

The Technology Context – B101

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Syllabus topics

- Sustainable development
- Solar energy
- Clean water
- Electronic waste
- Urban development
- Ethics

1. Accuracy

- Are information sources clearly indicated?
- Can you verify the information from your own knowledge?
- Can you verify the information using other sources?
- Is the information up to date?
- Are there grammatical or spelling errors?

2. Authority

- What are the author's credentials or qualifications?
- Why is the author qualified to write on this topic?
- Is there a way to contact the author about the article?

3. Objectivity

- Is the article intended for the general public or an expert audience?
- What is the primary purpose of the article?
- Is the information mostly fact, opinion, marketing or propaganda?
- What is the author's point of view?
- Does the article use emotional language?

4. Credibility

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Congestion pricing: an idea that makes sense

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25 July 2007

Singapore has had congestion charging since 1975. London introduced one in 2003. Does urban congestion charging make sense?

Road users, quite naturally, only think of themselves when taking a trip. Their extra trip, however, imposes extra delays on thousands of drivers. The result is wasted time, wasted fuel, and unnecessary pollution, to say nothing of the other happiness-reducing aspects of traffic congestion – frayed nerves, road-rage, missed appointments, etc.

The early years of the post-war boom in personal car ownership saw governments trying to solve the 'traffic congestion' problem by widening roads, building new highways and improving public transport. Better roads spurred car ownership (as SACTRA (1994), Goodwin (1996) and Goodwin and Noland (2003) say, 'building more roads increases traffic') and better public transport merely kept traffic congestion at the boiling point. The problem grew along with cities' populations. Today, many urban authorities just throw up their hands and assume that traffic headaches are just part of city life. Others have adopted draconian solutions that are imposed when pollution levels exceed critical levels. Banning cars with odd or even numbered plates, banning traffic on certain days or in certain zones are standard examples. There are, however, better answers.

To think about solutions to this problem, it is useful to think of traffic congestion as the outcome of a market – the market for road usage. In most cities, the 'price' of road usage is just the private cost: the cost of your own time, vehicle, fuel and peace of mind. If this price is too high, you may decide to take public transport, ride a bike, etc., but otherwise you drive. Since road users are not 'paying' for the costs they impose on other road users, the natural result is over-usage, i.e. traffic congestion. From one perspective, this lack of pricing is strange.

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If electricity, water, telephone calls, trains and planes were free, no one would be surprised to see 'congestion.' To prevent the resulting chaos, the 'price' of these services includes a monetary fee as well as the usual private costs. In fact, in most settings, these fees are higher during periods of peak demand. Doing the same for road usage is a natural extension of this reasoning.

Singapore realised this in the 1970s when, in the midst of high economic growth rates, it decided to reduce traffic congestion. If nothing else, congestion increases the cost of doing business and acts as a deterrent to foreign investment, or at least that was the perception of the Singaporean government back then. In 1975, the Area Licensing Scheme (ALS) was introduced. At certain times of the day, vehicles entering the seven square-kilometre restricted zone were required to purchase and display a paper licence on their windscreen.

The scheme was a success. The ALS increased average speeds from 18 to 35 km per hour (Willoughby, 2000, p.10). Traffic in the restricted zone fell substantially, although it began to rise with expanding employment and vehicle ownership. In 1998 Singapore replaced the scheme with a much more finely tuned system called electronic road pricing (ERP). Vehicles are equipped with 'in-vehicle units' and smart cards that allow automatic charging each time a vehicle drives by a gantry.

The most interesting feature about ERP charges is that they vary according to vehicle type, time of day, and location of the gantry. For example, charges for passenger cars, taxis and light goods vehicles vary between S\$0.50 and S\$4.50. There is even a special rate for the first five minutes of each new charging period to discourage motorists from speeding up or slowing down to avoid higher charges. The charges are published on the Land Transport Authority website, and are adjusted periodically in order to maintain target speeds.

Singapore was the pioneer, but other nations are following with various schemes. The US has a few examples of high-occupancy/toll lanes, where low-occupancy vehicles are charged a toll, while high-occupancy vehicles are allowed to use the lanes for free or at a discounted toll rate. Italy and Norway also have traffic charging schemes but they are not really congestion charges. In Italy, most traffic is banned in small zones within historic city centres – the few vehicles allowed have to pay for a permit. Norway has had toll rings in a number of cities since the middle 1980s, but these are designed to finance infrastructure, not to manage traffic demand.¹

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London's Congestion Charging Scheme (LCCS)

London introduced a Congestion Charging Scheme in 2003 for central London. All vehicles inside the charging zone must pay £8, Monday to Friday from 7am to 6pm. The scheme was extended westward in 2007. The whole charging zone is still relatively small (representing only 2.4% of Greater London) as the map shows.

From a classic cost-benefit analysis, London's policy is a solid success. Table 1 presents the main costs and benefits showing that the benefits-to-cost for London's scheme is a healthy 2.47.

Table 1: Annual costs and benefits of the London scheme (£ million at 2005 values and prices)

| | |
|---|---------------|
| Costs | |
| TfL administrative and operation costs | 90 |
| Total | 90 |
| Benefits | |
| Time savings and reliability benefits | 303 |
| Loss of initial gain in time savings and reliability due to induced traffic | 75.75 |
| Charge-payer compliance costs | -19 |
| Vehicle fuel and operating savings | 28 |
| Accident savings | 14 |
| Environmental benefits | 3 |
| Dis-benefit to deterred trips | -31 |
| Total | 222.25 |

Source: TfL (2007, Tables 6.2 and 7.2)²

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Not Pigovian taxation

Although congestion charging is an idea that Pigou himself urged, neither the London nor Singapore fees are true Pigovian taxes – that is to say, fees that are computed to ensure each driver faces the full marginal costs of his or her trip, including the congestion costs on other drivers. There is of course a link between the London and Singapore schemes and Pigou's theory, although such link has never been made explicit. Singapore adjusts the various charges to maintain target speeds. In London the £5 and the £8 charges were decided almost arbitrarily, although with some public consultation.

Political economy

Economists have argued for congestion charges for decades, but implementation came from the will of politicians. In the case of Singapore, the dominant political party (the People's Action Party) has been in power since 1959. In the case of London, the current Mayor made a congestion charge part of his election manifesto in 2000. Upon taking office, he found that the essential research had already been carried out³ and he already had the necessary legal powers. Both the original scheme and the westward extension found a fair amount of public opposition, but the Mayor persisted. While there was never a referendum on the scheme, the Mayor was re-elected the year after it was introduced. By law, all net revenue from the London scheme is spent on London's transport sector, with about 80% of it spent on improving the bus network.

Lessons for other cities

Hundreds of scientific studies have been published showing that congestion pricing makes sense. Singapore and London are living proof that congestion pricing can work politically as well. Stockholm conducted a trial of electronic congestion charging in 2006 and the city's residents voted for a permanent implementation in a follow-on non-binding referendum. The sitting government has decided to introduce road pricing as of August 2007. In contrast, Edinburgh voters rejected road pricing by a wide margin (and the referendum was binding so the local authority could not go ahead).

Other towns and cities around the world may want to consider the idea. The main piece of advice I would give any local authority is quite obvious: make sure there is an alternative uncharged mode of transport (such as buses), which is reliable, and be transparent with the use of revenues.

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Footnotes

1 Only lately has Norway started to contemplate the possibility of turning some of those schemes into congestion charging projects.

2 TfL (2007) follows a different methodology for Cost-Benefit Analysis, in line with Government guidance on the Costs to Public Accounts.

3 Two important reports had been published: *The London Congestion Charging Research Programme* (The MVA Consultancy, 1995) and *Road Charging Options for London: A Technical Assessment* (ROCOL, 2000).