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**Article**

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## LONDON CONGESTION PRICING – IMPLICATIONS FOR OTHER CITIES

TODD LITMAN\*

### Background

A basic economic principle is that consumers should pay directly for the costs they impose as an incentive to use resources efficiently. Urban traffic congestion is often cited as an example: if road space is unpriced traffic volumes will increase until congestion limits further growth. For decades economists have recommended road congestion pricing (special tolls for driving on congested roadways) as a way to encourage more efficient use of the transport system, and address congestion and pollution problems, providing net benefits to society.

In recent years a few cities have implemented various forms of congestion pricing, including Singapore, Orange County (California State Route 91) and the cities of Trondheim, Oslo, and Bergen in Norway, but proponents have been frustrated by the political resistance congestion pricing faced in other major cities.

Central London is a particularly suitable city for congestion pricing because of its limited road capacity (the streets network in the core area has hardly expanded since the medieval ages), and heavy travel demand result in severe congestion, plus relatively good travel alternatives, including walking, taxi, bus and subway services, which are used by most travelers. Only about 10 per cent of peak-period trips were made by private automobile. For decades transport planners have recommended congestion pricing in central London.

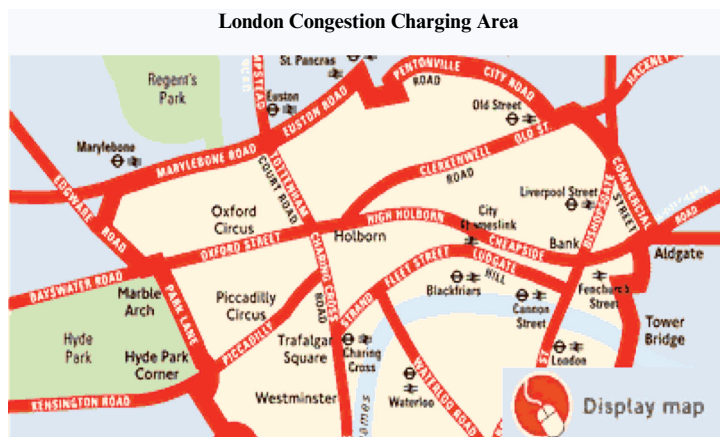
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In 2000, London's political system was restructured to create a new, elected mayor with new powers to manage the city's transport system and raise taxes to fund transport improvements. Ken Livingstone won with a platform that included congestion pricing implementation. Revenues are to be used to fund public transit improvements.

This plan was criticized by various interest groups, including politicians, motorist groups and some labor organizations. The Conservative mayor candidate promised to end the congestion pricing program if elected. There are half a dozen daily newspapers published in London, and many of them were skeptical or opposed to the program. However, Mayor Livingstone, considered a "radical" politician, proceeded with the charge.

### How the program works

Since 17 February 2003 motorists driving in central London (see Figure) on weekdays between 7:00 a.m. and 6:30 p.m. are required to pay £5, increasing to £8 in July 2005. There are some exemptions, including motorcycles, licensed taxis, vehicles used by disabled people, some alternative fuel vehicles, buses and emergency vehicles. Area residents receive a 90 percent discount for their vehicles. The charging area is indicated by roadside signs and symbols painted on the roadway. The city is currently developing a plan to expand the charging zone westward in 2006 or later.



Payments can be made at selected retail outlets, payment machines located in the area, by Internet and cellular telephone messaging, any time during that day. Motorists can purchase weekly, monthly and annual passes with modest (15 percent) discounts. A network of video cameras records the license plate numbers of vehicles and matches it with the paid list. The owners of vehicles that have not paid as required are sent a £80 fine. This fine is reduced to £40 if paid within two weeks, and increases to £120 if not paid after a month – the same policy for parking penalties in the inner London area.

The system is considered effective. Approximately 110,000 motorists a day pay the charge (98,000 individual drivers and 12,000 fleet vehicles), increasingly by mobile phone text message. Non-payment rates were high during the first few weeks, due to general confusion and errors (such as motorists confusing number 0 or 1 and the letter O or l), but these have declined as users and operators gain experience.

This system is not considered optimal because:

- The fee is not based on how many miles a vehicle is driven within the charging area.
- The fee is not time-variable, that is, the fee is not higher during the most congested periods and lower during less congested periods.
- The fee does not vary by location. It would be more efficient to have higher rates on more congested roads.
- The system has relatively high overhead costs.
- Transit service (particularly the underground rail system) is crowded and unreliable, although this is changing as bus service improves and pricing revenue is used to upgrade the system.

**Costs and revenues**

The program was predicted to have the following costs and revenues between 2001 and 2008, including three years of development and five years of operation:

Table 1 shows the charging program’s originally projected costs and revenues. However, charge revenues turned out to be lower, and penalty revenues higher than anticipated – resulting in a net “gain”. The 2004/05 budget year is projected to earn £190 (instead of £160) million in total revenues (£118 million in fees and £72 million in fines), with £92 million in overhead expenses, resulting in £97 million in net revenues.

**Travel impacts**

*Transport for London*, the local transport authority and part of the city of London’s administration, and various academic organizations established a five-year monitoring program to evaluate the transport, economic, social and environmental impacts of congestion charging (see references for London Congestion Charging Website).

Just over a million people enter central London during a typical weekday morning peak (7–10 a.m.). Over 85 percent of these trips are by public transport. Prior to the congestion pricing program about 12 percent of peak-period trips were by private automobile. During the programs first few months automobile traffic declined about 20 percent (a reduction of about 20,000 vehicles per day), resulting in a 10 percent automobile mode share.

**Table 1**  
**Congestion charging program: Projected costs and revenues**

	Total (NPV) in £ millions	Per operating year in £ millions
Start up costs	180	36
Operating costs	320	64
<b>Total cost, 2001 – 2003</b>	<b>500</b>	<b>100</b>
Charge revenues	690	138
Penalty revenues	110	22
<b>Total annualized revenue, 2004 – 2008</b>	<b>800</b>	<b>160</b>

NPV = net present value.

Source: Compilation by the author.

Most people who change their travel patterns due to the charge transfer to public transport, particularly bus. Some motorists who would otherwise drive through central London during peak periods shift their route, travel time or destination. Others shift mode to taxis, motorcycles, pedal cycles, or to walking

This has significantly increased traffic speeds within the zone. Average traffic speed during charging days (including time stopped at intersections) increased 37 percent, from 8 miles-per-hour (13 km/hr) prior to the charge up to 11 miles-per-hour (17 kms/hr) after pricing was introduced. Peak period congestion delays declined about 30 percent, and bus congestion delays declined 50 percent. Bus ridership increased 14 percent and subway ridership about 1 percent. The third-year annual report indicates that these improvements are continuing (*Transport for London 2005*).

Taxi travel costs declined significantly (by 20–40 percent) due to reduced delays. Vehicles can cover more miles per hour, so taxi and bus service productivity (riders per day) and efficiency (cost per passenger-mile) increased substantially. There has been some increase in motorcycle, moped and bicycle travel, and vendors have promoted these modes.

The program's net revenues will be used to improve public transit services, including more buses and major renovations to the subway ("tube") system, which is widely agreed to be in need of significant redevelopment. Bus service is being improved in many ways, including an expanded bus lane system, with enforced surveillance using a network of over 1,400 on-bus and roadside video cameras.

### Public and political response

Before implementation this plan was widely criticized by various interest groups, including politicians, motorist groups and some labor organizations. The Conservative mayor candidate promised to end the program if elected. Many newspapers were skeptical or opposed to the program, and opponents produced a website titled Sod-U-Ken (see references) to promote their objections.

The congestion pricing program has since become generally accepted by the public and interest groups, including many that initially criticized it, such as automobile clubs. Within a month of its start residents of other areas in London began requesting to be included, and the Conservative candidate no longer promised to end the fee. In 2004, Mayor Livingstone was reelected, largely on the success of the road pricing program and his plans to expand the pricing zone.

*London First* (see references), a business group whose members account for 22 percent of the city's GDP, supports the city's congestion charge. A survey performed May 2003 found that its members consider the scheme to have overall positive impacts on business activity. The majority (69 percent) felt charging had no impact on their business, 22 percent reported positive impacts on their business, and only 9 percent reported an overall negative impact. Many industries support the charge because its direct costs are offset by savings and benefits, such as faster delivery times. Cert Logistics, a distribution company that delivers to many downtown restaurants and hotels, reports its delivery times have been cut by as much as 50 percent, and oth-

er industries find that their employees spend less time delayed in traffic, and so can attend more out-of-office meetings in a day. The £5 charge pays for itself in just 17 minutes of travel-time savings for employees earning average London wages (£34,000 per year), and many city center employees earn far more.

*London Chamber of Commerce* (see references) members have been more skeptical of the program. A March 2003 survey found that many city center retailers blame the charge for reduced sales (although the Iraq war and its security measures, a temporary closure of two subway lines, and a general economic downturn also impacted local business activity), and some threaten to leave the city. Opposition to the program tends to be greater among smaller retailers, and may partly reflect political ideology (the business community tends to oppose Mayor Ken Livingstone and his policies), and may represent a political strategy to gain more special treatment to benefit local retail businesses, such as lower parking fees and special discounts.

### Criticism

Some issues of criticism are discussed below.

#### *Business activity*

As mentioned above, some businesses consider themselves harmed by the program, particularly bulk good retailers that rely on customers who drive private cars. However, other economic activities have benefited due to improved access by other modes, reduced delay for high-value vehicle trips, and improved environmental conditions. A shift in the location of bulk retailing is not necessarily harmful to the regional economy if the city center locations they vacate are used for equally productive activities. Economic theory suggests that congestion pricing should increase overall productivity and business activity by favoring higher-value activities over lower-value activities, and reducing congestion costs. Some criticisms were based on inaccurate assumptions (for example, theater patronage impacts are slight since the charge does not apply evenings and weekends when most performances occur), or were addressed by special treatments (such as discounts for certain types of employees). Various studies and surveys indicate minimal overall impact on economic productivity and activity, although some sectors and businesses are affected more than others, either positively or negatively (Transport for London 2005).

*System accuracy*

The congestion pricing system uses a network of video cameras to record license plate numbers, and optical character recognition (OCR) technology to read this information, identify “unpaid” vehicles and generate citations for violators. During the first few weeks the rate of false positives (motorists wrongly ticketed) was high, in part due to both drivers and OCR systems misinterpreting characters or using incorrect registration data. Failure rates have declined over time as motorists and operators gain experience.

*Traffic spillover impacts*

There was concern that congestion may increase on nearby roads due to diverted traffic. Although some diversion occurred the effect appears to be too small to measure, and may be addressed in the future by expanding the priced area and charging more variable fees (higher rates in the center and lower rates in outer zones). Although there is 10 percent more traffic on the peripheral roads, journey times on them have not increased, in part because traffic signal systems on these roads were adjusted in anticipation of these traffic shifts.

*Fairness*

Some critics argue that road pricing is unfair because it constitutes “double charging”, since motorists already pay registration and fuel taxes and is unfair to lower-income people who must drive, such as workers who commute to central London during off-hours. Some motorists are exempt (e.g., people with disabilities) or have substantial discounts (residents within the priced area) not available to others. This criticism has raised debate concerning what pricing is equitable and how reforms can be most fair and beneficial to consumers. Some concerns have been addressed with special exemptions or policies.

*Pricing efficiency*

Most economists favor a variable road use fee that reflects the type of vehicle, when it is driven, where and how much it is driven within the priced area, since that most accurately reflects the costs

imposed by driving and gives motorists an incentive to minimize their negative impacts, for example, by shifting from peak to off-peak periods, or by minimizing their mileage. The current system uses a flat fee applied to any vehicle that drives within the central area during weekdays, so once a motorist pays the fee they have no incentive to minimize driving. This flat-rate system was chosen because it was relatively fast and easy to implement, and simple to understand. A more sophisticated system that allows variable fees is likely to be implemented in the future.

*Cost efficiency*

A substantial portion of revenue is used to pay program expenses. About half of the program’s revenues are spent on overhead costs (project development, equipment and operations). Critics argue that there are more cost effective ways to collect money. However, as a congestion reduction strategy and a way to improve bus service it has proven to be an effective and cost efficient investment.

*Loss of privacy*

There is concern that the network of video cameras and the system for tracking vehicles within London is an invasion of privacy. However, British cities already have extensive video surveillance systems, and access to vehicle location data is controlled to limit invasion of privacy. However, these factors have not eliminated this concern.

**Winners and losers**

Table 2 characterizes the groups which are either winners or losers of London congestion pricing.

**Table 2**

**Congestion pricing: Winners and losers**

Winners	Losers
<ul style="list-style-type: none"> <li>• Downtown bus riders</li> <li>• All transit riders (due to increased funding for improvements)</li> <li>• Taxi riders and drivers</li> <li>• Motorists with high-value trips</li> <li>• Most city center businesses</li> <li>• Overall city productivity</li> <li>• Pedestrians and cyclists</li> </ul>	<ul style="list-style-type: none"> <li>• Motorists with marginal-value trips</li> <li>• City center businesses that depend on low-cost weekday car access</li> <li>• Residents and motorists in border areas who experience spillover impacts</li> <li>• City center parking revenue recipients</li> </ul>

Source: Author.



## Implications for other cities

London's congestion pricing project is considered an important test of the political feasibility of congestion pricing in major democratic cities. London's experience shows that congestion pricing is technically feasible and effective, and that it is possible to overcome the political and institutional resistance to such pricing. As a result, it will help put congestion pricing on the menu of transportation improvement options in other cities.

This pricing program indicates that private automobile travel is more price sensitive than most experts believed. This is good news for congestion reduction but bad news for revenue generation.

Better pricing systems are needed to optimize the incentive, with prices that vary depending on the type of vehicle, when, where and how much it is driven. These are technically feasible, and have been implemented in Hong Kong and Singapore, but they involve greater investments and potential loss of privacy.

Implementation is not easy. It requires a suitable combination of travel and political conditions, including widely dispersed benefits and the ability to overcome public skepticism. Compared with other cities London has a particularly small portion of automobile commuters, and many of them reside outside the city. As a result, a relatively large portion of voters perceive themselves as benefiting from the fee. Voters in other cities may be more skeptical that they will benefit from such a fee.

## Summary

Since 17 February 2003 the city of London has charged a fee for driving private automobiles in its central area during weekdays as a way to reduce traffic congestion and raise revenues to fund transport improvements. This has significantly reduced traffic congestion, improved bus and taxi service and generates substantial revenues. Public acceptance has grown and there is now support to expand the program to other parts of London and other cities in the UK. This is the first congestion pricing program in a major European city, and its success suggests that congestion pricing may become more politically feasible elsewhere.

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