



Portland Metro Area Value Pricing Feasibility Analysis

Final

Round 2 Concept Evaluation

Executive Summary



May 7, 2018



EXECUTIVE SUMMARY

Project summary

Technical Memorandum 4 presents findings from the round 2 evaluation of five pricing concepts for I-5 and I-205 from the Oregon/ Washington state line south to the I-5/I-205 interchange near Tualatin, Oregon. The purpose of this evaluation is to examine the benefits and impacts of different pricing concepts to inform a recommendation by the study's Policy Advisory Committee (PAC) to the Oregon Transportation Commission (OTC), based on application of a series of performance measures to the five concepts.

Background

In 2017, the Oregon Legislature authorized substantial funding to improve highways, transit, biking and walking facilities, and use technology to make the state's transportation system work better. The Legislature also directed the OTC to seek federal approval to implement value pricing on I-5 and I-205 in the Portland metro area to address congestion.

The Oregon Department of Transportation (ODOT) initiated the Portland Metro Area Value Pricing Feasibility Analysis to explore the options available and determine how and where congestion pricing could help improve congestion on I-5 or I-205 during peak travel times.

The feasibility analysis included two rounds of evaluation. The first round of evaluation assessed the opportunities and issues associated with the primary types of highway congestion pricing applications. Following the round 1 evaluation, a total of five round 2 concepts, referred to as Concepts A through E, were developed based on technical evaluation results, input from the PAC and the public on the initial concepts, and project team experience with congestion pricing systems throughout the U.S. These refined concepts allowed for a more detailed assessment of potential impacts and benefits for defined pricing strategies and locations.

- Concept A – Northern I-5 Priced Lanes
- Concept B – I-5 Priced Lanes: Toll all lanes between Going Street/Alberta Street and Multnomah Boulevard
- Concept C – I-5 and I-205 Priced Roadway: Toll all lanes
- Concept D – I-205 Priced Lane – OR99E to Stafford Road
- Concept E – Abernethy Bridge Priced Roadway

Equity and diversion mitigation strategies

The Oregon Transportation Commission has established that considerations of equity and diversion to surrounding communities are priorities in evaluating potential congestion pricing concepts. The PAC Charter includes both equity impacts and diversion of traffic as factors to be considered in the evaluation of congestion pricing options. The Charter also requests that the PAC identify potential mitigation strategies with a potential to reduce the impact on Title VI and/or Environmental Justice communities and adjacent communities.

Some mitigation strategies that were identified by the project team, the PAC and solicited from the public during outreach events include the following:



- Many diversion impacts can be addressed through design of the system and rate structure. Appropriate rate setting through dynamic pricing could maximize flow on the priced portion of the facility and reduce the incidence of diversion; it should be noted that for Concept E, this could reduce revenue substantially.
- A strategy that combines pricing concepts on I-5 and I-205 could improve overall flow and help to manage diversion between the two freeways.
- Transit, bicycle, and pedestrian improvements or introduction of transit service as well as traffic calming strategies could address local diversion concerns.
- Where diversion increases traffic on surface streets, improvements to walking and bicycling facilities may be needed to mitigate potential safety impacts.
- Discounting programs, such as free, reduced or pre-paid toll tags for Title VI and Environmental Justice communities may be considered. Such programs may also be considered for area residents who do not have viable, toll free alternatives. For example, the residents of Hayden Island must use I-5 to get off the island and may therefore require such mitigation programs if I-5 is to be tolled in the future.
- Lane pricing, as opposed to roadway pricing may result in relatively higher tolls for use of the priced lanes. As such, additional consideration of toll discounting policies for low income users may be needed for approaches where only certain lanes are to be priced.
- Freight vehicles are restricted by Oregon statute from using the left inside lane of highways. In general, when a lane pricing (as opposed to roadway pricing) approach is adopted, it is the inside left lane(s) that is priced. If such an approach were used in Portland, freight vehicles would therefore be restricted from using the facility and thus would not benefit from pricing. As such, revisiting and refining Oregon statutes in relation to tolling on the use of the inside left lane by freight vehicles might be considered as a freight-oriented mitigation measure if lane pricing is implemented.
- A monitoring program with key performance measures could be established to evaluate effectiveness at addressing regional goals.

Round 2 evaluation measures

The round 2 pricing concepts were evaluated using performance measures to demonstrate the range of positive and negative impacts of pricing. This evaluation will inform a project team recommendation for the PAC so it can in turn develop a recommendation for the OTC. Performance metrics were organized based on the following policy considerations, which are identified in the PAC Charter:

- Traffic operations improvement on I-5 and I-205
- Diversion of traffic
- Transit service and active transportation
- Equity benefits and impacts
- Benefits and impacts for the community, economy and environment
- Revenue and costs
- Implementation
 - Consistency with state and regional law and policy
 - Federal feasibility
 - Project delivery schedule



Concepts were assessed as to how they generally performed against each performance metric, with concepts that provide positive impacts or reduce negative impacts performing “well” and concepts that reduce positive benefits or increase negative impacts performing “poorly.”

Round 2 evaluation results

Table 1.1-1 is the performance evaluation summary of Concepts A through D, which were developed with the primary intent to minimize congestion. Results are explained in greater detail in the next section. Concept E results are included separately in the next section because the intent of the Concept E analysis was to evaluate its revenue generation potential as opposed to minimizing congestion.

Table 1.1-1. Concepts A through D: performance evaluation summary

Policy consideration	Metric	Concept			
		A	B	C	D
Traffic operations improvement	Vehicle and person throughput on I-5 and I-205				
	Freight truck throughput on I-5 and I-205				
	Passenger vehicle travel time on I-5 and I-205				
	Passenger vehicle travel time on managed lanes		N/A	N/A	
	Freight truck travel time on I-5 and I-205				
	Assessment of change in duration of peak vehicle traffic conditions				
	Delay on priced facility				
	Safety impacts				
	Trip length distribution				
Diversion of traffic	Diversion impacts on non-tolled facilities				
	Safety impacts to all modes of transportation (including bicyclists and pedestrians) on routes with diversion				



Policy consideration	Metric	Concept			
		A	B	C	D
Transit service and active transportation	Adequacy of transit service				
	Bus transit travel time				
	Mode share shift (high-occupancy vehicle [HOV], single occupancy vehicle [SOV], transit, walk, bike)				
	Availability of bicycle travel on alternative routes				
	Completeness of pedestrian network				
Equity	Value or travel time savings for Title VI and/or Environmental Justice communities (regional)				
	Changes in travel time based on geographic zones				
	Access to jobs				
Community, economy and the environment	Physical impacts to existing residences and businesses				
	Regional travel time savings				
	Regional vehicle miles traveled (VMT) (including non-freeway)				
	Change in air pollution				
	Value of travel time savings				
Cost and revenue	Capital expenditure on facility				
	Estimated gross toll revenue potential from tolled facility				
Implementation	State law & policy				
	Regional law & policy				
	Federal feasibility				
	Project delivery schedule				
Legend:	Performs well 	Performs moderately 	Performs poorly 		



Concept A: Northern I-5 Priced Lanes

In Concept A, a single lane in each direction would be converted to a tolled managed lane. The concept would convert an existing general purpose lane in the southbound direction, and the existing HOV lane in the northbound direction.

Concept A has limited congestion relief benefits, which are generally restricted to the tolled lanes during peak hour. Conditions on the unpriced lanes are mostly unchanged, and diversion would be limited. Both revenue and capital costs would be relatively low. This concept would likely cover its own tolling infrastructure operating costs but would not offset all roadway rehabilitation and reconstruction costs. Tolling authority for the southbound segment could come under FHWA's Value Pricing Pilot Program and the northbound segment would qualify under FHWA's HOV/High-Occupancy Toll (HOT) Lane Program.





Concept B: I-5 Toll All Lanes between Going St./Alberta St. and Multnomah Blvd.

Concept B converts all lanes between NE Going Street/Alberta Street and SW Multnomah Boulevard to a priced roadway. Concept B has strong potential to reduce congestion along I-5 with modest diversion to I-205 and adjacent facilities. This concept also has a much denser network of transit and multi-modal facilities that can serve as a toll-free travel alternative to minimize impacts. This concept generates more revenue than single-lane concepts and would cover all toll collection and operating costs, as well as routine and periodic roadway operations and maintenance. The beginning and end points of the corridor segments where this concept would be implemented would need to be examined as part of the future environmental analysis process. Tolling authority for this concept could come under FHWA's Value Pricing Pilot Program.





Concept C: Priced Roadway – Toll All Lanes

Concept C would implement pricing on all lanes of I-5 and I-205 from the Washington/Oregon state line to the I-5/I205 interchange near Tualatin. Concept C has the greatest potential for reducing congestion and generating travel time savings for the widest possible range of users. Because of the scale of this concept, it could be considered as part of a broader regional pricing application in the future, pending success of a pilot pricing program. While diversion can be expected, it could be minimized through dynamic tolling. This concept would by far generate the largest amount of revenue compared to the other concepts. Tolling authority for this concept could come under FHWA's Value Pricing Pilot Program.

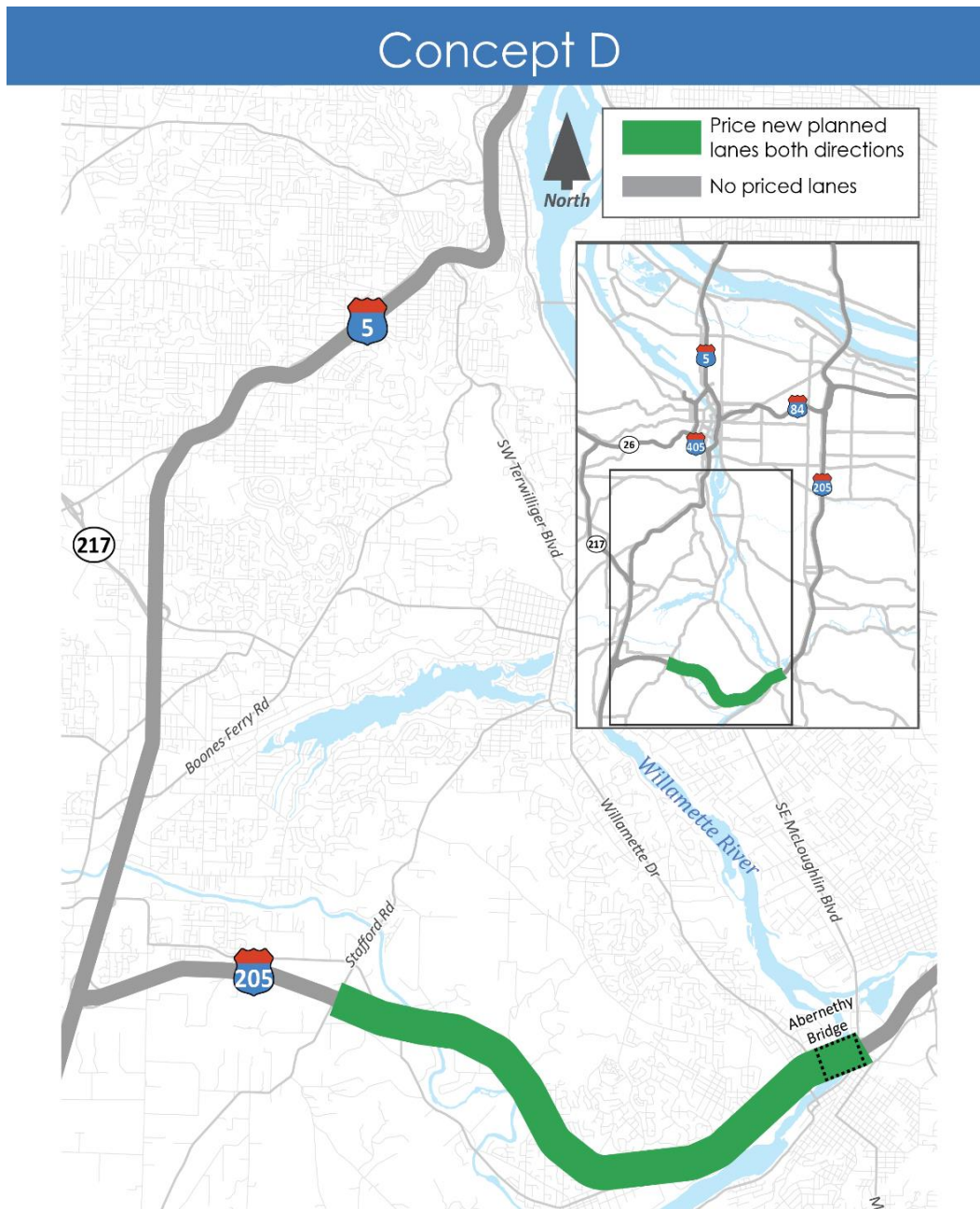




Concept D: I-205 Priced Lane – OR99E to Stafford Rd.

Concept D would price the third lane in each direction, currently planned on I-205 from OR99E to Stafford Road, including widening of the Abernethy Bridge. Existing general purpose lanes in each direction would remain unpriced. The future planned project was considered part of the 2027 baseline for all concepts in the evaluation.

Concept D shows some congestion relief benefit with minimal traffic diversion and provides some benefit to I-205. The pricing concept is not expected to generate significant revenue to contribute toward the construction of the planned lanes and bridge widening project. Concept D would qualify for implementation under Section 129 of U.S. Title 23 if the planned additional lanes were constructed as priced lanes.

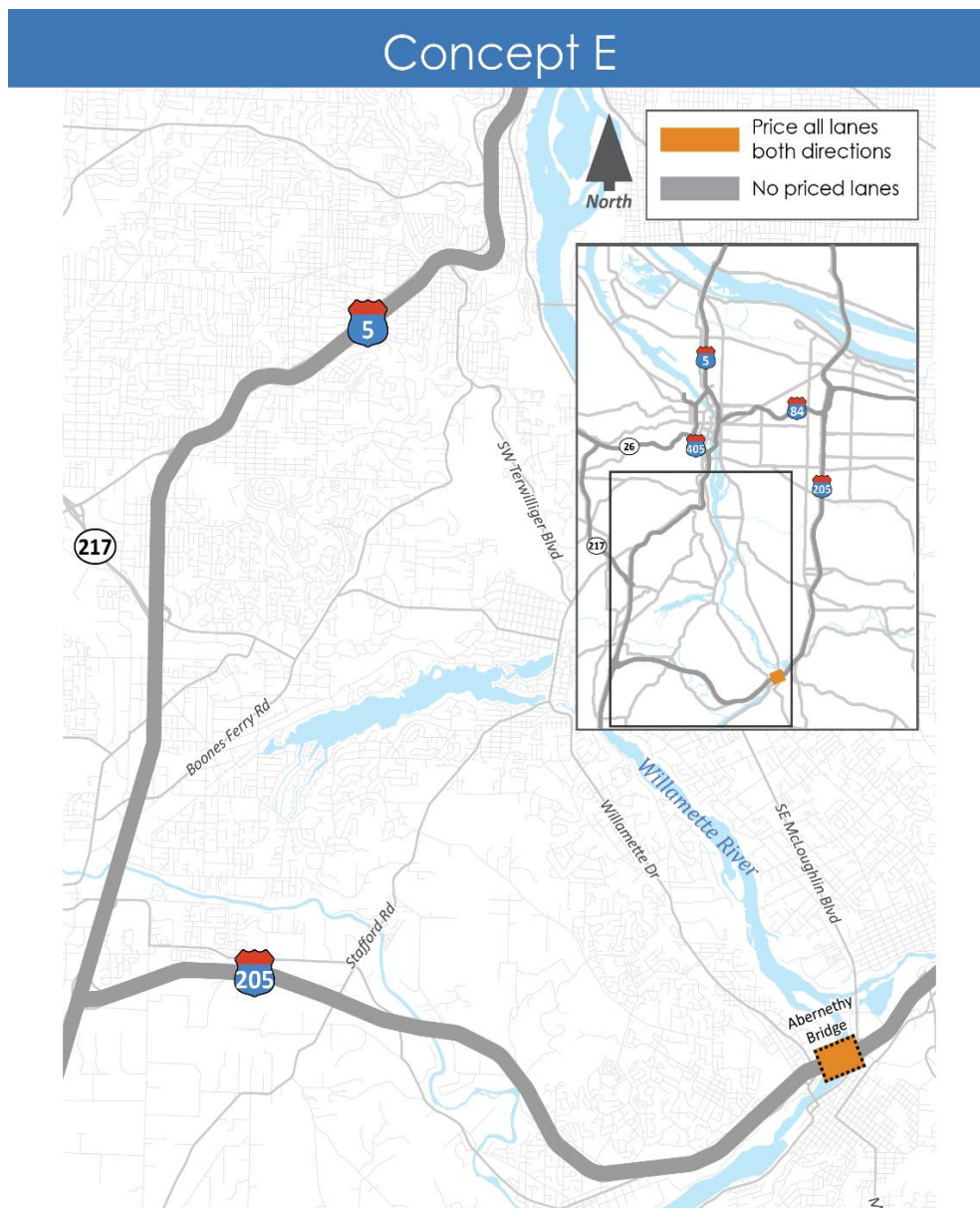




Concept E: Abernethy Bridge Priced Roadway

Concept E applies pricing on all existing lanes of the Abernethy Bridge as well as additional lanes to be constructed as part of the planned bridge widening. While this Concept assumes a variable rate structure, with highest rates during peak hours, it was evaluated to determine its potential to help fund the planned addition of a lane on I-205 from OR99E to Stafford Road and reconstruction of the Abernethy Bridge.

Concept E shows promise to raise revenue and reduce congestion on I-205. This concept, or a variant, could pair with a pilot program to balance the travel choice between the I-5 and I-205 corridors. Mitigation strategies would likely be needed to address potential diversion to OR99E and the Arch Bridge. The beginning and end points of the corridor segments where this concept would be implemented would need to be examined as part of the future environmental analysis process.





Key findings

The evaluation of the five round 2 concepts has shown that congestion pricing on I-5 and I-205 has potential benefits to people living and traveling through the Portland metro area and would be effective in addressing traffic congestion on these facilities. Key findings to help support the recommendation are provided on the following pages. Additionally, general findings and considerations include:

- Any concepts considered further should be paired with policies or programs that address potential impact on lower-income and adjacent communities.
- The analysis indicates that all five concepts would likely generate sufficient revenue to pay for tolling operations. However, there is less certainty regarding whether revenue from Concepts A and D (both single-lane concepts) would also cover capital costs of tolling implementation.
- Concepts B, C and E all indicate they would provide revenue to support mitigation and/or planned transportation projects in the Portland metro area.
- A phased approach—implementing a smaller-scale application as a pilot program and following up with monitoring and scheduled reporting—may ensure that the pricing application meets state and regional goals, and may also lay the foundation for a more comprehensive pricing approach for the Portland metro area.
- Key performance measures could be established to gauge success during future monitoring.

Consultant team recommendation

Based on the key findings from the evaluation, the consultant team recommends a phased approach to implementation of congestion pricing on I-5 and I-205:

- Initial implementation of Concept B as a pilot pricing program, coupled with a sunset or trigger to evaluate success.
 - *Rationale:* Strong potential at congestion reduction along I-5 with minimal diversion to I-205 and adjacent facilities; has a much denser network of transit and multi-modal facilities that can serve as a toll free alternative; significant improvements in facility efficiency and vehicular throughput, meaning that more vehicles can be moved and diversion to free facilities can be managed.
- Consider implementation of Concept E concurrent with implementation of Concept B.
 - *Rationale:* Provides the benefits of Concept B while generating funding to advance the addition of new lanes on I-205 where only two lanes in each direction currently exist as well as retrofitting and adding a lane in each direction to the Abernethy Bridge.
- After assessment of the performance of the initial pricing project, and assuming successful evaluation, implementation of Concept C in phases with more comprehensive system analysis.
 - *Rationale:* Greatest potential for reducing congestion and generating travel time savings for the widest possible range of users; significant improvements in



facility efficiency and vehicular throughput, meaning that more vehicles can be moved and diversion to free facilities can be managed.

- Do not implement Concept A or D.
 - *Rationale:* Little congestion relief benefit; would not provide a reasonable test for the potential for pricing to provide congestion relief.

Next steps

At the fifth PAC meeting on May 14, 2018, the PAC will review and consider the evaluation presented in this technical memorandum as well as the public comment received over the past six months. In May and June 2018, the PAC will develop a recommendation(s) to advise the OTC. The OTC will submit a report to FHWA by December 2018. After coordination with FHWA, the OTC will provide direction about next steps such as an environmental analysis, which would include additional public involvement, Title VI and Environmental Justice analysis, traffic analysis, and other analysis of potential benefits and impacts.