

Lessons from Bus Operations

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1 Learning from bus operations

1.1 The bus system is the backbone of public transport in Singapore, an island city-state of 700 square-km in area and 4.2 million in population, 84% of whom live in high-rise residential blocks in new towns dotted around the island. There are 8,300 lane-km of roads in this highly urbanized country and the car : population ratio is about 1:10. Bus travel, which accounts for sixty percent of the total public transport trips, is popular because of the comprehensive road network coverage, comfortable air-conditioned fleet, frequent and convenient service and relatively cheap fares. Even without any direct government subsidies for operations, the two commercially operated bus companies remain profitable and financially sound. This situation has not come about fortuitously, but as a result of prudent management and the continual striving for improvement in bus operations by the bus companies, the government and the regulators. This paper examines the current situation of bus travel in Singapore and the lessons learned from the various modifications and alterations to the mode of bus operations over the past century, especially over the past 4 decades. These modifications have sometimes involved radical changes, gradual improvements and even stop-gap measures, when the situation was acute.

2 Relevance of public transport today

2.1 The advent of the motorcar and its popularisation , as a means of easy travel for the populace was one of the most revolutionary events of the twentieth century. Very soon, cars began to take over and shape the layout of cities, so much so that the planner Lewis Mumford wrote, “Cities are meant for the care and culture of men, not for the constant passage of cars.” Yet, a city would find it difficult to be vibrant without streets and cars. Streets mean an agreeable sense of busyness and bustle in the city. Cars mean accessibility, without which a city’s vitality would be greatly diminished. In many major cities, it is not unusual to find an inordinately large amount of space i.e. about 10-15% of the area devoted to streets.

2.2 Therein lies the dilemma - it would be nice to have no streets in the cities because streets also bring about traffic congestion, atmospheric pollution, traffic accidents, traffic noise and unattractive street furniture. As opposed to it, if we restrict accessibility unduly, cities lose their attractiveness to draw people. An alternative is thus mass carriers of people in a public vehicle, in other words, the bus, which in the earlier literature was

called the omnibus i.e. one that carried all and sundry. Though horse-drawn carriages for mass transport have been around since the 1700's, motorised buses became popular by the mid-1930's. For the traveler, the bus can seldom offer the same convenience of the private car- it can seldom provide door-to-door service. Yet, salvation for many major cities experiencing acute traffic congestion lies in increased use of public transportation, namely buses and urban trains.

3 A brief history of public transport in Singapore

3.1 Public transport in Singapore is provided by buses and urban trains. Both have been around since the beginning of the twentieth century.

3.2 In colonial Singapore, electric trams started operating in the city area in 1905. The Singapore Traction Company (STC), formed in 1925 took over and replaced the electric trams with trolley buses. Individual operators plied the rural areas with 7- seater "mosquito buses", which formed the nucleus for the formation of ten private Chinese bus companies. During the Japanese Occupation years in the early 1940's, a scaled down version of bus services existed. The number of bus routes expanded after the war, in the late 1940's and 1950's.

3.3 By 1955, the services of STC and the Chinese bus companies were plagued with operational difficulties, poor management and labour unrest. In 1956, the Hawkins Report advised that the eleven bus companies be amalgamated into one single undertaking, a nationalised government-run company or a statutory limited liability company, financed partly by government and partly by private investment, but there was no follow up on the recommendations. After independence from Britain in 1965, the government embarked on a massive urban renewal programme for the city, public housing to get rid of slums and road development to improve accessibility. The operations of bus services were not keeping pace with these developments. In 1971, following the publication of a Government White Paper on the reorganization of buses, the ten Chinese bus companies amalgamated into three large ones, with the STC being left intact. Since things did not improve, the government intervened which resulted in the formation of a single company, Singapore Bus Services (SBS) in 1973. The second bus company, Trans Island Bus Service (TIBS) was formed in 1982 to provide competition and benchmarking in the bus industry. By 1987, the first urban trains started running, being operated by a newly formed Singapore Mass Rapid Transit (SMRT) Corporation. In 2001, when the concept of multi-modal operation of bus and train services was being promoted, SMRT Corporation became the first multi-modal operator when it acquired TIBS to form SMRT Buses Ltd, which became a sister company of SMRT Trains Ltd. SBS also renamed itself as SBS Transit Ltd and started running train services in 2003.

3.4 The first rail line built in 1903 was the railway running northwards from Singapore town to Johor Baru town in Peninsula Malaya for a length of about 27 km. The passenger operations appear to have ended by 1930's. Parts of the line were upgraded to form the main railway line between Singapore and Peninsular Malaysia,

which is still operating passenger services between the two countries. Work on the first urban rail system (known as Mass Rapid Transit (MRT) system) started in 1983 and the trains started running in 1987. SMRT Corporation was appointed to run the North-South and the East-West Lines, which run underground within the city and on overhead viaducts elsewhere, with total length of 90 km and with 49 stations. SBS Transit Ltd was appointed to run the fully underground driverless North East Line (NEL) of total length of 20 km and with 16 stations, which opened in June 2003. There are four major train interchange stations where commuters can transfer among the three lines, which connect the central business district, major new towns, industrial estates, the port and the airport.

4 The pull-push transport strategy to encourage public transport usage

4.1 After independence in 1965, land scarce Singapore needed a sound long term plan to accommodate its growing economy. During the period 1967-71, the State and City Planning Study developed the Singapore Concept Plan for the physical development of the island. On transportation, the study concluded that it would be environmentally unacceptable and physically impossible to build enough roads to meet the prevailing rate of growth in cars; and that buses alone would be unable to meet the future public transport needs. From these findings has arisen an overall transportation strategy that attempts to maintain a desirable balance between the use of private and public transport. The average car occupancy in Singapore is 1.7 while the bus can accommodate between 85 to 143 and the six-carriage train 1800. Public transport is an efficient mover of people and an efficient energy user. The emphasis is to improve public transport and encourage its use; and to restrain the widespread use of the private car by demand management.

4.2 Measures aimed at improving public transport were the construction of the new urban train systems and the upgrading and improvement of bus services, which have continued unabated from the mid-1970's till now. Restraint measures have mainly targeted private cars, which have always accounted for slightly more than half of the total vehicle population. The measures introduced since 1972 include restraint on vehicle ownership by imposing high upfront vehicle taxes and the use of the certificate of entitlement, and restraint on vehicle usage by the road pricing scheme.

4.3 This two-pronged approach to encourage greater use of public transport – to improve public transport services - the “pull” factor; and to restrain the widespread use of private transport - the “push” factor resulted in a marked shift towards the use of public transport. Today, three out of five daily trips are being made on public transport, as compared to two out of five in the mid-1970's. Merely improving public transport is unlikely to have produced such a significant shift.

4.4 **The government has to take an important role in defining the role of public transport and pursuing policies that encourage and favour their use over that of private transport.** This is unlikely to be a popular measure among the many car owners and aspiring car owners, but unless such a stand is taken, public transport will always be

viewed as the mode of “last resort” and as a residual mode for those with no access to cars.

4.5 Figure 2 shows the efficiency of various modes for moving passengers. The bus is suitable for moving moderate amounts of commuters over near and medium distances while the train is suitable for moving large amount of commuters over medium and far distances. The advantage of the bus over urban trains is that the bus has degrees of freedom that the train running on its dedicated track does not have. However, buses are subject to delays on the road because they move in a mixed traffic stream. **In major cities, with large populations, a combination of bus and urban train public transport is required.**

5 Current public transport scenario

5.1 The current public transport system comprises 3,500 buses operating on 270 routes with 4,400 bus stops; 3 heavy urban rail lines of 109 km with 67 stations; 3 light rail lines of 29 km with 43 stations; and 22,000 taxis operated by 7 taxi companies. By a judicious combination of land-use and transport planning, public transport is accessible to a large part of the population. The modal split in favour of public transport (bus, train and taxi) is 62% during the peak periods (i.e. mainly journey to/from work) and 58% for the whole day. The average daily number of bus passenger trips was 2.9 million in 2005. As compared with this, average daily train and taxi trips amounted to 1.3 million and 0.9 million trips respectively.

5.2. The two companies SBS Transit Ltd and SMRT Corporation, which are both public listed companies on the Singapore Stock Exchange run the bus and train services on a commercial basis within the maximum fares approved by the regulator, the Public Transport Council, with no direct operating subsidies from the government. The fares, advertisement and rental revenues need to cover operating and maintenance expenditure and depreciation. However, government funds the capital cost of public transport infrastructure.

5.3 For buses, the government funds the construction of bus infrastructure of interchanges/termini, bus shelters and priority measures, such as bus lanes and bus signals. Under the government’s vehicle ownership policy of managing the growth of vehicles to manageable levels, would-be-owners of vehicles need to take part in an electronic public auction to bid for the right to own one (called the Certificate of Entitlement, COE). The two bus companies are exempt from obtaining COEs for the purchase of new buses. All buses are diesel powered rather than petrol (gasoline) powered. Due to their higher efficiency and reliability, diesel engines are usually the dominant power source for heavy duty buses. Petrol pump prices include taxes while diesel pump prices do not, but diesel vehicles pay a diesel tax. However, buses are exempt from paying this diesel tax.

5.4 For trains, the government funds the construction of the track, the stations, the control centre, the depots and the purchase of the first set of operating assets such as

trains. For purchasing of the second set of operating assets at the end of the useful life of the first set, the companies need only meet the historical cost, with government financing the inflation cost. The government envisages to extend the current 138 km of rail network to 540 km by the year 2030.

5.5 While a strong stand has been taken that the government will not subsidise public transport operations, it has been prudent to realize the importance of public transport and to fund public transport infrastructure, which it considers as sunk costs that will not be recoverable. Such a policy helps ensure the viability of commercially run public transport companies.

6 Current bus operations

6.1 The two companies are assigned specific areas or territories of responsibility within which, each company is responsible to plan and deliver a comprehensive network of bus services to meet the service standards set by the regulator. Bus companies carry out surveys, projections and analysis to facilitate bus route planning. They are expected to deliver satisfactory bus services, in the way of day-to-day running of them, to meet the mobility needs of commuters. Concessionary travel for students, senior citizens and national servicemen are borne solely by the operators. Promotional and assistance fare schemes are the operators' initiatives, based on their own commercial and social considerations. Government does not reimburse the shortfall in revenue resulting from these initiatives.

6.2 Main bus services in the form of trunk and feeder services are operated from 5.00 am to 1.00 am daily with 80% of the routes operating at not more than 15-minute headway (i.e. the interval between the dispatch of consecutive buses of the same service number from the bus interchange/terminus) during peak periods. The shortest headway is 3 min during the peak period while the longest is 35 minutes for very low-demand routes during the off-peak period. Trunk services are long-distance services that connect new towns with industrial estates and the city, whereas feeder services are short-distance services that serve the residential neighbourhoods within major new towns by bringing commuters to the town center and nearby bus interchanges/train stations. Most feeder services operate past midnight with last bus leaving after the last train arrival. The longest trunk bus route is 38 km long one way. The bus fleet consists of single deckers, double deckers and single deck articulated buses (All buses are one-man operated by a driver, who is usually referred to as the bus captain or service leader).

6.3 The two bus companies have set up a service company, Transit Link Pte Ltd, in an effort to integrate trains and buses to function together as one single, comprehensive public transport network. Transit Link facilitates fare integration, information integration and network integration.

6.4 Fare integration is through a common ticketing system using a contactless smart card, the ez-link card as the mode of payment. The ez-link cards can be used on trains and buses of both companies. Its main advantage is that it offers cost savings to commuters making transfers between train/bus and between bus/bus by granting cash

rebates. To qualify for these rebates, the transfer has to be made within the stipulated window period of 45 mins. Commuters enjoy transfer rebates for the first, second and third transfers on a journey. The ez-link card can be topped up with cash at train stations, bus interchanges and convenience stores; or linked to bank accounts for automatic topping up periodically. Commuters without the ez-link card are able to pay the bus fare by dropping the exact fares in a coin box, located next to the bus captain, for him to dispense a paper ticket. The fare for cash payment is however, higher than if it is paid by ez-link card.

6.5 Information integration is through the publication of “ Transit Link Guide “, which lists all information on bus routes and train lines; and by putting up information panels at major bus stops on the bus services calling there. Transit Link provides an electronic guide, the e-Guide on the Internet and operates a toll-free call centre for integrated information on bus and train services.

6.6 Network integration is through centralised rationalisation of bus services whenever a new train line is introduced to reduce wasteful duplication of bus and train services. Transit Link uses a computer model (TRIPS) which is able to predict and forecast changes to commuter demand and ridership, when new train lines and new bus routes are added. However, the programs do not generate bus routes, which need experience and knowledge of conditions on the ground.

6.7 Integration of fares, information and network facilitate seamless travel for commuters. The greatest benefit is to have a common farecard for use on all forms of public transport. When cash rebates are given for commuters making transfers between modes within prescribed times, it lowers commuters’ grouses towards making transfers.

6.8 There are 22 bus interchanges which form the hubs for trunk and feeder services to start/end their journeys. The interchanges are built by government and handed over for day-to-day management by the bus companies, for which they pay nominal rent. Bus companies are permitted to rent out space for compatible uses. Many of these interchanges are within major new town centres and located next to train stations, so as to facilitate transfers between modes. They are generally located at town centres with commercial facilities, away from residential areas to mitigate noise pollution to residents, but to be easily accessible from the main roads. Commuters are discouraged from walking across the bus maneuverings area because of the potential danger posed by buses that are reversing. Bus interchanges have bus control offices and rest areas for bus captains. There are adequate commuter amenities such as ticketing counters, area route maps, service information boards, cafeteria and toilets. Saw tooth and end-on berths with queue railings are built to facilitate orderly boarding of commuters, who wait under shelter. Some interchanges allow buses to park overnight. But normally overnight parking, repairs, periodic maintenance and testing are done within the bus depots owned by the companies. (Not all buses start/end their journeys at interchanges. Some services use bus termini, which are generally purpose-built while a few are along the roadside. There are 17 such bus termini. Unlike an interchange, the facilities at a terminus for bus

captains are on a smaller scale. Owing to the lack of space, commuter amenities at these termini are limited, if not non-existent

6.9 Bus interchanges are focal points for commuters and bus captains and need to be designed to be user-friendly. They should be easily accessible for the buses and for the commuters.

6.10 Timekeepers are deployed at interchanges and termini to ensure smooth bus operations. Bus captains clock in at each departure and arrival. The timekeepers monitor the adherence of each bus trip to the pre-defined timetables and take corrective action to minimise service disruption. If a bus arrives late, the next bus departure of the same service will be brought forward to close the gap between departures. The timekeepers will call in spare buses from the depot when a bus breaks down/is involved in an accident, or when there are severe traffic delays, they may also re-deploy buses from high-frequency routes to other services to ensure the headway of a service is not lengthened too much. The average accident rates for the past 5 years are a low value of less than one per 100,000 bus-km.

6.11 The two companies are very much into the latest technology for bus operations of fleet management, bus and crew scheduling and bus dispatching.

6.12 Real time fleet management uses General Packet Radio Service (GPRS) riding on the Global System Mobile (GSM) of telecommunication operators and by a satellite-based automatic vehicle tracking system, called the Vehicle Location System (VLS). Global Positioning System (GPS) receivers are fixed on the buses, as well as in-vehicle computer keeps the bus captains automatically informed, in real-time, whether they are running on-time, and allows them to regulate their speed accordingly, to adhere to the scheduled interval between buses as close as possible. There are two-way data and voice communications between the bus control centres and the bus captains. Central software creates an interactive display that allows control centre operators to visually track fleet movements. The control centre also monitors reports of traffic congestion, bus breakdowns/accidents and is responsible for sending out replacement buses and tow-trucks.

6.13 Computer programs are used to automate the processes of scheduling of bus captains and vehicles, dispatching of buses and rescheduling. The program uses real-time data, intelligent logic and rules for the control centre to make better decisions. It alerts the control centre when corrective action has to be taken, such as when a bus captain has not reported for work, or when a particular bus has not returned. It also has a re-scheduling module to smoothen out the headway between bus departures to suit actual conditions.

6.14 The bus companies are forward looking and use the latest in the state-of-the art to improve the productivity and efficiency of their operations. They are both commercially viable and have operated successfully without operating subsidies from the government.

7 Government intervention to merge bus companies

7.1 When cities start to run their own subsidised bus services, there is unlikely to be more than one company. The other alternative is when private bus companies mushroom to provide services to areas that lack it. This was the case in the early 1970's where there were 11 bus companies operating 117 services. Many had begun as family businesses in the 1930's and the descendants ran the services even at a loss in the latter part just to keep up the family's pride. Each company served a different sector without any integration of fares, routes or timetables. Bus services had become grossly inadequate for serving the ever-increasing population. Buses were overcrowded, broke down frequently, bus drivers skipped bus stops and bus conductors were involved in quarrels with commuters.

7.2 The Government White Paper entitled, " Reorganisation of Motor Transport Services of Singapore" led to amalgamating the eleven companies into four by 1971. Many of the companies were obliged to merge, albeit reluctantly. The situation deteriorated even further with lower profits, frequent bus breakdowns, absenteeism and industrial unrest. In 1973, all the companies were involved in another merger to form the Singapore Bus Service (SBS). Realising the importance of a good public bus service and being frustrated with earlier efforts by the companies themselves, the government intervened and sent in a team of officials to clean up the management and improve financial status by weeding out outdated, unproductive and sometimes corrupt practices. By 1978, SBS was strong enough to seek listing on the Singapore Stock Exchange.

7.3 In Singapore, the panacea to solving the problem of numerous poorly planned and operated bus services with wasteful duplication and no common fare structure was strong intervention and direction by the government in private companies' affairs, although government has never directly subsidised bus operations. This meant resisting vested interests and avoiding transferring unwieldy government bureaucratic procedures to the new company, which could often be the case of government intervention. Whether government intervention will be tolerated in the affairs of private companies in other cities is a moot point.

8 Stop-gap measures

8.1 The mid-1970's was a period of momentous change for public transport in Singapore. SBS had just been formed and immediate improvements to the already acute bus situation could not be expected. Some stop-gap measures were implemented to ameliorate the situation.

8.2 The first of this was the Supplementary Public Transport Scheme implemented in 1974. Many primary school students are ferried to school by private school buses. The school starting and ending hours are slightly earlier and later than the normal office peak hours of 7.30 am- 9.00 am and 5.00 pm- 6.30 pm. This presented the opportunity to implement two supplementary services using school buses – one group from residential areas to industrial areas and another group from residential areas to the city. These school buses were allowed to ply along designated routes of SBS services and to pick up and

drop off commuters at the bus stops. They were allowed to provide these services only after having fulfilled their obligations to the students and during the peak periods, which meant that they could do about two trips during each period. They usually charged a slightly lower fare than the normal SBS service. The scheme started off with 55 services with more than 800 buses, which lessened the pressure on the then overcrowded SBS buses. Conductors were used initially, but today the services are one-man operated and commuters drop the fare into a coin box. Owing to the vast improvements in the basic bus services and expansion of train network over the past 3 decades, the scheme has dwindled and in 2005, there are only 14 such services with about 50 buses.

8.3 In addition, private bus operators and school buses could also enter an agreement with adult workers to transport them between their homes and designated place of work. They charged monthly rates that were negotiated between the employers and operators. There were no restrictions on their hours of operation, but they were not allowed to pick up commuters at bus stops for fares on the route. Many of these services have also stopped operating because of the vast improvement in basic bus services and the expansion of the train network.

8.4 As there were insufficient buses in 1974 to provide the supplementary systems, lorries were also brought into the scheme (termed lorry bus), for the scheme mentioned in 8.3. There was no major retrofitting to the lorry other than a tarpaulin roof, ladder-steps and benches across the load-deck for commuters to sit. Only the more adventurous commuters traveled on them. Very few lorries participated and their use died out after a few years because of their unpopularity.

8.5 The early and mid-1970's saw a worsening of traffic situation on the roads because of high car growth rates and usage. In 1975, the government introduced a road pricing system called the Area Licensing Scheme for the city area. Private cars and taxis (other than car pools of one driver and three passengers) had to pay a fee to enter the city area during the morning peak period of 7.30am – 10.15 am.

8.6 Car pools became popular as a way of gaining free entry into the city. A genuine car pool is one whereby 4 car-owning persons use one car, but this was not what was happening. Car drivers stopped at or near bus stops to pick up 3 passengers (at no cost to the driver or passengers) to offer free lifts to popular destinations in the city. This was hitch hiking. The situation at the bus stops became untenable and special "car pool pick-up points" were set up at popular places. Although the car pool exemption was viewed as a loophole of getting round the Area Licensing Scheme, it lessened pressure on the overcrowded bus services in the early years. Because of this, the bus companies had no cause to complain about the loss in ridership. At the height of its popularity, car pools carried about 20,000 passengers during the two and three quarters hour morning peak period, which was the equivalent of 180 double decker buses. The car pool exemption was scrapped in 1989 when the Area Licensing Scheme was revised to include all vehicles. The exemption had outlived its usefulness and there had been significant improvements in the public transport scene with new train services and improved basic bus operations.

8.7 In response to the complaint by motorists in 1975 that the Area Licensing Scheme would penalise them because of the absence of good public bus system at that time, the government implemented a park-and-ride scheme. Fifteen car parks with ten thousand car park lots were built on the fringe of the city area. Eleven shuttle bus services with seated-only passengers left the fringe car parks at regular intervals for major destinations in the city. Those who parked at the fringe car parks were offered a discount for these bus rides.

8.8 The scheme failed miserably with the fringe car parks being empty and the shuttle buses underutilised. It was found that, if the motorist decided to switch to buses, he did so from his home rather than from the fringe car park, which was contrary to earlier response from motorists. The fringe car parks were put to other use such as parking of lorries, hire cars and tourist coaches. The shuttle bus routes had to be extended to serve the nearby new towns, but still continued to serve the fringe car parks en route, in case there were still a few motorists who were using the park-and-ride system. One such shuttle service still continues to operate even after a period of 30 years.

8.9 The park and ride system failed for a number of reasons:

8.9.1 the park-and-ride was offered at the “door-step” of the city area and motorists felt, that after having come that far it was worthwhile to pay the fee for entering the city, rather than park-and-ride, which entailed some inconvenience.

8.9.2 most of the fringe car parks were devoid of shade other than for a few trees. If the motorist had a shaded car park at or near his home, he preferred to park the car there and take a bus, rather than park the car in the hot sun at the fringe car park.

8.10 In 90s, Transit Link introduced another park and ride scheme that packages public transport farecard with monthly (season) parking at existing car parks near train stations and bus interchanges. But it is not popularly used, with only about 1000 users.

8.110 In an effort to woo motorists to use public transport in 1975, a limited number of flat fare peak-hour express services (commonly known as ‘blue-arrow’ services) were introduced by SBS in private residential areas with high car ownership. Some private air-conditioned tourist coach services were also enlisted to run similar services. They operated for a few years until there were improvements in the basic bus services.

8.12 Desperate systems need desperate solutions. Whenever problems on public transport arose in the early years, all available resources were brought in to try to improve the situation. Some were successful and some failed dismally, but that did not prevent experimentation. These schemes were always considered for what they are – mainly stop-gap and there has been no total reliance on them to the exclusion of improvements to basic bus services.

9 Regulating Authority- The Public Transport Council

9.1 Acting on the recommendations of the Hawkins Report (1956), the government set up the Omnibus Services Licensing Authority in 1956 for regulating bus services,

approving new routes and setting standards. This was replaced by Bus Services Licensing Authority (BSLA) in 1971. The approval of fares was under the Ministry responsible for transport matters. This state of affairs continued until the mid 1980's.

9.2 Since public transport is an issue that involves a large segment of the population, it was felt that there was a need to have a wider representation from the community in the decision making process. Hence in 1987, when the trains started their operations, it was considered an opportune time to establish a Public Transport Council (PTC) to replace BSLA, as an independent body to safeguard the interest of commuters by ensuring adequate public transport services and affordable fares, and at the same time ensuring the long-term financial viability of public transport companies.

9.3 The Minister for Transport appoints the fifteen Council members from a wide cross section of society. This permits a wide representation of the views of the public and makes PTC's decisions more acceptable to the commuters.

9.4 PTC issues bus licences, approves new bus services and amendments to existing bus services, regulates bus service standards and approves bus and train fares. Until 1998, PTC also approved taxi fares, which have since been deregulated. PTC issues licences for basic services, supplementary services, premier services, and special services. Until 2005, it also licensed inter-state coach services that operate between Singapore and Malaysia. Licences are normally valid for one year and renewable annually.

9.5 The basic service is the fundamental bus service. The two operators have to meet the Universal Service Obligation (USO). This requires the provision of bus services to commuters within reasonable walking distance of about 400 m and at an acceptable headway, even in areas where there is only a minimum level of passenger demand. This ensures that almost all areas, except where there is a very low demand are served by a bus (or a train) and that there are direct connections to the city, industrial estates and major employment centres.

9.6 To assure quality of basic bus services, PTC has a set of service standards covering bus service coverage, frequency, bus loading and passenger information. PTC conducts regular audits to ensure the basic bus operators comply with the standards. PTC is empowered to impose fines on the companies if they continually fail to meet the service standards. The service standards for the non-basic services are regulated only lightly.

9.7 PTC invites public feedback directly through its website/surveys. It carries out a passenger satisfaction survey annually to determine the quality of bus service from their viewpoint. The main grouses of the commuters for the past two years has been about long waiting and travel time, as well as overcrowding of buses during peak periods. Such information is passed on to the companies to act upon. PTC works in partnership with the Land Transport Authority and bus companies to continue to improve bus services. PTC provides regular inputs to transport policy reviews of the government.

9.8 PTC acts as the final arbiter between the interests of the commuters and the bus companies. **It is important to note the terms of reference given to PTC - to safeguard the interest of commuters by ensuring adequate bus services and affordable fares, and at the same time ensuring the long-term financial viability of operating companies. The role is not just to regulate and ensure that commuters get the best from the bus services but also to ensure that bus companies are sustainable in term of financially viability and they are not asked to provide services that are unjustifiable.**

10 Monopoly or Competition for bus services?

10.1 A bus monopoly without competition can lead to deterioration of services and inefficiency, with the public suffering insufficient coverage, poor frequency, poorly maintained buses affecting safety and comfort or even high fares. It is common knowledge that many government-run bus companies fit into this bill and suffer annual losses, which need further government subsidy.

10.2 From 1973 onwards, there was only one bus company, Singapore Bus Services. This was not an ideal situation and the government opened up the market again for a second bus company to compete and benchmark with SBS. This resulted in the formation of a new company, Trans Island Bus Services (TIBS) in 1982 which was awarded the licence to operate in some of the sectors that SBS used to operate. TIBS was later absorbed by SMRT Corporation to become SMRT Buses Ltd

10.3 The two companies are now two mutually-exclusive monopolies created by artificially carving up the market into non-competing segments, except in the popular destinations such as the city and the industrial towns. It merely broke up one natural monopoly into two smaller monopolies. There is only a limited amount of cross-territorial competition.

10.4 But, there may be sound economic reasons for granting the two bus operators the duopoly status for bus services. First, each large operator can enjoy better economies of scale, with consequential benefits for the commuters. There are sunk costs and overheads (e.g. building of depots), that need to be incurred, regardless of the scale of the bus operations. Full competition would lead to the emergence of several smaller players. Any additional costs due to the loss of the economies of scale will eventually translate into higher fares for commuters. Second, this best protects the interest of commuters along unpopular routes (e.g. less densely populated estates). Currently, the two companies run these routes at affordable fares because they have the ability to balance the profitable routes with the unprofitable ones, within the regulated framework of limited competition.

10.5 Nevertheless, in response to clamour for more competition, PTC called a competitive tender in year 2000 for provision of bus services to a small industrial island (Jurong Island) connected to the mainland. It also opened up short feeder services in new towns in 2002 for free competition. Would-be-operators were given the leeway to decide on the type of buses that they deploy, which could be less comfortable than those

provided by the two main companies, subject to meeting minimum vehicle standards. They were required to provide full daily service with adequate coverage at reasonable headways and to provide direct access to the nearest major bus interchange. After meeting these requirements they were free to set the fares. A private company currently operates the Jurong Island bus service, but there have been no takers for the feeder services in new towns.

10.6 Monopoly, duopoly or unlimited competition for bus services? Competition is necessary to improve operational efficiency and quality of bus services. However, wasteful competition has to be avoided and a balance must be struck somewhere in between. Ultimately, the decision should be one that does not put the commuters at a great disadvantage. Larger operators can balance unprofitable routes with profitable routes that smaller ones would not have the flexibility to do. Larger ones in a monopoly or duopoly would need a watchful eye to ensure that service standards do not deteriorate and that fares remain affordable.

11 Bus fare adjustments

11.1 The most sensitive issues in bus operations is the determination of bus fares. Rather than leave the decision of approving bus fare changes in the hands of the government, it was considered better to get an independent body with representatives from the various sectors, namely the Public Transport Council to evaluate and undertake this work.

11.2 The current financing framework for public transport system is based on the concept of partnership. Under it, government pays for public transport infrastructure, commuters pay for its usage (without operating subsidy) and the public transport companies operate efficiently under the maximum fares approved by and regulatory oversight of PTC.

11.3 There are three principles for the framework on fare regulation. Operating revenue should cover operating costs; there has to be a sustainable policy on asset replacement; and fares have to be affordable and revised periodically to adjust for justifiable cost increases. Based on these, PTC has approved small fare increases at regular intervals, using a formula that caps annual fare increases to the consumer price and wage index.

11.4 Bus fare adjustments become even more sensitive when private bus companies run the service at significant profits. There is always the perception that they are merely profit oriented, while providing less-than-satisfactory services. The best arbiter is not the government, who usually want to avoid the odium of bus fare increases, but an independent body such as PTC, using rational methods in approving fare adjustments proposed by the two companies.

12 Fare collection

12.1 With small buses, drivers could often identify the commuters who paid the fare and who did not. As buses became larger, there was a need for a conductor to do this. Payments came in two forms – a flat fare or distance-related fare. For distance-related fare, it was necessary to set up fare stages as a proxy for distance traveled. Each company determined its own fare stages at about 800 metres apart, usually indicating them on the bus stop pole for identification by commuters and conductors. Tickets came printed with fare stages and the conductor's job was to collect the fare and punch the tickets.

12.2 In bus operations, wage costs account for a large percentage of operational costs. So, in the early 1980's both bus companies started doing away with conductors and letting the driver collect the fare, as the commuters boarded the bus. The one-man-operations (OMO) had already started in 1975 with a few express buses charging flat fares for the journey where the commuter dropped the fare in exact amount in the coin box. It also introduced charging step-down fares, where the fare decreased gradually as the bus neared its destination. This was followed in 1980 by the One-man-Ticketing System (OTS) where commuters dropped exact distance-related fare into a coin box and the driver punched in the details of the fare for a ticket dispensing machine to issue the ticket. Ticket inspectors boarded the bus at regular intervals to check that commuters were traveling with valid tickets, and that they were not underpaying. One-man operations slowed down boarding of buses by commuters because the driver had now also to collect fares and issue tickets. The opportunity for review of ticket collection came with the start of the operation of the train systems in 1987, when stored value magnetic strip fare cards were introduced.

12.3 In 1990, the magnetic fare card ticketing system was extended to the buses, so that commuters would require only one card for both trains and buses. Buses were fitted with a bus validator, which required the commuter to slot in his fare card and select the correct fare. The validator checked the cash balance on the fare card, deducted the appropriate amount from it, and returned it with a paper ticket. Those without fare cards needed to pay the bus driver the exact fare for him to issue a ticket at the ticket dispensing machine. Ticket inspectors boarded the bus at regular intervals to check that commuters were traveling with valid tickets and that they were not underpaying. By 1991, there was full integration in bus and train fares, when cash rebates were given for transfers between modes and between buses within stipulated periods.

12.4 As the public transport network expanded, the amount of information that was needed to be stored in the magnetic fare card increased. The existing system could no longer meet these needs. With the impending opening of the third rail line, it became obvious that the magnetic fare card would prove inadequate. Bus companies also were troubled by the problem of underpayment of fares by some commuters because the driver was not able to watch what they were paying. They punched in the lowest fare for the ticket at the validator, hoping to ride the whole journey without a check by an inspector. Even when found out by the inspector, all they had to do was to pay the additional fare.

12.5 As a way of overcoming these shortcomings, the government funded the software development and the infrastructure for the contactless smartcard or EZ-link card to replace the magnetic fare cards in 2002. Passengers tap this fare card against a card reader on entry and exit on buses (or at the entry and exit fare gates of train stations) for the correct fare to be deducted on a distance-related basis. Infants in arms and children below the height of 0.9 m ride free when they are accompanied by a fare-paying adult. For trunk bus services, the fare is deducted based on total fare stages traveled. If commuters fail to tap their cards on exit, the maximum fare will be deducted. Cash rebates are provided for multiple rides when commuters transfer between buses or between bus and train within stipulated periods. One of the main advantages of using the ez link card is that the commuter does not need to know or need to ask the bus captain about the exact fare; the system automatically calculates the exact fare to be deducted. Personalised EZ link cards permit concession travel for senior citizens, students and national servicemen. Another advantage is that the system knows where each commuter boards and gets off a bus, because he/she has to tap his ez-link card against the entry and exit readers. Such information, which was not available before, is extremely useful in bus route planning and performance monitoring. The ez-link ticketing system is highly reliable with an error rate of 0.06%.

12.6 Fares on all trunk services are distance-based with fare stages being allocated to bus stops. The system needs to know the fare stages for correct deduction. Initially, the updating of fare stages was done manually by bus captains, which resulted sometimes in wrong fare deduction. This has now been overcome by automatically updating the fare stages by the Vehicle Location System (VLS), which is a satellite-based bus tracking system, to determine the position of the bus. VLS determines the fare stage by matching the bus' actual location on the road against a pre-programmed set of data in the system.

12.7 There has been a natural evolution in fare collection from the very basic coin box to sophisticated automatic fare cards. Each step has resulted in further convenience for commuters and safeguarded revenue collection for the bus companies. When wage costs rise, it is natural that there will be a job enlargement for drivers to also collect fares. Automatic cashless fare collections, which offer many advantages are the way to go.

13 Improvements in bus fleet for the basic bus services

13.1 In 1905, the Singapore Electric Tramways started running the first electric trams. In 1925, the Singapore Traction company replaced these trams with electric trolley buses drawing power from overhead cables. In the 1940s, STC began replacing the trolley buses by diesel run buses with proper bus chassis. The Chinese bus companies started their services with small 7 seater buses and gradually increased their sizes, but for their buses, they were using truck chassis which were locally assembled. Truck chassis is meant for carrying cargo and hence has higher floor boards and harder suspension as compared with bus chassis. During their initial period, both SBS and TIBS were using buses with truck chassis. This was necessary in the earlier years in order to meet the

demands for large numbers of buses at economical costs. As part of the overall upgrading of buses, all buses registered after 1990 had to use bus chassis.

13.2 Double deckers were put into use in 1977. Air-conditioned buses started operating in 1984. Articulated buses, called bendy buses appeared in 1996. 95% of the bus fleet consists of air-conditioned single decker, double decker and articulated buses with wide doors for two streams boarding and alighting. Most with low steps and some have low floors and no steps, while the new double-decker buses are equipped with manual ramps for wheelchairs. All use automatic transmission for driving and hydraulic operated doors, controlled by the bus captain. Commuters enter by the front door next to the bus captain and exit at a door in the middle of the bus. The maximum carrying capacity for single decker is about 85 (seating about 50), double-decker is 131 (seating about 90) and articulated bus is 143 (seating about 53). Over hanging straps and handrails are provided for the safety of standing passengers. Double deckers do not permit standing passengers on the upper deck. The ratio of seated : standing passengers for the single deckers is 65%. Some seats near the entrance and exit have signs requesting commuters to offer them to senior citizens and the disabled. The statutory life of a bus is 17 years and it has to pass rigorous vehicle inspections at six-monthly intervals.

13.3 Buses are fitted with the automatic fare collection machines at the entrance and the exit. There is a coin box next to the bus captain and a ticket dispensing machine behind him, to issue printed tickets to those who pay the fare by cash. Push buttons are provided throughout the bus for commuters to signal the driver to stop for alighting Each bus displays a “bus stopping” lighted sign, as soon as someone presses the pushbutton. Door closing alarms, automatic retractable doors and door interlocking devices are installed to enhance safety of alighting passengers.

13.4 Some buses have television screens with entertainment programmes, provided by a commercial mobile TV operator, who leases the space and bears the full costs of hardware, installation, and equipment maintenance. Advertisements are allowed within the bus and on the body of the bus. Full body advertisements have to ensure that the windows are not covered to an extent that light transmission is hampered, and that the commuter’s view is not unduly affected.

13.5 The bus companies have kept up with the times and upgraded and improved their fleet to suit the discriminating needs of commuters while enhancing passenger safety. This has been especially important in Singapore to dispel the notion that the bus is the mode of last resort and that it can provide some competition when it comes to a choice between the bus and the car.

14 Complementary and niche bus services

14.1 In addition to the basic bus services, PTC approves licences for niche bus services to meet special needs, most of which are operated by private bus operators. Their service

standards and fares are loosely controlled and they are not required to meet the Universal Service Obligations.

14.2 Premier services are express and semi-express services with high-quality minibuses or standard air-conditioned buses with no standing passengers, targeting at car users of private housing estates. They are advertised as “business class on the roads” and charge a higher fare than the basic services

14.3 Specials services only run during special periods to selected locations during some events. There are night services (after 12.00 am when basic bus services stop running), shuttle services between housing condominiums and train stations and shopping centres, shuttle services to industrial estates and ad hoc services during the festive season. Some of the shuttle services are provided free of charge to attract visitors to shopping centres.

14.4 Interstate coach services run between Singapore and the various states of Peninsula Malaysia and Thailand.

15 Road network to cater for bus movements

15.1 There are 150 km of expressways, 560 km of major arterial roads, 425 km of collector roads and 1930 km of local access roads. Buses do not normally travel on local access roads. About 10% of the bus routes make use of the expressways on part of their journeys, but bus stops are not normally permitted on expressways, except with the use of parallel service roads.

15.2 The double decker, which is the highest vehicle on the road at 4.3 m is within the 5.4 m height limit permitted on the roads. Where there are structures with lower height limits than 4.3 m (very few roads), advance steel overhead gantry signs, corresponding to the height of the structure are put up in advance to warn motorists. Double deckers do not use such roads. All bridges and structures are able to take the maximum laden weight of a fully laden bus, which are 19 and 28 tonnes for 2 and 3 axles respectively without stress. The minimum width of a traffic lane which is 3 m accommodates the width of the bus at 2.5 m. The longest bus, which is the articulated bus at 19m can stop at most bus bays, without the back protruding into the main traffic lane. The turning radius at all junctions on expressways, major arterials and collector roads are designed to accommodate bus and truck movements, without part of the vehicle overhang protruding into the pedestrian footpath when the vehicle is turning.

15.3 In the few instances, when the bus has to use a local access road, design adjustments are made to the junctions, as required. Locating bus stops with shelters along local access roads in high quality residential estates pose problems because many residents do not wish to have the bus shelters mar the appearance of their frontages. Some local access roads have road humps to discourage speeding of vehicles. Normal humps are not used on bus routes because unwary standing passengers might fall and hurt

themselves, when the bus negotiates the hump. Special “bus-friendly” road humps, which are wider with a flat top are used on bus routes, if humps need indeed be provided.

15.4 Bus stops, bus lanes and junctions, where buses frequently turn are subject to large surface stresses. Asphalt concrete (or bituminous premix) surfaces are used on 98% of the roads, as compared with concrete (or rigid) surfaces. Bus bays have always used concrete surfaces. There is heavy rainfall during the monsoon season and surface water combined diesel spillage from buses resulted in the asphalt concrete roads breaking up frequently. In an effort to arrest the situation, a massive exercise was undertaken in 1987 to change heavily used bus lanes to concrete surface. Major junctions with heavy turning bus movements also use concrete surface for an approach length of about 50-100 m.

15.5 It is essential that the road network be friendly to bus movements , so that the buses can reach and serve as much commuters , as possible. The design and construction of new roads should take the needs of the bus into consideration.

16 Bus priority on the roads

16.1 Unlike trains, buses move in a mixed traffic stream and are subject to delays that other vehicles face. On the average, bus speeds are around 60% of car speeds because they have to stop regularly to drop and pick up commuters. The average global speed of buses is 18kph during peak hours and 22 kph during the off-peak hours. To speed up bus movements, 112 km of bus lanes (in the same direction of traffic flow and hence called with-flow bus lanes) have been implemented since 1974. The bus lanes operate for a period of about two and a half hours each during the morning peak hours and evening peak hours. Along one busy commercial street, bus lanes operate throughout the day. Bus lanes are marked on the left kerbside lane with 300 mm yellow longitudinal marking. Only buses and bicycles are allowed within the bus lane during these hours. Buses are allowed to overtake other buses by using other lanes. For the convenience of non-bus left turning vehicles, bus lanes are cut back and marked with yellow dotted line for a length varying from 30 m to 200 m (depending on the volume of left turning traffic) from the junction stop lines, so that these left turners can enter the left lane to turn left.

16.2 To justify a bus lane, there has to be a minimum of 50 buses per hour using the road during the peak hours and the road should preferable have at least three lanes in each direction. As mentioned earlier, some breaks in the bus lane (by marking dotted yellow lines) have to be provided for left turning vehicles at junctions and for taxis to drop and pick up passengers at the kerbside. Roadside parking has to be banned on the left lane and loading and unloading activities by goods vehicles confined to the non- bus lane operating hours. Contra flow bus lanes (bus lanes operating in the opposite direction) are not used.

16.3 With bus lanes, bus speeds increased as much as by 15% and since buses kept to the bus lane, drivers did not bypass the bus stops. However, when the buses converted to one-man operations by 1985, boarding times slowed down which negated some of the improvements that bus lanes brought about. This had to be overcome by automatic fare

collection, which speeded up passenger boarding times. Bus lanes reduce road capacity for other vehicles, but are justified on the basis that they help to move more people.

16.4 There are a couple of “bus only streets”, which were specially built to allow buses to avoid circuitous routes and reduce their journey times.

16.5 It would be ideal for bus lanes to be brought right up to the stop line at signalised junctions. This is not feasible because of the presence of left turning non-bus traffic at junctions. Nevertheless, some junction priority measures are possible with special bus signals with “green B” indications at traffic signals. These “B signals” light up about 6-8 secs before the full green for other vehicles appears, permitting the buses waiting at the stop lines to move first. This is useful for buses to form up correctly without interference from other traffic, especially if they have to turn right at the next junction. If the first vehicle waiting at the stop line on the left lane during the red period is a vehicle other than a bus, this B signal does not prove effective.

16.6 In addition, buses enjoy freedom from traffic restrictions such as “No Right Turn” and “No Entry” at certain junctions and roads. These restrictions apply to other vehicles. These measures permit buses to avoid circuitous routes. When there is a “No Right Turn except buses” sign, it is possible that the buses might need a special “green arrow” phase to turn right at the junction. This “green arrow” is demanded by special wide and long bus loop detectors laid under the road surface of the right lane. Only the presence of buses, and not other vehicles will register this special demand.

16.7 Mere provision of bus priority measures without effective enforcement is unproductive. Other vehicles have an incentive to use bus lanes during the peak hours because it gets them from junction to junction, quicker than if they were to queue up in other lanes. Hence, there are strong deterrents by way of hefty fines if drivers are found violating bus lanes during the operational hours. For a while, bus captains were encouraged to photograph violating vehicles and send such photos to the enforcement authority. However, this practice was discontinued because the bus captains’ job was considered already onerous, without adding on this responsibility.

16.8 An interview with bus captains indicated that they are more irritated with drivers of vehicles who wait in the bus lane and block buses than those who travel in the bus lane.

16.9 Buses move in a mixed stream of traffic and suffer the same delay as other vehicles. Today, bus priority measures backed up with enforcement are an essential traffic management measure for any city hoping to improve public transport usage.

17 Minimising delay at bus stops

17.1 Bus stops are located at intervals of about 400 metres along the left lane, except along the expressways where buses are not permitted to stop. They are located near areas of activity and near other transport modes such as train stations, harbour and the airport. Bus stops are usually located close to junctions and pedestrian crossings such as push

button pedestrian signals, pedestrian overhead bridges and underpasses, so that commuters can cross the roads in safety. Each bus stop is demarcated by a bus pole which displays the service numbers of all buses, who will call at the bus stop and the fare stage number (if applicable). All bus stops are numbered and in areas of high activity, they are identified by plates on the bus pole, bearing the name of the nearest prominent building/ public facility..

17.2 If additional land is available on the roadside, bus stops have bus bays (lay byes) for buses to stop away from the main traffic flow on the left lane, without blocking other vehicles. This is good from the safety point of view. But this means that buses have problems getting back into the main traffic flow on the left lane, if other vehicles refuse to give way to them. If there is always a queue of vehicles extending to the exit of the bus bay making it impossible for buses to enter the left lane, then yellow boxes are marked on the road at the exit to warn other vehicles to keep that space clear, for the buses to emerge to the left lane. If buses are prevented from entering the main flow by a moving stream of traffic refusing to give way to them, the yellow box is ineffective. There are signs posted along the roadside and on the buses urging motorists to give way to buses pulling out of the bus bay.) It is hoped that “giving way to buses emerging out of bus bays” will become a norm for the motorist soon.

17.3 Bus stops are a major source of delay when large numbers of commuters board during the evening peak hours. Buses waiting for loading hold up other buses behind them, resulting in “bus trains” at popular bus stops. When commuters alight from the buses, as during the morning peak hours, these delays are less of a problem, since many buses open up their doors simultaneously, once they reach close to the bus stop.

17.4 To ameliorate such a situation, yellow bus markings called bus boxes are marked at the bus stop for two to three buses to allow commuters to board simultaneously, but this still causes unnecessary delay if the first bus in the queue is not ready to move off. Even more effective is the use of parallel loading bays at high-volume bus stops for loading to take place simultaneously, without the buses blocking each other. Where kerbside on the left lane is limited, another innovation is to provide bus stops with bays on the right side of one-way streets, with a traffic island between the bay and the right lane, for locating the bus shelter since the buses have their doors on the left side.

17.5 Another possibility is the staggering of bus stops, whereby certain services stop at one bus stop and other services stop another bus stop, a slight distance away. In other words, the buses ‘leap frog’ and experience less delays. Long distance commuters benefit by experiencing less delays, but short distance and transferring commuters lose the many choices they would have had, if all the buses stopped at one bus stop.

17.6 Unwarranted delays at bus stops are a major source of irritation to commuters. Hence measures must be in place to cut down this delay, as far as practicable.

18 Commuter facilities

18.1 Public transport will never be as convenient as private transport. It cannot provide door-to-door service. In a household interview perception survey conducted in 1989 by the Public Works Department after the train service started, respondents rated the bus below the car and the train in terms of speed, riding comfort, safety and noise. The bus scored above the car and the train only, in terms of cost of travel. The bus journey becomes even more tiresome when commuters need to transfer between modes or travel during rainy days, which is typical of Singapore's weather. Therefore, facilities are provided for commuters to walk to bus stops under cover and wait at bus shelters comfortably. This makes the public transport experience more acceptable.

18.2 Of the 4,400 bus stops, more than 90% have bus shelters with seats. Bus shelters are often compared unfavourably with train stations, which are much more comfortable with better amenities. Commuters at bus shelters experience noise, dust and fumes and buses do not come as regularly as trains. It is thus necessary to provide commuters with a place where they can wait comfortably for the buses.

18.3 Initially, the bus shelters were small and spartan in appearance. There were requests for bigger bus shelters that protect the commuters from sun and rain. This is difficult to achieve in a tropical city with humid weather and occasional thunderstorms. If the commuters are to be protected from the rain, the shelter has to be enclosed, but an enclosed bus shelter will be unbearable on a hot humid day. Over the years, bus shelters have become larger and some even have high roofs to protect commuters from the rain when they board double decker buses

18.4 Since 1995, private firms have been given advertisement rights for a fixed number of years in return for building/maintaining new bus shelters and cleaning them periodically. Tastefully designed lighted advertisement panels that change displays as frequently as a fortnightly, are commonplace at most bus shelters.. In the remote areas where firms have no interest in advertising, government builds and maintains the bus shelters.

18.5 In another effort to make walking to bus stops and train stations, fully sheltered from the sun and the rain, there is a network of covered walkways over roadside footpaths and across open areas leading to these terminals, from areas of high pedestrian concentration.

18.6 One of the hassles of taking public transport is making transfers between modes. There are walking and waiting times to contend with. Much effort has gone into physical integration of commuter facilities near train stations. Bus stops, taxi stops, car pick-up/drop off points and controlled pedestrian crossings are provided near to train stations, for commuters to transfer easily from one mode to another conveniently.

18.7 The bus travel experience involves the travel within the bus, the waiting and the walking period. Merely improving the travel in the bus is inadequate. The journey has to be treated as a whole and comfort and ease of transfer also provided. It may be possible to get sponsors to provide some of these facilities in return for advertisement rights.

19 Multimodal (bus/train) operators

19.1 When the first trains started running in 1987, many of the areas covered by the train were already served by SBS bus services. To prevent wasteful duplication, bus services were rationalized to ensure optimal use of resources, and reduce duplication within the public transport system. Some bus services that covered the same routes as the direct train service were withdrawn or re-routed to become feeder services, from the new towns to the train stations. Some other services have remained, as long as they did not duplicate the train route for more than a certain number of stations. In other words, the trains were given protection from competition from the buses.

19.2 Understandably, these measures led to some unhappiness- the bus operator had to use some of his buses to feed commuters to the train rather than use them for long-haul transportation. Some commuters who used to have direct bus services to their destinations now had to make transfers at the train station. This might not have meant longer journeys because the trains were not subject to the vagaries of traffic on the roads, but they had to incur higher fares. The automatic common fare card introduced in 1991 ensured that the system could recognize genuine transfers between modes (that is transfers made between bus/train or train/bus within 45 minutes) and provide a fare rebate.

19.3 The trains and buses had progressed on two different paths. There was one train operator SMRT Corporation operating two rail lines and two bus operators SBS and TIBS as at year 2000. The government had taken the initiative to develop the common fare card which allowed for convenient multi-modal travel. The government also funded commuter facilities to make transfers between modes easier. So there was already multi-modal compatibility in the public transport system.

19.4 The rail lines were being extended aggressively and there was the possibility of the bus share of public transport shrinking considerably. So, when the third train line was to be commissioned for operations, the government felt that time was ripe to promote the concept of multi-modal operators. This would enable better integration bus and train services for the commuters from end-to-end and ensure the long-term viability of the public transport operators.

19.5 To facilitate competition and benchmarking of train services, the government did not offer the concession for running the third line to SMRT Corporation as it had done before, but invited proposals from the two bus operators, SBS and TIBS. SBS was successful in being appointed for operating this train line and hence effectively became a multi-modal operator, renaming itself as SBSTransit Ltd.. At the same time, SMRT Corporation also moved into bus operations by buying over the second bus company TIBS to also start multi-modal operations under SMRT Trains Ltd and SMRT Buses Ltd.

20 Conclusions

20.1 For many large cities, good public transport is the answer to combat the ever-looming problems of traffic congestion. Both the bus and urban train have their own roles and are probably needed in most cities. In most cases, the bus will form the backbone of the public transport because of its versatility and low cost. If the public transport is not good enough yet, stop-gap measures by the use of other available resources should be considered, until a more permanent solution is found.

20.2 The government has to decide on where it stands on public transport. If it believes that public transport is to be the predominant mode, then policies (even congestion pricing for private vehicles) have to be introduced to encourage public transport usage. It also needs to invest in public transport infrastructure and play an active role in improving public transport services.

20.3 Whether public transport should be provided by the state or by private sectors through competitive tendering process, and whether it should be subsidized or commercially operated have invited much debate. There are different models and practices adopted worldwide. In Singapore, the government funds the public transport infrastructure and considers the costs as sunk costs which will not be recovered, but will not subsidise operational costs. Private bus and train companies, each assigned sectors or lines provide services on commercial basis with no direct operating subsidies from government.

20.4 Whatever the model, the government has to provide an adequately maintained road network, priority for bus movements and adequate commuter facilities. Private participation could be sought by way of giving the right to advertise at bus shelters..

20.5 An independent regulator performing the role of setting and auditing service standards, and approving revisions to bus fares, based on rational principles, is better than the government doing them.

20.6 The bus companies have to be forward looking and implement technological improvements to deliver bus services efficiently and cost-effectively within the maximum fares approved by the regulator.

20.7 Where there are more than one bus operators or when there is bus and train service, establishing a common farecard and facilitating multi-modal transfers are beneficial to commuters for a seamless travel and encouraging the use of the public transport system.

20.8 Ultimately, it is the partnership among the government, the regulators and the bus companies that determines the success and the effectiveness of the bus system. This has been amply demonstrated by the Singapore experience, where the bus system has come a long way in a period of three and a half decades; and which is a far cry from the days of the Wilson Report of 1970 (which studied the public bus transport) which commented :-

“It is difficult to avoid the impression that bus passengers in Singapore are regarded as second class citizens for whom antiquated, poorly designed and badly maintained vehicles, lacking in comfort and cleanliness are good enough.”

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