Value Pricing

What is it?

Value pricing (also called road pricing or congestion pricing) refers to charging motorists a fee that varies with the level of congestion. Value pricing is different from tolling in that it is used to manage congestion or demand, while tolling is used to generate revenue to repay a bond or debt (though tolls may include a value pricing component). Value pricing reflects the idea that pricing roadways directly benefits motorists through reduced congestion, reduced wear and tear on vehicles, and improved travel time reliability. There are four main types of value pricing strategies:[1]

Which Mosaic Categories does the program support?

ECONOMIC VITALITY
ENVIRONMENTAL STEWARDSHIP
FUNDING/ FINANCE
MOBILITY

- **Variable priced lanes:** This type of pricing involves variable tolls on separated lanes within a highway, such as express toll lanes or high occupancy toll (HOT) lanes. During congested periods, drivers can opt to use the priced lanes for a fee (or for free for HOT lanes if minimum vehicle occupancy requirements are met).
- **Variable tolls on entire roadways:** With this type of pricing, flat toll rates on existing roads or bridges are changed to a variable toll schedule so that the toll is higher during peak travel hours and lower during off-peak hours. This encourages motorists to use the roadway during less congested periods, and allows traffic to flow more freely during peak times.
- **Cordon Pricing:** Cordon pricing involves charging a fee to enter or drive within a congested area, usually a city center.
- **Area-wide Pricing:** Area-wide pricing refers to per-mile charges, which may vary by level of congestion, on all roads within an area.

Electronic payment and pricing applications, particularly variable tolling and congestion pricing, are key elements of the U.S. Department of Transportation (USDOT) Tolling and Pricing Program.

What are the benefits?

- **Economic Vitality:** Reduces traffic congestion, which provides positive economic impacts in the form of improved freight travel time and reliability and increased access to employment centers.
- **Funding/Financing:** Generates operating revenues for local transportation or other infrastructure improvements, which can help create jobs.
- **Mobility:** Encourages spatial and temporal shifts in demand to less congested routes, modes, and travel periods. This helps ensure free-flow travel conditions, reduces congestion, and improves travel time reliability (for transit and/or autos).

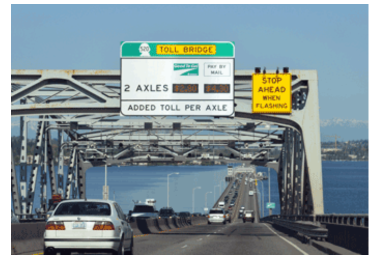
[1] Federal Highway Administration. *Congestion Pricing: A Primer*. https://ops.fhwa.dot.gov/publications/congestionpricing/sec2.htm.

- **Environmental:** Reduces the emission of criteria air pollutants and greenhouse gas emissions (GHGs) that are harmful to the environment and human health by supporting more fuel-efficient travel speeds and potentially encouraging shifts to more sustainable transportation modes.

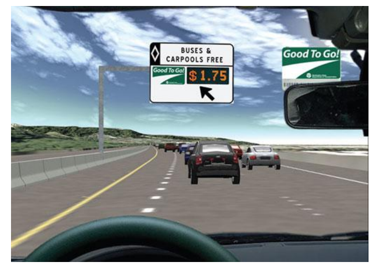
Where is it being used?

Value pricing is becoming more common as public agencies look for more efficient and cost-effective ways of utilizing existing roadway capacity. Examples on the west coast include: [5]

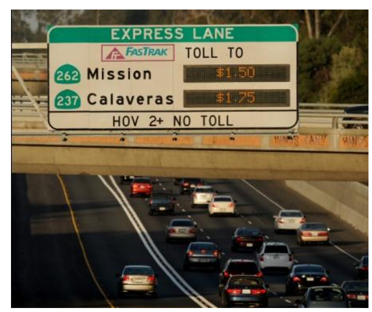
- SR 520 Floating Bridge, King County, WA
- SR 167 HOT Lanes, King County, WA
- I-580/I-680 Express Lanes, Alameda County, CA
- I-15 Express Lanes, San Diego, CA
- I-10 and I-110 Express Lanes, Los Angeles, CA



SR 520 Floating Bridge, WA[2]



SR 167 HOT Lanes, WA[3]



I-680 Express Lanes
Alameda County, CA[4]

How effective is it?

A broad literature review of value pricing programs in the U.S. and around the world conducted by the Federal Highway Administration (FHWA) in 2008 concluded that the introduction of pricing results in vehicle trip reductions ranging from 7% to 30%, depending on the pricing and breadth of the strategy. The highest values represented comprehensive city core area pricing systems (rather than narrow corridors) that were introduced with simultaneous increases in transit service and shared-ride alternatives.[6]

Additionally, according to the OSTI Greenhouse Gas Toolkit, congestion pricing could result in a 0.5% to 1.6% reduction in total transportation sector baseline GHG emissions in 2030, and cordon or area pricing could result in a 0.1% to 18.6% reduction in total transportation sector baseline GHG emissions in 2030, depending on the intensity of implementation.[7]

Variable Pricing for Lanes and Roadways

According to a 2012 United States Government Accountability Office (GAO) study, evaluations of 14 value pricing projects in the U.S. have generally resulted in reduced congestion, although other results are mixed. Overall, findings show that HOT lane projects reduce congestion, increase vehicle

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[2] https://www.wsdot.wa.gov/.
[3] https://www.wsdot.wa.gov/Tolling/SR167HotLanes/default.htm.
[4] https://www.alamedactc.org/files/managed/Document/8206/I_680_Southbound_Express_Lane.jpg .
[5] In this summary, the best available data on program effectiveness is used. Whenever possible, information is provided for the referenced examples; however, that information is not always available.
[6] Federal Highway Administration. *Examining the Speed-Flow-Delay Paradox in the Washington, DC Region: Potential Impacts of Reduced Traffic on Congestion Delay and Potential for Reductions in Discretionary Travel during Peak Periods: Final Report.* "Chapter 4. Effectiveness of Congestion Pricing Strategies: Literature Review Key Findings." 2008. https://ops.fhwa.dot.gov/publications/fhwahop09017/018_section_4.htm
[7] *Oregon Greenhouse Gas Toolkit Report*. https://www.oregon.gov/ODOT/Planning/Pages/GHG-Toolkit.aspx.

throughput, and generally increase speeds and decrease travel times in both priced HOT lanes and un-priced general purpose lanes. Specific project examples are described below:[8]

- The SR 167 HOT Lanes Pilot Project in Washington improved peak-period, peak-direction vehicle speeds in both the general purpose and HOT lanes for the years 2007 and 2009, even as traffic volumes increased. Specifically, average vehicle speeds increased 21% (from 40.5 to 49.3 miles per hour [mph]) in the general purpose lanes (in conjunction with an 11% increase in traffic volumes) and average vehicle speeds in the HOT lanes increased by 6% (from 57 to 61 mph), in conjunction with a 4% increase in northbound traffic volumes.[9]
- On I-15 in San Diego, drivers in the HOT lanes reportedly saved up to 20 minutes more than drivers in adjacent un-priced lanes during the most congested times. On I-95 in Miami, drivers have reportedly saved about 14 minutes in the HOT lanes and 11 minutes in the adjacent un-priced lanes per trip.[10]
- According to a 2006 evaluation of the I-394 project in Minneapolis, vehicle throughput in the HOT lanes increased by 9% to 13% and by 5% in the adjacent un-priced lanes after the lanes opened. A 2000 evaluation of the SR 91 project in Orange County estimated that vehicle throughput increased 21% on the entire roadway.[11]
- A bridge toll demonstration in Lee County, Florida, included a 50% discount in the hours directly before and after the main peak period (shoulders of the peak) to induce shifts in travel patterns away from the main peak hours. The discount was attributed to a 7% reduction in AM peak hour traffic. In 2001, the Port Authority of New York and New Jersey instituted off-peak savings of 20% for drivers crossing the Hudson River, with early results producing peak-hour volume reductions close to 20%.[12]
- Of seven variable pricing projects that assessed impacts on transit ridership, only one project (I-95 in Miami) was found to result in an increase in transit ridership. Between 2008 and 2010, the average weekday ridership on the I-95 express bus in Miami increased by 57%, from about 1,800 riders in 2008 to more than 2,800 in 2010. About 38% of these riders reported that they used to drive alone.[13]
- Three projects (SR 91 in Orange County, I-394 in Minneapolis, and SR 167 in Seattle) assessed equity impacts on low-income drivers. Results indicated that drivers of all incomes use the HOT lanes, with high-income drivers using them more often than low-income drivers.
- Evaluations of three HOT lane projects (I-15 in San Diego, SR 91 in Orange County, and I-394 in Minneapolis) and one peak-period pricing project—the New Jersey Turnpike—assessed the impacts of pricing on air quality. Minimal air quality improvements were reported on I-15, I-394, and the New Jersey Turnpike, and no effects were found for SR 91.

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[8] United States Government Accountability Office. *Traffic Congestion: Road Pricing Can Help Reduce Congestion, But Equity Concerns May Grow.* 2012. https://www.gao.gov/assets/590/587833.pdf.

[9] Washington State Department of Transportation. *SR 167 HOT Lanes Pilot Project Performance Update.* 2010. https://www.wsdot.wa.gov/Tolling/SR167HotLanes/publications.htm.

[10] United States Government Accountability Office. *Traffic Congestion: Road Pricing Can Help Reduce Congestion.* 2012.

[11] United States Government Accountability Office. *Traffic Congestion: Road Pricing Can Help Reduce Congestion*. 2012.

[12] *Transit Cooperative Research Program (TCRP) Report 95.* "Chapter 14: Traveler Response to Transportation System Changes: Road Value Pricing." 2003. p. 14-5. https://onlinepubs.trb.org/onlinepubs/tcrp/tcrp_rpt_95c14.pdf

[13] United States Government Accountability Office. *Traffic Congestion: Road Pricing Can Help Reduce Congestion.* 2012.

Cordon and Area Pricing

While no area-wide projects are in place in the U.S, the state of Oregon is currently testing a pricing scheme involving per-mile charges, which may be considered as a replacement for fuel taxes in the future. A value pricing component is also being tested, with higher charges during congested periods on high traffic road segments.[14]

In Norway, several cordon toll programs have been in operation over the last few decades. The first of these "toll rings" was established in 1986 in Bergen (population: 300,000). The idea subsequently spread to Oslo (Norway's capital - population 700,000) in 1990, and to Trondheim (Norway's third largest city - population 140,000) in 1991. The programs charge drivers of autos between $0.80 to $1.75 during workday hours to cross a ring around central areas and have been able to reduce traffic by 5% to 10% through modal shifts away from single-occupancy vehicles (SOV) and temporal shifts away from peak congestion periods.[15]

How much does it cost to implement?

The costs to develop and maintain value pricing and HOT lane schemes depend on the size, scope, and purpose of the program. The costs to convert HOV lanes to HOT lanes as part of congestion projects conducted in three metropolitan areas ranged from $9 to $17 million (M):[16]

- Denver, Colorado (2005): The Downtown Express HOT lanes project cost $9M to implement and included a two-lane barrier-separated reversible facility in the median of a 2-mile section of I-25 and US 36.
- Minneapolis, Minnesota (2005): It cost $13M to implement the conversion of HOV lanes that extended from Highway 101 to I-94 to dynamically-priced HOT lanes. The project included a 3-mile section that had two reversible lanes separated by a barrier from general purpose traffic and an 8-mile section that had one lane in each direction separated from general purpose traffic by double-white stripes.
- Seattle, Washington (2008): In Puget Sound, an HOV to HOT conversion project cost $17M to implement and included 9 miles along SR 167 that extended from 15th Street in Auburn to I-405 in Renton. As of January 2010, the average monthly operating costs for the SR 167 HOT lanes was $97,600 (which included monitoring, maintenance, enforcement, transaction processing, emergency response, a customer service center, TMC operations, and tolling operations). From May through November 2009, the SR 167 lanes generated an average monthly gross revenue of $32,740.[17] Within 12 years, the net annual toll revenue is expected to have recouped the preliminary capital costs of the conversion.[18]

The cost estimate for the cordon pricing program in Oslo, Norway, is shown below: [19]

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[14] Federal Highway Administration. *Congestion Pricing: A Primer*.

[15] *TCRP Report 95.* "Chapter 14: Road Value Pricing." 2003. p. 14-11

[16] Federal Highway Administration. *Intelligent Transportation Systems Benefits, Costs, Deployment, and Lessons Learned Desk Reference: 2011 Update.* 2011. p. 135.

https://www.itskr.its.dot.gov/its/benecost.nsf/files/BCLLDepl2011Update/$File/Ben_Cost_Less_Depl_2011%20Update.pdf

[17] Washington State Department of Transportation. SR 167 HOT Lanes Pilot Project Performance Update. 2010.

[18] Federal Highway Administration. *Intelligent Transportation Systems Benefits, Costs, Deployment, and Lessons Learned*. 2011. p. 135.

[19] Federal Highway Administration. *Intelligent Transportation Systems Benefits, Costs, Deployment, and Lessons Learned.* 2011. p. 140.

- Oslo, Norway (1990): implementation: $40 M; annual operations and maintenance: $23.3 M.

Implementation resources

The following resources may be helpful for jurisdictions wishing to explore the implementation of value pricing:

- Congestion Pricing, Federal Highway Administration
- Road Pricing Overview, Federal Highway Administration
- Tolling and Pricing Program, Federal Highway Administration:
- Road Pricing TDM Encyclopedia, Victoria Transport Policy Institute:
- Road Pricing Can Help Reduce Congestion But Equity Concerns May Grow, U.S. Government Accountability Office