Bloomberg's Folly?
Congestion Pricing in New York City

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Introduction

Congestion pricing is the concept of charging motorists a fee for using a particular stretch of highway, a bridge, or for the use of a particular urban area. It is a market-based traffic management strategy designed to encourage shifting peak period trips to off-peak periods, away from congested facilities, and onto alternative transportation modes. Congestion pricing has been implemented in various cities throughout the world, including Singapore, London, and Stockholm. New York City Mayor Michael Bloomberg recently announced a congestion pricing plan that would charge drivers a fee for entering congested areas of Manhattan during peak travel times in his PlaNYC 2030, a comprehensive sustainability plan for the city's future. New York builds its congestion pricing plan on those of cities in other countries that have been successful at reducing road congestion and pollution and increasing transit ridership. New York City would be the first city in the United States to implement an area wide congestion pricing system. It is projected to decrease traffic within the zone by 6.3 percent and increase speeds by 7.2 percent, resulting in decreased vehicle travel times, increased transit ridership, and decreased greenhouse gas emissions (PlaNYC 2007).

What is Congestion Pricing?

Congestion pricing is a form of road pricing that charges drivers for the use of roads. This scheme charges road users a fee for using roadways during peak congestion times in an effort to both manage traffic congestion and generate revenue for investment in the transportation system. Traffic congestion is an expensive phenomenon, causing an estimated 3.7 billion hours of travel delay and 2.3 billion gallons of wasted fuel in 2003, according to the Texas Transportation Institute (FHWA 2006). These costs do not account for the environmental impacts of automobiles idling in slow traffic. Much of this roadway congestion is the result of the lack of an efficient mechanism to control the use of roadway space.

A typical response to increased roadway congestion has been to increase road capacity by adding traffic lanes. Most states fund such capacity improvements with revenues generated from gas taxes. These funds often cannot provide enough revenue to build large-scale improvements. Capacity improvements are only used efficiently during peak hours. The benefits of capacity improvements are generally underused during off-peak hours. Congestion pricing is a technique that can help manage the current transportation infrastructure more efficiently and provide funding for future capacity improvements.

The majority of users on a typical urban highway system during rush hour are not commuters (FHWA 2006). Rather, they are drivers making discretionary trips such as travel for shopping and leisure purposes. These trips could be made much more efficiently- by reducing travel time, fuel consumption, and emissions- if shifted to off-peak hours. One of the primary goals of congestion pricing is to reduce the amount of these discretionary trips during rush hours and shift them to off-peak times. The airline, telephone, and utility industries have developed rate structures that charge higher rates for use during peak usage time periods in an effort to discourage non-essential use. Congestion pricing works in a similar fashion by charging drivers a premium for driving on roadways in congested areas during times of peak usage.

Cordon pricing is a method of congestion pricing that charges users a fee to drive within the boundaries a predefined congested area, typically the Central Business District of a major city. As cars enter the cordon during peak hours, they are charged a fee to drive within the cordon. These fees may be fixed or variable, and are usually based on a variety of factors such as time of day, level of congestion, distance traveled, and other factors. These fees are paid through electronic means, eliminating the need for toll booths and causing minimal driver inconvenience. Vehicles can be equipped with transponders linked to credit cards that pay fees electronically as they travel through cordon zones. Vehicles without transponders can pay fees on the internet or at electronic pay stations located throughout the cordon zone. License plate cameras enable the identification and prosecution of toll violators.

Congestion pricing systems are typically implemented on existing roadways experiencing high levels of congestion. Successful road pricing programs require initial capital to pay for fee-collection infrastructure. They also require marketing programs to educate the public about the goals and objectives of the program, as well as the technicalities and boundaries of the cordon zones. Such efforts encourage user acceptance of the system, which is essential in developing successful alternative transportation systems. Funding for congestion pricing systems is generally obtained from the revenue generated from the user fees. Fees are structured to generate revenue that exceeds the maintenance and administration costs of the roadway system, thus yielding excess revenue to direct towards transportation system investments. Only 12 percent of revenue generated from Singapore's congestion pricing program is required to pay administration costs (ITS Decision 2007).

In the United States, funding is available at the Federal level to help pay for some of the capital costs of implementing road pricing systems. The Federal Highway Administration's 2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) provides funding for vale pricing programs. It continues the Value-Pricing Pilot Program created by the 1998 Transportation

Equity Act for the 21st Century (TEA-21) which provides 80 percent matching funds for state and local governments to establish, maintain, and monitor value-pricing projects. The objective of this program is "to encourage implementation and evaluation of value pricing pilot projects in order to promote economic efficiency in the use of highways and support congestion reduction, air quality, energy conservation, and transit productivity goals" (FHWA 1998). Additionally, the United States Department of Transportation created the concept of "Urban Partnership Agreements" in its *National Strategy to Reduce Congestion on America's Transportation Network* in May 2006. These partnerships provide funds totaling $853 million to several model cities for developing congestion pricing systems. Miami, Minneapolis-St. Paul, New York, San Francisco, and Seattle were chosen as "urban partners" (U.S. DOT 2008).

Another funding mechanism for congestion pricing systems is the use of public-private partnership (PPP). With PPP, a public agency enters into a contractual agreement with the private sector to facilitate the delivery of a service. In the transportation context, the private sector typically funds the innovation and development of public projects in exchange for receiving a portion of the revenue from the project. The idea is that the private sector is more profit-conscious and thus will cut costs and deliver services more efficiently than government-run services. Also, since the private sector is often more willing to take risks than the public sector, they are able to think outside the box and develop more innovative ideas and technologies (ITS Decision 2007).

Benefits of Congestion Pricing

The largest and most noticeable benefit of congestion pricing is the reduction of peak-period and total roadway congestion. As specific roadways or sections of a city are priced, drivers will be more likely to limit the number of trips in the priced area. If they must frequently visit the priced area, such as for work or for home, they have options of car-pooling and the mass transportation system. Visitors to the priced area also have these options, as well as combining multiple destinations into one trip, shifting routes to untolled or less-tolled roads/areas, or changing their destination altogether.

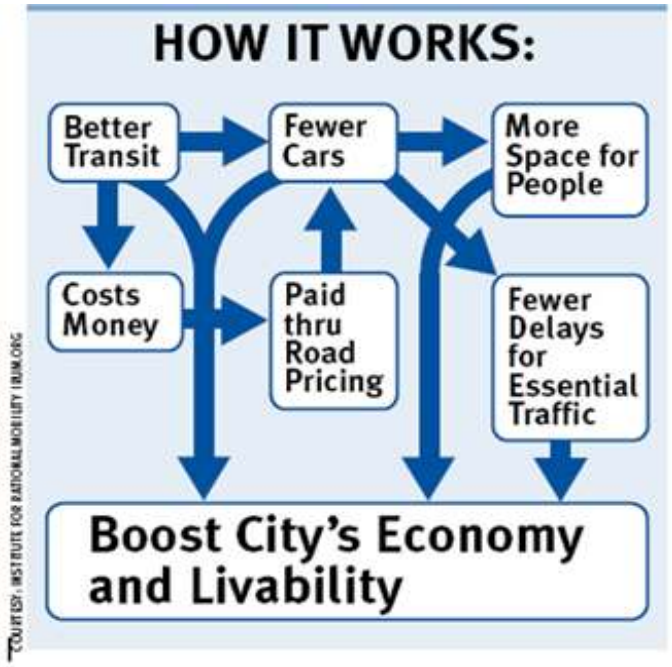
As was described in the previous pages, the fees collected from congestion pricing will be used for roadway and mass transit improvements. Not only will the City's engineering and transportation divisions have a larger budget to work with due to the pricing, but the reduction in the number of vehicles on the road will result in less

wear and tear on the roads. There will also be a reduction in roadway repair and the need for new construction to serve the increasing peak period demand.

Congestion pricing not only affects the public's pocketbooks, but also affects the environment. Reduced congestion will reduce emissions of pollutants and greenhouse gases and reduced energy consumption. Some of these are emissions of hydrocarbons, carbon monoxide, and carbon dioxide (ITS Decision 2007). There also will be a reduction of fuel consumption due to fewer vehicles on the roads. If overall trips are reduced, emissions of environmentally harmful nitrogen oxides will also be reduced.

Though the complete effects are still unclear, the implementation of congestion pricing has been predicted to affect future land use. Some argue that congestion pricing will discourage urban sprawl, while others believe it will increase decentralization. In the long-run, land use patterns could be affected, for better or for worse, in ways that are still unknown.

Congestion pricing also has an outcome of increasing traffic safety (ITS Decision 2007). In a typical case, when there are fewer automobiles on the road, the number of accidents tends to decrease. The fewer number of automobiles on the roads is due to congestion pricing and people's choice to reduce trips in order to save money. The results are somewhat mixed because, while crashes are more common under congested conditions, crashes that occur on less congested roads are more severe due to higher vehicle speeds.



(*Transportation Alternatives*)

Costs of Congestion Pricing

As with all plans, there are costs that go along with the benefits. The first major cost of congestion pricing is the funding and construction of the toll collections infrastructure. The infrastructure must then be staffed and enforced, both of which cost extra money from the system.

Congestion pricing results in an inconvenience to motorists. There are some cases where tolls are collected electronically and allow traffic to flow continuously, while others require motorists to stop and pay a toll to drive on the road or enter an area of the city. This leads to questions of enforcement. While electronic toll collection systems and license plate identification cameras are quite accurate, there still remains a margin of error. How will the system identify and address the issue of people erroneously receiving citations for unpaid fees because an EZ-Pass reader failed to register the proper vehicle or a license plate camera identifies the wrong license plate number? Electronic enforcement also brings to issue the notion of charging the registered owner of a toll-violating vehicle with a fine regardless of who was driving the vehicle. One such electronic enforcement system in Minneapolis was recently overturned by the Minnesota Supreme Court because red light cameras were unable to identify the person operating violating vehicles.

If congestion pricing does in fact reduce the number of vehicles driving into Manhattan, it may also in turn decrease the demand for parking. As parking facilities compete for a shrinking market of automobiles, they may reduce their prices to encourage people to use their lots. If parking rates are reduced by an amount higher than the congestion fee, the total transportation cost will be reduced for people driving and paying for parking. This could in turn attract people who initially switched to transit back to driving their cars to the city everyday.

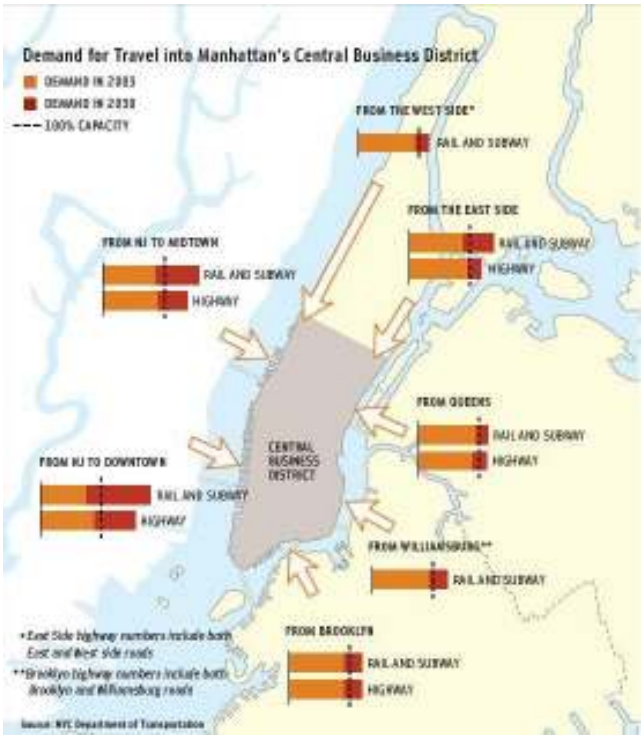
A final negative effect of congestion pricing is the issue of privacy. In the case of electronically paid tolls, a computer records the license plate number and any other information given by the registered vehicle owner. This information can then be used and viewed by certain members of the operating organization. While engineers want this data to conduct analyses of traffic patterns, citizens do not want unknown people knowing when and how often they enter a toll road or a certain area of the city.

The New York City Traffic Problem

As in any Central Business District in any large city, congestion is a major problem. The amount of personal vehicles, taxis, buses, and delivery trucks, to name a few, driving on the streets is constantly increasing and does not seem to slow down. New York City is no exception to this stereotype. The congestion in the Central Business District is considered to be one of the worst in the United States.

Data has been collected periodically on the amount of congestion occurring in New York City. In 1983, New York City commuters were experiencing an average of 20 hours lost to congestion per peak hour driver per year. The same data was collected in 2003, and resulted in approximately 50 hours lost to congestion per year (PlaNYC 2007).

A recent study conducted by Quinnipiac University found that a majority of New Yorkers believe there is a traffic problem within their city. Students of the University conducted a poll and found that 87 percent of city voters agreed that traffic congestion was a "very serious" or "somewhat serious" problem (Schuster 2007). When asked what they believed to be a solution to the problem, numerous residents responded with "congestion pricing."



(*NYC Department of Transportation, PlaNYC 2007*)

PlaNYC 2030: Congestion Pricing in New York City

On Earth Day, April 22, 2007, New York Mayor Michael R. Bloomberg introduced a series of proposals aimed at guiding New York City to a sustainable future. *PlaNYC 2030: A Greener, Greater New York* is the result of years of community engagement, and is a comprehensive sustainability plan that seeks to reduce the environmental impact of the city while accommodating population growth and improving infrastructure. Among one of the most radical and controversial provisions of the plan is the creation of a traffic congestion fee in the borough of Manhattan. The plan suggests that the negative effects of traffic congestion can be reduced by increasing the use of transit, cycling, and ferry services. The plan indicates that congestion pricing is a viable option to get some people to switch from cars to these alternate transportation modes.

Under Bloomberg's plan, automobiles and trucks would be charged a flat fee of $8 for cars and $21 for trucks to drive in the Central Business District (CBD) between 6 a.m. and 6 p.m. on weekdays. These fees would be charged when entering or leaving the zone. Cars traveling within the zone during this time, and not entering and exiting, would be charged $4 and trucks $10.50. Buses, taxis, for-hire vehicles, vehicles with handicapped license plates, and emergency vehicles would be exempt from the fee. The congestion zone would be defined as the area in Manhattan south of 86th Street. Traffic traveling exclusively on FDR Drive, the West Side Highway, and West Street would be exempt from the toll zone. All of the bridges on the east side of Manhattan are also exempt (PlaNYC 2007). This allows traffic traveling through Manhattan from one borough to another to travel without paying the fee.

Fees will be collected using the current EZ-Pass system that is in widespread use at tolled crossings across the nation. This system uses transponders that identify automobiles as they enter or travel through the zone, and bills EZ-Pass accounts accordingly. Vehicles not equipped with EZ-Pass and not entering at tolled crossings into the city can pay their fees on the internet, telephone, or at selected retailers within 48 hours of travel. License plate recognition cameras located throughout the zone will capture license plate information of all vehicles without EZ-Pass and checked 48 hours later against a database containing payment information. Registered owners of vehicles not paying the fee will be issued fines by mail. All license plate records of complying vehicles will be destroyed in an effort to protect privacy and quell a big-brother fear that festers in the minds of many opponents (PlaNYC 2007).

The PlaNYC congestion pricing program is projected to decrease traffic within the zone by 6.3 percent and increase speeds by 7.2 percent. This will also decrease the number of vehicles traveling through areas surrounding the zone as the number of cars passing through the area destined for Manhattan decreases. Everyone who drives in Manhattan will experience reduced traffic congestion and increased travel times. Businesses that depend on the roadway system will experience increased productivity with decreased travel times. In many situations this increase in productivity results in profits that far exceed the costs of the congestion fees paid by these firms. Decreased congestion means decreased tailpipe emissions of vehicles idling in traffic, helping achieve the Plan's goal of reducing the city' greenhouse gas emissions 30 percent by 2030. The plan is projected to bring in nearly $400 million in net revenue in the first year of implementation. Part of this revenue will go towards investing in the mass transit system to make its use more attractive. 94,000 drivers are projected to make the shift from cars to transit, and only 1.4 percent of travelers from outside the zone are expected to discontinue travel to the zone due to the fee. These people will most likely travel to other destinations in New York City (PlaNYC 2007).

New York City has not dedicated funding for the congestion pricing program, but it has received assurance from the federal government that it will receive funding support. New York City applied for federal funding of its congestion pricing program under the Urban Partnership Agreement. The U.S. Department of Transportation indicated that New York City would receive federal funding support for the program if the State government pledged its support to the program (U.S. DOT 2007). On August 15, 2007, the U.S. Department pledged $354 million to the initiative, earmarking $10 million for the installation of computerized tolling equipment. This is much lower than the estimated cost of $223 million. The remaining $344 million in funds would go towards transit and other transportation initiatives of the 2030 plan (Neuman 2007). The city hopes that the remaining upfront costs can be paid for by future federal funds, state funds, and perhaps a public-private partnership.

New Yorker's Opinion

A study has been continuously conducted by the Quinnipiac University to determine if residents of New York City would approve a congestion pricing plan. Over the six months of the study, the opinion of Manhattan, as well as the opinion of New York City altogether, on congestion pricing has become more negative as time has gone on. In barely three months, the number of Manhattan residents who support Bloomberg's plan to charge motorists to enter the Central Business District dropped from 54 percent in August 2007 to 46 percent in November 2007 (Schuster 2007).

The results are even worse when the entire city of New York City was polled. In the early days of the study, back in July 2007, 52 percent of the City residents approved a congestion pricing plan while 41 percent opposed it. In August 2007, the rates changed with 57 percent in favor and only 36 percent opposing the plan. This increase is mainly due to the increased knowledge of the residents of the PlaNYC. New Yorkers began to question the facts of the plan, and in mid-November, new results of the study came out to the public. It found that only 33 percent of the City favor and 61 percent oppose the congestion pricing plan (Schuster 2007).

As more and more people oppose the congestion pricing plan, over 50 percent of residents citywide continue to say that they would back the congestion pricing plan if the revenues were used to prevent proposed transit fare and bridge toll hikes, as well as improve mass transit systems.

Case Studies

Congestion Pricing has been implemented in several cities across the world. Singapore has had a Congestion Pricing scheme in place since 1975, while London has only recently enacted such congestion-reducing programs. A study of the places where Congestion Pricing has successfully reduced traffic congestion can help planners of the New York Congestion Pricing Scheme design a successful program that takes advantage of the previous experiences of those cities.

Singapore

Congestion pricing in Singapore began in 1975 under the name "Area Licensing Scheme". Such a tactic had never been implemented before, but Singapore seemed to be the perfect place to start. Singapore is an island city-state with an extremely high population density and 100 percent urbanization. Roads comprise 12 percent of the land use of the island (Munnich 2007). Singapore's growing economy was leading to an increase in personal vehicle ownership, and therefore more traffic congestion. A solution to the congestion was sorely needed.

The Area Licensing Scheme designated a Restricted Zone in the Central Business District which drivers would have to pay a fee to enter. At its inception, the scheme featured manual toll booths at all entry points that collected the fee from drivers who entered the Restricted Zone between 7:30-9:30 a.m. on all days but Sundays (Transport for London 2007). This fee differed based on the size of vehicle and which

route the driver chose to enter through. The initial program was not as successful as was hoped, however. Results showed that three main problems were created by the Area Licensing Scheme. First, rather than traveling during the restricted times, drivers had a tendency to drive before or after those times. Second, drivers who would typically have traveled through the Restricted Zone chose other routes so as to avoid the fee. Third, drivers who circumnavigated the Restricted Zone on their way into the city chose to return straight through the CBD because there was no fee during evening rush hour. These three results did not reduce overall congestion, but merely spread it out across the day and across the city. Congestion in the CBD during peak hours was reduced by 45 percent, so much so that reports showed those roads were underutilized, not an optimal situation (Toh 2004).

Over the years, Singapore changed various aspects of its congestion pricing scheme to optimize congestion reduction. The restricted time was first extended in the morning, then an evening restricted time was added, and in 1994 an all-day program was put in place to eliminate the incentive to travel during off-peak hours. The fee was first increased, then reduced, and currently a "shoulder pricing" system is in place. This system charges a higher fee during rush hour times than during the periods between morning and evening peaks. It was an attempt to smooth out the traffic congestion throughout the day. The most important change has been in the method of fee collection. Singapore no longer uses manual toll booths, which contributed to traffic queuing, and were outdated, inefficient, and complicated. In 1998, the city switched to an electronic road pricing system, which increased efficiency.

Studies show that Singapore's congestion pricing reduced peak hour traffic by 13 percent, and increased road speeds by 20 percent (Munnich 2007). Critics believe that Singapore has succeeded because it recognizes that congestion cannot be entirely eliminated, therefore it seeks to manage congestion through fees. Singapore, as the trial city for congestion pricing, has set an example by which other cities can learn and follow. At the same time, however, Singapore is an extreme and unusual case, and it would not be reasonable to expect New York to follow a similar pattern of years of trial and error.

London

London, a city of 7.5 million people, has long suffered traffic problems. According to Transport for London, prior to the Congestion Charging Scheme London had the worst traffic congestion in the UK and was one of the most congested cities in Europe. Londoners spent 50 percent of their driving time in traffic queues, and the time lost due to congestion costs the city £2-4 million ($4-8 million) per week (Transport for London 2007). In addition to inefficiencies in the traffic network, the environmental

and social concerns of congestion were part of the reasons behind the creation of the Congestion Charging Scheme. The scheme was put in place in 2003 by London Mayor Ken Livingstone and paired with improvements in public transport in order to make the entire transportation system work more efficiently for London. London's Congestion Charging Scheme has been called "the world's most radical experiment in reclaiming the city from the tyranny of the automobile" by a 2003 New York Times article (Litman 2006). Though this is an exaggerated statement, the scheme has been very successful in improving the traffic situation in London, though it has its critics as well.

The London Congestion Charging Scheme designates an area around the city center as the Congestion Charging Zone. The zone is clearly marked by signage in advance of entering it. To enter this zone at any location between the hours of 7 a.m.-6 p.m. Monday-Friday, drivers must pay an £8 ($16.50) charge (Transport for London 2007). When a vehicle passes through the electronic readers at the beginning of the Congestion Charging Zone, an electronic reader takes a photograph of the license plate and matches it to the vehicle registration data. The owner's account is then billed for the journey. There are several ways of paying, including having it taken from a prepaid account, paying online or by text, paying at a stationary machine in the city center, or paying at a participating local shop. The driver has until midnight on the evening of the journey to pay the £8 fee, or until midnight the following day to pay a £10 fee. If the driver fails to pay within that time frame, the penalty fine can reach as high as £100. These profits are all put toward improving transport.

Prior to the Congestion Charging Scheme, automobile traffic only accounted for 12 percent of the total number of trips into London during peak travel times (Litman 2006). London has a history of having a vast transport network of underground and aboveground trains, buses, taxis, or other modes. After congestion pricing was put in place, the share of automobile travelers decreased to 10 percent, showing a clear modal shift to transport, which was the intended consequence (Litman 2006). Buses and taxis were exempt from the congestion charge to encourage their use over personal vehicles. In preparation for this shift, London added more buses, more bus routes, and increased frequency and reliability of existing bus routes to encourage commuters to choose buses rather than cars. The results of congestion pricing in London show that traffic entering the Congestion Charging Zone was down 22 percent, due to a combination of the modal shift to transport and drivers who's final destination was not the city center going around London rather than through it. Traffic delays within the zone were reduced by 22 percent as well, while traffic speeds increased 37 percent. Benefits of the Congestion Charging Scheme include reducing emissions by 13-15 percent and reducing fuel consumption by 20 percent by reducing the amount of time spent in traffic queues. Transport saw increases in

effectiveness due to the lowered number of cars on the road, with bus speeds up 6 percent and wait times at the stop down 20 percent (Munnich 2007). This led to a 15 percent increase in bus ridership and a 1 percent increase in subway ridership (Litman 2006).

Londoners have mixed reactions about the Congestion Charging Scheme, but for the most part it is seen as a positive benefit to the city. Businesses especially stood to suffer consequences from the scheme, as delivery vehicles and customers are charged to enter the city center. Most businesses, however, have reported that they have either felt positive or no effects from the charge. The additional costs of the congestion charge are offset by the decreased cost of sitting in traffic wasting fuel and time. Some businesses have reported that the fee pays for itself in less than an hour by eliminating costs they would have faced from congestion. It is the smaller businesses who cannot so quickly recover the costs of the fee and who may suffer from reduced patronage because potential customers are staying out of the city center. The majority of London's business community is content with the Congestion Charging Scheme. The scheme has met political favor across party lines, and public opinion is that congestion pricing is a good thing for London. The following table diagrams the stakeholders who win and lose from the effects of London's Congestion Charging Scheme. When environmental improvements are considered as well, it is clear to see that the winners far outweigh the losers.

Winners	Losers
Downtown bus riders	Motorists with marginal-value trips
All transit riders (due to increased funding for improvements)	City center businesses that depend on low-cost weekday car access
Taxi drivers and riders	Residents and motorists in border areas who experience spillover impacts
Motorists with high-value trips	City center parking revenue recipients
Most city center businesses	
Overall city productivity	
Pedestrians and cyclists	

(Litman 2006)

London has managed to create an integrated system which planned ahead for the effects of the Congestion Charging Scheme. Recognizing that charging roads which go into and through the city center may increase congestion on other motorways, such as was the case in Singapore, a large effort was made to prepare other motorways for additional traffic by improving signaling systems. Travel times on ring roads have not increased, though traffic amounts have. Unlike Singapore, London chose to impose a

flat rate on all traffic rather than vary it based on type of car, time of day, or route taken. Some have criticized this, saying it does not stop drivers from driving as much as they want after they have paid their £8 fee for the day. Other criticisms include privacy concerns about personal travel data being collected and potentially misused, as well as equity concerns for low-income drivers who must make low-value trips into the Congestion Charging Zone using their vehicle.

London serves as a good example for New York in how to successfully implement a congestion pricing scheme in a way that plans for the resulting consequences in advance, and achieves support from commercial, economic, political, and public sectors. It must be recognized, however, that London started off with a lower number of automobile commuters than New York currently has, and London's network of public transport is more extensive.

Conclusion

As we move into the future, traffic congestion is predicted to get increasingly worse throughout major cities across the United States. Congestion pricing is a theory that can help reduce congestion, and with that reduce the impacts on the environment. In New York City, it is projected to decrease traffic within the Central Business District by 6.3 percent and increase speeds by 7.2 percent, resulting in decreased vehicle travel times, increased mass transit ridership, and decreased greenhouse gas emissions (PlaNYC 2007). It would also reduce noise, increase the speed of bus and taxi trips, create more space for pedestrians and make the boroughs of Manhattan a more attractive place to work, live, shop and be entertained. While the congestion pricing has proven to be successful and effective in London as well as in Singapore, citizens of the United States will have to wait to see if the implementation of the plan on New York City will prove successful.

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