

## Performance Contracting for the Pennsylvania Turnpike Environmental Defense Fund

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**Summary:** Congestion pricing and emissions-based road pricing can encourage timely adoption of less carbon-intensive fuels and higher-efficiency vehicles, while boosting efficient use of existing road capacity. A Pennsylvania Turnpike PPP agreement will deliver financial benefits for the State along with improved environmental performance, improved public health protection, and more efficient use of the existing roadway if it:

- (a) encourages timely adoption of premium toll charges for dirty diesel trucks and buses, with discounts for vehicles meeting the clean vehicle and low-carbon fuel standards;
- (b) encourages use of higher toll charges during peak periods for some or all users on road segments where congestion threatens to increase delays or emissions, perhaps through the use of Super HOT lanes that provide money-back guaranteed congestion-free travel;
- (c) includes performance-based contract provisions that ensure the concessionaire has a financial incentive to manage the facility for pollution and congestion reduction, possibly based on availability payments that compensate the concessionaire based on performance, rather than having the contractor simply keep the toll revenues they collect.

**Experience Elsewhere:** The Ports of Long Beach/Los Angeles are adopting a new container fee system that will allow only clean emissions certified trucks. Time-of-day road pricing has cut congestion and pollution in many places including Port Authority bridges and tunnels between NY and NJ, and interstate roads in California, Texas, Minnesota, Utah, and Colorado. London is targeting emission-based tolls on heavy, legacy (high-emitter) trucks. Germany charges a 50% toll premium for dirty, old trucks on its motorways which is spurring rapid upgrading of truck fleets, cutting pollution. Calibrating tolls to advance public health and welfare goals as well as to manage congestion can eliminate pollution hot spots and control of transportation carbon emissions and energy use. Shadow toll payments (also known as availability payments with performance adjustments) are widely used in PPPs abroad and are being used in a new Port of Miami PPP contract.

**Public Acceptance:** Tolls of any type are a hard sell to the general public. The key to public acceptance is (1) fairness, (2) better system performance, (3) choice and (4) use of revenues. Toll roads were initially accepted because the public supported the vision of long-distance, congestion-free road travel. Gov. Rendell has declared that revenues from any PPP lease will be used to repair 5,900 below-standard bridges and fund transit. This builds public support, minimizes the temptation of legislators to ask for special projects in return for their vote, and outflanks Pennsylvania Turnpike Commission efforts to use revenues to fund the Mon-Fayette Toll Road.

Experience from London, Stockholm and Oslo to San Diego shows that fairness, delivering better performance, effective use of revenues and choice are all crucial to key to winning public acceptance of tolls on existing free roads.<sup>1</sup> These same principles apply equally when

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<sup>1</sup> For more information, see [www.environmentaldefense.org/go/highperformancenetworks](http://www.environmentaldefense.org/go/highperformancenetworks).

introducing variable tolls to advance public health and welfare objectives on already-tolled freeways such as the Pennsylvania Turnpike.

Health science shows that people living within 500 to 1500 feet of busy roadways experience significantly elevated risks of asthma attacks, heart attacks and other diseases like cancer.<sup>2</sup> The public already has a very high degree of acceptance of regulatory controls to improve human health, especially vulnerable populations such as children and the elderly. Reasonable monitoring and remedial action requirements to protect human health will meet with public acceptance if implemented fairly and in conjunction with a public education campaign on the health benefits of such a program. Moving to energy-efficient vehicles, low-carbon fuels and smoothing out traffic flow through congestion pricing produces both air quality and CO2 benefits. These can be marketed jointly to the public.

Performance-elements in a Turnpike contract could add important safeguards that long-term PPP deal will serve and protect public welfare. If the concessionaire is to be compensated based in part on performance in reducing congestion and emissions, it is critical to give the concessionaire flexibility to vary tolls by (1) by time-of-day and road segment (responding to congestion) and (2) the emission characteristics of vehicles. Many U.S. concession agreements include toll rate schedules that cap tolls to respond to public concern about potential price gouging. Caps should be structured so they do not impede the ability of the concessionaire to manage traffic demand during peak periods of congestion.

**Contract Design:** Concessionaires should be invited to provide proposals structured to maximize mobility and emissions reductions. Two options might be considered:

**Option 1 – Concession Payment with Performance Specifications:** This is most similar to the approach that has been under discussion to date in Pennsylvania. Potential Turnpike concessionaires would compete on the basis of the up-front payment they make, enabling the State to invest in an annuity to invest in bridge and road repairs and transit. But all concessionaires would agree to:

- Ensure reasonable further progress in cutting greenhouse gas emissions related to traffic operating on the Turnpike and related maintenance, operations, and construction, guaranteeing to reduce these emissions by at least 3 percent a year each year during the concession compared to the previous year (accumulating a guaranteed 60% cumulative reduction from the baseline year over a 30 year period), with significant performance penalties in the event of failure to achieve these goals.
- Identify and eliminate air pollution hot spots along the Turnpike by funding independent monitoring of the highest likelihood air pollution hot spots adjacent to the Turnpike in the vicinity of residential, commercial areas, or sensitive populations with not fewer than five PM 2.5 and mobile source air toxics monitors located not more than 15 meters from the edge of the Turnpike right-of-way at these potential hot spot locations, with monitor siting and protocols periodically revised in response to guidance from EPA, the state air agency, and public comment, and with significant performance penalties in the event of failure to meet the objective.

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<sup>2</sup> For more information, see [www.environmentaldefense.org/go/allchokedup](http://www.environmentaldefense.org/go/allchokedup).

- Monitor and operate the Turnpike to avoid loss of throughput capacity due to congestion delay, with graduated performance penalties assessed when the speed on any Turnpike segment falls below 40 mph in any hour of any day.

The concessionaire would be encouraged to meet these goals by using:

- (a) congestion and emission-based tolls,
- (b) the introduction of low carbon fueling opportunities, anti-idling power stations at rest stops, and service stations that retrofit legacy trucks with energy-saving APU units, energy-efficient tires, and other efficiency improvements,<sup>3</sup> and
- (c) investment in improved public transportation and goods movement options to boost mobility in the corridor while reducing growth in vehicle traffic.

Emission toll premiums would be applied to vehicles with high emissions, especially targeting large, old (legacy) trucks on long-haul trips spewing emissions on local communities. Congestion toll premiums might be applied to high-speed lanes (Super HOT lanes) allowing other drivers to choose to remain in more congested flat-toll lanes. Any incremental capital costs of installing equipment or infrastructure needed to support Super HOT lanes or emissions-based tolling would be covered by asset lease agreements and amortized over the term of the lease.

**Option 2 - Shadow Tolls With Performance Adjustments:** A major concern of private concessionaires will be their ability to model congestion and emission-based tolls with sufficient accuracy to have confidence that they can implement such a program and still secure an adequate rate of return for their investors. An effective way to address this is through the use of shadow tolls where the concessionaire is paid a flat rate based for each vehicle served at free flow speeds - not on the basis of tolls collected. Under this model the public owner of the facility might assume more of the risk of toll revenue adequacy in return for tying toll policy to public health and welfare objectives. The private concessionaire would be assured of a predictable stream of revenue based on the negotiated shadow toll rate. The risk of decreased revenues from future improvements on parallel highway facilities would be reduced. Additional incentives would be written into an agreement to award a concessionaire with bonus payments based on overall efficiency of travel services provided (e.g. less congestion and travel speeds calibrated to efficient fuel consumption earns bonus payment for the concessionaire). A spectrum of risk-sharing models can be observed in PPPs abroad.

Potential concessionaires might compete on the basis of the net present value of the annual payment stream they would guarantee the State, adjusted by the net present value of the anticipated payment stream from shadow tolls (also called availability payments) they agree to accept as compensation for their operation and management of the facility.<sup>4</sup> This option could build on an approach the Federal Highway Administration calls, “Concurrent Real and Shadow

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<sup>3</sup> For an example of an innovative, non-profit venture to retrofit legacy trucks with energy and emissions-efficient improvements along I-5 in California and Oregon see [www.cascadesierrasolutions.org](http://www.cascadesierrasolutions.org).

<sup>4</sup> The use of availability payments is being piloted in the PPP agreement for the Port of Miami Tunnel project in Miami, Florida. The Concurrent Real and Shadow Toll model has been proposed by FHWA’s Patrick DeCorla-Souza in various papers, including *A New Public-Private Partnership Model for Road Pricing Implementation*, 2005 Transportation Research Forum.

Tolling,” in which the concessionaire would be invited to (a) set the toll rates on segments threatened with congestion to ensure free-flowing traffic during peak periods (applying these only to Super HOT lanes or to all lanes) and (b) set toll rates to reduce air pollution and GHG emissions.

Under Option 2, any excess toll revenues above a benchmark flat toll rate (called a “shadow toll”) specified in the concession agreement would go to the public authority. This revenue would be available to pay performance bonuses and support other transportation needs. The concessionaire would earn a specified graduated performance bonus (which could be in the form of tradable greenhouse gas emission reduction credits or public payments to the concessionaire) based on the amount by which measured carbon emissions on the facility are reduced below business-as-usual. The concessionaire would be subject to specified performance penalties if air pollution hot spots adjacent to the highway are measured but not remediated within a stipulated short time.

**Conclusion:** This performance-based contracting approach to managing the Turnpike could provide significant public health, welfare, and carbon reduction benefits to Pennsylvania citizens. Perhaps the most important result could be to advance in U.S. state and federal discussions the now missing principle that *public toll roads and PPP agreements for tolled highways and bridges can be managed for high performance public health and welfare outcomes*, not just for generating revenues or speeding up new transportation investment. Now is the time for action by environmental and public health leaders, and their allies to insist that these public values are built into any future plan for the lease or revised management of the Pennsylvania Turnpike.