

'Traffic Management Schemes – the London Congestion Charge and the São Paulo 'Rodízio' Programme'

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1.0 Introduction

Traffic management schemes restricting vehicle movements into city centres have now been operational successfully worldwide for nearly 30 years. Singapore manual road pricing system was first introduced in 1975, while other schemes introduced since include Norwegian toll schemes, and schemes in Melbourne, Toronto and Durham in the UK.

Objectives of such schemes include reducing traffic congestion, raising revenues and improving air quality. The Oslo toll scheme aimed primarily to raise funds mainly to finance road projects; the Trondheim scheme also aimed to shift some peak traffic to off peak periods. Schemes in Singapore focused on reducing traffic levels.

Irrespective of their main objectives, most of these schemes seem to impact traffic levels, increase traffic speeds, and reduce air pollution, while raising people's awareness of the impacts of car use in the urban environment.

This paper will present a review of two traffic management schemes currently in operation in London and in São Paulo.

2.0 London Congestion Charge

'Congestion charging was a radical solution to a long-standing problem. Before the introduction of the charge, London's roads were clogged with slow-moving traffic and congestion was costing business £2m a week. The scheme has made a real difference in getting London moving again. Fewer vehicles in the zone coupled with improved bus services and faster, more reliable vehicle journeys make London a far better place to work, live and visit. Despite the dire predictions before the launch of

the scheme, congestion charging has proved a success and that is why nearly three quarters of Londoners now support the scheme – because it works’, Mayor of London, Ken Livingstone

Objectives

The main objective of the London Congestion Charge scheme was to reduce traffic congestion in and around central London and also to generate net revenues to improve transport in London. The scheme was intended to contribute directly to four of the Mayor’s Transport Strategy priorities:

- To reduce congestion
- To make radical improvements in bus services
- To improve journey reliability for car users
- To make the distribution of goods and services more reliable, sustainable and efficient

How it operates

The London Congestion Charge has been in operation since 17 February 2003. Drivers are charged £5 daily if they enter or park a vehicle in the cordon area covering 22 square kilometres in central London, from 07:30 a.m. to 18:30 p.m. weekdays. It excludes weekends and public holidays.

Drivers can pay the charges in retail outlets, over the Internet, through call centres, by mobile phone text messaging, or at the post office. Of the 110,000 daily charge payments, 80,000 comprise payments by non-residents, 18,000 residents’ payments, and a further 12,000 fleet payments. Exemptions include taxis, motorcycles, buses, and registered disabled drivers. In addition, residents within the area can register for a 90% discount.

Enforcement is done through cameras capturing images of vehicles entering, driving within and leaving the zone, and their registration number plates are interpreted by ‘Automatic Number Plate Recognition’ computer systems. Drivers who do not pay the charge by midnight on the day of the journey are fined £80 issued to the registered keeper of the

vehicle, which is reduced to £40 if payment is made within 14 days of the offence. If penalty is not paid within 28 days the fine increases to £120.

Main Results

Transport for London (TfL) published the first six-month report of the scheme in October 2003. Results were very positive, and the scheme had by then achieved its main set targets in terms of reducing traffic entering the charged zone. Conclusions were that the emerging impacts of the scheme were broadly along the lines expected by TfL and that driver attitudes to the charging scheme appeared to have become more positive (TfL 2003).

There are now about 60,000 fewer daily car movements entering the zone. Overall there has been a reduction of 30% in car movements and conversely an increase of 20% of taxi movements, a 15% increase in bus and coach journeys, while pedal and motorcycle traffic have increased respectively by 30% and 20% (TfL 2003). In addition, bus patronage increased by 20% in 2003 alone.

This reduction in car movements has had a positive impact on traffic delays and speeds. Traffic delays have reduced by about 30%; journeys to, from and across the charging area have decreased by an average of 14%; and average speeds have increased by 17% from 14.3 km/h to 16.7 km/h, while journey reliability has improved by 30%.

The charging zone and the Inner Ring Road are experiencing greater accident reductions than the rest of London. Since the scheme has been operational there has been a reduction of 8% in the number of reported personal injury accidents in the charging zone compared to the same period in the previous year. Some 6% fewer pedestrians were involved in accidents, along with 4% fewer motorcyclists and mopeds, 7% fewer cyclists and 28% cars, also compared to the same period in 2002. Although this data is encouraging, TfL considers that is still too early to draw firm conclusions about the effects of congestion charging on road accidents (TfL 2004).

Despite the success in reducing traffic entering into and moving within central London, the scheme has not raised the £200 million targeted for its first year. The amount actually raised is expected to be around £18 million.

Scheme acceptance

Views on the scheme differ. According to TfL (2003), since the introduction of the charges, there has been growing support by London residents. More than 50% of all London residents are positive towards the scheme, while around 30% oppose or tend to oppose it. About 70% consider the scheme to be very effective in reducing congestion in central London (TfL, 2003). According to Ken Livingstone, Mayor of London, nearly $\frac{3}{4}$ of Londoners now support the scheme.

A survey of 500 firms has found that almost 72% of the capital's business believe that the congestion charge is working; 58% believe that the charge has been good for London's image; 26% said the charge has a negative impact on the economy, while 35% were of the opinion that their costs had increased as a result of the congestion charge (GLA, 2004b).

Another survey of the Royal Institution of Chartered Surveyors has found that 90% of central London retailers and 75% of leisure businesses (restaurants and theatres) considered that the congestion charge has brought a downturn in turnover, with businesses on the zone's periphery reporting the greatest impact (GLA, 2004b).

Next steps

The Mayor of London began a ten-week consultation in February 2004 on extending the charge zone to include the rest of Westminster and Kensington, west of the current charged area (Figure I). The decision however, will not be taken until the charge scheme



now in place is operational for two years.

Figure I - Proposed extension of Congestion Charge in London

Source: Transport for London, 2004

3.0 São Paulo Peak Hour 'Rodízio' Programme

Objectives

There were two distinctive traffic management schemes introduced in São Paulo – one at the state level (1996-98) and one at the municipal level (since 1997). Both state and municipal schemes were imposed. There was also a consultation process regarding introducing congestion charges in the city of São Paulo, which was strongly criticised by the media and rejected by the public, according to surveys in 1996.

In 1996 the State government environmental authority introduced a car ban strategy known as Operação 'Rodízio' ('Rota' Operation). It was as a contingency measure to tackle air pollution, and to reduce externalities resulting from traffic congestion on public health in the Metropolitan Region during the winter. It covered the city of São Paulo and nine other municipalities in the Metropolitan Region.

In 1997 the São Paulo Municipality, in addition to the State-level scheme, decided to adopt a similar scheme, 'Peak Hour Rodízio Programme', all year round, except in January, during school summer holidays. This programme was aimed primarily at curbing traffic levels and reducing congestion by restricting vehicle access to and movements within a cordon zone in the city centre in morning and afternoon peak hours (Figure II).

How it operates

The State government scheme banned traffic into the metropolitan region during weekdays according to vehicle number plates' ending, from May to September from 07:00 a.m. to 08:00 p.m. The 'Peak Hour Rodízio' programme, covering a much smaller geographical area, became permanent in 1999, after the new State Environmental Secretary discontinued the State government scheme, despite its positive environmental outcomes.

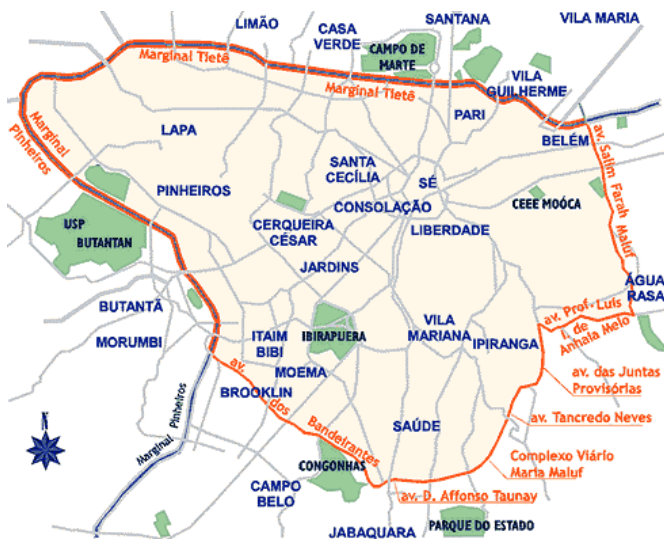


Figure II - São Paulo Traffic Restricted Zone

The Transport Engineering Company (CET) introduced the permanent traffic access restriction scheme within the so-called 'Mini Road Ring' area. Vehicular traffic including lorries, are banned from 07:00 to 10:00 a.m. and 05:00 to 08:00 p.m. according to the vehicle's license number plate endings during weekdays only. Drivers breaking the ban are heavily fined and lose four points in their driving license. Traffic wardens and camera monitoring enforce the traffic ban in main corridors within the zone.

Source: Companhia de Engenharia de Tráfego - CET

Main Results

In order to assess the impact of the traffic ban scheme surveys were undertaken in 1998, comparing both the state and the city schemes. However, no recent data or evaluation is currently available on the impacts of the municipal scheme in operation.

In 1998, São Paulo local authorities estimated that there was an overall 18% reduction in daily congestion in the traffic-restricted area. Furthermore, during the morning peak, the traffic reduction was around 37% and up to 24% in the afternoon peak. There was an increase in average traffic speeds in some critical corridors in the city centre. Traffic

speeds increased by 23% in the morning and by 24% in the afternoon. However, in the downtown area as a whole no significant variation was found, when compared to speed ratios before the scheme was introduced.

However, the early reductions in traffic levels were soon offset by an increase in the city's vehicle fleet from an estimated 3.5 million vehicles in 1997 to approximately 5 million in 2003. Levels of congestion today are similar to or in some cases worse than, when the programme was first implemented. However, it is likely that traffic and emission levels would have been much worse today had no traffic restriction scheme been put in place.

Another reported positive impact of the scheme was a remarkable reduction from 1998 in the number of road accidents and in road accident casualties, despite the constant increases in the urban fleet. The total number of accidents decreased by 10% in 1999, while the reduction in accidents with victims reduced by 25% in relation to the previous year. The overall number of casualties reduced by 31% between 1998 and 1999, despite an increase of 8% in the number of fatalities (CET, 2000).

Some positive outcomes of 'Peak Hour Rodízio' include savings in time of 78.6%, fuel of 10.1%, and about 2% to 5% in emissions' reductions. Environmental gains proved to be relatively small compared to the results of the state scheme in previous years. There may have been a significant displacement of journeys into the inter-peak/ban period, which re-distributes traffic but doesn't affect air quality. Nevertheless, CETESB, the state environmental agency that monitors air quality in the metropolitan region, reported a progressive general improvement in air pollution rates since then. This can be attributed to fleet renewal, where new cars with cleaner fuel technology replaced older ones.

Despite covering only peak periods, the municipal scheme reached its objectives in terms of congestion reduction.

Scheme acceptance

Public response was assessed according to the level of compliance, and from opinion polls. During the first week, when the scheme was trialled on a voluntary basis, there was a 33% compliance rate during the morning and 27% in the afternoon. After the scheme became compulsory, compliance increased significantly and reached 90% and 85% respectively.

A survey by a major São Paulo newspaper (OESP, 1998) showed that 57% of respondents preferred the 'Peak Hour' scheme, as opposed to 43% who preferred the previous 'State' car-ban scheme.

Nevertheless, improvements in traffic have been well received by public transport users, who have a high level of support for the initiative, according to the opinion surveys undertaken in the scheme's earlier days (SMA, 1996, CET, 1998).

4.0 Conclusions

Although both schemes had different objectives, and used different approaches to deal with traffic management on a large scale, they have impacted on traffic congestion by reducing vehicle movements and thus congestion levels, and as a result increased traffic speeds. However, the apparent greater success of the London scheme may be do with the approach taken in the UK, which was more comprehensive. Several measures were also put in place to encourage public transport, cycling and walking in central London ('carrots and sticks'), whereas the São Paulo Peak Hour municipal scheme was an isolated measure that was not part of a more general strategy or transport policy.

The São Paulo schemes were both a top-down approach - the population and stakeholders were not consulted prior to its implementation, whereas the Congestion Charge in London adopted a bottom-up approach involving a consultation process. The population and main stakeholders were consulted, as they are currently being consulted on the extension of the charged zone. Nevertheless, these disparate approaches do not seem to have affected people's attitudes toward the schemes – initial resistance, but once the positive effects were felt, a change in attitude and a more positive view of the systems, followed by general public support.

The São Paulo Peak Hour scheme derived from an initiative to address public health promoted by State government. It became permanent following the discontinuity of the State scheme, and is now accepted by the citizens as necessary to improve congestion levels and quality of life in São Paulo. There are no other initiatives to address this issue in the city, although general traffic management measures also include improving public transport by increasing dedicated bus lanes, expanding and upgrading the bus fleet.

It is also clear that both schemes have raised awareness of congestion traffic issues and have improved the living environment in London and São Paulo as a whole. In London there has also been a significant increase in bus patronage and public transport has coped with this increase in demand.

While London is considering extending the congesting charge zone, other cities are now considering following London's example and introducing congestion charging schemes – Cardiff, Edinburgh in the UK and Barcelona and Milan in mainland Europe.

The authors fully endorse traffic management schemes to discourage vehicle movements in urban areas. Such measures, to tackle traffic congestion and address air quality and public health, should be an integral part of transport, health and land use policies.

5.0 References

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