



## Portland Area Mainline Needs Assessment

DRAFT

# Congestion Pricing: Working Paper #2



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## 1. Overview

The authors of this whitepaper have performed a high-level industry survey of agencies that employ congestion pricing in some form. This whitepaper will describe the methods used for both conventional toll facilities and managed lanes.

Agencies that have made use of congestion pricing fall into two broad categories:

- Conventional toll facilities like the Maine Turnpike, in which all vehicles using the roadway are tolled, and the tolls are in effect around the clock.
- Managed lane facilities with variable tolls, in which at least one of the following is true:
  - Tolls are not applied 24/7; and/or
  - Only selected lanes are tolled.

The following table depicts the share of average daily traffic that originates within the Portland Area Mainline (PAM) zone, from Exits 44 through 53:

**Table 1 – Average Daily Traffic in PAM Zone**

<b>Origination Point</b>	<b>Average Daily Traffic</b>
Exit 44 to Exit 45	35.4%
Exit 45 to Exit 46	47.2%
Exit 46 to Exit 47	53.7%
Exit 47 to Exit 48	53.3%
Exit 48 to Exit 52	50.5%
Exit 52 to Exit 53	42.2%
Overall Average	47.3%

Less than half of all mainline traffic operating within the PAM zone actually began its trip at some point between Exits 45 and 53. Therefore, the ability to manage traffic is constrained if congestion pricing is applied solely to traffic that begins within this zone. Less than half of all traffic in the zone would have its behavior impacted by this approach to congestion pricing.

In order for congestion pricing to be effective within the PAM zone at a reasonable price, it should be applied to all trips—not just those that start within the zone. The drawback of this approach is that half of all tolled trips on the Maine Turnpike do not travel through the PAM zone. Thus, the proposed congestion pricing scheme would impact many vehicles that do not contribute to the traffic-related issues on the Maine Turnpike in Greater Portland.

## 2. Conventional Toll Facilities

Transportation agencies have undertaken various methods for implementing congestion pricing on conventional toll facilities, as outlined below.

### 2.1 Port Authority of New York and New Jersey

The Port Authority of New York and New Jersey (PANYNJ) operates four bridges and two tunnels that connect New York and New Jersey. PANYNJ applies peak-hour pricing on weekdays (6-10am and 4-8pm) as well as weekends (11am-9pm). During off-peak periods, cars pay \$10.50; the rate jumps to \$12.50 during peak hours. Thus, peak-hour prices are 19% higher than off-peak. Cash prices are set at \$15.00 and do not vary by time of day.

### 2.2 New York State Thruway Authority

The New York State Thruway Authority (NYSTA) employs congestion pricing at both the Spring Valley plaza (4-6pm) and on the new Tappan Zee Bridge (7-9am). However, congestion pricing only applies to commercial vehicles. Passenger cars pay no toll at Spring Valley, and they pay a consistent toll on the Tappan Zee. Some unique elements of this plan include:

- The fare is structured so that peak fares are two times higher than off-peak fares;
- There is a 45-minute “shoulder period” at the front end of the peak period in which rates gradually rise, and then there is another 45-minute shoulder at the back end during which rates gradually fall back to off-peak levels; and
- The peak/off-peak distinction only applies to E-ZPass customers. Cash-paying customers pay the “peak period” rate at all times.

### 2.3 Chicago Skyway

The Chicago Skyway is an 8-mile toll facility on I-90 on the southeast side of Chicago, operated for the City of Chicago by lease to a private entity. Like NYSTA, the Skyway applies peak-period pricing only to commercial vehicles. All commercial vehicles pay a 40% surcharge from 4am to 8pm. The surcharge applies to both cash and E-ZPass customers; the rates are the same regardless of payment type.

### 2.4 The Toll Roads of Orange County

This All-Electronic Tolling (AET) facility encompasses four different state routes (CA-73, CA-133, CA-241, and CA-261) running generally north-to-south in Orange County, CA. Peak period pricing generally applies for an hour in the morning and another hour in the evening. For vehicles equipped with a transponder (FasTrak), the peak period surcharge ranges from 10% to 29%, depending on the toll plaza. For customers without a transponder who have set up an “ExpressAccount”, which entails pre-registering the vehicle’s license plate and pre-arranging a method of payment, the tolls are \$1.00 higher than the FasTrak tolls. Customers choosing the “One Time Toll” option pay the “peak period” rate at all times.

### 2.5 State Route 520 Floating Bridge, Seattle

The Washington State Department of Transportation (WSDOT) operates this AET facility—one of four toll facilities in the Seattle area operated by the Department. Tolls on SR-520 vary throughout the day according to a pre-determined schedule. For vehicles equipped with a Good to Go! transponder, the weekday fare can range from as low as \$1.25 (from 11pm to 5am) to as high as \$4.30 (from 7-9am and again from 3-6pm). On weekends, the Good to Go! fare ranges from \$1.25 (11pm to 5am) to \$2.65 (from 11am to 6pm). Customers that choose to pay by mail are required to pay a \$2 surcharge per transaction.

The table below provides a brief summary of the various peak-period pricing policies at these five facilities.

**Table 2 – Peak-Period Pricing at Conventional Toll Facilities**

Facility	Peak Pricing Period	Peak vs. Off-Peak Differential
<b>PANYNJ</b>	6am-10am (weekday mornings) 4pm-8pm (weekday evenings) 11am-9pm (weekends)	19% for passenger cars
<b>NYSTA</b>	7-9am (Tappan Zee) 4-6pm (Spring Valley)	100%, applied only to commercial vehicles
<b>Chicago Skyway</b>	4am-8pm	40%, applied only to commercial vehicles
<b>The Toll Roads</b>	7:30-8:30am (SB) 5-6pm (NB)	10% to 29%, depending on location
<b>SR-520 Bridge</b>	7-9 am & 3-6pm (Weekdays) 11am-6pm (Weekends)	244% (weekdays) 112% (weekends)

In summary, congestion pricing strategies on conventional toll facilities vary significantly. The following points are focused on customers equipped with a valid transponder:

- The length of the peak period varied from as short as 1 hour to as long as 16 hours.
- Some agencies applied a two-tiered system, with a peak period price and an off-peak period price. Other agencies used a more graduated approach, with rates that gradually transition between the off-peak price and the peak price.
- Some agencies applied peak-period pricing to all vehicles; other focused the strategy solely on commercial vehicles.
- For some agencies, the peak price was only 10-20% higher than the off-peak price. For other agencies, the peak price was as much as 240% higher.
- Some agencies assessed the same fares to ETC and non-ETC customers. Others held non-ETC prices at a higher rate.

### 3. Managed Lane Facilities

Numerous managed lane facilities are now in operation around the country. Some facilities employ dynamic pricing, in which prices respond to traffic conditions. Other facilities employ time-of-day pricing, in which rates are published in advance to respond to historically-determined peak periods. The table below summarizes some of the rates in effect at selected managed lane facilities.

**Table 3 – Managed Lane Fares**

Facility	Type of Pricing	Typical High Fare	Typical Low Fare	Ratio
<b>I-95 Express Lanes Miami, FL</b>	Dynamic	\$10.50	50¢	21:1
<b>Katy Freeway Houston, TX</b>	Time of Day	\$3.20	40¢	8:1
<b>SR-91 Orange County, CA</b>	Time of Day	\$9.80 (EB) \$5.45 (WB)	\$1.60	6:1 (EB) 3.5:1 (WB)
<b>I-66 Inside-the-Beltway W. of Washington, D.C.*</b>	Dynamic	\$21.50 (EB) \$17.00 (WB)	\$2.75 (EB) \$4.25 (WB)	8:1 (EB) 4:1 (WB)

*\* I-66 ITB rates were drawn from Friday, February 1, 2018. Eastbound tolls are in effect from 5:30-9:30am, and Westbound tolls are in effect from 3pm to 7pm. Maximum and minimum rates on this facility can vary significantly from day to day.*

On the whole, rates at managed lane facilities experienced a greater range of fluctuation than rates at conventional facilities. This was likely driven by two factors:

- First, most managed lane facilities had an obligation to provide a specified level of service for their customers. This requirement created a situation where the facility must, on occasion (i.e. periods of peak demand), be very aggressive in its pricing in order to manage the demand.
- Second, most managed lane facilities were configured in such a way that free alternative routes were readily available. Therefore, drivers could easily evade high priced tolls by shifting into the free lanes, albeit at a diminished level of service.

By contrast, conventional facilities generally had no statutory requirement to provide a given service level, and alternative routes were generally more difficult to access. As a result, the operators of these facilities were typically inclined to be less aggressive with implementing pricing differentials.

### 4. Summary

Any “congestion pricing” scheme for the Maine Turnpike should be modeled after the schemes that have been implemented at the conventional facilities cited herein. A congestion pricing scheme intended to reduce congestion in the Greater Portland area should consider the parameters outlined below.

A differential of 50% for E-ZPass customers would be a reasonable place to start. This is well-positioned inside the range of differentials used at various conventional facilities today. Experience suggests that a toll differential of 50% would yield a reduction of 5-10% in traffic volumes during the tolling period.

The differential should be applied to both passenger cars and commercial vehicles. Commercial vehicles only comprise approximately 5% of peak-period traffic on the Maine Turnpike. Therefore, if the surcharge were applied solely to commercial vehicles, there would be very little benefit in terms of peak-period capacity.

On the Maine Turnpike, E-ZPass rates are (in some instances) capped by the cash rate in effect for the same movement. Therefore, it will be critical to increase cash rates as well. The cash rates will need to be adjusted such that they will not constrain the implementation of the E-ZPass peak-period surcharge. For sake of simplicity, the cash rates should probably be kept constant throughout the day.

The timing of the application of a toll differential depends on the periods in which capacity is a constraint.