

7 BEST PRACTICES

Congestion Pricing

SINGAPORE, LONDON, STOCKHOLM

WHAT IS IT?

Congestion pricing uses electronic transponders in vehicles, database-linked cameras, and other barrier-free means to charge drivers as they enter heavily congested parts of the city. Congestion pricing programs can charge varying fees based on different tiers that factor in complementary benefits (those in addition to congestion relief) or address equity concerns. London, for instance, offers exemptions for electric cars, while other systems include allowances to address perceived inequities in the pricing system (e.g., pricing caps or reductions for downtown residents, persons with disabilities, low-income travelers, etc.). These systems work well in combination with public transit and can be used as a source of funding for improved public transit systems.

WHY DO IT?

Congestion pricing reduces congestion by offering an economic incentive to take transit or other non-auto means to enter central business districts. Traffic congestion in central districts degrades transit performance, delays emergency response vehicles, impedes the movement of goods, and costs residents in lost time and excess fuel usage. Congestion pricing can reduce vehicle miles traveled (VMT), an important contributor to global climate change, air pollution, and other congestion-related problems including negative impacts on the city's economic competitiveness resulting from reduced access. While it may



seem counterintuitive, cities that have implemented congestion pricing have actually improved access to downtowns by balancing travel to more spatially efficient modes. In some cases, this also benefits goods movement, an industry that places high value on time. Congestion pricing can also provide a revenue stream to be used to improve transit service and enhance non-drive alone modes.

HOW WELL DOES IT WORK?

A number of European and Asian cities have successfully implemented cordon pricing, or tolls, to charge drivers when entering entire subareas of cities. These comprehensive programs limit travel to, and congestion within, large geographic areas, not just along highway corridors. Similarly, parking pricing can provide some of the benefits realized by full congestion pricing but often are limited to publicly owned/controlled facilities, limiting results. Several successful congestion pricing programs are noted here.

Singapore

In 1975, Singapore was one of the first places to implement congestion pricing through an area licensing system (ALS) that required drivers to purchase a sticker to drive into the core of the city. The ALS was very effective in reducing traffic and has since been enhanced and expanded. In 1998 the paper-based license was replaced by radio frequency identification (RFID) tags that use differential pricing—pricing that varies by time of use—on more routes. Studies have shown that traffic volume on weekdays entering the restricted zone has dropped between 20 and 24%, while average traffic speed has increased from 30 to 35 km/hr to 40 to 45 km/hr.

London

London has the most ambitious congestion pricing program to date, and it provides a success story for congestion pricing advocates¹. Drivers are charged a fee for crossing into the central business district (CBD) by any route and can pay by internet, at retail outlets, in booths, and via cell phone.

The system is enforced by over 400 video cameras around the city. This system is much more comprehensive than previous programs, and requires no long-term commitment or investment on the part of the driver. Transport for London (TfL), the local government body responsible for most aspects of transportation in the London region, has found that congestion has fallen by 22%. In addition, waiting times for bus service fell 30% in the first year and 18% in the second year, despite a 37% increase in ridership.

¹ Central London Congestion Charging, Impacts Monitoring, Fourth Annual Report, June 2006 The Stockholm Trials (www.stockholmsforsoket.se)

Stockholm

Following London's example, Stockholm implemented a similar system in 2006². In this system, cameras record license plates and charge drivers without requiring driver action (this is similar to the system proposed for New York City). The cordon pricing system in Stockholm has shown initial success. Traffic in the central area has been reduced by between 20 and 25%, and emissions from automobiles have decreased 14%. There was little increase in traffic on roads just outside the cordon.

North American cities

The use of high occupancy toll (HOT) lanes is widespread around the U.S and Canada, though HOT lanes are not a tool for reducing congestion in a central area. The only two U.S. metropolitan areas currently using dynamic (variable) pricing are San Diego and Seattle. Dynamic pricing allows the congestion pricing system to vary prices based on time of day or in response to changing congestion conditions. Both San Diego's I-15 express lanes and the SR-167 HOT Lane Pilot Project are located in the suburbs. There remains an opportunity for a U.S. city to take the lead in implementing dynamic pricing to reduce congestion and maximize benefits.

² Stockholms Stad (2006) Facts and results from the Stockholm Trial. Second Version - June 2006

LONDON

The London congestion pricing program has been in place since the beginning of 2003, covering a 10-square-mile zone of central London. The zone is approximately one-eighth the size of the City of Seattle. Congestion fees are charged between 7:00 A.M. and 6:30 P.M. Mondays through Fridays, except on public holidays. There is a flat fee of £8 (\$15) per day for entering, exiting, or driving within the zone if the fee is paid by 10:00 P.M. on the same day. There is an additional surcharge of £2 if the fee is paid between 10:00 P.M. and midnight. Late payment fees are charged immediately after midnight, and amount to £50 for the first 14 days, £100 for the following 14 days, and £150 thereafter. Vehicles with three or more outstanding penalty fees may be booted or towed; this policy is effective across the entire Greater London area. The congestion charge can be paid in advance or on the same day in multiple locations.

Successes

Congestion has been reduced inside London's zone by an average of 26% since the program's introduction in 2003³. Congestion is defined as the excess delay above what would be experienced under clear conditions. London's pre-congestion baseline delay was 2.3 minutes per kilometer with 2005 figures showing an improvement to 1.8 minutes per kilometer. These reductions in travel times are a result of less traffic. Statistics from 2005 confirm a 17% drop in total traffic with a 31% decrease in potentially-chargeable vehicles in relation to equivalent pre-charging figures for 2002. From 2002 to 2005, the total number of car vehicle-kilometers driven fell 39%.

³ 2006 TfL Annual Report

Road accidents have also decreased, with a net reduction of between 40 and 70 personal injury accidents per year. There is no evidence of adverse traffic impacts on roads surrounding the zone, and there is an overall pattern of slowly declining “background” traffic levels in inner London. London reduced greenhouse gas (GHG) emissions from road traffic by 16% within its congestion pricing area, lowered traffic, and improved transit and bicycle use. London estimates a 9% reduction in pedestrian injuries and a 20% increase in bicycle trips.

Data revealed no significant impacts on business performance; recent economic activity saw a brief decline due to the July 2005 subway bombings, but retail and business profitability have since rebounded. Overall, the congestion zone appears to have a neutral effect on business. Surveys also indicate that 78% of the charge payers are satisfied with the quality of service.

Data on financial performance shows a net benefit from congestion pricing systems. The system generated net revenues of £90 million in 2004/05 and £122 million in 2005/06 (provisional figures), which are being spent largely on improved bus service within London. The increase in revenue between the two years can to a large extent be attributed to a fee increase from £5 to £8 in July of 2005. Interestingly, the 60% increase in daily fee seems to have contributed to only a 4% reduction in entering traffic, which is towards the lower end of Transport for London’s prior expectation. However, these results have yet to be confirmed. There are also additional public transport fares generated by those transferring to bus, Underground, and rail services. TfL estimates that these are on the order of £15 million per year, largely offsetting the additional costs of £20 million

per year for providing additional buses. The success in the central London charging zone has prompted a future western extension of the zone.

Challenges

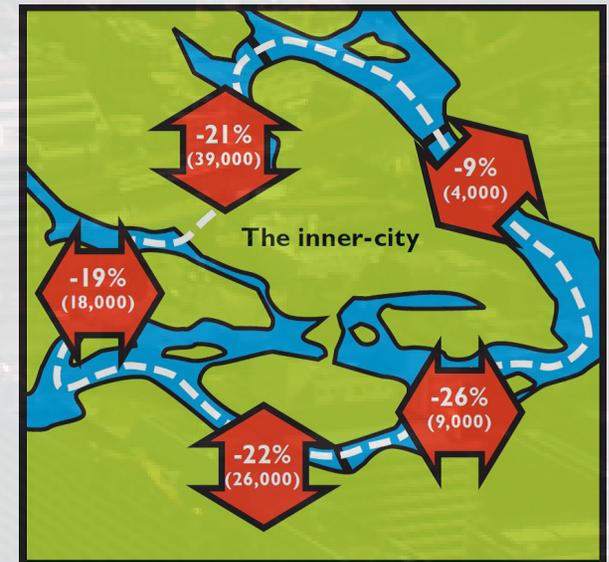
London’s congestion pricing system, while successful, is not considered optimal for several reasons⁴:

- 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 Tube) is crowded and unreliable, although this is changing as bus service improves and pricing revenue is used to upgrade the system.

⁴ Todd Litman, London Congestion Pricing: Implications for Other Cities, Victoria Transport Policy Institute (2006)

STOCKHOLM

Sweden’s capital, Stockholm, recently introduced congestion charging. The Swedish government and the City of Stockholm managed a seven month trial period of a congestion tax in Stockholm between January 3 and July 31, 2006. During this period, vehicles entering or exiting any of the 18 control points into or out of the Stockholm inner city on weekdays between 6:30 A.M. and 6:29 P.M. were required to pay a congestion tax. A referendum on the permanent implementation of congestion charges held on September 18, 2006 succeeded with a 51.7% approval. The zone covering the city’s core is approximately 13 square miles in size.

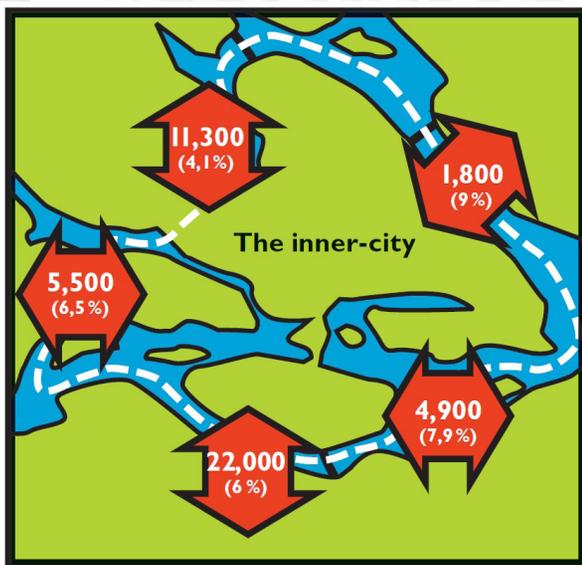


Reduction in Car Traffic

Source: The City of Stockholm, Facts about the Evaluation of the Stockholm Trial, http://www.stockholmsforsoket.se/upload/Hushall_eng.pdf.

Vehicles are registered by cameras photographing the license plates, similar to the London system. Vehicles equipped with an electronic unit for direct debit payment are also identified through this means. Traffic flow is not affected as drivers are not required to stop or slow down when passing a control point.

The cost per entrance or exit is \$1.35, \$2, or \$2.70 depending on the time of day. The maximum amount is charged during peak hours from 7:30-8:29 A.M. and 4:00-5:29 P.M. The maximum amount payable per vehicle per day is \$8. Payment must be registered within 14 days of passage. Owners of vehicles that are not equipped with an onboard unit must pay the fees at local chain stores, via credit card, on the Internet, or through Internet banks. If the tax is not paid within



Increases in Travel by Public Transportation

Source: The City of Stockholm, Facts about the Evaluation of the Stockholm Trial, http://www.stockholmsforsoket.se/upload/Hushall_eng.pdf.

the 14-day time frame, the vehicle owner will receive a reminder to pay the tax within four weeks, with an additional administration charge of \$9.50. If the tax and fees are not paid within the four-week period, a new reminder is sent out with an additional \$70 fee.

Exemptions

The following vehicles are exempted from the congestion tax:

- Emergency vehicles
- Buses with a total weight of at least 14 tons
- Diplomatic cars
- Taxis
- Motorcycles
- Vehicles registered abroad
- Military vehicles
- Cars that are equipped with technology for partial or total operation using electricity, alcohol, or gas other than gasoline, and are registered as such at the Swedish Road Administration
- Owners of the following types of vehicles must apply for an exemption:
 - Mobility service vehicles with total weight below 14 tons
 - Cars that are used by persons with a disabled person parking badge

Cost of Implementation

The Swedish government has budgeted \$510 million to cover all the costs of implementation, including technology, transit improvements (such as 12 new express bus lines, expanded service for nearly 20 other bus lines, and new bus stops), about 1,800 new park-and-ride lots, information campaigns, and monitoring. The revenue from the congestion charge is approximately \$8 million per month. If the

congestion charge becomes permanent, it will yield a significant annual surplus of \$75 million (after deduction for maintenance and operations). In other words, the system will be repaid in less than seven years. In addition, estimates of socioeconomic gains, due to shorter travel times, increased traffic safety, and improved health and environment, yield savings of \$100 million annually.

Effectiveness and Impacts

Six months into the program the average traffic reduction across the control points between 6:30 A.M. and 6:29 P.M. was 22%, and nearly 100,000 vehicle trips per day has been removed from the roads. The reduction reached its peak during afternoon rush hours at 24%. Traffic reduction in the inner city was a bit lower than the average across the control points, showing a 15% drop in vehicle kilometers traveled. This indicates that individuals driving within the control points take advantage of the reduced traffic situation and drive more. Vehicle travel times dropped significantly within and around the inner city. The largest reductions were observed around the control points, where time spent in congestion was reduced by a third in the morning peak hour and by half in the evening peak hour. Public transport usage increased by 6% between the spring of 2005 and the spring of 2006. The congestion trial is estimated to account for 4.5% of this increase, while increase in gas prices and other external factors cover the remaining 1.5%. A conservative estimate of the effects on personal injury accidents is 5-10% reduction within the zone.