The Open Road

The Region's Coming Toll Collection Revolution

Tri-State Transportation Campaign

May 2004

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The Tri-State Transportation Campaign is a non-profit policy watchdog organization whose aim is to promote a more balanced, environment-friendly and efficient transportation system in the New York/New Jersey/Connecticut metropolitan region.

TRI-STATE TRANSPORTATION CAMPAIGN

Mobilizing the Region

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Cover photo: *High-speed E-ZPass express lanes opened at the NJ Turnpike Exit-18W toll plaza in January 2004. Motorists pay tolls while traveling at 55mph. Photo courtesy of the New Jersey Turnpike Authority.*

NJ Turnpike Exit 6

The Open Road — Guide to Sections

Executive Summary and Recommendations

What this paper argues:

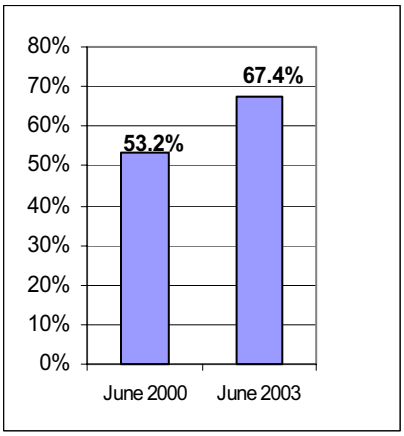
Open-road tolls are already changing how drivers pay on the Garden State Parkway and NJ Turnpike.

A decade after the introduction of E-ZPass, it is clearly time to update the region's electronic collection systems. While E-ZPass is widely — and rightly — regarded as a major step forward for the region's transportation system, it has generally retained the troublesome toll plaza. At MTA bridges and tunnels, automated gates still block E-ZPass lanes, requiring stop-and-go entry.

Agencies like the New Jersey Turnpike Authority, New York State Thruway Authority, and Port Authority of NY/NJ are upgrading toll plazas to obtain the full benefits of electronic toll collection — they are implementing "open-road" tolls, which allow drivers to pay without slowing down from highway speeds. In the interim, they have also implemented "roll-through" toll plazas that provide more moderate improvements in speed. These new facilities are already transforming the way metropolitan drivers pay tolls on roads and crossings like the Garden State Parkway and George Washington Bridge. In a few years, the toll road system will bear little resemblance to its 20th Century origins.

However, even as other regional agencies lead the charge for hassle-free tolls, the Metropolitan Transportation Authority has shunned both roll-through and highway-speed E-ZPass. The pending MTA 2005-2009 capital program is an important opportunity for the region's largest toll agency to join the trend and offer the biggest customer service improvement ever to its toll-paying customers. Governor Pataki and the NY State Legislature should not let this chance to begin high speed tolling at MTA bridges escape them.

Weekday E-ZPass share of collected tolls, Port Authority crossings.



data: Port Authority of NY/NJ

We urge:

1. The MTA to immediately investigate the possibility of abolishing barrier arms at toll facilities on bridges that are parts of limited access highway networks, and to increase the 5 mph speed limit.
2. The MTA to create an open-road toll pilot program by 2005 and to install lanes designed to match the 40-45 mph speed limits on the Verrazano, Throgs Neck, Whitestone and Henry Hudson Bridges by 2006.
3. The MTA to test "roll-through" lanes at the Midtown or Brooklyn Battery Tunnel by 2006.
4. Governor Pataki to establish a Non-Stop Toll Task Force among the MTA, Port Authority, and NYS Thruway Authority to develop a uniform strategy for designing and implementing open-road tolls.

The Coming Toll Collection Revolution

Although it may not be apparent to many area drivers, tollbooths in the United States are well on their way to becoming artifacts of history, like typewriters, rotary phones, and home movie cameras. For instance, motorists traveling across Oklahoma pay tolls while traveling at 70 miles per hour. They don't jockey for position at plazas crowded with bumper-to-bumper traffic or even think twice about the transaction. Instead, drivers safely cruise by at normal highway speeds.

This is made possible by open-road tolling, an adaptation of the electronic identification systems first developed by the Air Force. Overhead or roadside antennae read electronic tags mounted inside vehicles and a computer system automatically deducts tolls from motorists' accounts. Meanwhile, overhead cameras record the license-plate numbers of unregistered vehicles, and a bill is mailed to drivers who fail to pay the toll.

Now that E-ZPass is an integral feature of the regional highway network, it is time to update the system, and agencies like the NJ Turnpike Authority, NY State Thruway, and Port Authority are doing so. The Metropolitan Transportation Authority, however, is resisting both higher speed and non-stop E-ZPass. Instead, the agency – which controls all of the toll bridges and tunnels within New York City – seems determined to maintain old-fashioned, stop-and-go barrier gates. In reality, non-stop tolls promote safety, save money, and reduce pollution. This paper chronicles those benefits, reviews non-stop tolling throughout the region, and argues that the MTA should institute a non-stop toll demonstration project.

Key Definitions

Open-road tolls *allow drivers to pay tolls without slowing down from highway speeds. The arrangement may also be called non-stop, high-speed, or free-flow tolling.*

Roll-through tolls *allow drivers to pass through traditional tollbooths with E-ZPass readers at speeds up to 20 mph. The arrangement is in use at many regional toll facilities, and may also be called higher-speed tolling.*

Hillsdale plaza on the Garden State Parkway, 1960s. Before E-ZPass' introduction in the 1990s, toll booth operation and technology had changed little since the mid-20th Century.

Our Toll Roads in 2010

A Forecast and a Question

In 2010, non-stop tolls have replaced traditional plazas on roads and crossings throughout the region.

Or have they?

Every weekday morning, thousands of commuters, business-people, truckers, and tourists must make the do or die decision: which way to go?

With 1010 WINS blaring out the inevitable traffic disasters and long delays, drivers head north, south, east, and west through gateways like the Verrazano and George Washington bridges and over thoroughfares such as the Thruway, the Staten Island Expressway and the Grand Central Parkway. They aim for the fastest route, but no matter which direction they take, motorists may get stuck in miles of traffic as they approach stop-and-go toll plazas at regional crossings and roads. And unfortunately, this scenario confronts not only commuters and commercial drivers, but also families heading to beaches, ski areas, family visits and other weekend getaways.

Now imagine an alternative scenario. The year is 2010 and non-stop tolls have replaced the traditional toll plaza on roads and crossings throughout the region. Connecticut residents zoom over the Whitestone bridge at 40 mph on their way to catch a flight at JFK. Commercial vans zip out of Queens over the Triboro to deliver goods to a Bronx distributor. Families travel all the way from New York to the Jersey Shore or Boston to see friends without slowing down once for a toll. And the 1010 WINS traffic reports starts off: "Thanks to those new non-stop tolls at the Goethals, you are good to go…"

We know this future will come to pass on the NY Thruway, New Jersey's toll roads and the Port Authority crossings because they are now working to implement it. But if the MTA remains aloof from this trend, its major crossings at the heart of the region's road system will remain some of our worst bottlenecks.

Hillsdale plaza today (recently renamed to Pascack). Four non-stop lanes allow driver to pay tolls at 55mph.

Increased Capacity at Non-Stop Tolls

All of the advantages of non-stop tolls – including enhanced safety, economic savings, and reduced pollution – stem from their ability to move more vehicles through toll areas, and to significantly reduce the weaving and lane-jockeying typical of 20th Century toll plazas. Open-road tolls transform throughput from the very low levels of manual cash-collecting or coin-toss booths — or the medium capacities of slow-n-go E-ZPass facilities — to those of normal unhindered highway lanes.

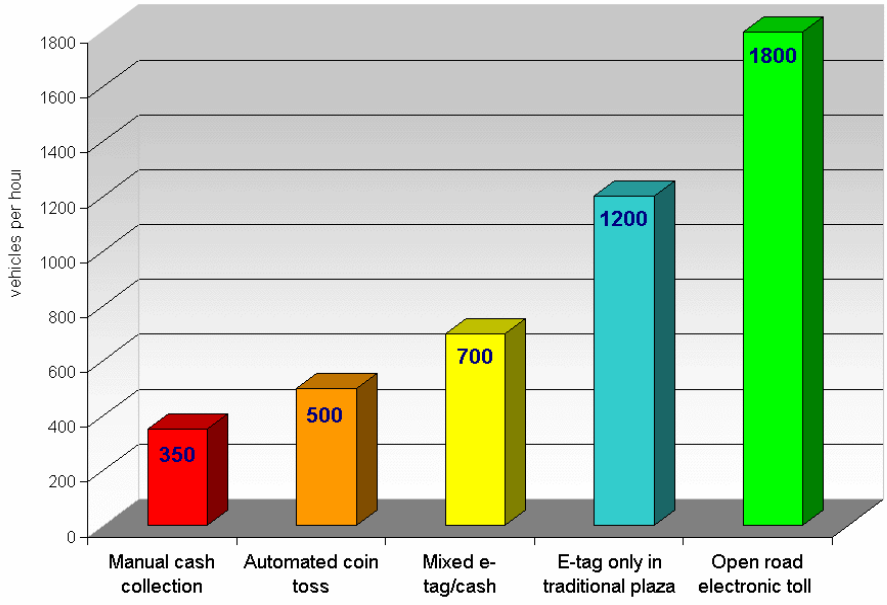
Non-stop tolls can process more vehicles for two main reasons. First, they eliminate the queuing delays associated with traditional toll plazas because motorists simply don't have to wait in line. Second, they don't force drivers to slow down from highway speeds as they approach a toll plaza and then accelerate back to highway speeds after paying the a toll. Instead, motorists maintain a constant highway speed.

As a result, troublesome highway bottlenecks are eliminated and motorists spend less time in traffic. The NJ Turnpike Authority projects that drivers will save over two minutes at the Garden State Parkway plaza in Raritan and at least a minute at the Bergen and Pascack Valley plazas after they are converted to non-stop tolls. This means 25 fewer hours spent in gridlock each year for an E-ZPass commuter who travels from Hillsdale to Raritan during the peak hour, five days a week.[1]

High-speed E-Zpass is the equivalent of normal driving. No tollbooths, no unnecessary swerving to reach a lane.

— New Jersey Governor James McGreevey

General Toll Plaza Lane Capacities by Method of Collection



MTA facilities fall in the "mixed e-tag/cash" and "e-tag only" groups, though the MTA's use of barrier arms may reduce capacity somewhat further.

Source: Michael C. Pietrzyk, "Electronic Toll Collection Systems," Curbing Gridlock: Peak-Period Fees to Relieve Traffic Congestion. 1994.

Protecting Safety, the Economy, our Environment

Every U.S. toll operator we spoke with said open-road toll facilities were nearly accident-free.

Safety Benefits:
Non-stop tolls avoid the safety pitfalls of traditional toll plazas. They spare motorists from stop-and-go traffic and dangerous merges, as well as the reckless drivers who jockey for lane position. At the same time, non-stop motorists are less likely to be sidetracked by distractions – like fumbling for money – that are common at traditional toll plazas. In conversations between the Tri-State Campaign and managers at toll road agencies around the country, we found that all of the U.S. toll operators we spoke with said that their open-road tolls were almost entirely free of accidents.[2]

High-speed tolls also protect driver safety through careful design. Plazas are engineered so that non-stop lanes are located consistently throughout a given highway system, and concrete barriers separate high-speed from cash-pay lanes. Drivers have plenty of time to find the appropriate lane because signage alerts them to the upcoming split well in advance. These measures prevent dangerous, last-second merging between low-speed and high-speed lanes. And, if participating drivers do miss the dedicated high-speed lane, they can use cash-pay lanes, which also accept electronic payment. Tunnels or overpasses are constructed to protect toll collectors traveling to and from their stations on foot.

Economic Benefits:
Gridlock is not just annoying – it is costly to motorists, shippers, producers and consumers. Idling vehicles suffer unnecessary wear-and-tear, waste fuel, and raise the overall cost of driving. The NJ Turnpike Authority estimates that once non-stop tolls are introduced throughout the Garden State Parkway, an E-ZPass commuter will save almost $650 per year in "congestion costs if he travels during peak hours on the Parkway, five days a week, from Hillsdale to Raritan."[3]

Non-stop tolls can also boost the region's overall economy. They minimize the gridlock that burdens truck operators with higher costs, which are passed on to producers and consumers and ultimately hamper the region's economy. Open-road tolls also help trim the long commutes that cost workers valuable time on the job and have been shown to result in greater stress and decreased worker productivity.[4]

The cost of building and operating non-stop tolls is the same as for regular electronic lanes – and both are considerably less than manual and/or automatic lanes.[5] Although the cost of retrofitting existing toll plazas varies, area agencies are reporting relatively modest costs. The Garden State Parkway Authority will spend $125 million to refit its 11 largest plazas with high-speed toll lanes.

According to press reports, the Parkway's Pascack Valley toll plaza cost $8.1 million.[6] While NY State Thruway officials estimate they will spend $30 to 50 million per toll plaza, these costs include other planned capital improvements, such as pavement rehabilitation around the plazas.[7]

Environmental Benefits:
Air pollution, a major consequence of our transportation system, is made worse by vehicles idling in tollbooth queues. Cars actually produce *more* volatile organic compounds – which contribute to smog – at low speeds. In fact, these emissions decrease as speed increases up to 55 mph, and then increase again from 55 to 65 mph. The same pattern holds true for carbon monoxide, another major air pollutant regulated by the federal government.[8]

Tollbooth bottlenecks also increase fuel consumption. Studies suggest that if a car were engaged in the toll collection process for an hour, it would burn an extra half-gallon of fuel.[9] This extra combustion, in turn, produces greater amounts of carbon dioxide, which contributes to global warming. High-speed tolls help reduce global warming by reducing the idling time. The implementation of E-ZPass on the New Jersey Turnpike saved 917,000 gallons of gasoline in 2001.[10]

Gridlock burdens truck operators with higher costs, which are passed on to producers and consumers and hamper the economy.

Express E-ZPass traffic is separated from vehicles paying cash well before the toll barrier at NJ Turnpike Exit 18W, reducing weaving and jockeying and promoting safety.

Open Road Toll Innovations in the Metro Area Today

Several of the region's transportation agencies are already reaping the benefits of non-stop tolls. In several cases, outmoded tollbooths have been eliminated and motorists are driving by at highway speeds. In others, roll-through facilities serve as a stepping stone to future high-speed tolls. If these trends continue, New York area drivers are well on their way to a tollbooth-free drive all the way to Boston in 2020.

The Port Authority will open high speed lanes at its Staten Island Bridges between 2005 and 2007.

Port Authority Bridges:
Three out of eight toll lanes on the Port Authority's New Jersey-Staten Island Outerbridge Crossing now permit 25 mph speeds for E-ZPass drivers. The Port Authority estimates that these lanes process 200 more cars per hour than E-ZPass lanes fitted into old-style tollbooths. The improvements are expected to further hike the E-ZPass market share at the bridge, which is now 72%, and up almost 3% from a year ago. The Port Authority hopes to install 45 mph lanes at the Outerbridge by 2005, and possibly replace the existing toll plaza entirely.

The Goethals Bridge will receive non-stop toll lanes when it is eventually replaced or rebuilt. In the meantime, 25 mph roll-through speed lanes and a highway-speed facility (45 mph and up) will be installed over the next two years. The Bayonne Bridge, the third New Jersey-Staten Island crossing, is expected to have highway-speed tolls by 2007.

As at other bridges, the Port Authority is progressively increasing E-ZPass lane speeds at the George Washington Bridge. Last year, roll-through speeds were raised from 5 to 15 mph, and by 2007 both the upper and lower levels are expected to have 45 mph high-speed collection lanes. Non-stop tolls will open later in 2004 at the entrance unto the bridge from the Palisades Interstate Parkway.[11]

Port Authority graphic of high-speed lanes under development at the Outerbridge Crossing.

New Jersey Toll Roads:
The NJ Turnpike Authority, which now runs both the Turnpike and the Garden State Parkway, is implementing non-stop tolling on both roads. Governor McGreevey has committed to providing high-speed lanes at nine Parkway and Turnpike toll plazas by 2005, and significant progress has already been made towards that promise. In January, non-stop facilities opened at the Parkway's Pascack Valley Toll Plaza (formerly called the Hillsdale Toll Plaza), at the Parkway's northern end. Already, 93% of E-ZPass-equipped drivers use these lanes. The Toms River, Raritan South and Asbury Park interchanges are slated to open non-stop facilities in the summer of 2005. The sites were chosen on the basis of their high (50% and over) E-ZPass participation rates.

The New Jersey Turnpike is also heading down the road to non-stop tolling. Non-stop tolls opened at Exit 6 in 2001 and at 18W this past January. As at the Parkway's Pascack Valley plaza, 18W is already seeing overwhelming acceptance of its

Over 90% of E-ZPass-equipped drivers at the Hillsdale and 18W toll plazas in New Jersey use the new high-speed lanes.

The first round of non-stop toll projects implemented or underway around New Jersey

non-stop lanes; 96% of E-ZPass customers are choosing them. Meanwhile, dedicated non-stop lanes are also slated for Exit 1 by the summer of 2004 and at Interchange 16/18E by the summer of 2005. The Turnpike Authority estimates that these non-stop lanes process 800 more cars per hour than traditional E-ZPass lanes.[12]

Finally, non-stop tolls will debut on the Atlantic City Expressway this spring. An express lane – permitting speeds up to 55 mph – will run in both directions at the Pleasantville toll plaza, near Atlantic City.[13]

A new capital program will bring high-speed tolling to the New York State Thruway.

NY State Thruway:
The Tappan Zee Bridge toll plaza, run by the New York State Thruway Authority, now features two refurbished lanes on its left side that allow cars to roll through at 20 mph. The lanes opened in December of 2003, and the Thruway Authority estimates that they process 500 more cars per hour than traditional E-ZPass lanes (the two lanes replaced three standard toll plaza lanes).[14] Eventually, a replaced or rebuilt Tappan Zee Bridge is expected to feature high-speed lanes, although no plans have been made due to the uncertain nature of the bridge's future (a long range study of options for replacing the bridge is underway, conducted jointly by the Thruway Authority and Metro-North Railroad).

In a five-year capital program the Thruway anticipates releasing and beginning next year, it will seek to develop open-road toll lanes at many of its barrier plazas, including those at New Rochelle, Spring Valley, and several upstate sites. A pending federal transportation bill is expected to provide $1 million for work at the New Rochelle plaza, which has also had 20 mph roll-through service for several years.[15]

Pennsylvania Turnpike Authority:
The PA Turnpike Authority plans to open a non-stop lane later this spring at a toll plaza in Marshall and Pine Townships in Allegheny County, in the south-western part of the state. The speed limit will be 55 mph, and the lane will be located on the left-hand side of the toll plaza and separated by a median. In the coming years, the authority plans to open additional open-road facilities, under the name "Express E-ZPass." [16]

Why Won't the MTA Bring Open Road Tolls to New York?

Despite the benefits of higher-speed and open-road tolling, the MTA — the United States' largest collector of tolls — seems determined to keep its old-fashioned barrier gates. These gates force vehicles to come to a dead stop – creating long lines and dangerous stop-and-go traffic. Nevertheless, in a letter sent to the Campaign in 1998, past president Michael Ascher stated that "[The] E-ZPass system has surpassed all customer expectation and [we] do not believe that the elimination of gates would be appropriate."[17] Agency statements since then have reaffirmed this position.[18] But the agency's case seems slim against the experiences of other toll agencies across the United States.

"The best way to improve safety is to eliminate the tollbooth altogether."

—John Leonard, Deputy Director, Georgia CruiseCard

MTA argument #1: The MTA claims that barrier gates promote safety "because they force customers to slow down and look before proceeding" into the merge beyond the toll plaza.[19] Further, the MTA points out that many employees are engaged in "toll collection or maintenance activities and must cross toll lanes to get to their assignments."[20]

The Reality: While barrier gates may reduce accidents at *old-style* toll plazas, non-stop tolls eliminate these dangerous structures altogether, along with their hazardous merges. At many toll plazas, ten or more toll lanes must converge into three or four highway lanes. This creates dangerous bottlenecks at the precise moment drivers are accelerating to get back onto the highway. In this context, the MTA's affinity for gates is like claiming a reckless motorcyclist will be fine, as long as he wears a helmet. The helmet may help, but it doesn't address the source of the danger, which in this case is the merge itself. Non-stop tolls reduce the total number of toll lanes, and merges, considerably.

Tollbooths are also dangerous because they create speed differentials both before and after toll plazas. John Leonard, the Deputy

Jam at the Midtown Tunnel

This report urges:

1. The MTA to immediately investigate the possibility of abolishing barrier arms at toll facilities on bridges that are parts of limited access highway networks, and increasing the 5 mph speed limit.
2. The MTA to create an open-road toll pilot program by 2005 and to install lanes designed to match the 40-45 mph speed limits on the Verrazano, Throgs Neck, Whitestone and Henry Hudson Bridges by 2006.
3. The MTA to test "roll-through" lanes at the Midtown or Brooklyn Battery Tunnel by 2006.
4. Governor Pataki to establish a Non-Stop Toll Task Force among the MTA, Port Authority, and NYS Thruway Authority to develop a uniform strategy for designing and implementing open-road tolls.

Director of Georgia's CruiseCard program, explains that "accidents tend to increase significantly when you have a speed differential … if you've got a queue and someone's not attentive [he's] going to whack the person in front." He concludes that "The best way to [improve safety] … is to eliminate the tollbooth altogether."[21] Indeed, since non-stop lanes opened in 1999 at the Biddle's Corner toll plaza on Route 1 in Delaware, there has not been a single crash.[22]

Non-stop tolls are also safer for workers as well as drivers. Fewer collectors and maintenance crews are needed to maintain these facilities, which are generally constructed with special pedestrian bridges or tunnels. In contrast, the MTA forces employees to cut across toll lanes in order to assist drivers who are stuck behind barrier gates. Congestion at MTA facilities also appears to require the hiring and deployment of workers to direct traffic entering toll lanes.

If the MTA is truly concerned about the alleged safety hazards of roll-through E-ZPass, one wonders why the agency removed the barrier gates on the eastbound side of the Verrazano Bridge toll plaza after the tolls were abolished by an act of Congress. Currently, drivers heading from Staten Island to Brooklyn can drive through the toll plaza at 20 mph.

MTA argument #2: The MTA claims that adopting non-stop tolls could mean "an unconscionable loss of more than $12 million in toll revenues that would support mass transit and our operation."[23]

The Reality: All non-stop toll plans include ways to deal effectively with violators or people who mistakenly get in the wrong lane. Typically, overhead cameras record the license plate numbers of unregistered vehicles, and a fine is mailed to drivers who fail to pay the toll. These penalties are generally $20 or more per violation, and increase over time if left unpaid. This allows agencies to more than recoup any lost revenue. "You don't lose revenue, because you get it back through the violation fine," commented Mike Williams, a representative of the Delaware DOT.[24]

In addition, the violation rates themselves are quite low. On Georgia's Route 400 Extension, a mere 0.2 percent of vehicles in the CruiseCard lanes – or 5,200 out of 3 million – failed to pay in January 2004.[25] Considering that this figure includes transponder malfunctions, the number of people who intentionally cheat the system is even lower. In our area, the picture is similar; there is a one percent violation rate in E-ZPass lanes on the NY State Thruway.[26]

MTA argument #3: The MTA claims that non-stop tolls are "generally a feature of new roads that were conceived and built from scratch with non-stop tolling in mind."[27]

The Reality: Other agencies in the New York area are adapting existing roads and highways to accommodate roll-through and high-speed E-ZPass. The Port Authority added these facilities to the Outerbridge, Goethals, Bayonne, and George Washington Bridges and the NY State Thruway Authority retrofitted the Tappan Zee Bridge. The Garden State Parkway and NJ Turnpike have high-speed tolls in a number of locations, as well as roll-through tolls. All of these roads and bridges existed well before electronic tolling.

Agencies in our region, and throughout the United States, have successfully retro-fitted older, urban toll facilities for high-speed toll collection.

Toll authorities in other parts of the country have also retrofitted existing roads and bridges. The Dallas North Tollway has roll-through lanes (allowing speeds up to 30 mph) in lanes that are only ten feet wide[28] (the same as that of MTA lanes) and were converted from regular cash toll lanes. Similarly, cash toll lanes on I-294, I-88, and I-90 in Illinois were retrofitted to permit roll-through tolls at up to 30 mph.[29] And in California, the Bay Area Toll Authority added dedicated Fast Track lanes (allowing speeds up to 20 mph) to all seven Bay Bridges from 2001 to 2003.[30]

The MTA's Throgs Neck Bridge, a key connection between highway networks in Queens and the Bronx.

MTA argument #4: The MTA claims that "travel conditions at our plazas have never been better"[31] and sees no reason to make the effort to improve the status quo.

The Reality: While E-ZPass has vastly improved conditions at MTA bridges and tunnels, the agency is unjustifiably complacent. These crossings still experience some of the worst congestion in the country. A recent report by the American Highway Users Alliance states, "[A] very large share of delay in the New York area is related to bridge and tunnel crossings into Manhattan, most of which are toll facilities" and asserts that if toll plazas had been included in a ranking of America's twenty-five worst bottlenecks, then "several river crossings into Manhattan would no doubt be included."[32]

Considering that New York's bridges and tunnels will experience even worse traffic in the future, the MTA should look for solutions today. Non-stop tolls are the best way to increase capacity without expanding the roadway. Michelle Damico, a senior communications manager for the Illinois Toll Highway Authority, reports that "Express I-Pass has increased our main line plaza capacity by 50 percent, with only a six percent increase in plaza lanes."[33] Open-road tolls are the easiest, most efficient way to move ever-growing vehicle volumes into and out of New York City.

Notes

1) Garden State Parkway Congestion Relief Plan," NJDOT 11 August, 2001.

2) We conducted interviews by telephone with officials at the NJ Turnpike Authority, the Port Authority, the NY Thruway Authority, the Georgia State Tollway Authority, the Illinois Toll Highway Authority, Delaware DOT, and California DOT in April, 2004 .

3) Garden State Parkway Congestion Relief Plan, 11.

4) "Mobility and Costs of Congestion in New Jersey, 2001 Update." The National Center for Transportation and Industrial Productivity at the New Jersey Institute of Technology, July 2001. www.transportation.njit.edu/nctip/final_report/congestionstudy12.pdf p. 2

5) Pietrzyk, 478.

6) Joe Malinconico, "It's not quite as E-Z as you think," The Star Ledger 18 January 2004.

7) Meeting between Tri-State Transportation Campaign staff and principals of the NYS Thruway Authority, 11 February 2004.

8) "Unclogging America's Arteries: Effective Relief for Highway Bottlenecks (1999-2004)," American Highway Users' Alliance, 10.

9) Jonathan R. Peters and Jonathan K. Kramer, "The Inefficiency of Toll Collection as a Means of Taxation: Evidence from the Garden State Parkway," Transportation Quarterly, Summer 2003, 25.

10) Peters and Kramer, 25.

11) Telephone interview with Charles Meara, Port Authority, April 2.

12) Walter Kristlibas, Director of Electronic Toll Collection, NJ Turnpike Authority, interview by telephone.

13) Sharon Gordon, Press Officer, South Jersey Transportation Authority, interview by telephone, 14 April 2004.

14) The average throughput of the lanes has gone from 950 vehicles per hour to 1,500 vehicles per hour. All information from Casey Canastrani, Press Officer, NY Thruway Authority, interview by telephone, 8 April 2004.

15) Thruway info from Governor Pataki press release, August, 2003 and meeting with Thruway principals, 11 February 2004.

16) Cathy Libler, Press Officer, PA Turnpike Authority, interview by telephone, 14 April 2004.

17) Michael C. Ascher, President, MTA Bridges & Tunnels, letter to the Tri-State Transportation Campaign, 10 December 1998, 2.

18) Joie Tyrrell, "Speeding Into Our Hearts," Newsday 13 July 2003.

19) Michael Ascher, 1.

20) Michael Ascher, 1.

21) John Leonard, Deputy Director, Georgia Cruisecard, interview by telephone, 8 April 2004.

22) Michael Williams, public relations representative, Delaware Department of Transportation, interview by telephone, 8 April 2004.

23) Michael Ascher, 1.

24) Michael Williams, 8 April 2004.

25) John Leonard, 8 April 2004.

26) E-ZPass Evaluation Report, prepared for NY State Thruway by Vollmer Associates LLP, August, 2000. p 39.

27) Michael Ascher, 2.

28) Gerry Shelton, Operations Manager, North Texas Tollway Authority, int by tel, Aug 1999

29) Jim Wassel, Finance Manager, Illinois State Tollway Authority, interview by tel, Aug 1999

30) Lauren Wonder, Public Affairs Manager, California Department of Transportation, interview by telephone, 14 April 2004.

31) Michael Ascher, 2.

32) Unclogging America's Arteries: Effective Relief for Highway Bottlenecks (1999-2004)," American Highway Users Alliance. p 12.

33) Michelle Damico, Senior Communications Manager, Illinois Toll Road Authority, interview by telephone, 8 April 2004.

Governor McGreevey quote in page 4 call-out is from Daniel Sforza, "High-speed E-Zpass Coming to Toll Roads," The Bergen Record 31 October 2002.