LAND TRANSPORT POLICIES AND STRATEGIES FOR A SUSTAINABLE TRANSPORT SYSTEM

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Summary

This paper briefly describes Singapore's policies, strategies and efforts to build a sustainable and comprehensive transport network to meet the needs of society and the growing demand for mobility.

1. Introduction

Transport is an integral part of modern city life. It is an issue that is close to the heart of almost every one of us as it influences the fundamental decisions on where we live and where we work. It is not an end in itself but a necessary activity, which supports many facets of economic and social life; it is a link upon which the efficiency and attractiveness of many of these activities depend on. An efficient and effective transport system is vital for economic growth and quality of life. Economic growth in turn generates greater demand for transport while affluence increases the desire for more personalized forms of transport like the private car. Left unchecked, these two trends are not only unsustainable but also potentially incapacitating to the functioning of the economy and the long-term well-being of society.

These trends can be found manifested in varying stages in many countries around the world, but the problem can be especially acute in small countries like Singapore with scarce land resources and a relatively large population. In addition, the impacts on

transportation on the environment must also be recognized. Planners of modern transportation systems should be mindful of their responsibilities for the sustainable use of energy, to support a quality living environment for future generations. Hence, there is a need to plan and build a sustainable and comprehensive land transport network to meet the needs of the economy and the growing demand for mobility. This paper describes the strategies adopted and initiatives undertaken by the Government of Singapore to provide the public with a transport system that will meet the needs and demands of a dynamic and growing city.

2. Background

Singapore is an island city-state with a total land area of 650 km^2 supporting a population of 4.1 million. In September 1995, the Singapore Government set up the Land Transport Authority ("LTA") to spearhead efforts to improve the land transport network. The LTA was formed by the merger of four government agencies: the Mass Rapid Transit Corporation, the Roads and Transportation Division of the Public Works Department, and the Land Division and Registry of Vehicles of the Ministry of Communications. With the merger, all Governmental functions relevant to land transport were then integrated under one roof. The merged entity became responsible for the planning, designing, development and management of all upstream, midstream and downstream transport-related functions including road building and maintenance, rail development, vehicle ownership and demand management policies. The formation of the LTA was a significant milestone in the land transport scene of Singapore. As a single integrated agency, the Authority would be able to ensure that the transport projects and measures, previously carried out by different agencies, supplement and complement each other in the most effective and efficient manner.

Demands on Singapore's land transportation system have been explosive since the early 1990s. Today, roads and road-related facilities occupy 12% of the land area, about the same percentage as housing. Over the last 10 years, the length of the road network in lane-kilometers was increased by 11%. On the other hand, Singapore's vehicle population grew faster in the same period, at 27%. The land take for road expansion would be at the expense of housing, schools, factories, offices, shops and gardens, which could be construed as opportunity costs in economic terms and social costs in terms of the environmental impacts. Given Singapore's limited land area, it is not tenable to continue to rely on road expansion to solve all its transport needs.

Travel demand has grown exponentially, fuelled by greater affluence, rapid household formation, population dispersion, changing demographic patterns and a plethora of economic and social activities. The number of motorized daily trips has increased almost threefold over 21 years, from 2.7 million in 1981 to about 7.8 million trips in 2002, and the number is expected to increase further to some 10 million by 2010. About 23% of all trips are made during the short 2-hour period comprising morning and evening peaks. About 5 million daily trips are made on public transport with 3 million on buses, 1 million on the Mass Rapid Transit (MRT) and 1 million on taxis.

The transport system for Singapore in the new millennium will have to meet not only the increased demand for transport, but also rising expectations for quality transport. In

1980, barely 5% of Singapore students entering elementary school obtained tertiary education. By 1994, it was 16% and it is expected to rise to 38% in 2020. These young professionals aspire to own cars. The desire is for a public transport system that offers service standards comparable to private transport and hence the challenge to provide enough quality transport alternatives to satisfy the public.

3. Policies and Strategies

To meet the transport demand of commuters and the business community, but given the constraints and considerations described above, the following policy goals were set:

- To increase the capacity and quality of Singapore's land transport system to a level that is sustainable, given the economic, social and environmental constraints; and
- To provide a wide spectrum of transport choices, while ensuring that they are integrated, affordable and correctly priced to suit each individual's preference and pocket.

It is recognized that a judicious combination of measures to moderate road usage, coupled with an attractive public transport system, can help achieve sustainable levels of public and private transport usage whilst maintaining a high quality of life for the citizens. Thus, the Singapore Government has adopted the following strategies to attain the above-mentioned twin-policy goals:

1. Improving public transport;
2. Managing demand for road usage;
3. Developing a comprehensive road network;
4. Harnessing technology to maximize network capacity; and
5. Integrating transport and land use planning.

3.1. Improving Public Transport

The aim is to provide a transport system where commuters enjoy highly efficient, comfortable and convenient rides in free-flowing traffic. Having a world class public transport system would be a key component of this system. Public transport vehicles like buses and trains are highly efficient carriers of passengers, compared to private cars. Moreover, there is no running away from the fact that public transport is and will always be the major mode of transport in Singapore. The highest priority has thus been given to provide the public with a comprehensive range of quality public transport choices.

Quality public transport systems should provide convenience, reliability, ease of use, comfort, and competitive travel times and at an affordable price. Where journeys involve more than one mode of transport, the transfers must be fast, easy and comfortable.

Some of the initiatives that Singapore has embarked on include:

- Expanding the Rapid Transit System (RTS) network: Mass Rapid Transit (MRT) to serve heavy transit corridors and Light Rapid Transit (LRT) systems to serve the medium traffic corridors and to serve as feeders to the MRT network.
- Improving bus and taxis services. Buses would continue to serve less heavy corridors and complement the RTS network. Besides the basic bus services, premium bus services have been introduced over the past two decades as and when they were required.
- Providing a level of service higher than basic bus services, mainly in the area of faster journey times and comfort.
- Catering for the increasingly differentiated needs, expectations and lifestyles of public transport users. (There is further room for innovative premier bus services to satisfy niche markets. Taxi services are being improved to provide more personalized services to cater for trips that cannot be met by scheduled and fixed route mass transit.)
- Enhancing the capacity of the integrated ticketing system, as the public transport network is expanded for seamless and convenient transfers.

Expanding the Rapid Transit System network

A viable and sustainable transport system is one that must provide good value for money. Air conditioned buses are relatively cheap, provide acceptable service along light corridors of travel, but are inadequate for heavy transport corridors. Only rail transport can meet the transport needs for heavy demand corridors while maintaining high travel speeds and predictability of arrival and departure. This explains why cities of high densities are critically dependent on rapid transit systems with dedicated rights-of-way, even though it is a more expensive option than buses.

Singapore recognizes that only the expansion of the RTS network can meet its transport needs while providing an attractive alternative to the motor car. Hence, the LTA is carrying out studies on the expansion of the rail transit system in Singapore. A hierarchy comprising a strategic network and a series of local networks is envisaged to achieve a comprehensive network. The strategic network includes high capacity radial lines linking the city area to the main population centres and the regional centres. There will also be orbital lines to provide connectivity across the main radial lines. The local networks will provide inter- and intra-town linkages and serve as feeder to the strategic network.

Presently, Singapore is served by two main MRT lines that link the main population centres along the North-South and East-West transport corridors. In November 1999, Singapore launched the first Light Rapid Transit (LRT) system to serve intra-town and localized transport needs of residents staying in the Bukit Panjang township. The comparative advantage of LRT over buses is the capacity for higher frequencies, greater reliability and sense of permanence. The Bukit Panjang LRT was a first effort to link a localized transit system to the trunk transit system to provide more integration and seamless travel.

Singapore's Rapid Transit System (RTS) network is currently 97 km in length. It comprises an 89 km long MRT network and the 8 km long Bukit Panjang LRT. Three

new MRT stations were opened in the last two years. They are the Dover MRT Station along the existing East-West Line, and two stations along the new Extension line to Changi Airport—the Expo MRT Station and Changi Airport Station.

Over the next five years, another 57 km of MRT and LRT lines, will be added to the existing network. The projects include the North-East line, LRT systems for the new towns of Sengkang and Punggol, and the first three phases of the Circle Line. The Circle Line will be completed in five phases and will be an orbital line linking the radial lines to form a distributed network. To enhance the accessibility of all MRT stations, all new and future lines will be provided with lifts and facilities to cater to the less ambulant. LTA is also carrying out a program to retrofit all existing MRT stations with lifts and ramps.

To ensure sustainability of this extensive rail expansion program, a stringent financing framework is adopted based on three principles:

- Fares have to be realistic and revised periodically to adjust for justifiable costs increases;
- Fares must cover operating costs and asset depreciation; and
- A sustainable policy on asset replacement.

Under this financing framework, the Government funds the building of the infrastructure and the first set of operating assets. Commuters pay fares that cover the operating costs including depreciation. However, the second set of operating assets will be financed by fare revenue covering only the historical costs of the first set of operating assets, while Government co-finances the balance.

Improving Bus Services

Buses are a major mode of public transport in Singapore. They are efficient carriers and are able to change routes and time schedules to suit commuters' demands and are relatively cheap to operate. In terms of flexibility and efficiency, buses are unmatched by any other mode of transport. To give bus commuters more choices, the LTA worked with the bus operators to introduce additional bus services beyond the basic scheduled bus network. These include premier and express bus services. Pilot projects to provide amenities such as newspapers and telephones on board buses were also implemented to make traveling on buses more pleasant.

As part of the efforts to provide greater comfort for bus commuters, about 1000 bus shelters were upgraded. Bus interchanges are being upgraded to cater for longer buses and a higher passenger volume, with some even providing air-conditioned boarding areas. Singapore's first air-conditioned bus interchange (in Toa Payoh) was opened in May 2002. To improve travel time especially within the city, the LTA has implemented more bus priority schemes, so that bus rides can be as quick and as smooth as possible. For example, a B-signal scheme, which gives buses a head start over other traffic at busy junctions, has been implemented at 20 traffic junctions in the city. In addition, the bus lane scheme, which provides a dedicated road-lane for buses during the morning and evening peak hours, has increased from 69 lane-km in 1996 to 113 lane-km today.

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Biographical Sketches

Maria Choy joined the Land Transport Authority of Singapore as its Director of Policy when it was formed in 1997. Since graduating from the University of Singapore in 1973, she served in the Administrative Service of Singapore from 1973 to 1997 and was involved in policy reviews, development and implementation in various ministries, namely the Ministry of Science and Technology, Ministry of

Health, Ministry of Labour and the Ministry of Communications. She now holds the appointment of the Director of the Vehicle & Transit Licensing Division in the Land Transport Authority.

Teo Yee Lan is a Senior Policy Officer in the Land Transport Authority of Singapore. She joined the Land Transport Authority in January 1998 after graduating with a Bachelor of Civil Engineering (Honors) degree from the University of Melbourne in Australia. She was a Project Engineer with the Projects and Engineering Division, before she joined the Policy Department. Her portfolio includes reviewing the public transportation industry framework and development.