenue slip ramp
The preliminary slip ramp concept included several options to bypass the Andresen/Padden intersection for vehicles destined north on 72nd Avenue from I-205 north. WSDOT developed an estimate for one of the options to include in the RTP.

I-205 Park and Ride at 18th Street
This project relocates the existing Evergreen Park and Ride facility and also includes additional commuter service to Portland. Transit vehicles would access I-205 south from the new 18th Street interchange.

2022 Low Cost Operational Strategies

The 2022 analysis examined how the addition of low cost operational improvements can manage or improve vehicle flow on I-205. The development of strategies has been an iterative process, and was based on regional model results, information from microsimulation analysis, video observation of current conditions, and review and collaboration with WSDOT staff. The short term 2022 analysis assumed that the Mill Plain to 18th Street project is in place with no other improvements in the corridor. RTC worked closely with WSDOT staff and other local agencies to develop a wide range of operational strategies and low cost projects which best manage corridor performance and improve efficiency without expanding roadway capacity.

The following section describes the 2022 strategies (Attachment 2) that warrant further consideration by WSDOT. A "promising" designation means that the strategy has a benefit to travel performance in the corridor and that further analysis and stakeholder consultation should occur consistent with the proposed policy process prior to implementation.

I-205 North / Mill Plain Boulevard Interchange

Ramp Meter from Mill Plain to I-205 northbound

- Smooths merging conditions at the ramp terminus by managing and breaking up vehicle platoons entering I-205.
- Further study is required to determine the feasibility of side by side storage lanes on the on ramp, placement of the meter, as well as other details regarding the installation and operation of a "smart" ramp meter.
- Managing platoons at this on-ramp may no longer be required after I-205 is widened between Mill Plain and SR-500.

I-205 South / Padden Parkway Interchange

Maintain two merge locations and meter just the eastbound to southbound ramp

- Smooths merging conditions at the ramp terminus by managing and breaking up vehicle platoons entering I-205.
- Further study is required to determine the feasibility of side by side storage lanes on the eastbound to southbound on ramp, placement of the meter, as well as other details regarding the installation and operations of a "smart" ramp meter.
- Managing platoons at this on-ramp may no longer be required after I-205 is widened between Padden Parkway and SR-500.

I-205 South / SR-500 Interchange

Reduce I-205 southbound from three to two lanes prior to the SR-500 overpass and allow the westbound to southbound on-ramp to become an add lane, and the eastbound to southbound on-ramp merge into this add lane.

- Creating an add lane will improve operations by reducing turbulence for vehicles entering I-205 from SR-500.
- This is a relatively low cost option that could be readily implemented.
- A two lane cross section on I-205 under SR-500 will have sufficient capacity for vehicle demand, as long as capacity is not increased upstream of this segment.
- The benefit and viability of this project would need to be reconsidered if/or when I-205 is widened from Padden Parkway to SR-500. Increased southbound volumes north of SR-500 may require converting back to three through lanes on I-205 at SR-500. Anticipated traffic demand will be evaluated for this section in conjunction with any upstream capacity improvements.

I-205 South / 18th Street Interchange

Ramp meter from 18th Street to I-205 southbound

- Smooths merging conditions at the ramp terminus by managing and breaking up vehicle platoons entering I-205.
- Further study is required to determine the placement of the meter, as well as other details regarding the installation and operation of a "smart" ramp meter.
- On ramp width will allow for a future bus (HOV) bypass lane onto I-205 south.

I-205 South / Mill Plain Boulevard Interchange

Ramp meter from Mill Plain Boulevard to I-205 southbound

- Smooths merging conditions at the ramp terminus by managing and breaking up vehicle platoons entering I-205.
- Further study is required to determine the feasibility of side by side storage lanes on the on ramp, placement of the meter, as well as other details regarding the installation and operation of a "smart" ramp meter.

TRANSIT OPERATIONS

Enhanced transit operations deployed in conjunction with freeway improvements is a regional strategy defined in the existing MTP and Clark County HCT System Plan. As part of the I-205 Corridor Study, RTC consulted with C-TRAN and WSDOT staff to conduct a screening assessment of HCT Plan recommendation for bus on shoulder (BOS) operations in the I-205 corridor.

Currently, C-TRAN's 20-year plan calls for up to 25 buses during the peak period on the Glenn Jackson Bridge by 2035. In addition, the Clark County HCT System Plan recommendations in the I-205 corridor included the following elements:

- All-day limited stop transit service between Salmon Creek and Gateway
- Includes direct access ramps, flyer stops, and bus on shoulder operations
- Maintain existing traffic lanes
- Serves Van Mall and park and rides at Salmon Creek, Central County, and 18th Street

The screening assessment focused only on one component of the HCT recommendation; whether conditions in the corridor would warrant further investigation on the viability and feasibility of BOS operations on I-205. The assessment looked at several factors based on criteria identified by the Transit Cooperative Research Program (TCRP Report 151: A Guide for Implementing Bus on Shoulder Systems). The factors listed below comprise the bulk of the screening assessment and are summarized by a brief description of findings based on I-205 corridor characteristics:

1. Are there at least 4 buses per hour?

   Yes. C-TRAN has 10 to 22 period buses in 2022 and 16 to 25 buses in 2035.

2. Is mainline speed less than 35 mph?

   Yes. Peak hour congested speeds for 2022 and 2035 based on the regional travel model on I-205 from 18th Street to I-84 show potential transit travel time savings on several segments in the corridor with BOS. Actual travel time data would need to be collected in the corridor to better determine if corridor congestion warrants BOS. In addition, BOS would not be invoked during the full peak period and would only be used during times when mainline speeds are below 35 mph.

3. Are entrance and exit ramps less than 1,000 vph?

   Some ramps are higher than 1,000 vehicles per hour, specifically at Airport Way and SR-14. Additional investigation would be needed to determine the feasibility to operate outside BOS at very high volume ramps.

4. Will inside/outside shoulder support buses?

   The majority of the asphalt pavement shoulder segments in Washington will need to be reconstructed. Shoulder depth for the Washington portion of the I-205 corridor, north of the Glenn Jackson Bridge, is generally 0.15 ft. with some locations having a pavement depth of 0.35 ft. A detailed examination to determine pavement depths and the cost of reconstruction would be needed.

5. Is inside/outside shoulder at least 10 feet (12 feet desired)?

   Some shoulder segments may need to be modified either through reconstruction or restriping to accommodate BOS on an outside or inside lane. Shoulder width varies throughout the corridor.

Based on the findings above, BOS in the I-205 corridor may offer future opportunity for: improved transit reliability; travel time savings; expanded commuter ridership; and, facilitate low-cost transit expansion in the corridor. However, further study is needed to examine in more detail the technical and policy details regarding implementation of timing of a project. A feasibility study designed to review both the policy and engineering opportunities and constraints is a logical next step.

Such a study effort would be convened among partners and would review technical parameters such as: inside and outside shoulder bus operation, operating characteristics, as well as the operational and physical constraints in the corridor prior to making specific project findings and recommendations. A study would include (at a minimum):

- Travel time studies to determine current mainline freeway speeds in the corridor by segment and time of day.
- Determining operational issues associated with inside versus outside lane operation.
- Outside lane feasibility should examine issues associated with high ramp volume locations for outside bus on shoulder operations.
- While inside BOS does not conflict with ramp operations, feasibility should examine issues associated the ability to maneuver transit vehicles to and from the inside median to enter and exit at freeway ramps.

- Conducting an engineering analysis of physical improvements and shoulder reconstruction required for either outside or inside lane BOS operations and order of magnitude cost estimate for both options.

OPERATIONAL POLICIES APPLIED TO THE I-205 CORRIDOR

The I-205 Study represents the first comprehensive assessment of low cost/low capital corridor wide improvements in the region and may serve as a model for how and when operational freeway improvements are addressed in other corridors within the region.

The following policy framework serves to implement a comprehensive operations based approach to future project investment along I-205. WSDOT's "Moving Washington" principles, specifically "Operate Efficiently" is the basis for this policy.

> *Operate Efficiently: Get the most out of existing highways by using traffic management tools to optimize the flow of traffic and maximize available capacity.*

The proposed policies provide guidance for evaluating broad operational strategies and guide the implementation of ramp metering in a corridor. The policies are applicable to I-205 as a recommendation to the Study effort and may be applicable to other limited access freeways across the region.

Operational Policies for Freeways

- Provide for the management of limited access freeway corridors through the development of operational strategies that address recurring congestion, traffic bottlenecks, and incident management.
- Consider implementing operational strategies in limited access freeway corridors where congestion levels are high and where there is potential for improved corridor flow and efficiency and expanded person throughput.
- Implementation of operational strategies should include incident management, intelligent transportation systems, ramp metering, expanded transit services, and other traffic management tools.
- Design considerations which complement operational strategies and which promote efficiency (such as ramp bypass) should also be considered to enhance person throughput and freight efficiency.

Analysis Factors: The assessment of specific operational strategies in a corridor should also consider and balance the following:

- What is the short and long term cost of the improvement?
- What is the short and long term life-cycle of the improvement?
- Does the improvement have a positive impact on traffic flow, person/freight throughput, or safety?
- Does the operational improvement defer or replace a future RTP capital improvement?
- Does the operational improvement complement a future RTP capital improvement?
- Does a future capital project negate the need for the operational improvement?

Implementation Policies for Ramp Metering

Prior to the implementation of ramp metering in the I-205 corridor:

- All affected agencies will be consulted.
- Metering needs to consider mainline travel flow and reliability as well as impact to adjacent arterial operations.
- Ramp meters should be "smart" to achieve freeway/arterial balance and meters would be turned off when not needed.
- Ramp bypass should be considered where feasible to support transit, freight, and person throughput.

NEXT STEPS

The I-205 Corridor Study's roadway, transit, and operational policy findings and preliminary recommendations are presented to the Board for review and discussion. With Board concurrence, RTC staff will:

- Incorporate the I-205 core projects into the 2035 RTP.
- Consult with WSDOT on the operational strategy findings and develop an approach for considering implementation.
- Discuss findings of the I-205 bus on shoulder assessment with WSDOT, C-TRAN and Oregon partners to gauge the interest in pursuing a feasibility study and a possible study proposal.
- Develop recommendations on regional operational policies for limited access freeways.

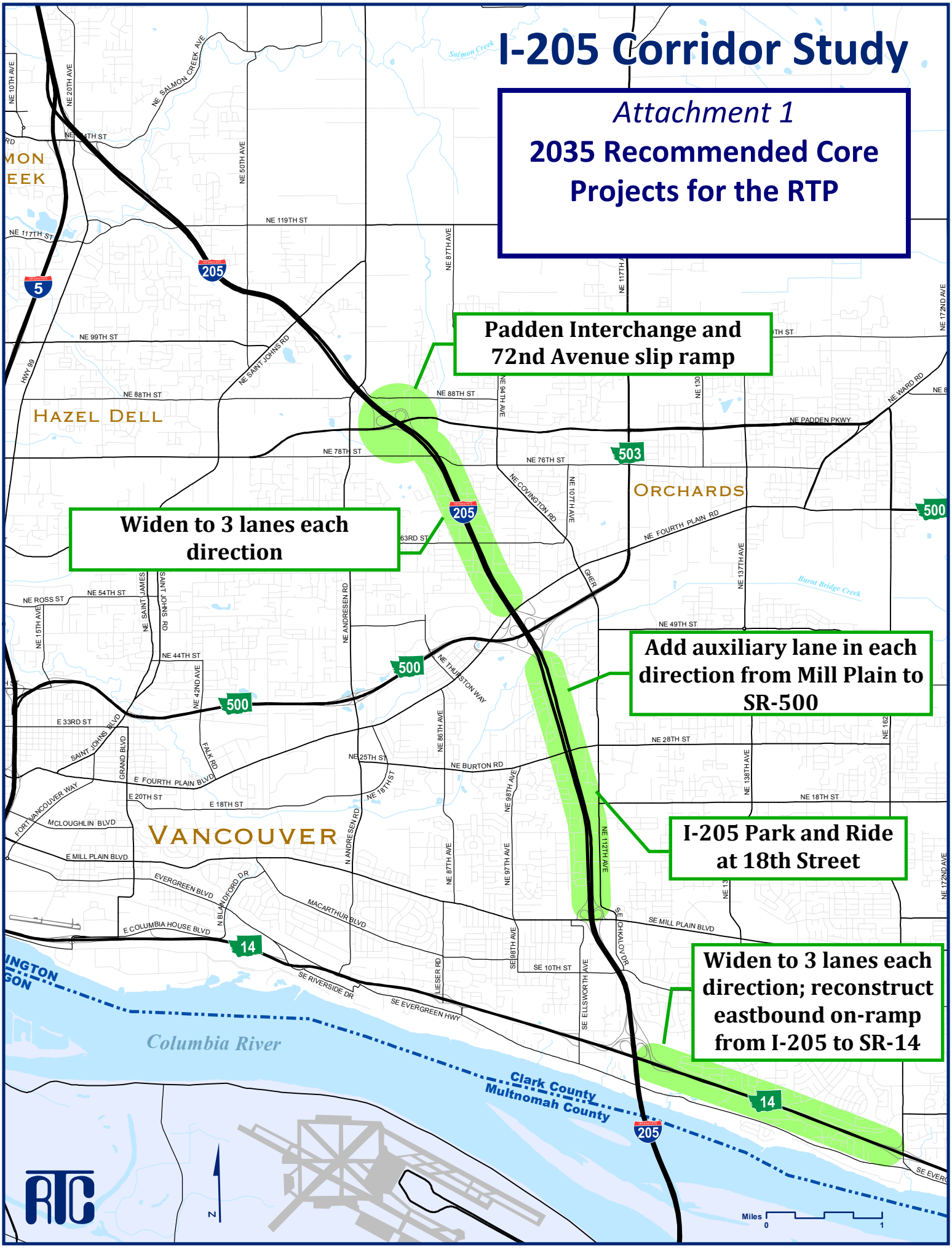
Recommendations will be brought back to the RTC Board for their review and adoption.

Attachments

I-205 Corridor Study

Attachment 1

2035 Recommended Core Projects for the RTP



I-205 Corridor Study

Attachment 2
2022 Low Cost Operational 'Promising' Strategies