



MEMORANDUM

TO: Southwest Washington Regional Transportation Council Board of Directors
FROM: Dean Lookingbill, Transportation Director
DATE: May 29, 2013
SUBJECT: **I-205 Corridor Study**

AT A GLANCE – DISCUSSION

The purpose of this memorandum is to provide the RTC Board with an update of the I-205 Corridor Study activities since February including the development of transportation modeling effort, an overview of I-205 operations workshop, as well as the preliminary operational strategies and evaluation measures being developed in coordination the I-205 Technical Advisory Committee partners.

BACKGROUND

In February, the RTC Board had a presentation the I-205 Corridor Study that included a description of the Study Purpose and Need and an overview of the Study. The Study recommendations, adopted by the RTC Board in November 2012, included moving forward with an I-205 Access and Operations Study for a detailed examination of low-cost operational strategies with the goal of maximizing the efficiency and performance of the I-205 corridor without building new mainline capacity.

This update will review the Study recommendations, highlight the transportation modeling activities, summarize the I-205 Operations Workshop, and outline the operational strategies and performance measures that will be considered during the Study.

I-205 STUDY RECOMMENDATIONS AND SCOPE

The first phase of the I-205 Study began with the full list of Metropolitan Transportation Plan (MTP) projects in the corridor. It conducted extensive analysis of 2035 conditions and recommended a core set of capital projects in the corridor that are most critical and a top priority for I-205. The cost for the full set of MTP projects in the I-205 corridor is \$540 million. The core projects, by comparison, are estimated to cost \$138 million. As a reminder, the recommended set of core projects is listed below.

- I-205 Widening (SR-500 to Padden)
- SR-14 Widening (I-205 to 164th)
- New SR-500 off-ramp/auxiliary lane from Mill Plain to SR-500
- Padden Interchange improvements with 72nd Avenue slip ramp
- I-205 Park and Ride at 18th Street

The Study also recommended that operations and access related to the core projects should be analyzed to determine their feasibility and constructability and to evaluate impacts on the adjacent arterials. As a result of this action, it was agreed that an operational analysis would be conducted to determine which low capital/operational improvements would be necessary to support the implementation of core projects and to ensure adequate corridor performance.

The I-205 Corridor Study effort will also examine short term operations (10-year timeframe) to determine how well the corridor would operate if the funded 18th Street Interchange is the only high-capital improvement to the corridor and how operational improvements can manage the corridor most effectively.

CURRENT I-205 CORRIDOR TRANSPORTATION MODELLING AND ANALYSIS

A transportation modeling team made up of technical staff from WSDOT, Clark County, Vancouver, and RTC has been meeting the last several months to discuss the type of analysis needed for the study, the transportation modeling tools available, and the technical protocol for quality control and review of model results. The modeling group identified the regional travel model and VISSIM microsimulation as the two primary transportation models to use for the operational analysis.

RTC Board members have some familiarity with the regional travel model used by RTC. It has served as an effective tool to examine the impact of capital intensive highway capacity and transit service project investments. The regional model provides data and analysis on vehicle miles traveled, roadway level of service, volume to capacity ratios, vehicle hours of delay, lane miles of congestion and other performance measures. The regional model will still anchor this phase of the analysis, but will be supplemented with a microsimulation tool to conduct the needed operational analysis.

VISSIM is a transportation model application that simulates the interaction of vehicular traffic by assigning each auto, truck, and bus, its own operating characteristics. The modeling tool can identify congestion hotspots, ramp operations, merge/weave problems at freeway entrances, and lane queuing on the freeway. In addition to its operations analysis capabilities, it provides visualizations of how traffic operates. A visualization example using VISSIM will be presented at the June 4th Board meeting.

The VISSIM modeling effort is being led by WSDOT with support by the partner agencies. Building the VISSIM for the I-205 corridor has taken months to construct. In addition to taking considerable staff time, it requires detailed hour by hour traffic counts, signal timing parameters, and origin/destination information from the regional travel model. Once these and several other inputs are fed in, the model then goes through another time consuming effort to ensure calibration and validation.

I-205 OPERATIONAL STRATEGIES WORKSHOP

A workshop was held on March 19, 2013 to discuss and select operational strategies and evaluation criteria that will be used to formulate the operational recommendations for the I-205 corridor. The workshop included participation by technical advisory committee members and modeling staff from

WSDOT, Clark County, City of Vancouver, and C-TRAN. The workshop provided an opportunity for participants to learn about operational issues in the I-205 corridor, the types of operational strategies and lessons learned from other areas. The workshop mapped the operational issues and problems in the I-205 corridor and provided detailed information on a wide range of operational strategies with information about best practices, experiences in other regions, and expected benefits.

Part of the workshop included presentation from Oregon Department of Transportation staff regarding experiences in the Metro region with two recent freeway operational initiatives: the Corridors Bottleneck Operations Study and Hwy 217 Interchange Management Study. The two studies examined many of the ideas being considered for the I-205 Corridor Study such as low cost capital projects, merge lane extensions, variable speeds, and travel time information. The final step of the workshop was to review the list of candidate strategies and evaluation measures for the I-205 Corridor Study.

CANDIDATE STRATEGIES

Attachment 1 lists the preliminary operational strategies from the workshop including a description of each strategy and its potential application to the I-205 corridor. The strategy list does not include improvements or strategies that are in the committed system or in the MTP. For example, it does not include additional transit service or park and ride capacity beyond what is listed in the MTP.

EVALUATION MEASURES

The workshop participants also looked at a wide range of potential evaluation measures and identified up to fifteen measures to assess the operational strategies and the performance of the corridor. The key operational measures discussed by the Committee include: I-205 mainline queuing, volume to capacity ratio by segment, merging/weaving conflicts, off-ramp delay and queue length, and congestion on adjacent arterials.

NEXT STEPS

The I-205 TAC is meeting in June to finalize operational strategies and evaluation measures for the analysis. WSDOT, with support from the modeling team, is continuing the calibration of the base year VISSIM model. This will be followed by development of VISSIM for operational analysis of 2022 conditions with no new capital projects and with additional operational strategies.

Under the current modeling schedule the next updates proposed for the RTC Board would consist of the following:

July

- I-205 corridor existing conditions and operational analysis
- Regional analysis of 2022 conditions in the corridor with the 18th Street project

September

- 2022 operational analysis and findings with the 18th Street project
- 2022 operational analysis and findings with operational strategies

Candidate Operational Strategies

Strategy	Description	Potential Application
<i>Flow Control</i>		
Ramp metering	Ramp metering is a method of limiting the rate at which traffic can enter the freeway so that capacity downstream of the onramp is not exceeded in order to reduce mainline bottlenecks.	Specific opportunities are available to apply ramp metering in the I-205 corridor. Potential ramp meters at Mill Plain to I-205 northbound and Padden Parkway to I-205 southbound.
Limited Access Meter Connector	Freeway-to-freeway metering regulates traffic flow between onramps connecting two limited access roadways.	Used at freeway to freeway interchange bottlenecks. Potential locations include: I-205 southbound to SR-14 eastbound, SR-500 westbound to I-205 southbound and SR-500 westbound to I-205 northbound.
<i>Active Traffic Management</i>		
Dynamic Lane Control	Dynamic lane control is the use of overhead electronic message sign panels displaying symbols indicating whether lanes ahead are open or closed (ex: green arrows or red x's). A typical use is to provide advance warning of a lane closure due to an incident.	The committee noted the application of this strategy in the Puget Sound area. A 'light' version could use VMS messages rather than full gantry deployments upstream for notice of critical bottlenecks. Could also be used to encourage through traffic to use inside lane near high volume exit ramps.
Variable Speed Control	Variable speed control also uses overhead gantries with electronic message sign panels to post dynamic speed limits that can change in response to current traffic conditions.	Variable speed limits provide a traffic smoothing effect to reduce incidents caused by drivers unexpectedly encountering a bottleneck. Application of this strategy is in the Puget Sound area, and potentially in Oregon.
<i>Arterial Signal Strategies</i>		
Ramp/arterial signal coordination	Coordinating ramp meter signals with nearby arterial signals to reduce traffic backups from I-205 ramps onto arterials.	Candidate locations include Mill Plain Blvd, Fourth Plain/SR-500 Blvd, and Padden Parkway.
Detour Route Signal Timing	Modified signal timing plans that can be implemented in the event of an incident that is diverting freeway traffic to arterials.	This strategy may build upon existing incident plans in the corridor, as well as recent traffic signal system updates by the City and County.
Integrated Corridor Management	Partner agencies manage the transportation corridor as a system-rather than the more traditional approach of managing individual assets. An ICM concept typically includes multiple technical and operational strategies and multiple modes and routes.	A key candidate corridor for is 112 th Avenue running parallel to I-205 for much of its congested length.
<i>Traveler Information</i>		
Static Guide signs	Traditional highway guide signs directing through traffic to stay in the mainline lanes to reduce bottlenecks at entrance/exit points.	Low cost approach to encourage through traffic to merge left away from ramp weave traffic. May apply to I-205 northbound south of SR-14 off ramp.
DMS route travel times	Dynamic message signs provided in advance of a freeway interchange providing the travel time to a common destination along two parallel routes, helping to divert traffic to the less-congested route.	Regional efforts are already underway to provide travel time information in the I-5 and I-205 corridors.
<i>Geometric Strategies</i>		
Auxiliary lane extensions	Provide an auxiliary lane connecting key entrance and exit locations to counter congestion caused by high volumes, short ramp spacing, and weaving maneuvers.	Ideas include auxiliary lane from SR-500 WB from 112 th to I-205 NB ramp. One of the core projects is an auxiliary lane on I-205 from Mill Plain Boulevard to SR-500.
Weave lane extensions	Extending merge areas to provide more space for drivers to find acceptable gaps during congested conditions.	WSDOT has identified specific opportunities in the I-205 corridor including extending the merge lane onto I-205 SB from SR-500.
Mainline restriping	Restriping mainline lanes for more efficient use of existing capacity or to balance with high volume on ramps.	Ideas include modifying I-205 left side drop lane north of SR-500 to right side drop lane and carrying only two lanes under SR-500 southbound so that southbound on-ramp from SR-500 can be an add lane.
Ramp Restriping, Reconfiguration, Extensions	Engineering improvements to interchanges that streamline movements between roadways, such as restriping ramps to allow two lanes and/or eliminating merge points	Ideas include restriping SB on-ramp from Mill Plain to two lanes at ramp entrance and extending SB on-ramp from SR-500 to I-205.
<i>Transit/Transportation Demand Management</i>		
Peak shoulder running - transit	Use of existing shoulders to allow transit vehicle use during peak hours with the most significant congestion to improve transit speed and reliability.	Could increase operational reliability for C-TRAN. Needs further investigation to determine threshold transit service frequency and operational impacts.
Rideshare Programs	Support for programs that provide ride-matching programs for commuters in private cars or vanpools, such as Rideshare Online.	Social media outreach to corridor commuters/employers noted as a potential option.