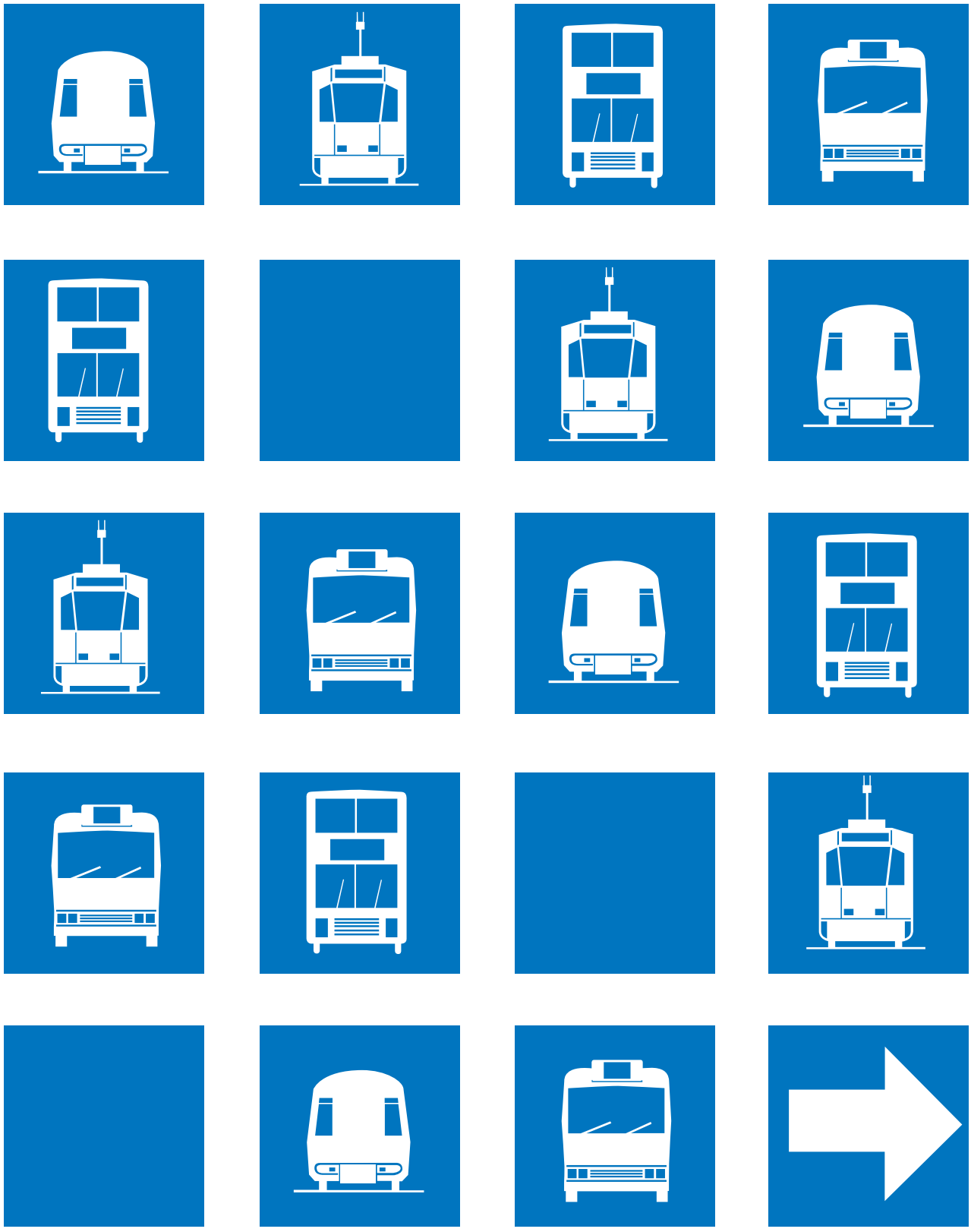

Competition in Public Transport

Competition in the Public Transport Sector and on Toll Roads

by Sustainable Transport Planning (Asia) Ltd.

Aspects of Public Transport in London, Singapore, and Tokyo that Illuminate Competition Issues Concerning Hong Kong's Public Transport

by Richard Gilbert

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May 2003

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Foreword

This is the third in a series of reports by Civic Exchange that explore the role of competition policy and regulatory regimes in Hong Kong. The first two reports, on competition policy in general and on telecommunications, are available at www.civic-exchange.org Public transport was selected as a case study due to its importance to the functioning of the economy and society and its direct impact on the public.

Two reports were commissioned for this study to explore the issue of competition - the first by Sustainable Transport Planning (Asia) Ltd. looks at the existing level of competition in the public transport sector in Hong Kong with a particular focus on franchised buses and rail. The second report by Richard Gilbert is a comparative study between Hong Kong, Singapore, Tokyo and London to see how these cities handle the issue of competition in the public transport sector and what lessons can be drawn.

As part of the study, a multi-stakeholder workshop was held for 45 participants from different sectors of the industry in February 2003. The purpose of the workshop was to consider an appropriate institutional and regulatory framework for a competitive system of public transport that is fair to users, providers, and society. The report from the workshop is also available at www.civic-exchange.org

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Competition in the Public Transport Sector and on Toll Roads

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May 2003

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Introduction

This paper considers some of the issues surrounding competition in Hong Kong's public transport sector and explores whether stakeholders, that is to say operators, the general public, and the traveling public, benefit from any changes to the competition regime.

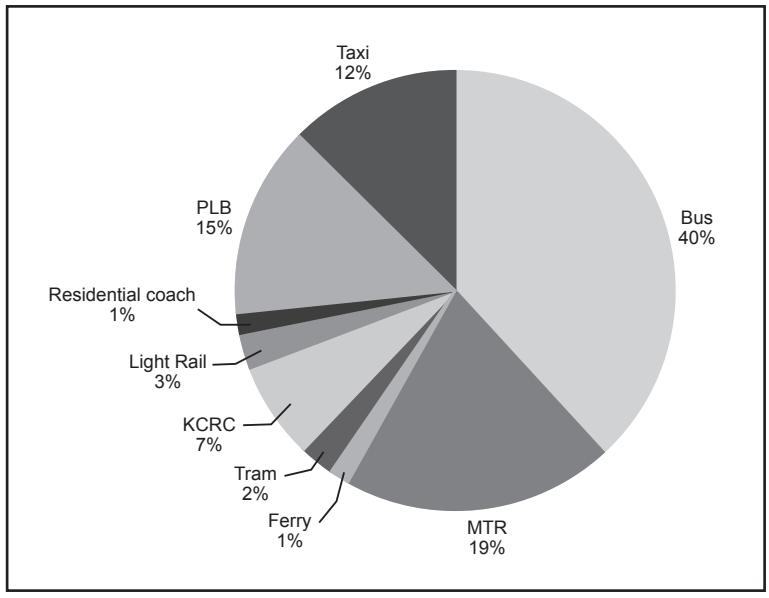
Hong Kong has one of the best public transport systems in the world, and professionals from many other countries visit to study the Hong Kong model. This model harnesses the private sector to provide a relatively inexpensive and high quality service, in terms of comfort, frequency and safety, with no direct subsidies. Consequently, whatever conclusions are drawn, it should be appreciated that they are intended to improve a system which is already very good by most, if not all, standards of measurement.

In addition to examining the public transport sector, the paper also briefly considers the issue of tolls on cross harbour traffic movements and roads in the New Territories and reviews whether the competitive environment is producing the best overall results for Hong Kong.

The discussion in this paper is focused on the franchised bus and rail services. Rail refers to the MTR and the existing East Rail services operated by the KCRC. Bus services are those operated by the three main franchised companies, KMB, Citybus, and Firstbus.

However some 34% of public transport boardings use modes other than franchised bus or rail. These other modes include ferries, trams, and Light Rail Transit (LRT), as well as the more heavily used taxis, minibuses, and residents' coaches (see Figure 1). Taxis and minibuses actually represent slightly more passenger trips than the two rail companies.

Figure 1: Market Shares for Hong Kong's Public Transport Modes in 2001[1]



[1] HKSAR Transport Department (2002), *Annual Transport Digest 2002,* http://www.info.gov.hk/td/eng/publication/digest2002_index.html

The Regulatory and Policy Framework for Public Transport

2.1 The Regulatory Framework

Historically, governments have tended towards the regulation of public transport services and this is the case with all advanced economies. There is a range in the extent of the regulations which governments impose; at the minimum, governments impose specific safety regulations for vehicles carrying fare-paying passengers, and at the higher end they impose control on frequencies and routes. Hong Kong tends towards the higher end, especially for road based public transport. These controls are discussed for each mode as follows:

Franchised Buses

The granting of bus franchises is undertaken by the Chief Executive under the Public Bus Services Ordinance, on recommendations made by the Transport Advisory Committee (TAC).[2] Franchises may be granted for a period not exceeding 10 years but are often granted for 5-6 years to enable the government to review the performance of operators prior to granting a longer franchise. Franchises may be extended by negotiation if the operator's performance is satisfactory. All bus franchises incorporate a basket of profit making and loss making routes which require cross subsidization.

Prior to 1997 the franchised services on Hong Kong Island and a number of cross harbour routes were operated by China Motor Bus. There was some disquiet about the standard of vehicles. The franchise was withdrawn and tenders invited for two packages of routes which were drawn up to combine profitable and unprofitable routes and maintain the service coverage; the packages were awarded to Citybus and New World First Bus (NWFB). The franchise period is for 10 years, and the principles which will govern the renewal of the franchises are clearly listed and include safety, fares, passenger satisfaction, staff relations, vehicle utilization, and vehicle standards. The competition for the franchises and the awareness of the need to perform well to win the franchise renewal has led to increased service levels on Hong Kong Island. The franchised companies are closely monitored by Transport Department to ensure that the vehicles meet maintenance standards and the operation meets the requirements of the franchise. Additionally all road vehicles are subject to regulation under the Construction and Maintenance Regulations.

Each change of franchise has generally increased the overall quality of the bus fleet be it in terms of emissions or passenger comfort and convenience.

Routes are inherited at the time of the granting of the franchise and may therefore be said to have been devised by the government initially. Operators can and do make suggestions for route changes, additions, and deletions, but major proposals may be opened to bidding by other operators. However the agreement of the District Councils is needed for any change in routing.

Fare adjustments are controlled by the Transport Department with review by the TAC. Thus operators must apply for permission to increase or decrease fares, or introduce concessionary fares. Since late 2001 the Transport Department has adopted a flexible approach in handling applications for fare concessions. Considerations which are taken into account include the impact on other operators including minibuses and taxis, effects on bus rationalization, congestion, and capacity.

Mass Transit Railway (MTR)

The former Mass Transit Railway Corporation was established by statute in 1975 to operate the MTR. In February 2000, the Legislative Council passed legislation to privatize a substantial minority of the government's shareholding in the company and the privatized entity, MTR Corporation Limited (the publicly-owned and privately-owned entities will both be referred to as MTRC), was listed on the Hong Kong Stock Exchange in October that year.

[2] TAC has 21 appointed members, including three government officials. The government officials represent the relevant bureaux and departments and include the Secretary for Environment, Transport & Works and the Commissioner for Transport. The 18 private sector appointees are members of the public who have a strong interest in transport but do not have commercial ties to the industry. Thus, TAC tends to have a strong academic presence. The TAC Chair is always a non-government member.

The Regulatory and Policy Framework for Public Transport

The MTRC has autonomy to raise and lower fares at its own discretion, but consults the TAC before so doing. This autonomy is considered to be essential to enable the Corporation to raise funds on the international capital market. The regulatory environment of the MTRC is thus relatively benign compared to that of the franchised bus companies.

Kowloon Canton Railway (KCR)

The KCR was commissioned in 1910. It is the first and oldest railway system in Hong Kong. The railway was operated by the government until the Kowloon-Canton Railway Corporation (KCRC) was established in 1982. It is wholly owned by the Government.

The KCRC has autonomy to raise and lower fares at its own discretion but consults the TAC before so doing. As with the MTRC, this autonomy is considered to be essential to enable the Corporation to raise funds on the international capital market which it is allowed to do. It is required to operate under sound commercial principles and exercise efficiency, economy, and safety. The regulatory environment of the KCRC is thus relatively benign compared to that of the franchised bus companies.

Red Minibuses (RMB), Green Minibuses (GMB), and Non-Franchised Buses

The control on these vehicles is exercised by the Transport Department through the licensing requirements of the Road Traffic Ordinance. There is a ceiling on the number of minibuses (red and green) of 4350 vehicles. The minibuses started operation in the mid-1960s when there was a shortage of public transport capacity; their services concentrated on the major corridors which in many instances are now served by rail, and where there is now surplus capacity. In seeking to maximize their profitability, they acquired a reputation for aggressive driving habits, and are often used as an example of the dangers of unregulated competition. The Transport Department continues to convert the non-franchised red minibuses (RMBs) to green minibuses (GMBs) running on franchised routes, in areas where the level of demand is insufficient to support a conventional double-deck bus. The numbers of RMBs are progressively diminished as GMB routes are established. The RMBs set their own fares according to what the market will bear; the GMB fares are set in the franchise, and changes to fares are controlled by Transport Department.

The operation of non-franchised bus services is regulated by passenger service licenses (PSLs) issued by the Commissioner for Transport under the Road Traffic Ordinance. Holders of PSLs are authorized to operate one or more types of non-franchised bus service as specified in the PSLs. However, for residents' services, employees' services, and free bus services, which are operated on the basis of fixed routing or destination, individual applications for new routes have to be submitted to Transport Department for approval to ensure efficient use of limited road space and to avoid duplication of services. The fare level is set by the applicant, which for a residents service would be the residents association, who then hires the operator.

2.2 The Policy Framework

The main franchised public transport services in the SAR are provided by the private sector which operates the bus, ferry and tram companies, and by the two rail corporations which are predominantly owned by the government but are expected to operate in a "prudent and commercial manner".

The public transport services are businesses as well as services, and the operators need to make a profit. However many of the most profitable routes are located in the busy corridors, such as northern Hong Kong Island, which used to be served only by bus, but where rail services now operate. Users of public transport can generally choose between bus and rail to make a journey; rail and bus thus compete.

The government policy for the role of buses and rail is spelt out in "Hong Kong Moving Ahead"[3]. Rail is the backbone or trunk of the transport system; buses assist this with a supplementary feeder role as required.

[3] HKSAR Transport Bureau. (2000), *Hong Kong Moving Ahead: A Transport Strategy for the Future.* http://www.info.gov.hk/etwb-t/press/background.htm

The Regulatory and Policy Framework for Public Transport

The planned expansion of the railway network will provide additional capacity for public transport travel. As part of government's forward planning for the implementation of the expansion, a cap on the number of franchised buses has been imposed by the approval or disapproval of the forward planning statements which each company is required to submit annually. Expansion of the fleet size is permitted only to achieve agreed and specific service improvements. The franchised bus fleet has been capped for some time and the total fleet size is shown in Table 1.

Table 1: The Capped Fleet Size For the Main Franchised Bus Operators[4]

Company	Fleet Size	Comment
Kowloon Motor Bus□	4588□	Including Long Win
Citybus□	955	
New World First Bus□	769	
Total□	6312	

The policy that rail should be the backbone is quite clear; however it needs to be applied not only to newly developed areas but also to long established areas where there is an effective and well patronized system of bus routes around which local residents have developed their travel patterns.

To make changes to existing franchised bus services, three parties need to be involved: the Transport Department, the operator, and the District Councils. The District Councils generally wish to obtain a good level of service for their area, with a wide range of modes and routings, and also require that any changes do not have a significant detrimental impact on their residents. This generally leads to bus routes continuing to operate when rail is introduced, unless there is strong evidence that residents will not be disadvantaged, particularly over fares, by the curtailment of a route. The operator wishes to operate the routes under his franchise in a professional and profitable manner. The Transport Department, as the authority in the designation of routes, seeks to satisfy the requests of the District Council and the operator, whilst ensuring that the principle of the rail as the backbone of the public transport system is followed. As a result, changes in bus services require extensive negotiation and compromises.

The current approach has led to the development of a very good system, even if it does not completely satisfy every party. Overall, there is a range of choice available to the public, and over the last two decades this has lead to improved quality and reduced overcrowding. But this also means that there is some surplus capacity, and therefore the financial efficiency of the system is lower than it could be. More integration and cooperation between operators could achieve benefits for the SAR as a whole by making more efficient use of resources, and this could ultimately lead to lower fares. Therefore there is a concern that the competition between bus and rail, and the potential competition between the MTRC and KCRC, will prevent optimization of the benefits of the rail investment planned for the next few years.

In summary, from the viewpoint of the three major stakeholders in public transport, the general public, the operators and the government, there are positive and negative features of the current arrangements, as listed in Table 2.

4 HKSAR Transport Department (2002), *Monthly Traffic and Transport Digest,* September 2002, Table 1.1.

The Regulatory and Policy Framework for Public Transport

Table 2: Positive and Negative Features of the Changes in Public Transport Over the Last Twenty Years for Different Stakeholders

Stakeholders	Positive Features	Negative Features
General Public	There is choice; different modes charge different fares and provide different characteristics (speed, accessibility, proportion seated).	Surplus capacity gives higher fares
	Increase in capacity, and reduced overcrowding	
	Improved level of service	
	Pressure for fare increases checked by competition	
Operators	For bus operators, provides basis for cross subsidy of loss-making routes.	For rail, the competition from other modes reduces revenues from fares
Government	Public provided with good service	Rail not used to full potential,
		Some avoidable traffic congestion
		Financial position of rail not optimal

Government Policy on Competition

3.1 General Competition

In 1998 the government set out its policy on competition in order to guide its actions in regulating industries. The main elements of the 1998 "Competition Policy Statement"[5] are:

- Reliance on market mechanisms, i.e. the public should have a choice, where possible;
- Maintaining a level playing field, i.e. the competition should be fair to all parties;
- Minimizing uncertainty by being transparent, consistent, and equitable.

3.2 Public Transport Competition

The three main components of the policy on competition as outlined in section 3.1 have the objective of providing a fair and consistent basis for the providers of services, and protecting the users from monopolistic tendencies of providers by maintaining choice where possible.

The first two principles, competition and the level playing field, work together in that clearly there should be choice for the public, but that choice needs to be reasonably fair. These principles were intended for general application; in the specific case of public transport the question of the fairness of the playing field arises, as there is government assistance to both rail and bus operators, combined with regulations aimed at maintaining the public service aspect. There are two aspects here which lead government to intervene in the market.

Firstly, to keep fares as low as possible, and provide concessions for particular groups such as the elderly and students, government waives fuel tax, first registration tax, and vehicle licence fees for bus operators. The rail corporations also provide fare concessions for the elderly and students.

Secondly, there is the need to provide service throughout the SAR at reasonable fares across both profitable and unprofitable areas, and also to provide essential night-time services. The bus operators provide a comprehensive service across all areas and time periods. There is an element of "public service" included in bus operation, because of the need to serve the low density and more remote areas, which are less profitable and in many cases unprofitable. In order to maintain overall profitability, the bus operator needs cross subsidies between routes. Therefore the network of each bus operator is judged as a whole. It should be noted that the most profitable routes are generally the high volume areas where rail also operates.

The following section assesses whether the current arrangements for regulating the public transport industry comply with principles of competition outlined in section 3.1.

5 HKSAR Government (1998), *Statement on Competition Policy*, www.info.gov.hk/tib/roles/psoc.htm

Assessment of Current Level of Competition Between Bus and Rail

4.1 Development of Bus and Rail Competition

The issues of competition in public transport cover the relationships between all the public transport modes; however the major issue is the competition between bus and rail as these are the two major long distance carriers. The government began to address this issue in the late 1970s with the planning for the initial stages of the MTR system, and continues to address the problem through modifications to the bus and minibus services to support the opening of the Tseung Kwan O Extension (TKOE) of the MTR in August 2002.

Prior to the opening of the first MTR line from Central to Kwun Tong in 1979, it had been anticipated that there would be a need for a major reorganization of the buses and other modes. However the implementation of rail was fortuitously timed and coincided with the sharp growth of the public transport market because of the development of the New Towns, rapid population growth and a very buoyant economy. The impact on the bus services arising from the MTR was therefore manageable and in practice led to improvements in the vehicle standards of buses and the level of service offered to the public. The changes are summarized in Table 3.

Table 3: Summary of Changes in Bus Operation after MTR Commenced Operation in 1979

Change	Description
Additional Role for Buses	Acting as feeders to the rail stations
Change in Services	Very few; reduction in bus frequency in response to demand
Vehicle Allocation	Displaced vehicles moved to growth areas
	Older vehicles scrapped; age of fleet improved
Level of Service	Overcrowding reduced
	Better vehicles
Impact on fares	Fare increases: basic KMB urban fare increased from 30 cents to 50 cents within about 3 years.

The changes to the bus services resulting from the expansion of rail through the 1980s, with additional MTR lines and the electrification and modernization of the KCR, followed the pattern set in 1979; the parallel bus services remained in operation but with reduced frequency to match their drop in patronage, and feeder services were provided to rail stations from those developments outside the walk-in catchment. The general growth of the public transport market, with a vibrant economy and the growth of demand in the New Territories, was able to support the growth of public transport capacity.

4.2 Competition Between Rail and Bus in 2003

The level of service provided by the bus operators has been very much upgraded since the MTR began operations, but this has increased costs. There is also a premium for air- conditioned fares; while operating costs are 20-25% higher, the differential for routes in Kowloon where both air-conditioned and non-air-conditioned vehicles operate is in the range of 32% to 43%. This may be due to other factors such as vehicle age and maintenance costs. Overall the differential between the rail and bus fares has been much reduced.

The comparison between bus and rail is now largely between air-conditioned services; there is less crowding on buses, with a large proportion of passengers getting seats, and the buses are able to offer closer to door-to-door service than rail. The main advantage of rail is that it offers consistent journey times in a controlled "weather-free" environment, and avoids road congestion and the jerky stop-start driving which occurs in heavy congestion.

A comparison of fares for selected movements is shown in Table 4. The fares are often very close and the user's choice depends on the detail of the movement, i.e. whether there is a direct bus and whether an interchange is required between the two rail systems. Table 4 shows only a selection of movements to illustrate the range, and make the point that the details of the journey, the origin and destination, are very important. It has been assumed that the journey is close enough to the rail stations as to not require a feeder bus.

Assessment of Current Level of Competition Between Bus and Rail

Table 4: Comparison of Bus and Rail Fares for Selected Movements

Origin	Destination	Bus Fare	Rail Fare	Details of Bus / Rail Movement		Rail/Bus Fare Ratio
Tai Po	Central	$20.30	$17.30	Bus: 307	Rail: KCR/MTR	0.85
Tai Po	Mongkok	$9.10	$7.30	Bus: 72X	Rail: KCR	0.80
Tai Po	Mongkok	$9.10	$12.10	Bus: 72X	Rail: KCR/MTR	1.33
Shatin	Central	$15.30	$15.10	Bus: 170,182	Rail: KCR/MTR	0.99
Kwun Tong	Central	$9.40	$11.80	Bus: 101	Rail: MTR	1.26
Mei Foo	Tsim Sha Tsui	$4.30	$6.80	Bus: 6	Rail: MTR	1.58
Chai Wan	Central	$6.50	$6.80	Bus: 781	Rail: MTR	1.05
Tseung Kwan O	Central	$15.30	$11.80	Bus: 691	Rail: MTR	0.77

Note: Both rail and bus fares given are adult fares for December 2002

In the selected movements, only one (Mei Foo to Tsim Sha Tsui) shows a large fare differential between modes. This results from different approaches between bus and rail in developing their fare scales. The bus system generally has a flat urban fare in Kowloon, and the Mei Foo to Star Ferry route is one of the longest distances to be traveled at that fare. The MTR fare is more distance related. Therefore the 1.58 differential is about the largest which would be expected.

In summary, the fare differential between rail and bus is generally not large. The fare differential has decreased since the MTR opened because bus fares have increased faster than rail fares. However, fares should be a less important factor now than when rail was first implemented because of higher incomes. Other issues of convenience (journey time and speed), access (proximity of bus stops and rail stations, or availability of feeder services), and comfort (air-conditioning, availability of a seat) may now be more important for the selection of the most appropriate mode for the journey.

4.3 Expected Observable Outcomes of Competition

It is worthwhile to consider the expected outcomes of competition in order to derive a set of indicators by which progress can be measured. In general, competition for the provision of goods and services may be expected to give the consumer what he or she wants at a progressively cheaper price (relative to income), with greater choice and with steadily improving quality. On the debit side, competition can lead to temporary oversupply of goods and services as providers battle to capture market share. It is this occasional oversupply which helps to drive the search for gains in productivity and which ultimately reduces prices.

In this discussion no differentiation is made between competition for the market (the bidding competition for the franchises) and direct competition in the market (competition between transport modes for passengers on a daily basis).

Reducing Prices

There have been no increases in rail fare scale since 1997.[6] Increases of the order of 2% to 3% had been proposed for both corporations for 2001, but after discussion at the Legco Transport Panel the increases were deferred to April 2002; however, because of the poor economic conditions facing the SAR, the rail corporations froze their fares for 2002. As for the buses, over this period there has been no increase in fare scale for Citybus and KMB since

[6] Although the scale is unaltered, the MTRC have added 10 cents to each use of the Octopus card to assist the financing of installing Platform Screen doors; some early morning fare concessions have also been withdrawn. The year 1997 is selected as the base as it is about the end of the period of high inflation and high costs, and marks the time when Citybus and New World First Bus took over CMB's routes.

Assessment of Current Level of Competition Between Bus and Rail

December 1997, although KMB have had some increase in revenues resulting from passengers switching to the higher fare air-conditioned services. The only increase in fare scales for buses has been the increase for New World First Bus in April 2001 of 2.4%, but this relatively small increase was sought by the smallest of the three bus companies, so the impact on total bus passengers is very minor. Therefore during the 5 year period from 1998 to 2003, rail fares remained constant, and for buses there was a very minor increase in fares for a few passengers.

In contrast, the unit wage costs in the transport sector have increased in this period by about 8%.[7] Wages are a significant proportion of public transport costs, typically 50% for buses and 30% for rail, with fuel costs for the bus companies representing about 10% of operating costs.[8] Therefore both the rail and bus companies have maintained their fares at about the 1997 level, and have absorbed the increases in labour costs, by seeking increased efficiencies. From discussions with operators and the Transport Department, there has also been a concurrent improvement in the quality of public transport as discussed below, therefore the passengers are getting better value for the fares they pay.

It is a moot point whether the maintaining of fares at the 1997 level, and the improvement of services, is due to the competitive environment, or the system for controlling fare increases, or the professional and corporative sensitivity of the operators to the economic issues facing Hong Kong. Whatever the contributory reasons, the outcome is beneficial for the public transport passengers.

Increasing Choice

Passenger choice of public transport mode in Hong Kong is probably greater than in any other major city in the world with rail, bus, minibus, ferry, taxi, tram, and residential coach services being on offer at many locations; the high usage of these modes is shown in Figure 1. On the other hand it has been argued that because investment in rail is too low, many areas of Hong Kong are effectively limited to road-based public transport options. Additionally, among the road-based options, unrestricted competition and deregulation would lead to severe problems of traffic congestion, lack of investment in higher quality buses and a general deterioration in conditions. In consequence this sector is highly regulated, with the exception of RMBs, and these vehicles are subject to extensive limitations on where they may operate. However, overall the wide choice of modes has been maintained, and on the major rail corridors passengers can generally choose between rail and bus services, as discussed in section 5.3.

Increasing Quality

The quality of public transport in Hong Kong has undoubtedly improved dramatically since the advent of the MTR in 1979, with the gradual improvement of the franchised bus fleet culminating in the award of the remaining CMB franchise to New World First Bus in 1998. The bus fleet has been continually upgraded and is much improved compared with when the MTR began operation. As part of the drive to satisfy customers and provide what they want, the bus companies have been required to carry out periodic Customer Satisfaction Surveys.[9] The trend towards a more modern fleet, which was already well under way, has been reflected in the surveys. The vehicles are more modern and comfortable, and there is a trend especially from the operators on Hong Kong Island to provide comfortable seating and handicapped access. More of the vehicles are air-conditioned, as this is the reported request of the passengers; all Hong Kong Island and cross harbour buses are completely air-conditioned whilst in Kowloon approximately 70% of the KMB fleet is air-conditioned.

Interestingly enough the current fares are reported as not a major concern, with satisfaction indicated by one company in the region of 70%. This satisfaction level has declined recently, possibly due to the impact of political leaders bringing the issue forward. It may be fairer to say that current fare levels, although important to some sections of the community, are not a dominant issue for most public transport users. The important issues for bus passengers are reliability and adherence to schedules.

The MTRC also carries out passenger satisfaction surveys. The main issues it finds are overcrowding and air-conditioning; the fare level is also an issue but has been declining in importance because of the stability of fares over the last four years. The MTRC has also been upgrading its services with station improvements, most visibly the platform screen doors.

[7] Census and Statistics Department.(2002). *Hong Kong Annual Digest of Statistics,* Table 2.12C, Year 2002 Edition.
[8] Discussions with Rail and Bus Operators undertaken during the consultation with stakeholders during the preparation of this paper.
[9] Passenger Satisfaction Surveys. The bus operators are required under their franchises to commission these surveys and to present them to Transport Department. The rail corporations also carry out surveys. This information is confidential and has not been made available to the consultants although the general conclusions have been discussed.

Assessment of Current Level of Competition Between Bus and Rail

Oversupply

There are clearly cases of oversupply in certain public transport corridors leading to underutilized capacity in the network. This is particularly evident in some rail corridors but also occurs both between buses, and between buses and other modes such as taxis and minibuses. The extent to which this is helpful in increasing standards and maintaining competitive pressures rather than just wasting resources can be debated. However, MTRC has reduced its service frequency from 34 trains per hour to 30 trains per hour to better match the needs of the travelers, and there are comments about the emptiness of buses in Central.

Summary

For whatever reason, the public transport system in Hong Kong has all the indicators of a successful competition policy; fares are not increasing at the same rate as wage inflation, consumers have a high level of choice especially if they live near rail corridors, and quality has seen dramatic improvements over the past twenty years.

4.4 Views from Consultees on Government's Strategy for Competition in Public Transport

The government strategy for public transport has generally worked well. The system has attracted investment because it is profitable and it offers modern, comfortable vehicles. The public transport system is safe, clean, and efficient, and provides regular service throughout the territory, day and night, and often a choice between modes. Users are generally very satisfied. There is no direct subsidy from government. Any changes should therefore be evolutionary rather than revolutionary, with fine-tuning rather than major changes.

This view was supported in the consultation with some stakeholders in the provision of public transport, namely the three major bus companies, the two rail corporations, Transport Department, Environment Transport and Works Bureau, and members of the Legislative Council and District Councils, undertaken as part of this Report. The stakeholders recognised the positive achievements of the current arrangements, but each stakeholder recognised different problems.

It was generally felt by the operators that the government policy on competition and public transport was reasonable and had worked well to date. However, there were mixed signals coming from government, with changes in the transport policy that were not being clearly communicated. The rail corporations in particular felt government policies were not clear in putting into practice their own strategy. Several operators made the point that they were not sufficiently involved in the planning process and stressed that uncertainty over the future was not conducive to private sector investment. Restricting this information reduces transparency, which goes against the competition policy objectives.

The view of government stakeholders was that competition seems to be working, with improved levels of service, a choice of modes generally available, and the recent completion of the MTR's Tseung Kwan O Extension was a good example of how competition could lower fares. As regards public transport policy, government wants to give priority to the development of railways, but once in place they have to operate within the competitive environment.

There were conflicting views as to whether the playing field was generally level. The bus operators felt that on the whole it was about right, but both rail corporations felt that the high cost of entry for rail justified some assistance when compared with buses who pay zero cost for use of the highways. The politicians and government prefer to emphasise the need for competition between bus and rail. However, the politicians and rail operators both recognised the need to educate the public about the issue of properly reflecting external costs, especially environmental resource costs, in the fares.

There were a range of views from civil servants and politicians, but the universal one was that there should be sufficient competition, now and in the future, combined with monitoring arrangements to safeguard the public interest on issues such as fares. While the passenger satisfaction surveys currently tend to rate the importance of fares below those of comfort, convenience, and regularity, this may change in the future as the public transport industry seeks to accommodate the impact of the expansion of the railway network and account for the external costs of operation. However, some operators were concerned that fares would become politicised, rather than based on sound financial assessment and justification.

Assessment of Current Level of Competition Between Bus and Rail

Everyone consulted agreed that a free-for-all competitive situation would be unacceptable and that competition within a regulated system (as at present) is best. Obviously views on the degree of competition vary. The railway corporations pointed out the issue of the Airport Railway, whose low patronage is mainly caused by the parallel bus routes. There is a concern that West Rail may have a similar outcome.

On the issue of integration and through-fares, both rail corporations noted that in their experience travel demand was relatively inelastic to fares at the levels currently charged in Hong Kong, therefore the question was the funding of any system of through-fares.

4.5 The Level Playing Field

No firm conclusions on the levelness of the playing field between franchised bus and rail could be reached, because there are different types of responsibility and assistance for each mode as listed in Table 5. Under current arrangements, the rail companies pay for the construction of their track; in contrast the franchised buses pay zero fuel tax and license fees and therefore make no contribution to the cost of road construction and maintenance. However, these costs are borne by general government revenue, rather than by hypothecated vehicle tax and licence revenue, because there are many beneficiaries of road construction such as adjacent property owners. Further, these exemptions are relatively modest in total and were granted in order to finance fare concessions (such as the elderly fare concession) and their removal would simply lead to a small increase in some fares.

Table 5: The Different Responsibilities and Assistance for Rail and Franchised Bus Companies

Mode	Rail , MTRC and KCRC	Franchised Bus Companies
Assistance	• Property development rights and the land premium paid based on assumption of no rail access. • KCRC benefit of Lowu surcharge (see note 1) • Government backing for loans • Some support in restricting competition: eg. the TSA in Tuen Mun, and limiting new services if the movement is served by rail (see note 2). • A 50 year franchise	• Zero license fee • Zero fuel tax, originally in exchange for old-age fare concession • Waiver of rent at Short Term Tenancy sites for Depots • Zero First Registration Tax
Responsibility	• Fare Concessions for elderly and students • Safety issues with Railway Inspectorate	• Fare Concessions for elderly and students • Service area includes very unprofitable routes; need for cross subsidy. • Provides night-time services • Stringent regulations on vehicles, with spot checks • Expected to provide service from the time of initial intake of a new town or new development.

Note 1: The Lowu surcharge; the KCRC fares to Lowu are approximately $20 higher than the fare to the previous station of Sheung Shui and are a surcharge on those passengers crossing the boundary at Lowu.

Note 2: The Tuen Mun Transit Service Area (TSA) covers the area where the Light Rail Transit system operates, and competition from buses and minibuses in this area was limited in order to encourage usage of the LRT.

Discussion of Public Transport Competition and Regulation Issues

5.1 Regulated Competition

The limitations of road space, and the need to provide safe, regular and high standard service throughout the territory irrespective of the local profitability, would suggest that completely competitive transport services would not offer such a uniform level of service and would ultimately be destructive. The public transport system in Hong Kong is therefore regulated. Within those regulations there is competition between bus and rail, and also competition in the tendering for the various franchises. The competitive framework for public transport in Hong Kong is thus best described as "regulated competition".

5.2 The External Costs

There is an argument that the playing-field between buses and rail is not level, with buses having an advantage because bus fares do not take account of external costs, such as emissions and congestion, which buses impose on other road users, pedestrians, and the environment. These external costs are likely to be much larger than the indirect subsidies that the buses gain due to exemption from fuel tax, Annual Licence Fees (ALF), and First Registration Tax (FRT). The arguments supporting the need to account for the full external costs are based on making better economic use of our resources and would encourage the use of more environmentally friendly transport modes. However to be fair, the charge for external costs would have to be applied to all vehicle types, including cars, taxis, and goods vehicles, otherwise the full benefits to the SAR will not materialize. Such an approach might also stimulate the development of alternative 'green fuel' systems by providing a strong financial incentive.

If the policy was adopted to remove all the exemptions that buses receive, and to charge for the external costs for all vehicle types, there would need to be extensive analysis in order to justify the charges and to minimize the disquiet which each interest group might feel at this fundamental change. A low-end estimate of the impact on bus charges would be the requirement to pay fuel tax, ALFs and FRT on new vehicles. But there is a question over what these rates should be as the non-franchised buses already receive some assistance with the rates being lower than the levy on some other vehicles. For example, goods vehicles have a 15% FRT whilst for buses the figure is about 4%; the ALF for a PLB is over HK$8,000 whilst for buses it is HK$4,000.

Assuming that fuel tax is about 60% of the cost and with fuel accounting for 10% of operating costs, the implementation of fuel tax for the franchised buses would add 6% to their total operating costs, assuming that there were no changes in service levels such as reduction in off-peak provision. The implementation of ALFs would add HK$4,000 per bus per year, but this would form only about 1% of operating costs. The introduction of FRT at 4% would add about $100,000 per bus for each vehicle bought, but with a cap on the fleet size, and a relatively new fleet, there are only a few vehicles being purchased each year. However, assuming a stable situation with a mature fleet and a normal 15 year life span for buses, requiring replacement of about 7% of the fleet every year, this would add around 1% to overall operating costs. All in all, the removal of these exemptions currently given to the franchised buses could increase costs by about 8%, which would need to be passed on in fares.

There is no agreed definitive assessment for estimating the value to be placed on the external costs and how these should be shared between all the vehicle types which use the Hong Kong road system. The critical issues are what costs to bring into the equation (examples are health, construction, congestion) and then developing an acceptable method for sharing these costs between the vehicle types. As regards the sharing of costs, there are many items which should be considered, some of which would favour buses against other vehicles, and some which would disfavour buses. The high occupancy of buses would be a positive factor, but the size, damage to the pavement, and emissions would be negatives. Much would depend on how these are calculated and taken into account, but it is likely that this would be more significant than the removal of the operating subsidies. The high-end impact on bus costs could in total be two times as much as the removal of the subsidies, i.e. about 15%, but this would be in the context of a reassessment of travel-related costs and how they were charged to the community, so other road users would also be facing higher costs. This value has not been used in the analysis, but has been set out to illustrate the range that may occur. In contrast the external costs of rail are lower but they obviously would need to be assessed and applied in parallel, including the external costs of electricity generation and transmission. The net effect would be most probably to make rail fares cheaper than bus, and also make the usage of cars, taxis and goods vehicles more costly.

Discussion of Public Transport Competition and Regulation Issues

The real issue for society is what value it places on the environment and to what extent railways are less damaging to the environment than buses. This leads to the questions of whether the amount of new rail construction should increase or decrease and how much competition from buses is allowed. Clearly any investment in rail will be more attractive if reasonable guarantees can be given with regard to competition and hence revenue, or if the track costs were not entirely borne by the operator. However, whether this would hasten the rate at which new railways are constructed is beyond the scope of this study.

The imposition of full external costs on all public transport modes and all road users would likely radically change the costs of travel. It is likely that some modes would be much more expensive, and it would alter the balance of usage between rail and bus, in favour of rail. Because of the impact on the fares for buses, minibuses, and taxis, and the operating costs of cars and goods vehicles, it would seem an unlikely policy initiative at this time of economic difficulty. However, when the rail system is expanded to cover more of the SAR, there will be fewer objections because rail fares would be little affected, and could possibly be reduced as a result of better utilization. Because of the environmental and economic benefits arising from such an approach, it needs to be a medium to long term policy option for the SAR, but is unlikely to be implemented in the near future.

5.3 Competition and Rationalization

The competition between bus and rail is not simply about price, it is also about convenience and comfort. Modern franchised buses are a very attractive form of transport in terms of convenience, frequency, accessibility, and comfort; most passengers are seated. In terms of accessibility the buses can better approximate door-to-door service. This is a far cry from the early 1980s when buses offered only a means of transport, with little comfort. However, there does appear to be a case for further rationalization of bus operations in rail corridors and in those corridors where there is bus-to-bus competition. There are three main arguments:

1. The argument for protecting, to some degree, the heavy investment necessary for construction of new railways. There is already some protection in practice; the question is whether this should be more forceful. This is a key issue which will continue to challenge the government in its attempts to expand the rail network.
2. The environmental argument which states that rail is less environmentally damaging than road-based transport and therefore passengers should switch from bus to rail wherever possible.
3. The argument for more efficient use of buses by route rationalization, which helps to keep fares in check by reducing operating costs.

However there are substantial obstacles to doing this, not the least of which is significant opposition from the traveling public. The negotiations required to achieve rationalizations are thus extremely lengthy and difficult.

In any discussion of the cutting back of buses it needs to be pointed out that they are very efficient carriers of passengers: the double-deck buses are more efficient than other road-based public transport vehicles, even allowing for their greater size and use of road space. In terms of emissions per passenger the buses are, on balance, generally better than these other modes. This is analysed in detail in Appendix 1. It should also be noted that during the peak periods, many roads in Hong Kong are heavily congested and it is very likely that there is suppressed vehicle demand at peak times. For these reasons, the cutting back of buses would not automatically result in the easing of traffic and environmental conditions unless additional parallel measures were introduced to manage the use of other vehicles

The bus companies have legitimate concerns about competition from other road-based modes of transport, in particular GMBs, RMBs, taxis, and residential coach services. The bus companies therefore take the view that in any scenario of rationalization of franchised bus routes, these competitors should be tightly controlled and not allowed to take market share. Taking this a stage further it can be seen that any rationalization of franchised buses carried out on the basis of the environmental argument will be a waste of opportunity if the road space is filled up with these other less environmentally friendly modes of transport, or private cars and goods vehicles. There is therefore a requirement to regulate other less environmentally friendly modes of transport if bus numbers are reduced.

A major education campaign would be required to convince the traveling public of the validity of the environmental argument and to put it into practice. Any capacity freed up by reducing bus numbers would be filled by the suppressed demand from other modes unless road pricing or similar measures were introduced. It might be possible on a limited area basis to redeploy road space freed by reduced bus flows to provide pedestrianisation schemes which would prevent the growth of other traffic.

Discussion of Public Transport Competition and Regulation Issues

5.4 Corridors with Competition

There is competition between buses and rail in a number of transport corridors, including the North East New Territories, the Harbour Crossing, and the North Island Corridor.

The proportions of passengers using rail and other public transport is shown in Table 6 for three locations covering these corridors: the Kowloon External Cordon, the Harbour Crossings, and the Island Corridor between Central and Admiralty.. At these major points, the MTR or KCR carry between 42% and 63% of the total rail, and bus/minibus traffic but on inclusion of all the other modes which form public transport, including taxis, ferries, and special purpose buses, the market share drops to 34% to 54%.

Table 6: Indicative Market Shares by Rail, Bus, and Other Public Modes for three transport corridors in 1997; units daily two-way passengers[10]

Corridor	Rail	Bus/Minibus	Rail	Other PT	Rail
	(a)	(b)	a/(a+b)	(c)	a/(a+b+c)
Kowloon external	893000	1219000	42%	520000	34%
Harbour Crossing	876000	499000	63%	246000	54%
Island Corridor	526000	391000	57%	183000	48%

The harbour crossing is the most financially rewarding for all forms of public transport.[11] Both rail and bus charge higher fares for the cross harbour routes if examined on a per km basis for buses or a per station/movement for rail. The justification for this has been the greater cost of provision for cross harbour facilities for rail or the tolls for buses. However the bus toll of HK$30 at the CHT is quite low when divided by the average daily bus occupancy of 46 at the CHT.

There have been comments that in the AM peak, there are many nearly empty buses in Central. It should be pointed out that passengers normally alight towards the end of the route, also many routes terminate in Central. Table 7 summarizes the proportion of franchised buses in the vehicle stream and bus occupancy at a selection of sites and screenlines in the SAR.

Table 7: Morning Peak Proportion of Buses in Traffic Stream and Their Occupancy[12]

Location	Proportion of Buses	Average Occupancy of Double-Deck Buses (No. passengers)
Tolo Highway	1.9%	82
Lion Rock Tunnel	5.7%	75
Cross Harbour	5.5%	80
Causeway Bay East	5.6%	57
Wanchai-Central	6.9%	36
HK External	5.0%	60
HK Internal	6.5%	37
Queensway	16.7%	33

Note: Morning peak hour 8am to 9am; figures are two-way, and on a directional basis would be slightly higher in the peak direction and slightly lower in the non-peak direction.

[10] Wilbur Smith Associates Ltd (1999), *Third Comprehensive Transport Study. Technical Report,* Tables 6.3 and 6.8. HKSAR Transport Department

[11] Confidential information from public transport operators. It has been understood that the cross harbour services have been very profitable for many years and continue to be so.

[12] HKSAR Census and Statistics Department (2000), *Annual Traffic Census, 2000*

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The table shows that occupancy is high on the approaches towards the central areas but decreases rapidly approaching the terminus. The same is true of the rail system, with the southbound Tsuen Wan Line being much emptier after Admiralty than on the approach to Admiralty, and the westbound Island Line being much emptier after Central on the segment to Sheung Wan. It may be possible to improve the operational efficiency of the buses adjacent to Central, but some drop in occupancy at the tail end of the route is inevitable.

There are several possible solutions to these problems as discussed below. These solutions are not necessarily the optimal ones for each corridor, but indicate the range of ideas which should be considered. These include operational and management approaches to improve routings and avoid the concentration of buses, and stronger measures on competition to curtail bus routes which parallel the rail for a long distance.

5.4.1 The North-East Corridor

If competition from buses is to be cut back in order to reduce wasteful competition, then the bus services that would need to be considered would be those which overlap most with rail, namely the long distance cross harbour routes and express services close to the rail alignments. Four routes, 72x, 307, 170, and 182, have been chosen as examples of typical services which would need to be curtailed or amended if the decision were made to be more supportive to rail through curtailment of parallel and competing bus services. Table 8 shows details of these services.

Table 8: Description of Possible Candidate Bus Routes from NENT for curtailment

Route	Origin	Destination	Fare	Buses/Hr	Comment
72X	Tai Po Central	Olympic	$9.10	8	Both terminals close to rail
307	Tai Po Central	Central	$20.30	6	Cross Harbour
170	Shatin(KCRC)	Aberdeen	$15.10	4	Cross Harbour
182	City One	Sheung Wan	$15.10	8	Cross Harbour

If the peak hour buses were cancelled for all 4 services this would provide relief of 26 buses per direction in the peak hour through Lion Rock. However, the disbenefit to the displaced passengers cannot be estimated without detailed analysis of the boarding/alighting patterns along the route. Public concerns are likely to focus on fares and accessibility; but it is unlikely that all the affected passengers would wish to switch to the use of rail and some reduction in rail fares would be necessary to make this option more acceptable for those passengers. A reduction in rail fares could be achieved with a through fare at Kowloon Tong between the KCR and MTR. There would also need to be controls on the parallel GMBs, RMBs, and taxi services, to ensure that passengers switching to these options lead to higher vehicle occupancies rather than growth in the number of vehicles.

5.4.2 Central

There is a perception that there are too many underutilized franchised buses in Central. At the same time there is spare capacity on the MTR, both the Island and Cross Harbour lines, which could be used to reduce the need for buses.

A transport study[13] has been undertaken to consider ways in which the franchised bus route structure could be adjusted to eliminate underutilized buses in the MTR corridor. It has looked at various strategies or principles such as linking routes, cancelling routes and reterminating routes. It should be stressed that these are broad-brush assessments which may not be publicly acceptable or viable in terms of operator agreement and terminus facilities. The Transport Department have examined this and developed concepts which could in the short-term lead to about a 10% reduction. If combined with further measures including a bus-to-bus-interchange (BBI), a 26% reduction could be achieved in the medium term. In the long term, further truncation and network adjustments are necessary, and could lead to a combined 40% reduction in buses. Other parties have suggested more radical ideas in order to

[13] Nielson Consulting Ltd. (2001), *Restructuring of Public Transport Services through Central and Wanchai, Final Report.* Report for the Transport Department, HKSAR Government.

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make full use of the MTR's capacity, requiring cancellation of almost 50% of the buses.[14] The acceptability to the public of this scheme is questionable unless there are measures to address concerns about increased fares and decreased accessibility.

Table 9: Suggested measures to eliminate underutilized buses in the MTR corridor[15]

Type of Measure	Requirements	Franchised bus flow each way per peak hour (Queensway)
Existing Situation	No change	370
Short Term	Truncate, Link, Reschedule	-30
Medium Term	Truncate, BBI,	-65 (-95 total)
Long Term (Post SCL)	Truncate, new termini	-65 (-1650 total)
Net Final Flow		**210 (approx 40% reduction)**

5.5 Integrated Fares and Feeder Services

Fare integration between different modes or services is simply another means by which fares can be reduced. The Octopus card can facilitate the transaction with the only inconvenience to passengers being the need to pass through two sets of ticket machines. Integration of fares between different companies is an issue of which company bears the brunt of the revenue loss and this has been unresolved in most cases to date. Fare reductions could generate a few extra trips, and could attract passangers from other modes; but the generation affect is unlikely to be significant because Hong Kong already has relatively high trip making, and about 90% of trip making is already using public transport.

The 1992 Travel Characteristics Survey reported that 17% of public transport passengers made more than one boarding to complete their journey; that is 1.2 million boardings a day at that time. There have been many new long distance routes introduced since then, especially to the NWNT, which might have reduced that number. However, there has always been considerable interchange in the public transport network, and the public have accepted the need to interchange and pay for the additional boarding. There is new impetus for improving fare integration with the need for better feeder arrangements to encourage rail usage and the development of a number of bus-to-bus-interchange (BBI) schemes which provide a discount on the transfer charge. The bus route structure could be improved and made more efficient with additional interchanges. The introduction of increasing number of BBI's in recent years indicates that this can be made acceptable to the public if discounts are offered.

As regards feeder buses to MTR and KCR stations, there is concern that offering a discounted fare would not generate sufficient additional ridership to offset any discounts. The rail corporations need to ensure that if they offer some form of discount, such as a joint "bus plus rail" fare, they will gain sufficient additional patronage to maintain or even increase revenue from this group of passengers. A significant volume of rail passengers already use feeder modes. If rail has already achieved a high penetration of this market then there would be no advantage to the rail corporations arising from the implementation of integrated fares. However each case would need to be examined in detail to assess whether there was scope for expanding the rail market share.

As regards the integration of fares between the two rail companies, the fare structure on both KCR and MTR is distance based with an initial boarding charge of approximately $3.00. This charge would need to be discontinued for any through fare between the two rail corporations. If there were integrated fares at Kowloon Tong, where over 100,000 passengers interchange every day, through passengers would not pay the initial boarding charge of about $3.00. This would mean risking the loss of $300,000 per day in the hope that maybe 40,000 to 50,000 additional rail patrons would be attracted, in order to restore the revenue to the original value. These additional passengers would mainly need to be found from the existing users of bus services through Lion Rock.

[14] Private correspondence to the consultants. Exchange of emails with the consultee from MTRC.
[15] Nielson Consulting Ltd. (2001), *Restructuring of Public Transport Services through Central and Wanchai, Final Report.* Report for the Transport Department, HKSAR Government.

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5.6 KCRC and MTRC Competition

The presence of two rail companies operating in Hong Kong does not bring many competitive advantages; there is only one movement where they are currently in competition (Kowloon Tong to Mongkok), and the successful operation of the future rail network with the many interchange options between KCR and MTR will require cooperation, not competition.

Indeed, the rail companies should not be competing; the objective should be to encourage their use. Even when the Shatin to Central Link (SCL) is constructed, there will still be very few movements directly served by both companies, but a large number of movements which they could serve together.

Each rail company feeds the other. The logical position would be to develop a joint marketing strategy with a through fare discount in the range of HK$3.00, equivalent to the boarding charge. Alternatively, each corporation could find a cheaper feeder mode, say bus, and promote the services provided by their feeders. However, this would add buses to the traffic stream rather than reduce their numbers, and would not be consistent with the objective of rail becoming the backbone of the public transport system.

In terms of providing an attractive rail option to public transport passengers, cooperation could be achieved by commercial arrangements between two separate corporations or from a merged single rail operator. It could be argued that the presence of two rail corporations provides alternative views about the need for fare increases and alternative tenders for construction of rail lines. However such alternative views could still be developed even if there were only one corporation by detailed review of applications for fare increases and by inviting construction companies to tender for building rail lines which would later be operated by the rail corporation.

The merger of the two rail corporations would appear to give the government some revenue benefits; it would also produce some overall cost savings, although the extent may not be large and is currently being assessed by government. The major winner would be the rail passenger as a merger is more likely to bring about the cooperation which will make the separate rail lines appear as an integrated whole. It would facilitate the construction of some cross platform interchanges; at present both companies need to ring-fence revenue and hence separate ticketing arrangements are required. Good interchange arrangements could be achieved through cooperation between the separate corporations, but they are more likely to be achieved with the merger.

Since the merged corporation would be very large; there would be a need to develop appropriate monitoring arrangements, especially over fares, to ensure that the public interest was fully taken into account, yet the corporation operated in the expected prudent and commercial manner.

5.7 Competition and Fare Levels

There is a concern that only the pressure of competition will keep fares as low as they could be, especially within the franchised bus companies. However, as proposals for bus fare increases are vetted by the Transport Advisory Committee (TAC), there is the potential for detailed scrutiny of any increases. While the TAC is largely made up of non-government members it depends of the government for Secretariat support. There would be more confidence in this arrangement if the TAC were supported by its own secretariat and research staff.

Fares are part of the competitive franchise tender assessment. Since, subsequent applications during the period of the franchise for fare increases or decreases form part of the assessment for renewal, there is every reason for the franchisee to respect the public interest. In addition the government is taking various actions to encourage fare reductions during this period of deflation, the main one being the bus-to-bus-interchange (BBI) which gives a rebate to the passenger. BBIs also reduce the number of buses on the road and encourage efficient operation; this in turn will help to reduce pressure on costs and fares.

5.8 Impact of Current Expansion Plans for Rail

There are a number of rail lines under construction and more which are under design and are likely to be constructed and in operation before 2010/2011. These are shown in Figure 2 and summarised in Table 10. By 2010-2011 all the major transport corridors will be served by rail apart for the south of Hong Kong Island. After the

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2011 date further lines may be constructed including the North Island Line, the West Island Line and the South Island Line. Together this represents significant extension of rail services and this will affect the competitive position of the modes.

Figure 2: Future Extent of Rail lines in the Short Term

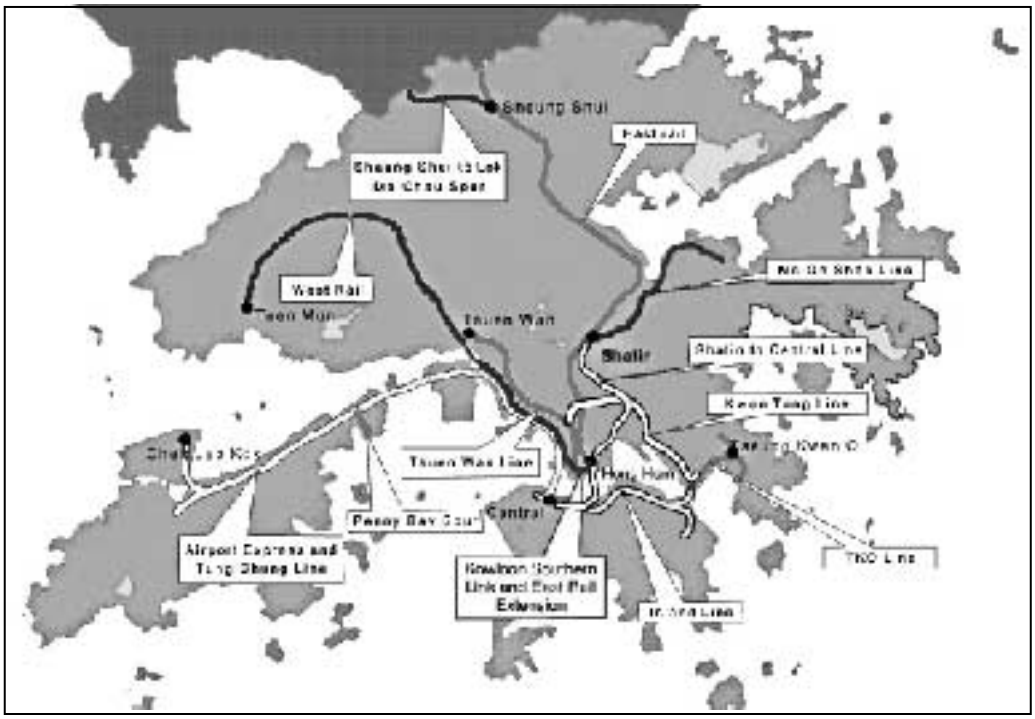

Table 10: Likely Opening Dates of the Rail Lines

Year	Line
2002	Tseung Kwan O Extension
2003	West Rail
2004	Ma On Shan Line
2004	Tsim Sha Tsui Extension of East Rail
2005	Lok Ma Chau Spur Line
2005	Penny's Bay Link (serving Disneyland)
2007-2008	Kowloon Southern Link
2008-2011	Shatin to Central Link
Post 2011	North, West and South Island Lines

With the rail expansion currently planned or happening, there are few major markets of bus operation which will not also be served by rail. The committed plans include the Shatin-Central Link, and the Kowloon Southern Link, whilst West Rail, the Tsim Sha Tsui Extension and the Ma On Shan Line will all be in operation by 2006. There are in addition possible schemes for rail to serve the south and the west of Hong Kong Island. These schemes were put forward in the Second Railway Development Study, which indicated that rail's market share of public transport would increase from about 31% to 42% by 2016.[16] There is little possibility of the buses and minibuses finding a large replacement market of that size within the SAR, and as a result there is limited scope for reallocation of buses and the bus fleet may need to contract. The potential role for buses in a more rail-dominated transport system will need to be carefully assessed.

16 MVA (Asia) Ltd and Maunsell (2000), *The Second Railway Development Study,* Report for the Railway Development Office, Highways Dept, HKSAR Government, May 2000.

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The approach government takes to the competition between modes will affect these market shares. Clearly the rail companies would prefer the government to follow the policy of making rail the backbone of the public transport system, and fully using the additional capacity provided by the expanded rail system. The bus operators wish to protect their own investments, whilst the public wish to have an improved range of choice with fares similar to today's levels. There is general agreement that buses now offer a very high level of comfort and convenience at a competitive price, which is what the customer wants. Consequently removing bus routes, even when new parallel rail services are implemented, is recognized to be very difficult. During the consultation for this report, operators' main concern was how the additional rail capacity would be used in a cost effective way to provide a good service to the community while a positive role is found for the bus services.

The bus operators' view was that to maintain a balanced provision of modes, any changes should be evolutionary rather than revolutionary and should take into account the substantial capacity of residential coaches, GMBs, taxis, and RMBs. These are less efficient users of road space, and any plan to attract traffic to rail from other modes should be more directed at these sources. Long distance buses are still needed as backup if rail services are disrupted and in order to provide a balanced system. This need to maintain a balance and some alternative provision in case of accident or disruption to rail was a view that was shared by the political consultees.

The rail companies view is that Hong Kong's environment would benefit if there was more rail and less road-based public transport. Society should take this as a goal and work towards it more vigorously in line with policy.

The manner in which this additional rail capacity is used presents a dilemma. At the policy level there is the principle of making rail the backbone of public transport, and taking full advantage of rail capacity; this would make the best use of the very significant investment in rail and also better reflect the external costs of public transport modes. However at the user level, the modern bus fleet that now operates in the SAR offers a very attractive service to the public with fare levels very competitive with rail. A policy which better accounts for external costs would lead to increased bus fares, which in the current economic climate is unlikely to be adopted. An alternative policy of assisting rail in some fashion, to reflect the fact that it has lower external costs, would require financial assistance from government and this is also difficult to defend at this time.

5.9 The Fares Dilemma

For social policy, the government would clearly like bus and rail fares to be reduced but has no control over the fares of the railway companies and only limited powers with regard to the bus companies. At the same time government wants to encourage a switch from bus to rail as part of the policy to promote rail; a lower rail fare and higher bus fare would help this objective. On the other hand, government expects its investment in rail to produce a good rate of return, and maintaining rail fares at the current level would help this. One potential resolution to achieve a transfer of passengers from bus to rail, without major cutbacks in bus routes and services, would be to make bus fares much higher than those of rail. Whether this is done by making buses pay a greater share of road costs through some taxation or by substantially reducing rail fares, it is clear that in the current economic climate this is unlikely to be achieved.

Competition on Toll Roads and Road Pricing

6.1 Introduction

Competition can also be found in the highway network, with different toll levels on roads serving the same transport needs. This can arise where a road or tunnel constructed by the private sector under a Build Operate Transfer (BOT) arrangement is paralleled by ordinary free roads or by other BOT roads or tunnels. Under a BOT arrangement the toll levels are set so that the investor who constructs the tunnel can expect to recoup his investment from the collection of tolls for an agreed number of years, generally about 30 years. The first tunnel built under this arrangement, the Cross Harbour Tunnel, was an outstanding financial success; and this led to the BOT principle being used to develop other tunnels. The three cross harbour tunnels, the Tates Cairn and Route 3 Tai Lam Tunnels have all been financed in this way. The construction costs of these BOT projects amount to about HK$20 billion in terms of the money spent at the time of construction.

The implication of this method of financing infrastructure is that each tunnel operator is expected, quite legitimately, to maximize his income from tolls in order to achieve a return on his very significant investment. However, within the heavily used SAR road network the outcome of treating each tunnel as a separate and free-standing entity is inefficient use of transport resources, and poor traffic and environmental conditions in access areas of certain roads and tunnels. This section examines alternative approaches to the current arrangements for the cross harbour tunnels and the tolled and free roads in the New Territories.

6.2 The Cross Harbour Tunnels

There are currently three road tunnels crossing the harbour as shown in Figure 3; the first, opened in 1972, was the Cross Harbour Tunnel (CHT); this was followed in 1989 by the Eastern Harbour Crossing (EHC), and then the Western Harbour Crossing (WHC) in 1997. The three tunnels were all constructed as BOT projects; the CHT has now reverted to government ownership after the expiry of the 30 year franchise in 1999. The access is best for CHT because it is the most centrally located. This is reflected in usage with over half the cross harbour traffic using CHT, as shown in Table 11.

The WHC provides the most capacity (about 43%) but attracts the lowest proportion of the cross harbour traffic, at about 17%.

Figure 3: The Cross Harbour Tunnels

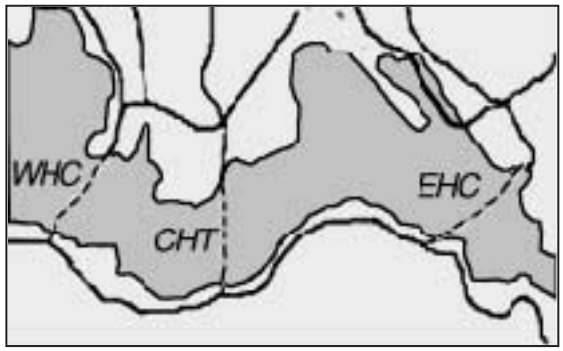

Table 11: Description of Traffic Flows for the Cross Harbour Tunnels

Tunnel	Demand and Access	Size (one way)	Daily Traffic
CHT	In the central and best location for both demand and access. Very good access from all parts of the SAR.	Two lanes	119,000 (51.3%)
EHC	Serves the demand in eastern harbour and spill-over from the CHT - Good access to east Kowloon and New Territories. - Good access to Hong Kong using the IEC	Two lanes	73,000 (32.5%)
WHC	Serves demand from west. - Access from Route 3 in Kowloon - Access on Hong Kong Island from Route 7, Rumsey Street Flyover and Connaught Road.	Three lanes	40,000 (17.3%)
Total		Seven lanes	232,000 (100.0%)

Competition on Toll Roads and Road Pricing

6.2.1 Tolls for Cross Harbour Tunnels

The CHT opened in 1972 with a HK$5 toll for cars and taxis. As it was the first tunnel, patronage and revenues exceeded expectations and there was no financial basis to justify toll increases. The initial toll was therefore maintained until 1984 when a passage tax was introduced to reduce congestion, and the tolls for cars and taxis increased to $10. The tolls charged to the public remained at this level until 1999 when tolls for cars were doubled to HK$20, but tolls for taxis and other vehicles remained the same. Thus taxis, goods vehicles, and buses are still charged at the same level as in 1984, and this level was only a small (in absolute terms) increase over the 1972 level. The tolls charged by vehicle category are shown in Table 12. The CHT tolls are slightly more expensive than EHC for cars; but generally the CHT is the cheapest of the three tunnels. The WHC, EHC and other private sector tunnels charge significantly higher tolls for the larger vehicles, such as buses and goods vehicles; on the basis that they are commercial, and because these heavier vehicles result in more tunnel maintenance and renewal works.

Table 12: 2002 Toll Levels by Vehicle Category at Different Cross Harbour Tunnels (HK$)

Tunnel	Car	Taxi	Light Van	Light Goods	Medium Goods	Heavy Goods	Light Bus	Double Deck Bus
CHT	20	10	10	15	20	30	10	15
EHC (1)	15	15	23	23	30	45	23	45
WHC (2)	37	35	50	50	70	100	47	85

1 - Tolls at EHC were last increased in 1998
2 - Tolls at WHC were increased in February 2003 for private cars, light buses and single deck and double deck buses; increased fares are shown in this table.

6.2.2 Increasing Toll Levels Over Time

Since the first Comprehensive Transport Study in 1973, the government guideline for future tolls and fares is that they should roughly keep pace with inflation. Firstly, because many components of transport costs are driven directly by inflation. Secondly, people's travel behaviour, such as choosing between modes or competing roads, is influenced by costs and to maintain these choices at approximately the current pattern requires relative costs to remain about the same in real terms. Since the first Comprehensive Transport Study it has been policy to encourage the use of public transport and limit the growth of vehicle usage; toll increases at least in line with inflation would be expected to be part of such a policy.

However the imbalance of cross harbour traffic and the congestion around the approaches to the CHT can be attributed to the fact that the tolls have become much cheaper in real terms. If the tolls at CHT had kept pace with inflation since 1972, they would now be much higher, for example the toll for cars should now be about HK$35 to HK$50, depending on the index used to represent inflation. The lowest end of the range comes from the CPI which gives a factor of about seven-fold between 1972 and the late 1990s before the recent decline in rental and food costs caused a drop in the CPI value; however the CPI expenditure-based approach is only one framework for assessing what should be the long term change in tolls. A preferred basis is to examine transport fares, and a factor of ten is the scale of increase that has occurred in other parts of the transport sector. For example the current taxi flagfall of HK$15 compares with 1972 values of HK$1 on the Kowloon side and HK$1.50 on the Hong Kong side. A further approach is to examine the trend in costs in the construction sector as this would determine the cost of providing additional or replacement facilities, and as noted below there have been considerable increases in the costs of constructing the second and third cross harbour tunnels when compared with the first. The WHC cost nearly 18 times more to construct than the CHT, in "money of the day" terms, and a very significant part of the increase must be due to inflation over the 25 years between the initialization of the two projects.

From this perspective users of the CHT have been paying less in real terms whilst incomes have been rising strongly. From the perspective of the government, there is significant revenue potential that has not been collected, and a distortion introduced into the provision of transport facilities.

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At the same time, tunnel tolls need to be put into perspective of the other costs incurred in making a journey by car or goods vehicle as it must be the total journey costs which are considered when choosing to make a journey or when selecting a mode of travel. A commuter traveling across the harbour by car, and paying $20 per hour to park for 10 hours, would incur out-of-pocket expenses of $40 for using the CHT in both directions, and $200 for parking. Although there are monthly parking arrangements that can reduce this item, the point is that the tunnel tolls are often only a small proportion of the total commuting expense. An increase of $10 each way for a private car is only equivalent to an hour of parking.

6.2.3 The Construction Costs

The other reason underlying the disparity in tolls between the tunnels is the construction costs. The EHC and WHC were constructed much later than the CHT and on alignments which were longer, plus the WHC has more lanes than the CHT. This is summarized in Table 13 which shows the construction of the CHT to be much less than the other tunnels in nominal terms, or "money of the day". To fully account for the reasons underlying the increase in costs between the CHT and WHC would require detailed examination which is beyond this assessment of competition; but the 25 year gap between the projects and the increases in costs in Hong Kong over that period, as well as the changes in the construction industry with the emphasis on good management practices, safety and quality assurance, are important to note. Whatever the reasons underlying the higher construction costs, the tolls charged at EHC and WHC have to reflect these later and inflated costs in order to generate a return on the private sector investment. However as noted above the CHT tolls have fallen far behind the rate of inflation, and the tolls for taxis, goods vehicles and buses have not increased since 1984.

Table 13: Construction Costs of the Cross Harbour Tunnels (in "money of the day" HK$)

	Date	Size	Cost of construction
CHT	1969-1972	4 lanes	$320m
EHC	1986-1989	4 lanes	$2200m
WHC	1994-1997	6 lanes	$5700m

Source; 1.CHT: correspondence with the WHC
2. EHC http://www.easternharbourtunnel.com.hk
3. WHC http://www.westernharbourtunnel.com

As a result the tolls on the three tunnels are now out of balance; and the natural locational and good access advantages of the CHT are reinforced by the disparity in tolls. This results in heavy congestion around the approaches to the CHT, which in turn contributes significantly to traffic congestion in the Hung Hom, Chatham Road and Gascoigne Road area in Kowloon, on the Hong Kong Island North Shore, and in Causeway Bay. Meanwhile, whilst traffic is queuing to access the four lane CHT, the six lane WHC is underutilized.

6.2.4 A Strategy of Increasing Tolls at CHT

The decline in value of the CHT tolls is a major cause of the imbalances in the cross harbour traffic flow, therefore an increase of tolls on the CHT should be the main feature of any solution. However the implementation of any solution especially during a recession presents problems of packaging and presentation. There are a number of questions to be resolved;

- To what level, and how quickly, should the CHT tolls be raised?
- The major underused capacity is at WHC; to make it more acceptable to the public, could a package be developed which raised tolls at CHT and lowered tolls at WHC?
- A package arrangement may involve transferring revenues from CHT to WHC if tolls are to be lowered. As WHC is owned by a private company, how would this commercial relationship be set up?

6.2.5 The Pricing and Economic Arguments

Another framework for examining the issue is the economic approach which gives theoretical support for congestion pricing, i.e.charging more for the most congested roads. A driver who decides to use his vehicle (car, goods vehicle or taxi) during congested periods imposes very high additional external costs in the form of slowing down other

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vehicles, and worsening environmental conditions in adjacent congested areas. The external costs are much higher when there is extreme congestion and impacts on other movements, as arises from the queues at CHT. There are significant economic benefits to society in keeping traffic levels free from congestion and the most effective way to achieve this is through demand side management measures such as a charging system.

Congestion often cannot be eased by expanding facilities, especially given the density of development in Hong Kong, and it would not be cost effective to do so when there are underutilized parallel facilities such as the WHC. Hong Kong generally has a user pays principle for many services, and tolls for private sector tunnels have generally been set on a cost recovery principle; it would be a natural extension of this principle to include charges to improve the overall pattern of usage of the road system. Indeed, the precedent has already been set in 1984 with the passage tax imposed at CHT.

If this approach were applied, the CHT would be one of the roads for which charges would be increased; and indeed the three cross harbour tunnels would be a natural cordon for a set of charges. This approach would enable the overall benefit to the SAR that arises from charging higher tolls at CHT to be estimated. A review of road pricing quotes results from earlier studies in Hong Kong which indicate that the optimum scheme could generate annual economic benefits which reach HK$2,900 million and annual revenues of HK$2,200 million when converted to 2002 prices.[17] Because the CHT is the key stategic link and central to any plan to resolve congestion, a substantial portion of these revenues and benefits must result from the CHT. It would need some detailed analysis to be carried out to determine the precise revenues and benefits that would result from placing an ERP charge only at the CHT, but it would be expected that these would be significant.

These ideas - road pricing, congestion charges, passage tax, and toll balancing - are labels for an approach which defines and justifies charges on vehicle use in order to produce less congested roads. There may also be potential surplus revenues generated which may be invested in other transport related projects to gain public support for such schemes.

6.2.6 Summary for Cross Harbour Tolls

Increasing tolls at the CHT can be justified on sound economic grounds by the high external costs (congestion, delays, environmental impacts) imposed on the rest of society by the tunnel users. The implementation could be a stand-alone adjustment at CHT, or include a toll-balancing approach whereby the increase could be used to achieve a toll reduction on the WHC and EHC; the latter approach would require negotiation with other parties. There are likely to be significant benefits to the HKSAR irrespective of the approach. There could well be surplus revenue, depending on the scale of increase at CHT and how any decreases in tolls at other tunnels were funded. However there is a strong public case that surplus revenues from either approach should be reinvested in improvements in the transport system.

This issue has been debated in the press and there have been editorials supporting the concept of toll-balancing. The CHT is government owned, and therefore the tolls can be increased, but it will require a convincing case to be put to the public. However the EHC and WHC are privately owned and if a toll-balancing arrangement were to be implemented, the owners of EHC and WHC would need to either be convinced that a toll reduction on their tunnels, combined with an increase on CHT, would provide more revenue, or else they would need to be recompensed for reducing their tolls, using revenues from the CHT. At the toll levels currently charged for crossing the harbour, higher tolls generate higher revenues, and this is obviously the experience and belief of the WHC as they have recently implemented a small increase in tolls. This would mean that the WHC and EHC would need sizable compensation for lowering tolls if the toll-balancing approach were adopted; therefore the gain in toll revenue for government accruing from the toll balancing scheme may be much less than that accruing from a straightforward toll increase on the CHT. The toll-balancing approach is a concept to make such increases more acceptable to the public.

[17] Hau, T. (1992). *Congestion Charging Mechanisms for Roads.* Policy Research/Working Papers/Transport - for the Infrastructure and Urban Development Department, The World Bank, December 1992. P 69, Table 4. Results converted to 2002 prices based on CPI.

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Toll increases are never popular. However, the under-pricing of tolls at the CHT has introduced distortions in the usage of roads which sooner or later will have to be corrected. Construction of more tunnels across the harbour is clearly not the answer. Toll increases, if adopted, would need to be phased over several years to let users adapt their traveling habits and to let the authorities judge the impacts. It should be noted that the HK$10 (or 100%) CHT toll increase for cars in 1999 was generally accepted by the public and only produced a small drop in car traffic. There is also considerable revenue which could be collected by government. A HK$30 increase on all vehicles at CHT, which would bring the toll in line with inflation, would produce government revenue of about HK$1 billion per year with minimal additional collection charges, even allowing for a 25% loss of traffic to other tunnels or modes.

6.3 Tolled and Free Roads in the New Territories

Three main corridors in the New Territories are used by cross boundary traffic to access the port and urban area. These comprise Route 3, which is tolled at the Country Park Section (CPS) and the free Tuen Mun Road and Tolo Highway (see Figure 4). Traffic volumes are higher on the two free roads especially for goods vehicles, as shown in Table 14.

Figure 4: The Three Major Road Corridors in the New Territories

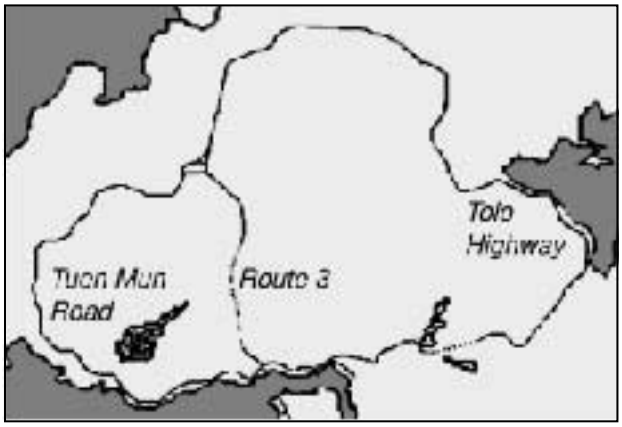

Table 14: Traffic Analysis of the Three Corridors: Route 3 CPS, Tolo Highway and Tuen Mun Road.[18]

Vehicle Corridor	Capacity (one way)	Daily Traffic (two way)	Share of Total	Vehicle Mix	
				Cars	Goods Vehicles
Route 3 CPS	3 lanes	46,000	17%	54.3%	29.8%
Tolo Highway	3 lanes	124,000	46%	44.4%	45.1%
Tuen Mun Road	3 lanes	100,000	37%	33.3%	39.7%
TOTAL	9 lanes	270,000	100%	42.2%	40.4%

Note: there are other roads in these corridors - Castle Peak Rd, Tai Po Rd, and Route Twisk - but they carry significantly less traffic volume.

[18] HKSAR Census and Statistics Department (2000), *Annual Traffic Census Year 2000.*

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Route 3 CPS carries well above the average number of cars, and significantly below the average number of goods vehicles compared to other strategic roads in the New Territories. The reason for this is the toll structure as shown in Table 15.

The toll levels by vehicle type on Route 3 CPS show a similar structure to the charges of other private sector BOT tunnels: goods vehicle tolls are almost double the car toll, depending on vehicle size. It is therefore not surprising that proportionately more of the heavy goods vehicles choose to use the free roads rather than Route 3 CPS.

Table 15: Tolls by Vehicle Class at Route 3 CPS (HK$) as at October 2002.

Tunnel	Car	Taxi	Light Van	Light Goods	Medium Goods	Heavy Goods	Light Bus	Double Deck Bus
Route 3	22	22	25	25	35	40	60	5

The tolls on Route 3 have been set at a level for the tunnel operator to theoretically maximize his revenue in order to generate a reasonable rate of return on an investment of some HK$7 billion. However the result is a relatively under-utilized Route 3 and heavy traffic flows on the other two corridors. The Route 3 CPS is designed to provide a by-pass for Tuen Mun New Town, but the need to charge tolls means that there are still very heavy traffic volumes in the town centre, with a high proportion of heavy vehicles. This imposes high external costs and environmental problems for Tuen Mun.

6.3.1 Possible Strategy

In the near term, the most promising solution is to reduce tolls on Route 3, in particular for goods vehicles. The difficulty is finding the funding and mechanism for such an arrangement. It should be possible through economic analysis to determine the traffic levels which reduce the external costs and indicate appropriate tolls. This may comprise a package of desired toll changes at Route 3, including a reduction for goods vehicles and an increase for cars. The arrangements would need to be discussed with the Route 3 operator, and some contribution from government would likely be required. This could possibly be introduced by means of shadow tolls whereby the Route 3 operators are recompensed (by the government) for each vehicle using the road. Potential sources of funding are:

- deferment of roads planned for the area (the Route 10 scheme has been proposed but final funding approval has yet to be given by Legco);
- placing a levy on cross boundary vehicles as these are some of the main users of these corridors;
- an increase in revenues at the CHT.

Conclusions

7.1 Public Transport

The public transport industry shows all the hallmarks of competition despite being heavily regulated. Fares have remained below the level of wage inflation, choice exists and quality has improved. Additionally it is generally accepted that Hong Kong has a very good public transport system by world standards and that any change should be evolutionary rather than revolutionary. No better framework for running our transport services has been found. The public transport operators are all privately owned, or run as if they were, and they are all making profits at present, within the existing regulatory and tax environment.

Whilst there are counter claims on both sides, the government does try to maintain a fairly level playing-field between the rail and bus modes; each mode has some form of assistance from government, as it seeks to preserve choice for the public while limiting the need for large increases in fares.

The main criticism of the current approach to the level playing field is that it overlooks the important difference between bus and rail that may become more important in the future, namely, that the external costs to society of the two modes are different. The external costs are likely to be much lower for rail than for bus, and the playing field has made no allowance for this. Looking to the future, the issues of sustainability and environmental protection are likely to play an increasing role, so it would seem probable that the argument for each mode to pay their full share of external costs will gain momentum. This would have an impact on fares with some increase in bus fares relative to rail. However, depending on the level of the fare changes, the switch to rail may not be large, because accessibility, frequency, and comfort are also important factors for consumers and the modern bus fleet currently operating in the SAR provides high standards in these aspects.

The case for permitting the playing field to better reflect the external costs, especially of franchised buses, only makes sense, environmentally, if some measures are taken to restrict less desirable modes from taking the place of buses in the road network. If bus fares are to contribute towards their external costs, the same policy would need to apply to other vehicles as well, including taxis, minibuses, and private cars and goods vehicles; their operating costs would all need to increase. One method of applying the costs would be some form of road pricing, and this would also assist the remaining buses to run more efficiently.

The case for limiting bus competition in order to make full use of the investment in railways is reasonable. The government has made a start by capping the size of the bus fleet, although this was introduced partly to reduce the risk of oversupply when the new rail lines start operation. However to fully resolve this issue requires the removal of some bus routes, implementation of fare integration, and feeder services; but these are all difficult areas for the government to tackle and progress is generally slow due to the conflicting demands of different stakeholders. For example, the District Councils generally wish to maintain a wide range of services for their residents which leads to the retention of services which compete with parallel rail services, and of unprofitable bus services, encouraging cross-subsidy within the bus network.

Government faces a dilemma. It must make best use of the additional capacity provided by the expanded rail network, within the existing competitive framework; ideally it would like this additional capacity to prompt a shift to rail from bus and other road-based modes. However, the government has maintained a regime of low bus fares by providing the bus operators with exemptions from some taxes thus assisting the bus services. Fares play a critical part in this dilemma because fares are a factor for passengers choosing between bus and rail. If government wishes to encourage use of rail, one approach may be to allow bus fares to increase by removing the tax exemptions and imposing a charge for external costs. Alternatively, they could lower the rail fares by providing some financial assistance, to properly reflect the contribution from the rail mode to their track costs and external costs.Both of these options present difficulties for government in the current economic environment; fare increases for bus passengers would not be welcomed, and the alternative of lowering the rail fare would place an additional burden on government either by funding this plan or accepting that the rail corporations were less valuable than previously estimated.

Conclusions

7.2 Toll Roads

The BOT tolled tunnels are competing for traffic against roads which are either free or have very low tolls. The playing field is certainly not level. For the cross harbour tunnels, the CHT tolls do not reflect the significant inflation which occurred in Hong Kong through the late 1970s and the 1980s and was a factor in the EHC's and WHC's construction costs and their toll strategy.

Any solution would need to include significantly higher CHT tolls, reflecting the fact that the tolls for CHT have not kept pace with long term inflation, and that tolls for goods vehicles and buses have not increased since 1984. The impact of the current toll arrangements is that the CHT is operating over capacity, the WHC is underused, and government is not collecting the revenues from CHT it could realistically expect to collect.

This solution could be put forward as part of a road pricing initiative or as part of government's transport policy of maintaining tolls in the long term in line with inflation. A refinement which could be more acceptable to the public in terms of average cross harbour toll levels could be a toll-balancing scheme across all three cross harbour tunnels, but this would need the cooperation of the private sector owners of WHC and EHC, and the safeguarding of their commercial interests.

The success of the tolled Route 3 Bypass to Tuen Mun depends on enough users valuing their time savings rather than using the less direct free roads. In the current economic downturn it is likely that goods vehicles have a low value of time; there may be less work for goods vehicles and any time saved may not be used for another productive journey or delivery, therefore there is no rational reason for many goods vehicles to pay the toll. Any solution will need to lower the cost differential between Route 3 and the competing roads, which in practice means a package of toll changes including reductions for goods vehicles in particular. The main obstacle is how to fund such a scheme.

In both corridors, the cross harbour and Route 3, the current arrangements have high external costs, in terms of congestion and environmental impacts. It may be questioned whether the original decisions to provide BOT facilities in the two corridors gave sufficient, if any, weight to this issue.

The introduction of electronic road pricing would provide a more comprehensive solution to many of the observed imbalances and congestion problems but it would be necessary to find a practical and acceptable solution before it could be implemented. However, tackling the toll issue would be a start in the right direction.

The strategic road network is a valuable commodity constructed at great financial and environmental expense. Every effort should be made to distribute traffic on it as uniformly as possible to reduce the demand for new road construction in some corridors.

If government adopts the policy direction suggested by this discussion, namely increasing CHT tolls and lowering the cost differential between Route 3 and competing roads, it would result in some relief to the current budgetary deficit in two ways;

1. Increases in toll income from government tunnels; as noted above this can be substantial;
2. Restoring the BOT industry, investor interest, and its contribution to easing government expenditure. There are a number of highway projects which are planned as tolled facilities, the Shatin-Lai Wan section of Route 9, and the next link to Lantau. The private sector and the construction industry could be interested in these projects, or taking a partial interest, if the competitive issues were realistically addressed.

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Appendix 1

Comparison of Traffic and Environmental Characteristics of the Road Based Public Transport Vehicles

General

The road-based public transport vehicles have a wide range of characteristics, in terms of emissions, passenger carrying capacity and traffic impact. The following analysis examines the traffic and environmental impact of these vehicles in terms of a common unit of "per passenger carried" in order to get a fairer comparison between these different vehicle types. The environmental impact is measured in terms of emissions, whilst the traffic impact is measured in terms of the "passenger car equivalence unit"(pcu). The values shown below for emission rates and for pcu's are standard figures used in the SAR in transport planning and traffic studies.

Traffic Performance

For the average passengers carried the average daily occupancy has been selected, as reported by the year 2001 Annual Traffic Census for some major roads comprising: the three cross harbour tunnels; the roads forming the screenline between urban Kowloon and the New Territories; and the roads at the south of Kowloon peninsular which cut-off the Hung Hom, Jordan and Tsimshatsui areas from the rest of urban Kowloon. By using the two way daily figures, the advantages of the double-deck buses, where the occupancy at peak periods in the peak direction may reach 80 to 90 passengers (about three times the daily average) are being downplayed.

Table: Calculation of Average Passengers Carried Against Traffic Performance For On-Road Public Transport Vehicles

Description		Taxi	Light Bus	Special Purpose Bus	Double Deck Bus
Occupancy	(a)	1.8	10	14	32
PCU Factor	(b)	1.0	1.5	2.0	3.0
Occupancy per pcu	(a)/(b)	1.8	6.8	7.0	11.0

The double-deck buses carry significantly more people per pcu than the other public transport road-based vehicles. Clearly, in traffic terms the double deck-buses are more efficient carriers of people, and if the patronage levels are high then they would be the preferred choice of vehicle type. And as noted above, at times of peak directional demands, the case is much stronger.

Appendix 1

Emissions

The following table summarizes the emission factors for most vehicle types as provided by the Environmental Protection Department for a recent transport study. These need to be placed on an occupant basis to reflect that the large buses carry more passengers than carried by cars and small buses.

Table: Emissions by Vehicle Type for Public Transport Vehicles

Type of Emission	Taxi	Light Bus	Special Purpose Bus	Double Deck Bus
CO (g/km)	1.00	1.25-1.26	9.29	8.89
NOx (g/km)	1.43	2.13-2.23	11.10	10.96
PM (g/km)	0.15	0.49-0.55	1.21	1.23
HC (g/km)	0.26	0.65-0.68	2.22	2.23

Setting these vehicle emissions in the context of the average number of passengers carried, the table becomes as follows;

Table: Emissions by Vehicle Type Per Passenger Carried

Type of Emission	Taxi	Light Bus	Special Purpose Bus	Double Deck Bus
CO (g/km)	0.56	0.13	0.010	0.278
NOx (g/km)	0.79	0.22	0.793	0.343
PM (g/km)	0.08	0.05	0.086	0.038
HC (g/km)	0.14	0.07	0.159	0.070

The double deck buses perform better than taxis (i.e. lower emissions), better than special purposes buses apart for the CO emission, and have some advantages and disadvantages compared with light buses. It should also be noted that these results use the average daily occupancy instead of the much higher occupancies which occur in the peak, especially for the double deck buses because of their much higher capacity. If this analysis were repeated with the higher occupancies then the double deck bus would be presented in an even more positive light.

Conclusion

These analyses of use of road space and emissions, which take account of the passengers carried, indicate that the size and type of vehicle should be selected to match the scale of passenger demand for a bus route; and indeed, this is one of the objectives of the planners of the public transport system. It is clear that if the double deck buses are used appropriately for the high volume routes, compared with other public transport vehicles they make the best use of road space and cause less environmental damage than other public transport vehicles.

A further conclusion is the need for caution in the discussions of curtailing services operated by the large buses; if reductions in these services lead to a large number of passengers still requiring road-based public transport, this could lead to worsening congestion and environmental conditions unless some form of traffic controls were in place to manage the type of vehicles which took over their services.

ASPECTS OF PUBLIC TRANSPORT IN LONDON, SINGAPORE, AND TOKYO THAT ILLUMINATE COMPETITION ISSUES CONCERNING HONG KONG'S PUBLIC TRANSPORT

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Contents

Introduction

This report provides an overview of competition in public transport in Hong Kong, London, Singapore, and Tokyo. This is followed by discussion of specific issues: bus occupancy, road charging, the desirability of competition in public transport, and Hong Kong's place in the world of public transport. The report concludes with responses to five questions posed by Civic Exchange.

Table 1. Data on passenger transport in Hong Kong, London, Singapore, and Tokyo

	Hong Kong	London	Singapore	Tokyo
Population (millions of persons)	6.3	7.0	3.0	32.3
Population density (persons per hectare of urbanised land)	320	59	94	88
Total private passenger vehicles per 1,000 people	**50**	**341**	**160**	**406**
Taxis per million people	**2,819**	**2,569**	**5,531**	**2,392**
Buses per million people	**887**	**754**	**1,156**	**419**
Minibuses per million people	**683**	**0**	**15**	**0**
Tram and light-rail units per million people	**42**	**20**	**0**	**11**
Metro rail units per million people	**120**	**557**	**133**	**100**
Suburban rail units per million people	**56**	**400**	**0**	**446**
Number of trips per person per day	2.8	2.8	2.6	2.9
Per cent of all trips made by walking or cycling	34	35	16	37
Per cent of motorised trips made by private passenger vehicle	16	55	39	35
Per cent of motorized trips made by taxi	10	2	11	2
Per cent of motorised trips made by public transport	74	43	49	63
Total annual public transport boardings per person (not taxi)	**545**	**381**	**482**	**611**
Per cent of boardings by bus or minibus	**60**	**45**	**76**	**10**
Per cent of boardings by tram or light rail	**7**	**1**	**0**	**1**
Per cent of boardings by metro	**24**	**39**	**24**	**17**
Per cent of boardings by suburban rail	**7**	**16**		**73**
Occupancy of regular buses (riders/seat)	0.31	0.19	0.38	0.55
Occupancy of metro (riders/wagon)	73	17	57	64
Occupancy of suburban rail (riders/wagon)	56	14		67
Annual private passenger transport energy use (MJ per person)	**4,103**	**13,223**	**10,375**	**10,441**
Annual public transport energy use (MJ per person)	**2,350**	**1,210**	**1,723**	**1,092**
Ratio of total cost of a car trip to the cost of a public transport trip	7.6	1.3	6.8	1.9
Public transport revenues as a per cent of operating costs	**136**	**90**	**114**	**176**
Metropolitan gross domestic product per person (US$)	22,968	22,363	28,578	45,425

Table 1 sets out 1995 data on the movement of people in the four urban regions.[1, 2] (This is the only year for which a wide range of comparative data are available.)

[1] The data in Table 1 are from Kenworthy J, Laube F, *The Millennium Cities Database for Sustainable Transport,* Union Internationale des transports publics (UITP), Brussels, Belgium, 2001 (CD-ROM). The London region corresponds to the area for which the Greater London Authority is responsible (32 boroughs plus the City of London). The Tokyo region is what is known as the Tokyo Metropolitan Region (Shuto Kotsu-ken). It includes the Tokyo Metropolitan Area and parts of Chiba, Ibaraki, Kanagawa, and Saitama prefectures.

[2] Some of the Hong Kong data in Table 1 were verified against the corresponding data for 1995 in Table 8.8 of the *Hong Kong Annual Digest of Statistics,* Census and Statistics Department, Hong Kong SAR, October 2000. They correspond closely in that the latter source reported the following breakdown of public transport boardings (not taxi or ferry): bus and minibus, 61%; tram and light rail, 7%; metro, 25%; suburban rail (KCRC East Rail), 7%. It has not been possible to provide such validation for other Hong Kong data or for the data on the other three urban regions.

Introduction

The following points about the four regions in 1995 are worth noting from Table 1:

- Compared with the other regions, **Hong Kong** had an extremely high settlement density, a low level of car ownership and use, a large number of minibuses, and low overall energy use for passenger transport.
- Compared with the other regions, **London** had the highest dependence on private vehicles and on its metro system, the most inefficiently used public transport (lowest ridership, highest vehicle stock, lowest seat occupancies), and, as a consequence, the lowest ratio of revenues to operating costs.
- Compared with the other regions, **Singapore** had the lowest amount of walking or bicycling, and the highest dependence on buses and on taxis.
- Compared with the other regions, **Tokyo** had the highest dependence on rail, particularly suburban rail, the most efficiently used public transport (highest seat occupancies), and, as a consequence, the highest ratio of revenues to operating costs.

At the beginning of 2003, the broad similarities and differences among the regions continue to apply. For example, public transport in Hong Kong and Singapore is still predominantly by bus, while in Tokyo it is predominantly by train and in London there is a more even balance between bus and rail. However, there are differences in detail from 1995. For example, Singapore now has an 8-kilometre, 14-station light rail system linking a housing development to a metro station, as well as additions to the metro network.

Some of Hong Kong's trends since 1995 are noted in Table 2.[3] The growth in the number of cars, regular buses, and heavy duty lorries on the road much exceeded population growth, as did ridership on regular buses and suburban rail. Note too that the increase in the number of regular (franchised) buses on the road much exceeded the increase in trips made on them, suggesting an overall reduction in the occupancy of these buses between 1995 and 2001.

Table 2. Changes in population, vehicles on the road, and use of public transport modes, Hong Kong, 1995-2001

	Change 1995-2001
Residential population	+7.1%
Private cars on the road	**+19%**
Heavy duty lorries on the road	**+82%**
Regular buses on the road	+37%
Trips by regular buses	+21%
Light buses on the road	**-5.9%**
Trips by light buses	**-5.1%**
Trips by suburban rail (KCRC)	+25%
Trips by metro (MTRC)	-5.5%

In all four regions, the provision of public transport is a mix of public and private ownership and operation, with strong regulation by government of both public and private sector activities. Details for each region are set out in the next four sections.

[3] Population data: Census and Statistics Department, HKSAR, http://www.info.gov.hk/censtatd/eng/hkstat/fas/01c/cd0012001_index.html. Accessed January 20. Other data:Transport Department, HKSAR, *Annual Transport Digest 2002,* http://www.info.gov.hk/td/eng/publication/digest2002_index.html. Accessed March 12, 2003.

Hong Kong

Most public transport in Hong Kong is owned and operated by the private sector, with strong regulation by the Hong Kong SAR Government. The largest portion is delivered by means of privately owned buses and minibuses owned by companies franchised to provide service on particular routes (except red minibuses, which are not limited as to route). Some bus routes feed the rail systems. Others provide competing service.

The next largest portion of overall public transport service is provided by the 79-km metro, which is owned and operated by the Mass Transit Railway Corporation (MTRC), of which the Hong Kong Government owns a 77 per cent share.[4]

The metro is followed in proportion of ridership by the 34-km suburban rail system (East Rail), owned and operated by the Kowloon-Canton Railway Corporation (KCRC), of which the Government owns a 100 per cent share.[5] KCRC also owns and operates the 32-km light rail system and a feeder bus operation. Street trams are run by a separate private company.

MTRC and KCRC serve different routes, with MTRC operating mostly on Hong Kong Island and Kowloon, providing three cross-harbour routes, and KCRC operating in Kowloon and the New Territories.

KCRC is presently constructing a new 31-km line (West Rail), due to open in 2003. West Rail will link KCRC's light rail service, confined to the north-west part of the New Territories, to Kowloon. It will terminate at one MTRC station and provide an interchange with another, tripling the number of points at which the two systems interact and thus providing more options for complementary service. With the June 2002 award of a new 15-km route (Sha Tin to Central) with a cross-harbour component to KCRC rather than MTRC, the Government will be introducing an element of competition between the two rail companies.[6]

Fare payment is by single tickets or through a pre-payment card. Except within the metro system, there are no transfer discounts: each part of a trip is charged as if it were a whole trip. Rail fares are set by distance. Bus and tram fares are usually per trip.

There are no direct government subsidies of public transport in Hong Kong. There are several indirect subsidies including exemption from fuel taxes for bus operations, provision of roads for bus operations (shared with other road users), assumption of risk for rail investment, and beneficial arrangements concerning development at rail stations. It is not clear whether the pattern of these indirect subsidies favours bus or rail operations. If external costs were to be counted as an indirect subsidy, the pattern would probably be seen to favour bus operations, in that buses may be responsible for more unpaid costs to society arising from environmental impacts and collisions than rail.

There is no road-pricing as such in Hong Kong, but there are numerous tolled tunnels, including the three under the harbour that connect Kowloon and Hong Kong Island, and two tolled bridges (the Lantau Link). Some of the tolled tunnels are operated directly by the Government. Others and the bridges are maintained and operated by the private sector under contract to the government. Yet other tunnels are privately owned and operated. Tunnel and bridge tolls are paid in respect of buses and taxis.

4 For corporate information about MTRC, see http://www.mtrcorp.com/eng/homepage/e_corp_frame.html. Accessed January 4, 2003.
5 For corporate information about KCRC, see http://www.kcrc.com/eng/corporate/about/history.asp. Accessed January 4, 2002.
6 Craig, R., "KCRC West Rail development nears completion" in *World Tunneling,* August 2002, available at http://www.mjconstruct.com/tunnel/archive/2002/august/kcrcwestrail0802.pdf. Accessed January 4, 2003.

London

Most public transport in the London region is owned and operated by the private sector, although a significant part, the metro system (known as the Underground or Tube), is mostly owned and is directly operated by the UK Government.

On January 1, 2003, the infrastructure of part of the Underground system was privatised (Jubilee, Northern, and Piccadilly lines); the Tube Lines consortium assumed ownership of the stations, tracks, and trains. The Government continues to operate the trains and stations on these lines.

The remaining nine lines are to be privatised in this way to another consortium, Metronet, during 2003. Then, operation of the trains and stations is to be transferred to Transport for London (TfL), a functional body of the Greater London Authority (GLA).

The GLA and TfL have strongly opposed the Government's privatisation plans, chiefly on grounds that they will lead to unsafe operating conditions and not result in early and affordable improvements. Thus, the prognosis for effective implementation of the new arrangement, as proposed, may be poor.

TfL presently has responsibility for all other public transport in the London region, including taxis and river services, but not suburban rail (see below). TfL also has responsibility for most major roads in the region and all traffic signals. It has authority to charge for the use of all roads. Such a charge will apply to the central 25 square kilometres of the 1,580-square-kilometre region from February 17, 2003 (see below).

TfL franchises bus routes by competitive bidding. TfL sets fares, routes, and service levels, and provides bus stops and stations. Bus services are entirely under private ownership and operation, with groups of routes being franchised to individual companies. Generally, bus routings complement and feed the rail systems. The occasional competition arises from historical factors or routing imperatives and not from policies requiring competition between modes.

There is occasional competition between the metro and suburban rail systems, but they generally serve different areas: the metro system is mostly north of the River Thames, which bisects the London region, and the suburban rail system is mostly south of the Thames. There is some competition among suburban rail operators.

London has two light rail systems, Docklands Light Railway and Croydon Tramlink. TfL oversees both and owns the first. Operation of the first and ownership and operation of the second has been contracted to private-sector companies.

The UK Government owns the suburban rail infrastructure other than the rolling stock. This infrastructure is part of the national rail network managed through Network Rail, a not-for-profit company.[7] Train service is provided by several private-sector companies, who gain franchises for routes by competitive bidding and set fares and service levels. Within the London region, Network Rail and the operating companies are required to cooperate with TfL.

Except for suburban rail services, fares are set by TfL. Single fares for bus journeys are generally lower than for comparable rail journeys. Most journeys are made using Travelcards, which give entitlement to unlimited travel in specified geographic areas during specified times with some restrictions on the use of the suburban rail system. Travelcards are priced according to when and where they can be used, with geographic restrictions being looser for buses than for rail. A trial of a pre-payment, contactless 'Oyster card' system is under way; it is based on Hong Kong's Octopus card system.

From February 17, 2003, most vehicles moving in central London during the daytime on weekdays will be required to pay a daily charge of about HK$60. Buses and taxis will be exempt. Registered vehicles of residents will attract a 90-per-cent discount. Payment can be made in several ways before, during or shortly after movement in the congestion charging zone. Numerous cameras will be used to check licence plates against payment records. A HK$500 penalty charge applies in the case of non-payment, rising to HK$1,500 is there is not timely payment of the penalty charge.

[7] Network Rail is the successor to Railtrack PLC, a private-sector operation that assumed responsibility for the rail track of the British Rail system in 1994 and was voluntarily liquidated in 2002.

Singapore

Public transport in Singapore is mostly owned and operated by four companies. SBS Transit Ltd and TIBS Holdings Ltd provide bus services, deploying respectively some 2,800 and 800 buses. Singapore MRT Ltd provides a 97-km metro service (with a 20-km addition under construction, the North-East line). Singapore LRT Pte Ltd provides an already-noted light-rail service.

SBS Transit Ltd is a true private-sector company. The other three companies are wholly owned subsidiaries of SMRT Corporation Ltd, 62 per cent of whose shares are owned by Temasek Holdings (Pte) Ltd, a holding company owned by the Singapore Government.

The four companies have formed Transit Link Pte Ltd to develop and implement integrated routing, ticketing, and passenger information systems.[8] Transit Link plans routes for the four companies, while fares, routes, and service levels are approved by the Public Transport Council, a statutory board whose members are appointed by Singapore's Minister of Transport.

During 2002, Singapore implemented a contactless, smart card system ('ez-link') similar to that in effect in Hong Kong. A commercial subsidiary of the Land Transport Authority, EZ-Link Pte. Ltd, has been formed to expand the use of the smart card for general micro payments. The Land Transport Authority is another statutory board under the Ministry of Transport, responsible for all land transport developments in Singapore.

The bus companies are allocated geographic areas in which to operate. Competition on the road between bus systems or between modes is rare (although see the next paragraph). Bus routes have been rationalised to feed train routes as these have become available.

A proposal is being implemented to open some bus feeder services in some satellite towns to on-the-road competition. This is in response to political pressure applied to secure lower fares and improved service. Competitors to existing services provided by one of the two bus companies will have to secure the support of the communities to be served and meet high service standards, although not as high as those that have to be met by the present two service providers.[9]

Singapore was a pioneer in road pricing. An area licensing scheme was in effect from 1975; vehicle users had to display a purchased coupon in the windscreen to move in and near the downtown. In 1998, this was replaced by electronic road pricing for approximately the same area. A charge is made each time one of numerous gantries is passed, ranging from zero to HK$27 according to location, time of day, and size of vehicle. Buses pay the same as other heavy-duty vehicles; taxis pay the same as private cars.

[8] http://www.smrtcorp.com/aboutsmrt_main.htm. Accessed January 4, 2003.
[9] Public Transport Council, August 14, 2002, http://www.ptc.gov.sg/nr06.htm. Accessed January 4, 2003.

Tokyo

Tokyo differs from the other urban regions in being much larger (having more than four times the population of Hong Kong and London and more than nine times that of Singapore), in having just about all of its public transport conducted by rail (roughly 90 per cent of trips in 1995, compared with 30, 55, and 25 per cent respectively for Hong Kong, London, and Singapore), and in having a much higher share of ridership on systems whose ownership is truly in the private sector, including the whole of the suburban rail system accounting for almost three quarters of boardings (see Table 1).

The route length of the Tokyo region's suburban rail network was 1,872 kilometres in the mid 1990s, including 876 kilometres owned and operated by the East Japan Railway Company (JR East) and 996 kilometres owned and operated by seven other private companies.[10]

The other main rail system comprises 12 metro lines with a total route length of 271 kilometres. Eight lines are operated by the Teito Rapid Transit Authority, a joint venture of the national government (53 per cent) and the Tokyo Metropolitan Government (TMG, 47 per cent). Four lines are run directly by the TMG, which also runs trams and buses. The metro infrastructure is owned by a joint-stock company involving the two governments and several private banks.

There are numerous private bus companies in the region. One of the suburban railway companies also operates a suburban tram service. There are two monorail services, both a joint venture involving a majority interest by TMG as well as private interests.

With the possible exception of the metro system, there is little direct government subsidy of public transport in the Tokyo region. However, as a partner in several joint ventures, the TMG in particular has assumed considerable investment risk that could amount to subsidization.

There is little competition within or between public transport modes in the Tokyo region, with one significant exception. Each bus company has its own operation area. Indeed, in issuing licenses to operate bus services, the national government specifically avoids the possibility of competition.[11] Bus routes are generally feeder lines to rail stations. The exception in terms of competition is between JR East and other suburban rail companies, which in three cases serve the same markets.

The three suburban rail routes where there is competition are served by trains using the same stations but different tracks. Public perception of the competition is favourable because of its impact on the performance of the rail companies. JR East's fares per unit distance are generally higher than those of other companies, but not on the routes where there is competition. As well, the quality of service provided by the other companies is generally higher where there is competition with JR East.

There is a common ticketing system via the stored-value Pass-Net Card for all rail transport in the Tokyo region, except for JR East services. JR East has its own stored-value card (Suica). Bus systems share a bus-only integrated ticketing arrangement.

Electronic toll collection was introduced in Chiba prefecture in 2001 and is being rapidly expanded throughout the Tokyo region.[12] This technology could form the basis for full-scale road pricing designed to reduce congestion and improve the environmental performance of road traffic.[13] This matter is still under study and there are no firm plans for introducing road pricing in the Tokyo region.[14]

[10] Tokyo case study in the World Bank's *Study of Urban Transport Development,* August 2000, http://www.worldbank.org/transport/utsr/yokohama/day2/padeco.pdf. Accessed January 4, 2003.
[11] See Footnote 4 in the source detailed in Footnote 10.
[12] http://www.kankyo.metro.tokyo.jp/kouhou/english2001/vp_2.htm. Accessed January 6, 2003.
[13] http://www.oki.com/en/otr/html/nf/otr-188-11-3.html. Accessed January 6, 2003.
[14] According to one source (Michael Walsh, *Carlines,* April 2003, available at the URL below) the Tokyo Metropolitan Government has just decided to implement a charge for entering a defined area of the city, beginning in April 2005. http://walshcarlines.com. Accessed April 23, 2003. As this paper went to press it had not been possible to confirm this new information.

Issues of Bus Occupancy

Bus occupancy data are hard to find and hard to analyse.[15] The latter is especially true when bus systems are reorganized because a frequent result of reorganization is better matching of bus sizes to loads, e.g., smaller buses are deployed where ridership is lower.

In the London region, revenue per bus-kilometre fell by 8 per cent between 1984-85 and 1994-95, while revenue per passenger-kilometre grew by 19 per cent.[16] The paradox is resolved by noting both that the *number of passengers per bus declined* by 22 per cent across this period (derived from the revenue data), and that there was a *trend to the use of smaller buses* across this period.[17] However, it is not clear whether this is a universal phenomenon, or how bus size and occupancy change with different competitive regimes.

Table 1 provides a rare instance of comparative data on bus occupancy, although for one year only. Bus occupancy in Hong Kong was in the middle, much above that of London, but much below that of Tokyo. Among the 57 affluent cities in the database on which Table 1 is based that provided data on bus occupancy, Hong Kong's overall average of 0.31 riders per seat was 34th from the top. The range among the 57 urban regions was 1.44 to 0.15.

[15] Three things must be known to provide an estimate of average bus occupancy during a particular period: the number of bus-kilometres moved (A), the number of passenger-kilometres travelled on the buses (B), and the weighted capacity of the buses (C). B/A (=D) gives the average number of passengers per bus. D/C gives the occupancy.

[16] World Bank (2002), *Cities on the Move: A World Bank Urban Transport Strategy Review,* Figure 7.2. Washington D.C., World Bank, 2002.

[17] Bayliss, D., *Buses in Great Britain: Privatization, Deregulation and Competition,* Table 13. Brussels, Union Internationale des transports publics, 2000. A version of this paper is available at http://www.worldbank.org/transport/expopres/bayliss1.doc. Accessed January 6, 2003.

Road Charging and its Impacts on Public Transport Operations

Charging for the use of roads is gaining in popularity. Although Hong Kong was a pioneer in such road charging,[18] by the end of 2004 it could be the only urban region of the four reviewed above in which there is not an area-wide scheme in place.

There are two key issues pertaining to public transport. One is whether public transport vehicles are charged for use of the roads. The other is whether the proceeds of road charging are used to support public transport. The Singapore scheme and the soon-to-be-implemented London scheme represent different perspectives on each issue. In Singapore, buses are treated like other road vehicles and the proceeds of road charging are not earmarked for support of public transport. In London, buses will be exempt from road charges, and the proceeds will be used to support public transport (although not necessarily bus operations). This matter has not yet been discussed in Tokyo.

How these two matters play out will determine the extent to which bus use is favoured over car use, and off-road public transport is favoured over bus use.

In Hong Kong, there is a particular issue concerning road charging that points to the need for an overall policy on the matter of road pricing. It concerns tolls on the three cross-harbour tunnels. They are relatively low for the two older tunnels and high for the new Western Harbour Crossing (WHC). The WHC remains relatively unused, and the operator continues to lose money, while the other two tunnels are congested. Cross-subsidization from the older tunnels to the newer tunnel appears to be desirable to reduce congestion and pollution, and to optimize the use of infrastructure. A recently released consultancy study has recommended a 'common owner' approach to the three tunnels so that toll levels could be adjusted to achieve a more balanced traffic distribution among the three tunnels.[19] However since neither of the private operators are interested the Government has warned that such a proposal is probably unworkable. At the urging of legislators the Government has agreed to reopen talks with the tunnel operators over the issue.[20]

[18] Hong Kong was a pioneer in fully automated toll collection. This was introduced during extensive trials of congestion charging systems in the early 1980s. The trials were abandoned and congestion charging was not introduced because (i) a weak economy lowered car ownership thus relieving some of the urgency for actions to reduce congestion; (ii) there were concerns about invasion of privacy by the systems used; and (iii) opposition to congestion charging grew because the use to which the government would put the revenues was unclear. *Worldwide experience with congestion pricing,* San Diego Association of Governments, June 1997, available at http://argo.sandag.org/fastrak/pdfs/599_a.pdf. Accessed March 12, 2003. Further work was commissioned by the SAR Government in the late 1990s, but it has not led to the introduction of road charging: http://www.path.berkeley.edu/~leap/itsdecision_resources/articles/Epayment_etc2.htm

[19] Environment, Transport and Works Bureau (2003). *The Provision and Operation of Tunnels and Tollways - Mainland and Overseas Experience*. Paper presented to the Legislative Council Transport Panel on 17 April 2003. http://www.legco.gov.hk/yr02-03/english/panels/tp/papers/tp0425cb1-1457-3e.pdf

[20] Lo, J. (2003) *Study backs single owner for tunnels*. South China Morning Post, 28 April 2003.

Desirability of Competition in Public Transport

As a general rule, competition in urban public transport *for the market* is good; competition *in the market* is not so good.[21] Competition *for the market* involves competitive bidding for the exclusive right to provide a service. It is to be contrasted with competition *in the market,* in which rivals bid directly for the same customers. In respect of bus systems, the two types of competition are known as *competition for the road* and *competition on the road.*

The general rule proposed in the previous paragraph is illustrated by the data in Table 3, which compares the experience of bus privatisation in the London region with that in the six next largest conurbations in England.[22]

In London, privatisation was achieved through competition for the road, i.e., through the franchising of packages of bus routes. Outside London, privatisation was achieved through competition on the road, i.e., companies can run buses wherever and whenever they wish, as long as they meet safety regulations and give 42 days notice of service changes.

The Government's main purpose in privatising bus operations was to reduce public transport subsidies. This objective was achieved, but more in London than outside London.[23] Unit operating costs fell more outside London, but revenues fell outside London too whereas in London they grew. The difference in revenues reflected the changes in ridership: in London there was growth in the number of bus boardings, but outside London they fell.

A conclusion from these data is that competition can reduce unit costs and the need for public subsidies. However, competition for the road is more effective in reducing the need for subsidy because it has a positive impact on ridership. Moreover, if ridership growth is an objective - whether for environmental or social reasons[24] - competition for the road also seems to be a superior approach.

Competition in the market (on the road) is a practice more likely to be found in less complex cities in less developed countries. A World Bank report has advised that in complex cities competition for the market may be the best form.[25] Thus, the continuation of competition between bus and rail in Hong Kong, and the proposal to have rail compete with rail for some cross-harbour passengers may be regarded as inappropriate and possibly counter-productive.

[21] In an overview of competition issues in public transport, the following conclusion has been drawn: "Competition in the market appears to have worked well in long distance air and bus transport, but to have been less successful in local transport. This may be because of the greater importance of frequency of service and the lesser role of price over shorter distances; price competition is less effective, and the market tends to lead to excessive frequency at too high a price, whilst also leaving problems in terms of network integration." This is on Page 346 of Henscher DA, Hauge O, Competition and ownership in land passenger transport: the 7th International Conference. *Transport Reviews,* 22 (3), 335-370, 2002. A version of this report is available at: http://www.its.usyd.edu.au/bus_and_coach_themes/Thredbo7_AllWkshpRpts.pdf. Accessed January 6, 2003.

[22] Table 3 is from Cartledge J, Privatising public transport: The British experience, *Public Transport International,* 51, 18-23, January 2002. For a more extensive analysis with slightly different results, see Matthews B et al, *Competitive tendering and deregulation in the British bus market-a comparison of impacts on costs and demand in London and the British Metropolitan Areas.* Paper presented at the 7th Thredbo Conference on Competition and Ownership in Land Passenger Transport, Molde, Norway, 2001, available at the URL below. The authors of this paper conclude that "... given the important differences between London and the British Metropolitan Areas in respect of levels of population density, car-ownership, income, parking availability, congestion, availability of complementary rail and underground provision, information provision, and integrated ticketing and fares concessions, it has not proved possible to be conclusive about the extent of the regulatory reforms." http://www.its.usyd.edu.au. Accessed March 12, 2003.

[23] One report noted that if *all* bus operations outside London are considered, not just those in the six next largest conurbations, subsidy levels actually *increased* after the introduction of competition on the road. The report is Cox W, Duthion B, *Competition in urban public transport: A world view.* Paper presented at the 7th Thredbo Conference on Competition and Ownership in Land Passenger Transport, Molde, Norway, 2001, available at the URL below. http://www.publicpurpose.com/ut-thredbo7.pdf. Accessed January 6, 2003.

[24] Growth in public transport ridership can have positive environmental impacts if the new riders have switched from more polluting modes. It can have positive social impacts if new riders engage in new trips that extend their interactions.

[25] See Footnote 16.

Desirability of Competition in Public Transport

Table 3. Changes in bus operations in London and in the six next largest English conurbations, 1985-86 and 1999-2000

	London region	Other six regions
Vehicle-kilometres operated	+34%	+14%
Passenger boardings	+13%	-44%
Real bus fares	**+43%**	**+67%**
Real bus passenger revenues	**+24%**	**-7%**
Operating costs per vehicle kilometre	-46%	-53%
Operating costs per passenger journey	-38%	-4%
Total real public subsidy to bus industry	**-80%**	**-54%**
Real subsidy per passenger journey	**-85%**	**-18%**

This conclusion about cross-harbour competition is drawn in spite of the apparently successful competition among suburban rail companies in the Tokyo region described above. Tokyo would appear to be the exception rather than the rule concerning rail competition in the market, made feasible by extraordinarily high passenger volumes. These high volumes sustain what appears to be efficient use of infrastructure overall (see Table 1). However, it is possible that service levels and efficiency in infrastructure use could be improved by more cooperative arrangements between providers of Tokyo's suburban rail services. More to the point, it is not clear that efficient use of infrastructure and high service levels will be sustained in the case of the proposed cross-harbour competition in Hong Kong.

Hong Kong's Place in the World of Public Transport

Among the 60 affluent urban regions worldwide represented in the *Millennium Cities Database for Sustainable Transport,*[26] Hong Kong is extraordinary in many respects concerning public transport. **Hong Kong leads or is second on the following indicators:**

- Settlement densities (residents and jobs per hectare of developed land)
- Intensity of public transport service (vehicle-kilometres of service per developed hectare and - second to Zurich - per capita)
- Extent of public transport use (trips per person)
- Modal split (public transport trips as a share of all motorised trips)
- Taxicab use (trips per person - second to Singapore)
- Cost of car use (overall cost and operating cost per passenger-kilometre)
- Spatial intensity of emissions of pollutants from passenger transport (weighted total per developed hectare)

Among affluent urban regions with available data, **Hong Kong is last or next to last on the following indicators:**

- Intensity of heavy rail network (metres of subway and surface rail track per person)
- Intensity of road network (metres of road per person)
- Car ownership (vehicles per person) and car use (trips per person)
- Journey length by car (average trip distance, next to last just ahead of Marseille)
- Parking spaces per employee (in central business districts only)
- User cost of transport (overall cost per passenger-kilometre for all public and private transport)
- Total passenger transport energy use per capita (all modes, in common energy units, i.e., megajoules)

The two most striking features of Hong Kong are its high modal split and its extreme settlement density. Hong Kong is the leader in the share of motorized trips made by public transport. Its 74 per cent compares with the 63 per cent of the next urban region (Tokyo). As well, Hong Kong is by far the leader in settlement density. Its 320 residents per hectare of urbanized land compares with the 191 residents per hectare of the next urban region (Barcelona).

[26] The database is detailed in Footnote 1.

Hong Kong's Place in the World of Public Transport

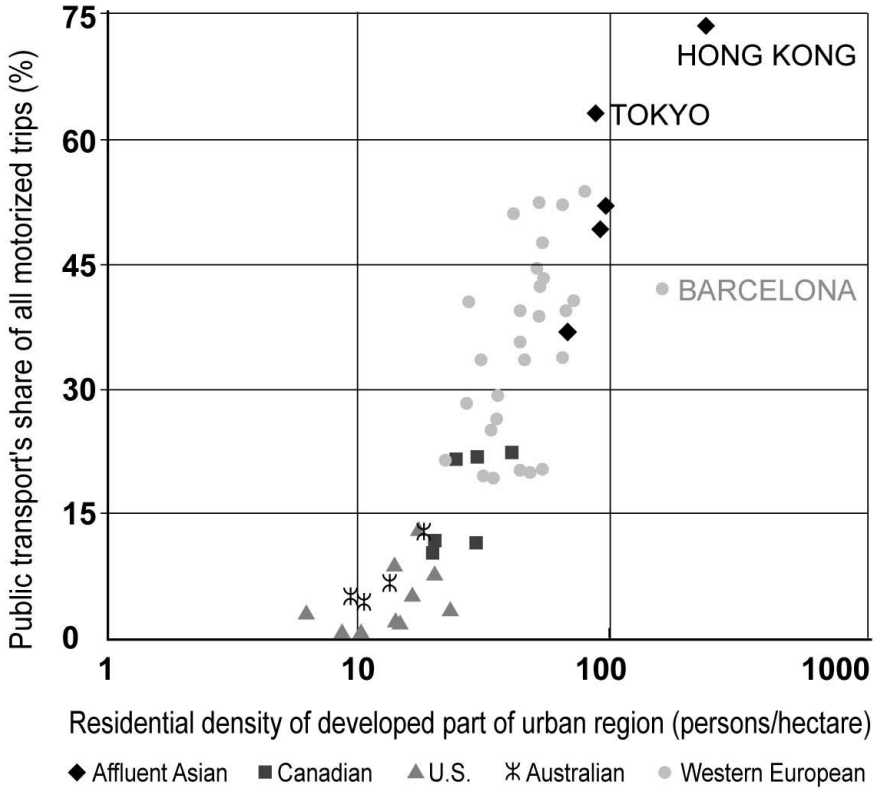
These two factors are probably related, perhaps strongly, as is suggested by Figure 1 opposite.[27]

Several questions arise from considering Hong Kong's extraordinary place in the world of public transport.

One is whether Hong Kong has much to learn from other places, given that it is so radically different in important respects (e.g., density, car ownership).

Another question is whether the influence of settlement density might be so strong as to make factors such as the details of competition arrangements insignificant in their determination of features of Hong Kong's public transport system. By this is meant the possibility that extreme high density coupled with affluence will ensure a high-quality, low-cost public transport system no matter what the competitive regime.

Figure 1. Residential density and public transport's share of all motorized transport, 52 affluent urban regions, 1995



An alternative perspective is that because public transport is more important to Hong Kong than to any other affluent urban region, special care should be taken to ensure that it functions in an optimal fashion. This includes ensuring a regulatory framework that optimizes the benefits of competition and reduces the costs.

The question of the quality of the system is subjective, but this author has heard only praise for Hong Kong's system from people who know about public transport, travel extensively, and do not live in Hong Kong.

The costs to the user, to the Government, and to society can be compared, although with difficulty. However the matter of cost is approached, it's clear that the cost of Hong Kong's public transport to the user is in the middle of the range of affluent urban regions. Per trip, it was about three times that of the lowest city (Nantes, France) and one third that of the highest city (London, UK). The cost of Hong Kong's system to government is among the lowest in the affluent world.[28] The societal costs of public transport may not be among the lowest because of Hong Kong's high level of use, its strong dependence on buses, and the large number of people who are in close proximity to emissions from the buses.

[27] Figure 1 is based on data in the source detailed in Footnote 1. Only 52 of the 60 affluent regions in the database are represented in Figure 1. The others had missing data or populations less than 500,000.

[28] Data on fares and costs are from the source detailed in Footnote 1.

Answers to the Questions

Five questions were posed by Civic Exchange. They follow, with answers based on the foregoing:

1. In what cases are competition between bus and rail desirable?

Because rail is generally much more environmentally benign than bus, it is hard to imagine circumstances that would justify such competition, which must reduce rail patronage. Moreover, for a city like Hong Kong, structuring effective competition *for the market* rather than *in the market,* whatever the mode or modes involved, may be a better way of reaping the benefits of competition.

2. How does Hong Kong's trend in bus occupancy compare to other cities?

For the most part, available data do not allow adequate estimates of trends in bus occupancy, in Hong Kong and elsewhere.

3. To what extent is bus occupancy level a factor of competition?

Bus companies in Hong Kong appear to focus on providing a comfortable ride. This is one of the two factors on which they compete well with rail, the other factor being price.[29] Providing a comfortable ride often means avoiding crowding on any part of a route, which can also mean low occupancies at the beginning and ends of routes. Such low-occupancy portions can be tolerated if close matching of service levels to ridership alienates riders.

4. Do other cities manage road congestion through road pricing or differences in road/tunnel tolls and if so, does this impact competition within or between public transport modes?

In the three other cities examined for this report, avoidance of competition between modes is considered desirable. Thus, a straightforward answer to the question cannot be given. It is possible that Singapore's road pricing scheme, which requires payments in respect of buses, deters deployment of buses in the affected area. However, the congestion-reducing benefits of the charging scheme may more than offset the additional cost of operation. In London, where buses will not pay the congestion charge, and where within the affected area, several journeys can be made by rail or bus, the greater ease of movement may well benefit buses and increase bus ridership at the expense of rail.

5. Are there any international examples of separate non-integrated rail companies operating in the same city and what are the pros and cons associated with that?

In Tokyo, there is some explicit competition for the market between rail companies. There is also occasional competition between London's suburban rail system and its metro (Tube) system. As noted, the instances of rail competition in the Tokyo region are perceived as good in that they reduce fares and improve comfort and service levels. Whether this would apply in Hong Kong is unclear. The critical factor may be availability of enough riders on a route to ensure that profitability can be achieved by multiple operators.

[29] This statement is based on a survey of 595 Hong Kong residents reported in Cullinane S, Attitudes of Hong Kong residents to cars and public transport: some policy implications. *Transport Reviews,* 23(1), 21-34 (2003). Respondents rated the four main modes of transport (franchised buses, minibuses, KCR, MTR) on five attributes (comfort, fares, reliability, frequency, and speed). Buses were rated better on the first two and worse on the last three. However, comfort was rated the least important of the five attributes. Their relative ranking was frequency (most important), fares, speed, reliability, and comfort.

Responses to Issues Raised at the February 18 Workshop

The paper to this point was mostly completed before the workshop on competition in public transport held by Civic Exchange at the Salisbury YMCA, Kowloon, on February 18, 2003. The lively discussions at the workshop were not such as to compel changes in the foregoing. However, several matters were raised that may make further comment useful. Two matters concerning London, UK, were raised - congestion pricing and bus subsidies - and a comment is made on each of them in what follows. As well, further comments, in addition to what is written above, are made on two topics discussed at the workshop: choice and subsidy.

Congestion pricing began in central London on February 17, the day before the workshop, as described above. Early reports indicate successful implementation of an effective programme. The charge was introduced during a period when traffic would normally have been low because of school holidays. The third week of the charge provided a more complete test of the scheme.

According to Transport for London, traffic within the zone was about 18 per cent lower than usual during this week of the year; this was close to the expected decrease.[30] Traffic around the zone appears to be higher in some places and lower in others, with an overall decline in traffic levels across Greater London. Use of public transport appears to have increased. The main impact on public transport seems to have been on the speed of buses, which are no longer impeded by so much congestion. Bus speeds have increased so much that timetables are being rewritten.

Acceptance of the congestion charging scheme seems widespread, except among those who are being fined for non-payment of the charge. About a quarter of the penalty notices are being disputed, i.e., about 1,000 drivers a day or one per cent of the number paying the charge.

The apparent success of the scheme has attracted attention from several other places. For example, Canada's federal minister of transport said recently that Montreal, Toronto, and Vancouver should consider implementation of such a scheme. However, there seems to have been little or no interest in Hong Kong.

Initially, it appears that the London scheme's net annual proceeds of about two billion Hong Kong dollars will be applied to fund the growing subsidisation of London's buses. This is set to rise from about five billion Hong Kong dollars in fiscal year 2002-2003 to about nine billion Hong Kong dollars in fiscal year 2007-2008, at 2002-2003 prices.

Subsidisation, whether of buses or of other forms of public transport, appears to be regarded as undesirable in Hong Kong, at least as represented by the majority of participants in the February 18 workshop. Only a few, however, regard the present indirect subsidies as excessive. On the other hand, no one seems to believe that public transport should be free - i.e., without charge to the user - so the question is where to draw the line.

It may be instructive to digress a little and consider the experience of a (small) city that made public transport free: Hasselt in Belgium. Use of public transport in this city of 70,000 residents (200,000 in the region) became free to riders in 1997 and service levels were boosted substantially. A more than eightfold ridership increase resulted. Of the increased ridership, 46 per cent comprised completely new trips; 23 per cent had switched from car use, 18 per cent from making trips by bicycle, and 14 per cent from walking. This result could well be less sustainable from an environmental perspective. The added bus trips (it's an all-bus system) could well have more than offset the reduction in car use in terms of energy use and emissions. Nevertheless, the added travel could represent progress from perspectives of social and economic sustainability. The increased travel likely represents more access to people and services, and could be associated with more economic activity.[31]

As noted in Figure 1, the share of all journeys taken by public transport is higher in Hong Kong than in other affluent cities. Thus, the issue is hardly that of needing to boost overall ridership for any reason, even if it would be possible. What would be the point of subsidy?

30 Transport for London, Congestion charging–summary of Week 3. Press release, March 7, 2003, available at the URL: www.londontransport.co.uk/tfl/press_cc_news_latest.shtml. Accessed March 11, 2003.

31 Information about the effects of making public transport free in Hasselt, Belgium, can be found at the Web sites: http://www.ils.nrw.de/netz/leda/database/measures/meas0270.htm. Accessed March 12, 2003; and http://www.ils.nrw.de/netz/leda/database/cities/city0100.htm. Accessed March 12, 2003.

Responses to Issues Raised at the February 18 Workshop

Additional public transport subsidies could be provided in Hong Kong for two kinds of purpose. One could be to distribute income through lowered fares. Most people in Hong Kong use public transport. To the extent that people who use public transport contribute less in taxation on average than people who do not, subsidies would have the effect of moving resources from richer to poorer segments of Hong Kong's population, albeit overlapping segments. This kind of purpose is more likely to be invoked in places where public transport is used only by the poorest people in society.

The second purpose could be to meet societal ends such as an improved environment or preparation for energy constraints. If it is agreed that rail-based public transport results in less pollution or will be more viable when worldwide production of crude oil can no longer keep up with demand, or both, and that an open market will not deliver sufficient rail-based infrastructure, then there could be good reason for government to invest in public transport.

Indeed, this is what happens now, but through the back door, so to speak. Hong Kong's two rail companies have, with the SAR Government's support, become increasingly dependent on the proceeds of property development, facilitated by the beneficial arrangements noted above. This is notably the case for MTR, which now appears to record by far the larger part of its profits from non-transport operations.[32] The argument that operation of public transport should benefit from the proceeds of development at stations is sound, but the present arrangement, which has resulted in Hong Kong's metro system becoming something of an appendage of a land development operation, may not serve the public interest best.

As well as exposing operation of the metro system to the vicissitudes of the property market, the present arrangement may well result in insufficient investment in rail to meet the Government's objective of increasing the total length of the heavy rail network from 146 kilometres in 1999 to over 200 kilometres in 2006, and perhaps to over 250 kilometres by 2016.[33] A better plan may be for the Government to separate out and combine the transport operations of the rail companies, capture the added value from station developments directly, and subsidize rail development directly.

In this way, the ambitious but essential expansion of Hong Kong's rail system would be assured, and even more expansion could be considered as a wise precaution against oil shortages during the next decade.[34]

[32] According to MTR's audited financial statement for 2002, available at the URL below, railway operations contributed less than 10% of MTR's profit before corporate expenses, which was HK$5.8 billion. (This happens to be slightly more than the total revenue from railway operations, which was HK$5.7 billion). Property development, ownership, and management contributed 78% of total profit before corporate expenses. http://202.153.113.77/eng/corporate/file_rep/pr1830-eng.pdf. Accessed March 12, 2003.

[33] For the Government's rail expansion plans see the document *Rail Development Strategy 2000,* Transport Bureau, Hong Kong SAR Government, May 2000. See also the 2001 policy statement by the Secretary for Transport, *A Safe, Efficient, Reliable and Environmentally Friendly Transport System,* available at the URL http://www.policyaddress.gov.hk/pa01/pdf/transe.pdf. Accessed March 12. 2003.

[34] For continuing, realistic assessment of the world oil situation, see the newsletters of the Association for the Study of Peak Oil at the URL: http://www.asponews.org. Accessed March 12, 2003.

Responses to Issues Raised at the February 18 Workshop

Choice of transport mode and operator is regarded as desirable in Hong Kong. This may be in part because lack of choice became associated with the operations of the now-defunct China Motor Bus company, a source of numerous complaints during its franchise. Among the four urban regions studied, Hong Kong is alone in encouraging choice in public transport, particularly competition between road and rail.

There is no doubt that choice can be attractive to the user in the short term. Potential longer-term consequences of intra-mode competition on the road are illustrated in Table 3 above. The specific concern in Hong Kong, however, is competition between bus and rail. This is illustrated by the fate of the MTR, which experienced declining ridership each year from 1996 to 2001.[35] It could well have experienced a further decline in 2002 if it had not been for the opening of the new Tseung Kwan O line. MTR management has cited "severe competition from buses" as the main factor in ridership losses.[36]

The longer-term consequences for Hong Kong of the practice of encouraging competition between bus and rail are severe. First, the huge investments in rail are underutilised, representing inefficient use of Hong Kong's limited resources at a time when Hong Kong's economy is not in a good position to accommodate inefficiency. Second, the corresponding high levels of bus activity contribute to environmental deterioration at a time when quality of life is an increasingly important economic and social asset. Third, and perhaps most important, declining ridership - or even ridership growth that does not keep pace with population growth - discourages expansion of the system at a time when preparation for an era of energy constraint should be of paramount importance.[37]

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35 For MTR ridership, see Page 87 of the source at the URL:
http://www.info.gov.hk/td/eng/publication/digest2002_index.html. Accessed March 12, 2003.
36 For the quote about competition from buses, see Page 9 of MTR's audited financial statement for 2002, available at the URL:
http://202.153.113.77/eng/corporate/file_rep/pr1830-eng.pdf. Accessed March 12, 2003.
37 For more on impending energy constraints, see the source detailed in Note 33.

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