Columbia River Crossing Project: Tolling

Summary of Recent Work

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COLUMBIA RIVER CROSSING

Oregon Department of Transportation

Washington State Department of Transportation

Columbia River Crossing Project: Tolling

Purpose of this Report

The Columbia River Crossing is a bi-state project to expand highway capacity and provide high capacity transit over the Columbia River between Vancouver, Washington and Portland, Oregon. The Oregon and Washington Departments of Transportation are leading the project.

In the past, projects of this nature have typically been funded through a combination of federal and state highway and transit funds. It is already clear, however, that traditional sources of funding, by themselves, are unlikely to generate enough money to pay for this project. Tolls are being studied as one source of project funding.

This report summarizes the results of recently completed analysis of tolling issues for the Columbia River Crossing Project.

Purpose of Tolling Analysis

The purpose of the work on tolling that has been done to date is to inform decisions about what tolling options, if any, should be studied in the upcoming Environmental Impact Statement (EIS).

Contents

1. Tolling – Glossary of Terms

Toll Rates: Traditional choices

The three most common ways to set tolls are: Fixed Tolls, Differential Tolls, and Variable Tolls. In practice, it is common to combine differential and variable tolls.

FIXED – All drivers pay the same toll at all times

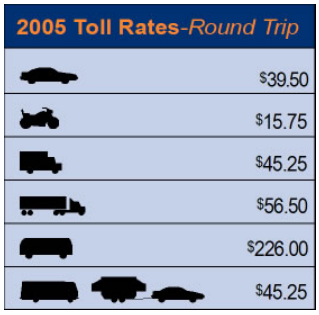
Pros

Simple to Collect – No technology required
Predictable – People know what they will pay.

Cons

Doesn't manage demand – There's no incentive to travel off-peak.
Doesn't maximize revenue – Peak and commercial travelers are willing to pay more.
Doesn't link tolls to wear and tear – Trucks cause more wear and tear but pay the same as cars.

DIFFERENTIAL – Different vehicles pay different rates



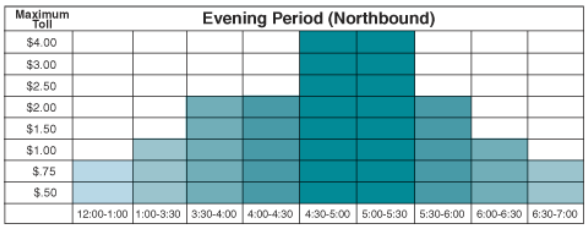
Pros

Simple to Collect – No technology required
Predictable – People know what they will pay.
Fair – Vehicles causing more wear and tear pay more.

Cons

Doesn't manage demand – There's no incentive to travel off-peak.

VARIABLE – Tolls change by time-of-day



Pros

Helps to manage demand – Because it costs more to travel in the most congested times, drivers may choose to travel off-peak.

Cons

Complexity – It can be confusing to drivers.

Toll Rates: Newer choices

Opportunities presented by new technology have led to new ways to charge tolls.

DYNAMIC
Tolls change according to road conditions

Pros **Can help keep traffic free flowing** – Tolls change in response to congestion and are set high enough to keep traffic moving on the tolled facility.

Cons **Drivers need a free or low-cost alternative** – Drivers need to be able to choose, in real time, whether or not they want to pay the toll. If they don't want to pay the current rate, they need an alternate route or lanes.

HOT LANES – 'High Occupancy Toll'
Carpools travel free
Solo drivers may choose to pay

Pros **Maximizes capacity of entire highway** – Solo drivers who 'buy unused space' in the HOV lanes free up space in the general purpose lanes.

Cons **Public perception** – Some people feel the HOV lanes are a 'reward' for people who choose to carpool or ride the bus, and solo drivers should not be allowed to use them. Some people also feel it's 'unfair' if the lanes were built with tax dollars to sell space in them only to those who can afford it.

Other Road Pricing Terms

A number of other terms are in common use for various types of tolling and road pricing schemes. Because this is a fast changing area of innovation, the various terms are often used to mean different things by different people in different places. Following are general definitions for some of the most commonly used terms.

Value Pricing

A term that encompasses different types of variable, dynamic and HOT Lane tolling. The idea embedded in the term is that people will pay more for 'value' – for example the value of a fast, reliable trip in a restricted lane, or simply the value of using limited highway space in a peak period versus traveling off-peak.

Congestion Pricing

Another term that encompasses different forms of tolling when the focus is on reducing congestion.

Peak Period Pricing

Tolls (variable, dynamic, and/or HOT lane) used to manage capacity and/or congestion in the peak.

Cordon or Ring Pricing

Tolls are charged to cross into and/or to travel within a certain zone – generally a highly congested central city.

2. How Tolling Works

2.1 Collecting Tolls – Manual and Electronic Toll Collection

Manual Toll Collection

All but a few toll facilities in the world accept manual tolls, that is a driver can hand money to a toll collector and, if necessary, receive change.

Manual tolls can also be paid "automatically" – the driver drops the money into a basket or pays a machine, which opens the toll barrier when it senses the correct toll has been paid.

Enforcement

With manual toll collection enforcement is straightforward. If the driver doesn't pay, the gate doesn't open. Often there are lights instead of gates, to speed travel, but there is still a human to take a license plate number or alert the highway patrol.

Advantages

- Drivers do not need to know what the toll is beforehand; they can ask.
- Drivers do not need to carry exact change.

Disadvantages

- All drivers must stop, which slows traffic.
- Toll plaza must have enough toll booths to accommodate traffic, which can require a great deal of land.
- Collection costs are high for staffed tollbooths.

Electronic Toll Collection (ETC)

Most major toll facilities now accept electronic tolls, though there are only a few facilities that are all-ETC.

How ETC works

Electronic toll collection is a relatively new and fast growing technology and there are, as yet, no universal standards for methods or equipment.

Transponders: One of the most common ETC methods is to equip each vehicle with a transponder – an electronic device that communicates with a sensor placed above or to the side of the road. Drivers set up a toll account which may be pre-paid, credit-card based, or billed. When the vehicle passes the sensor the transponder is read and the driver's account is charged (or billed).

Windshield Mounted Transponder

License Plate Photos: Another method works with cameras connected to computers with license plate reading software. Tolls are then deducted from pre-paid accounts linked to license numbers or drivers are billed.

Enforcement: Enforcement is more complex and more expensive with ETC. A common method is to photograph cars (and license plates) without transponders; another is to have highway patrol cars standing by to chase scofflaws.

Freeway speeds: Some ETC methods work at freeway speeds. Others require drivers to slow, or even stop. The latter is common, for safety reasons, when manual and ETC collection is combined in one toll plaza.

Advantages

- Less delay
- Lower collection costs
- Toll plazas are smaller (or non-existent)

Disadvantages

- Generally drivers must acquire a transponder and set up an account ahead of time; most systems won't accommodate occasional users.
- Enforcement is more complicated.

2.1 Columbia River Crossing Toll Collection – Toll Plazas

The work done to date on the Columbia River Crossing has been focused on the feasibility of tolling and the issues that might be associated with it. Clearly one of the major issues with tolling would be the design and location of toll plazas.

Mix of Manual and Electronic Toll Collection

The size requirements for toll plazas are determined by the volume of traffic and the split between electronic and manual toll collection.

It is easier to achieve a high level of ETC usage on a facility that serves primarily local drivers and frequent users. If drivers are from out of the area, or use the facility only rarely, they are less likely to sign up for a transponder and toll account

New Toll Plaza with Lanes Split for ETC and Manual Toll Collection

Considering the relative shares of local/frequent users and out-of-area/infrequent users, the Columbia River Crossing would likely see a split of about 40% ETC, and 60% manual toll payment, within three to five years of opening.

Size Requirements: Looking at future year traffic volumes (see Section 3, below) and projected ETC rates, a toll plaza at the I-5 and/or I-205 bridge would need about 12-18 lanes and would require between six and eleven acres of land.

Tolling One Bridge or Two

Two options for tolling the Columbia River Crossing have been studied.

- **Tolling I-5 Only**: This study option would assume that travelers pay a toll on the I-5 bridge in both the northbound and southbound directions. The I-205 bridge would provide a toll-free alternative.

- **Tolling I-5 and I-205**: This study option would assume that travelers pay a toll on both bridges, but only in one direction. That is, both bridges would be tolled either northbound or southbound.

Tolling I-5 Only would require toll plazas for both the northbound and southbound lanes. Toll plazas could be located either north or south of the river, and drivers tolled as they enter or exit the bridge.

Tolling I-5 and I-205 would require only one toll plaza at each bridge, capturing either the northbound or southbound traffic (it would have to be the same direction for both bridges).

Toll Plaza Locations

There are a number of challenges in locating toll plazas for the Columbia River Crossing.

- Both the I-5 and I-205 freeways, near the river, are closely bordered by development and environmentally sensitive areas, leaving scant room for toll plazas.

- Toll plazas are brightly lit 24-hours a day and generate added traffic noise from stopping and starting vehicles. Nearby land uses need to be sheltered from these effects.

- On- and off-ramps are located very close to the bridges. Capturing all the traffic would require placing the toll plaza(s) after the last on-ramp (and/or before the first exit ramp), or would require split plazas with toll collection on the freeway mainline and on the ramps.

- The share of drivers using Electronic Toll Collection is likely to be lower in the early years and higher in the later years. Ideally, toll plazas would be 'shrinkable' so that the number of manual toll lanes could be reduced in later years.

All of these issues and others will be studied in detail in the Environmental Impact Statement.

3. Tolling and Traffic

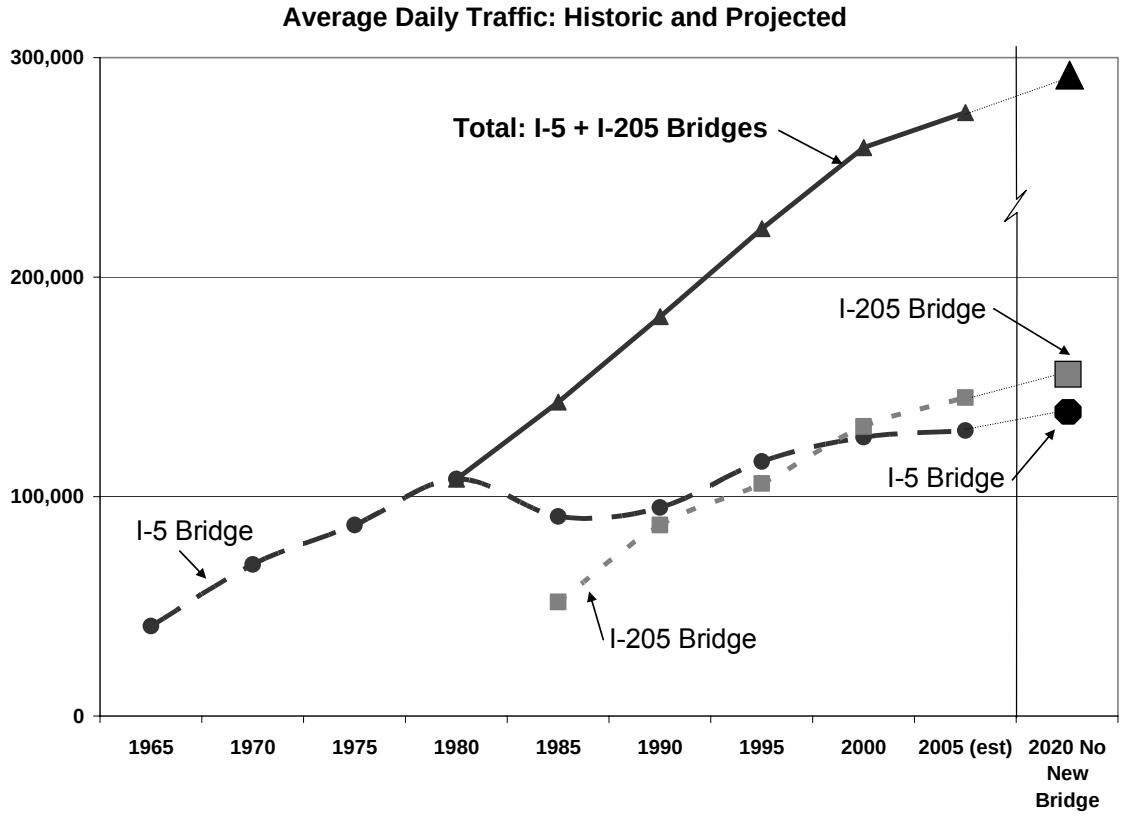
With or without new investment in the Columbia River Crossing, and with or without tolls, travel across the river is going to grow. The following numbers are based on work done over the last five years and include the results of the *Portland/Vancouver I-5 Trade Corridor Freight Feasibility and Needs Assessment Study* and the *Portland/Vancouver I-5 Transportation and Trade Partnership Final Strategic Plan*, as well as analysis completed in the last year.

Historic and Projected Travel Growth

The chart below illustrates forty years of growth in traffic on the Columbia River Crossing, as well as projections for the year 2020, assuming no new bridge in built.

Future Capacity with No New Bridge: The total projected growth for the next fifteen years is about equal to the growth in the last five years alone.

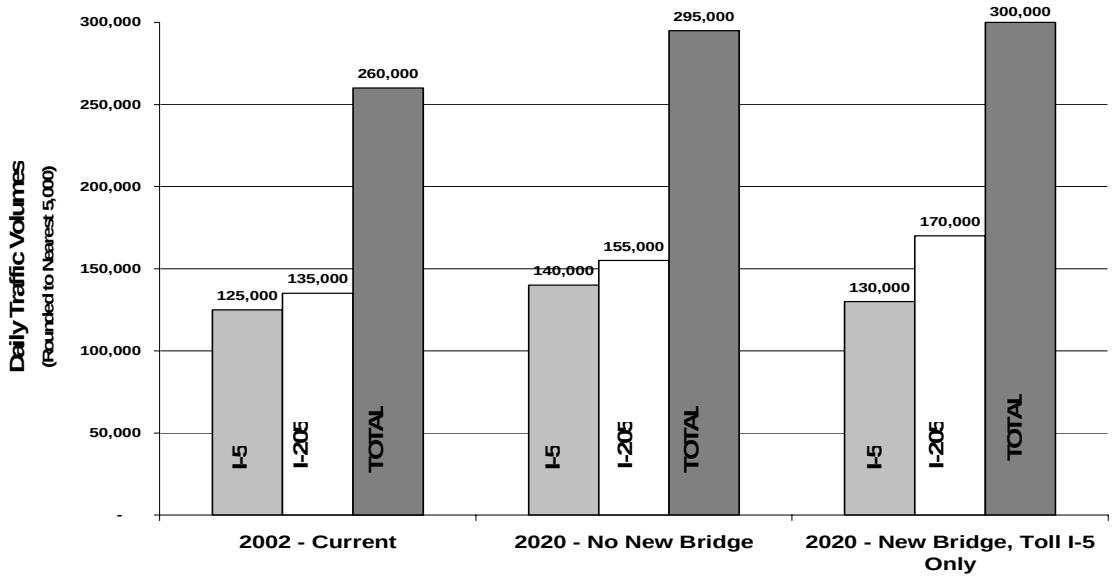
This significant slowing in growth would occur because both bridges are already operating at or near capacity in the peak hours. Future growth in travel will come from growth in traffic in what are now the off-peak hours. The I-5 bridge, in particular, would be likely to operate at or close to capacity for about eight hours a day.



The Effects of Tolls on Travel

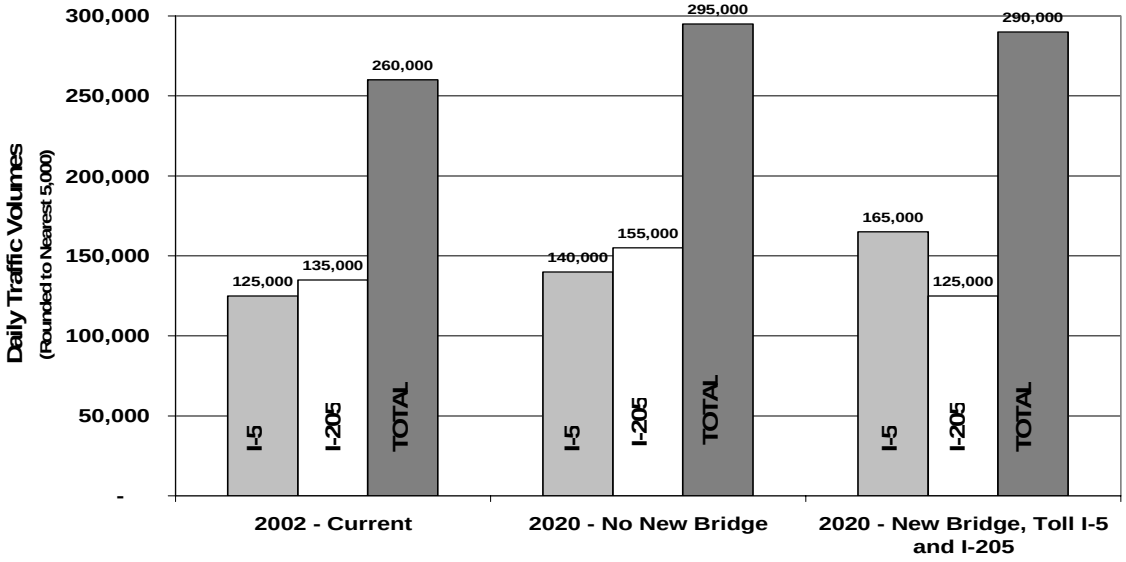
New Bridge, Toll I-5 Only

If a new or supplemental toll bridge is built at the I-5 crossing, while I-205 remains toll-free, traffic across the new bridge would be just slightly more than it is today, and less than if no bridge had been built at all.



New Bridge, Toll Both I-5 and I-205

If a new or supplemental toll bridge is built at the I-5 crossing, and I-205 is also tolled, the new bridge would carry about 40,000 more vehicles than today, while traffic on I-205 would decrease compared to today.



4. Tolling and Revenue

Revenue forecasts prepared for this project to date have been based on traffic projections prepared for earlier studies. In addition, a set of assumptions had to be made regarding what toll rates would be charged, whether there would be premium or discount tolls by time-of-day and for carpools, what the rates would be for commercial vehicles, how tolls would increase with inflation, and what the future rate of inflation is likely to be.

The purpose of this analysis is to inform decisions about what should be studied further in the Environmental Impact Statement. It is not intended to support recommendations regarding tolls or toll rates, or to support ultimate decisions about how to fund the Columbia River Crossing project. A number of different assumptions were tested.

The figures below are based on the following assumptions:

- The car toll would be $2.00, one-way, in 2004 dollars.
- If I-5 only were tolled, in both directions, the round-trip toll would be $4.00 (2004$). If I-5 and I-205 were tolled, in one direction, the round trip toll would be $2.00 (2004$)
- Trucks would pay more than cars, based on the number of axles.
- There would be discounts for Electronic Toll Collection users and for vehicles with three or more occupants (HOV3+). Buses would travel toll-free.
- Inflation is assumed to be 3% annually, and tolls would escalate with inflation in 25¢ increments. If the project opened in 2013, the opening day car toll would be $2.75.

	Toll I-5 Only Toll *ONE* Bridge Northbound *AND* Southbound – RT Toll $4.00	***Toll I-5 and I-205*** Toll *TWO* Bridges Northbound *OR* Southbound – RT Toll $2.00
2013	$125 million	$140 million
2025	$150 million	$170 million

Annual Projected Revenues from Tolls
(2004$ Rounded)

Higher Revenues from One-Way Toll: The reason revenues are higher when only one direction is tolled, even though the round-trip toll is half, is that all traffic crossing the river pays a toll.

5. Laws about Tolling

Both I-5 and I-205 are part of the federal Interstate Highway System and are subject to federal laws. The Columbia River Crossing also falls under the jurisdiction of the states of Oregon and Washington. Key legal questions relating to tolling are:

- **Tolling the Interstate**: Are tolls allowed on an Interstate project and, if so, under what circumstances?
- **Tolling one bridge or two**: If a new or supplemental bridge is built in the I-5 corridor, can tolls be collected on both the I-5 and I-205 bridges?
- **Revenue uses**: Can toll revenues be used for: Highway-related elements of the project such as interchange improvements? Transit projects? Project elements that are phased in over time?

Federal Law

Current federal law allows tolls on new tunnels and bridges, with various limitations. Traffic analysis completed to date suggests that tolling only I-5 could be counterproductive, leaving new capacity on the bridge unused as drivers would prefer the free alternative, I-205.

Federal statutes are quite restrictive about whether tolls could be imposed on an already existing bridge (I-205). To do so under current laws, the Federal Highway Administration (FHWA) would have to determine that the two crossings operate as "one route."

Oregon Law

Under Oregon law, the Oregon Department of Transportation may toll the existing I-5 and I-205 bridges and any new or supplemental bridges. Toll revenues may be used for the project where they're collected, related projects, and other constitutionally allowed transportation projects and programs, including transit.

Washington Law

Current Washington state law would allow tolls to be imposed to finance some Columbia River Crossing projects but not others. Even for those projects that would fall under current laws, new legislation might be desirable.

- New legislation would be required to:
  - Toll the I-205 bridge, because it cannot be defined as "constructed or acquired."
  - Have a single tolling program for both I-5 and I-205 because current law prohibits combining toll projects for financing purposes.
- New legislation might be desirable to:
  - Clearly permit project phasing.
  - Clearly permit toll revenues to pay for improvements to bridge approaches (projects on I-5 and I-205) that might be phased in over time.
  - Resolve bi-state issues including shared setting of toll rates.