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The Status of Bicycles in Singapore

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Compiled by Paul A. Barter, Assistant Professor
LKY School of Public Policy, National University of Singapore

1 Introduction

This paper aims to provide a concise report card on the status of bicycles in Singapore. The focus of this report is bicycles in the transport system. Bicycle sports and bicycles as recreation are not ignored but are not explored in any depth. The central conclusion is that bicycles play a limited role in Singapore's urban transport system. This is surprising in light of Singapore's reputation as a paragon of sustainability in urban transport and its vigorous restraints on the ownership and use of private cars (Barter 2008). Despite a relative neglect of bicycles as an urban transport mode, there is still much to report. There are also small signs of change towards a more positive policy setting towards bicycles.

2 Bicycle Ownership and Use

Statistics on bicycle ownership or use are apparently not yet compiled in a very systematic way in Singapore. This reflects the relative lack of interest in bicycles as

transport from the key land transport agencies, although there are small signs that this may be changing.

Even though data on bicycles in Singapore is rather scanty, the information that is available is consistent and reveals a low but not negligible level of bicycle use as a mode of transport. There may be signs of a recent slight increase in bicycle use after many decades of declining use. According to the 2004 HIS conducted by the Land Transport Authority (LTA), 'bicycle only' accounted for 1.1% of home-based work trips and 0.6% of home-based school trips. This work trip figure is very slightly up from the 1988 HIS, which had bicycles at 1.0% of work trips (cited by Willoughby, 2000)

Another source of data is the national census, which provides numbers for 'usual mode of transport to work', which is not strictly comparable with the HIS data above. As shown in Table 1, the 'bicycle only' share dropped from 2.1% in 1980 to 0.9% in 1990 and 0.8% in 2000.

Table 1 Usual Mode of Transport to Work for Resident Working Population Aged 15 Years & Over

Mode of transport to work/school	*Resident working persons aged 15 years and over*		
Census year	1980	1990	2000
Bicycle only	2.1%	0.9%	0.8%
Bicycle with another mode	n.a.	0.1%	0.1%

Source: Data request answered by Department of Statistics Singapore, June 2008

The 2000 Census and the 2005 General Household Survey provide data on the usual mode of transport to work, cross-tabulated with other variables. Unfortunately, bicycles are not reported but are included under the 'other' category. However, it may be reasonable to assume some correlation between 'other' and bicycles. In the 2000 Census of Population (Data Release 4), 1.2% of workers used a single 'other' mode of transport, while we saw above that 0.8% used bicycle only according to census data provided by the Department of Statistics. Therefore bicycles account for two thirds of this 'other only' category overall.

If we assume this proportion (bicycles as 2/3 of the single-mode 'other' category) to be consistent then a few more comments can be made about the role of bicycles. However, it must be emphasised that the following comments are extremely tentative. Bicycles are unlikely to completely consistent as two thirds of this 'other' category in all situations and across time.

A first tentative comment is that there may have been an increase in bicycle use between 2000 and 2005 (after decades of decline, as shown above). From 1.2% in the 2000 census, the 'other only' category in the usual mode for work trips rose to 1.6% in the 2005 General Household Survey (Department of Statistics 2005). Although this conclusion is tentative, such an increase would match some other, more anecdotal, evidence of a recent increase in bicycle use in Singapore. Note also that these figures apply to 'resident workers' which includes Singapore citizens and people with permanent residency status but excludes several hundred thousand workers in Singapore under work permits or employment passes. Anecdotally, bicycles are probably a more common mode among non-resident workers (many Singaporeans assume bicycles are used primarily by foreign workers!).

Other tentative conclusions also follow from the assumption above (that variations in the 'other only' category reflect variations in bicycle use). All of the comments below on the use of 'other' modes are plausible as conclusions to apply to bicycles. Those who use a single 'other' mode to get to work were apparently disproportionately male, from low-income households, elderly, and with work trips below 15 minutes in duration. Specifically, in 2005 2.1% of male workers used 'other' versus only 0.4% of female workers. In 2005, as mentioned above 1.6% of all workers usually went to work by 'other' modes, but the figures were 3.3% of workers in low-income (<$1000) households, 4.0% of those living in one or two room HDB flats, and 3.8% of those whose work trip is less than 15 minutes long (Department of Statistics 2005). According to the 2000 Census, 2.3% of resident workers aged 50 or more used 'other only' as their usual mode to work.

The 2000 Census also provides a geographical breakdown for the usual mode to work data. The planning zones in which a single 'other' mode represented more than the overall average 1.2% were (in order of decreasing use of 'other' mode): Rochor, Downtown Core, Geylang, Outram, Kallang, Novena, Bedok, Toa Payoh, Tampines, Marine Parade, Yishun, Jurong West. Interestingly, the first six of these are all older, inner districts with traditional fine-grid street networks, a strong mix of employment and housing, and in which a large proportion of work trips are likely to be short. The rest are public housing New Towns in various parts of the island. It is not clear what these may have in common but all appear to have flat terrain and to have significant employment (especially industrial employment) within their boundaries or nearby. If they do indeed reflect bicycle use (which is a little uncertain as mentioned above) then these patterns are interesting. The parts of Singapore with reputations as 'bicycle towns', where bicycle use is conspicuous, are Pasir Ris and Tampines in the outer east. However, bicycle use for work trips may actually be highest in the inner city areas, where residents are within cycling distance of large numbers of jobs.

2.1 Bicycles as a Feeder Mode to Public Transport

Bicycles are prominent as a feeder mode to certain stations on Singapore's urban rail system, especially the high-capacity MRT system. However, this role does not amount to a significant share of bicycle trips overall (as seen in Table 1 above).

Nevertheless, bicycles are visible as a feeder mode to the Mass Rapid Transit (MRT) system, with large numbers of bicycles parked at certain stations. Table 2 shows the numbers of formally-provided bicycle parking spaces at MRT stations as of 2002. These facilities were provided mainly by the two large public transport companies that operate these rail systems, SMRT and SBSTransit. Some were provided jointly with the Land Transport Authority. The parking provided is not of very high quality, being open to the elements and mostly using old-fashioned 'rack' style facilities.

Table 2 Bicycle parking places provided at MRT stations as of February 2002 *(only those with more than 50 are shown)*

MRT Station Name	*Number of bicycle parking places*
Pasir Ris	509
Tampines	470
Yishun	270
Sembawang	258
Admiralty	237
Woodlands	202
Tanjong Pagar	158
Choa Chu Kang	150
Kembangan	140
Bedok	110
Eunos	110
Kallang	88
Yew Tee	88
Simei	85
Ang Mo Kio	77
Khatib	72
Bukit Batok	72
Bishan	70
Bugis	70
Lakeside	65
Redhill	68

Source: Information provided by SMRT, 2002

The pattern of bicycle parking at MRT stations also has a distinct geographical pattern. The stations with large numbers of bicycle parking places are concentrated in outer New Towns in the eastern region of the island (Pasir Ris, Tampines, Kembangan, Bedok and Eunos) and the northern region (Yishun, Sembawang, Admiralty, Woodlands, Choa Chu Kang). One very central station near Chinatown (Tanjung Pagar) also had substantial bicycle parking. This geographical pattern of bicycle parking has some overlap with the planning areas that had a higher-than-average work-travel role for a single ‘other’ mode in the 2000 census data. However, only one inner-city district appears, probably because

more bicycle work trips in such areas are short and direct (without bicycle access to public transport).

2.2 Socio-economic Status of Bicycle Users

Bicycle users vary widely in socio-economic status. Circumstantial evidence from data on 'other' modes above suggested relatively low socio-economic status on average. Public perceptions apparently concur with such data. Day-to-day, short-distance use of ordinary bicycles (such as the cheaper mountain-bike-styled bicycles or traditional 'safety bicycles') is commonly associated anecdotally in Singapore with low-income elderly men and with male temporary workers in low-paying jobs (colloquially 'foreign workers').

Nevertheless, it would be misleading to generalise. Prominent segments of bicycle use, including some bicycle commuters, use high-end bicycles and accessories that convey an affluent image. Bicycles use for short trips within government-built housing estates, especially some of the newer outer ones neighbourhoods where footpath cycling is the norm, appears to involve quite a wide cross-section of people and both men and women.

2.3 Bicycle Crash Casualties

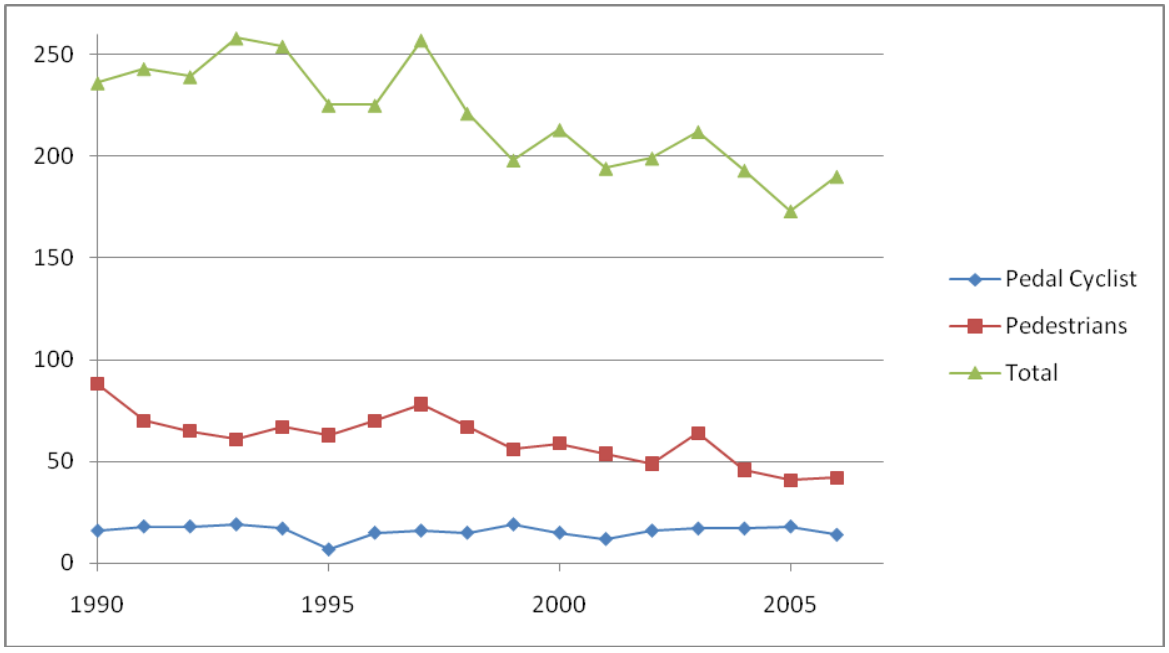
Bicycle users appear to be over-represented among road fatalities in Singapore relative to their role in the transport system. Bicycle users were 7.2% of all road fatalities in the whole period 1990 to 2006 (Table 3). This compares unfavourably with a work-trip mode share of roughly 1% through most of this period (as discussed above). We do not have data on the bicycle share of all trips but it seems unlikely to be more than 2%.

Table 3 Persons killed in road accidents, 1990-2006

Year	*Pedal Cyclist*	*Pedestrians*	*Total*	*Pedal Cyclist as %*
1990	16	88	236	6.8%
1991	18	70	243	7.4%
1992	18	65	239	7.5%
1993	19	61	258	7.4%
1994	17	67	254	6.7%
1995	7	63	225	3.1%
1996	15	70	225	6.7%
1997	16	78	257	6.2%
1998	15	67	221	6.8%
1999	19	56	198	9.6%
2000	15	59	213	7.0%
2001	12	54	194	6.2%
2002	16	49	199	8.0%
2003	17	64	212	8.0%
2004	17	46	193	8.8%
2005	18	41	173	10.4%
2006	14	42	190	7.4%

Source: Singapore Traffic Policy annual reports on road safety

Figure 1. Persons killed in road accidents, 1990-2006



Source: Singapore Traffic Policy annual reports on road safety (as shown in the reference list)

Both total road deaths and pedestrian deaths have been declining since the mid-1990s, despite a rapidly rising population as well as significantly larger vehicle fleet and more total vehicular travel since then. However, no such obvious downward trend in bicycle

user deaths can be seen. With small numbers it would be unwise to read too much into these data. And without being able to compare with exposure measures, we cannot draw conclusions about any trend in the level of danger for bicycle users. A speculative storyline here might be that Singapore's roads are slowly becoming safer for all users but that bicycle use may have been rising somewhat since around 2000 so that improved safety is not reflected in lower numbers of cyclist deaths.

Aged bicycle users seem to be especially over-represented among bicycle user fatalities. The year 1998 is the most recent with publicly-available data on the age breakdown of road deaths. Of the 15 'pedal cyclists' killed on the roads in 1998, ten were in the over 50 age group and eight of these were over 60 (Singapore Traffic Police 1999). In part, this may reflect the overrepresentation of the aged among bicycle users. The available data is not sufficient to know. However, older workers' use of bicycles in the use data presented earlier did not seem high enough to account for the extreme overrepresentation of the aged among the 1998 cyclist deaths. So higher exposure seems unlikely to be the only reason for this.

Unfortunately, no data has been presented publicly to breakdown the locations and causes of bicycle user deaths and injuries. Such information would be useful in assessing the widespread belief that cycling on footways is safer than riding on the road in the Singapore context. For example, it is unknown how many of the bicycle users killed over the years were riding on footways or park connectors but killed while crossing a road.

3 Bicycle-related industries

Singapore is not a major bicycle manufacturing site. However, it does have a significant bicycle component industry. In particular, Shimano has had a large plant manufacturing bicycle components in Singapore since 1973. Singapore imports more complete bicycles (and tricycles) than it exports (Table 4). However, for several categories of bicycle components exports greatly exceed imports, as seen in the data for 2000 in Table 5 below.

Table 4 Imports and exports of bicycles and other cycles including delivery tricycles not motorised (NMB)

Direction	*QTY(2000)*	*Value(2000)*	*QTY(2005)*	*Value(2005)*	*QTY(2007)*	*Value(2007)*
Import	297,151	17,146	248,131	15,620	247,693	17,349
Export	48,811	3,052	121,171	4,752	112,716	4,602
Total (Imp-Exp)	248,340	14,094	126,960	10,868	134,977	12,747

Source: Singapore Trade Statistics, Vol.4 #12 yr.2000, Vol.9 #12 yr.2005, Vol.11 #12 yr.2007.

Table 5 Value of imports and exports of bicycles and bicycle components 2000

(thousands of Singapore dollars?)

Description	*Direction*	*Value(2000)*
Bicycles and other cycles include delivery tricycles not motorised (NMB)	import	17,146
	export	3,052
Frames and forks and parts thereof bicycles & other cycles not motorised	import	1,216
	export	251
Wheel rim and spokes of Bicycles & other cycles not motorised	import	967
	export	420
HUBS excl coaster braking hubs & hub brakes & free-wheel sprocket-wheels of Bicycles & other cycles not motorised	import	890
	export	**5,580**
Brakes include coaster braking hubs & hub brakes & parts thereof of Bicycles & other cycles not motorised	import	1,501
	export	**3,542**
Saddles of Bicycles & other cycles not motorised	import	59
	export	11
Pedals & crank-gears & parts thereof of Bicycles & other cycles not motorised	import	205
	export	**221**
Other Parts & accessories of Bicycles & other cycles not motorised	import	253,337
	export	**454,820**

Note: Figures in bold indicate exports exceeding imports.

Source: Singapore Trade Statistics, Vol.4 #12 yr.2000

4 Bicycle Planning and Policy in Practice

This section briefly outlines Singapore's key policy settings and initiatives on bicycles as transport over the last decade or two.

4.1 A place for bicycles in the transport system?

The official Government view of the place of bicycles in the transport system is ambivalent. Since the early 1970s spatial efficiency has been a central focus of Singapore's urban transport policies (Barter, 2008). The peak agencies on land transport policy (the Ministry of Transport and the Land Transport Authority) remain unconvinced that bicycles are space-efficient enough to play a significant role.

This ambivalence is reflected in the following parliamentary reply by the Minister of State for Transport, Mrs LIM Hwee Hua, during the 2008 Budget debate, which represents the current official view (Hansard (Singapore), 2008):

> We recognise that cycling provides an additional, if not alternative, mode of transport, especially for intra-town travel and to key transport nodes, like the MRT stations and the bus interchanges.
>
> To promote greater use of public transport, LTA will be implementing several measures to facilitate cycling. Better bicycle parking facilities at the MRT stations and bus interchanges in housing estates will be provided. The bicycle parking facilities will be sheltered and more optimally designed for supporting and securing the bicycles. A one-year pilot will be carried out next year at the MRT stations cum bus interchanges at Pasir Ris, Tampines and Yishun. This pilot will allow LTA to gather feedback so as to better understand the usage patterns and needs of the cyclists before extending the facilities to all the other MRT stations.
>
> LTA, together with the public transport operators, will also launch a six-month trial from mid-March 2008 to allow cyclists to carry their foldable bikes on board trains and buses.
>
> However, we have to recognise that given our land constraints, it is not feasible to provide a comprehensive set of dedicated cycling tracks or cycle lanes island-wide, which is what Mr Teo Ser Luck has suggested. We have to ask ourselves if this is the best way to make full use of our very limited road space. The issue is not whether cyclists have a place in our public transport system, but how do we allocate space amongst competing users that will best make use of our very limited land.

Over the years, there have been many statements from Ministers or senior officials similar to that in the final paragraph above, stating land constraints as a primary reason to

not consider providing dedicated space for bicycles in the transport network. Also mentioned repeatedly are the related issues of space efficiency and the priority given to mass movement of people which only public transport can provide.

Nevertheless, the statement above, and the similar statements in the Land Transport Master Plan 2008, do reflect a slightly more positive view of the potential of bicycles than previously (LTA 2008).

4.2 Bicycles on roads

Although the general expectation under the law is that bicycles will be ridden on streets and roads, almost nothing has been done in practice to facilitate this or make it safer. There are no dedicated facilities for bicycles on Singapore roads, with exception of a small number of recently-erected signs warning motorists of bicycles at locations popular with recreational and sporting cyclists. For example, there are no bicycle lanes.

A number of standard features of road design in Singapore are hostile for bicycle users. These include the widespread use of wide-radius slip lanes at most major intersections, multiple lanes turning left and narrow kerbside lanes. An extensive system of one-way streets, especially in the central area and within and near major sub-centres, encourage high traffic speeds, create long detours for bicycle users and temp some cyclists to ride against traffic on such streets which is extremely dangerous. Bicycles appear to have been ignored in the design of Singapore's roads.

Traffic speeds also tend to be high. Currently, speed limit enforcement focuses on speeding on expressways and other high-speed arterial roads. It is not effectively deterring high speeds on many ordinary streets with the default 50 km/h speed limit, which are the locations with the largest number of bicycle users.

On the other hand, certain features of Singapore's road system are helpful for those bicycle users who do brave the roads. For example, on-street parking is extremely limited. In addition, road maintenance, repairs and surface quality are of high quality.

Currently bicycles are permitted in bus lanes, although this is not widely known. Many of these are too narrow for safe and comfortable sharing but some do nevertheless provide a haven or buffer from high-speed mixed traffic on many roads in peak hours.

A recent initiative undertaken at the urging of bicycle advocates has been the erection of signs warning motorists to expect cyclists at locations popular with recreational and sports cyclists. The Land Transport Master Plan 2008 flags an intention to extend this program to more locations.

4.3 Off-road paths

Since the mid 1990s, Singapore's agency responsible for National Parks and green spaces, NParks, has been providing off-road bicycle and pedestrian paths, known as Park Connectors. These are focused on recreational use rather than bicycle transport but some do serve useful destinations and get some transport usage presumably. They commonly follow the right-of-way opportunities afforded by water bodies, such as rivers and canals. A number of parks also have bicycle paths within them, most notably the long East Coast Park which runs many kilometres along the southeast coast of the island, as well as Bishan Park. NParks has also built a number of mountain biking trails around the country.

The network is currently incomplete, with many gaps, and with many of the routes ending at barriers such as expressways or water bodies, or requiring the stairs of an overhead pedestrian crossing to be negotiated in places. However, the network is planned to eventually reach more than 300 km in length and to have many of these gaps closed. The recent Land Transport Master Plan 2008 also declares an intention to 'close short gaps between the park connectors and transport nodes to cater to commuters who cycle to the MRT stations or bus interchanges' (LTA, 2008).

Park Connectors vary in design from place to place. Most are configured as dual use paths, to be shared by bicycle users and pedestrians (as well as in-line skaters and others). The heavily-used East Coast Park paths have segregated pathways for pedestrians/joggers

and for cycling/skating. The quality of the bicycle facilities in this network is generally quite good (with some much better than others) but unfortunately the design does not seem to follow a clear set of guidelines nor international best practices for such paths. A number of cyclists have criticised certain elements of the system. However, most criticism has focused on the incompleteness of the network currently.

Two local Town Councils in the east of the island, Pasir Ris and Tampines, have also taken initiatives to create some off-road bicycle ways (with some built in Pasir Ris and others in planning in Tampines). The ones built so far (in Pasir Ris) have significant design problems. Like the Park Connectors, these efforts appear to suffer from the lack of clear local guidelines or expertise on the design of such facilities.

4.4 Bicycles on footways and the Tampines Trial

Footpath cycling is illegal in Singapore (with one exception to be discussed below). Nevertheless, in practice, a large proportion of all bicycle use in Singapore takes place at low speed on footways.

A number of features make footway cycling attractive, especially in outer New Towns. Footpaths are generally quite high in quality, although generally relatively narrow. The pavement surface is smooth and sight-lines are usually good. Singapore's approach to urban design involves efforts to limit access directly onto arterial roads, with the result that there are few driveways and side-street entrances to most main roads, especially in newer areas.

The lack of side access may make footway cycling safer in Singapore than in many other countries, where frequent crossings of motor vehicle ways present an extreme hazard that has been argued to render footpath riding more dangerous than roads. However, there have been no systematic investigations of this hypothesis. The claim that footpaths are safer for cycling than roads is widely assumed here and there has been little or no questioning of it nor, to my knowledge, any research effort to verify or refute it.

As a pragmatic recognition of the reality, the traffic police have long been turning a blind eye to illegal cycling on footways. However, there has been more vigorous effort to try to prevent cycling on overhead pedestrian bridges, through pedestrian underpasses, and across zebra crossings. Ramped overhead pedestrian bridges and underpasses all have prominent 'no riding' signs with warnings of a S$1000 fine. In early 2005, the LTA tried to reinforce this message by installing U-shaped barriers to make cycling on such ramps difficult. However, these were removed in July of that year after a bicycle user struck one of the barriers in the dark and became paralysed (Straits Times, 19 July 2005 'LTA removes all bicycle barriers after mishap' by K. C. Vijayan).

Having a law banning footway cycling but not enforcing it is somewhat unsatisfactory. As the result of a Parliamentary question from Tampines MP Ms Irene Ng to the Minister of Home Affairs, the Traffic Police initiated a cross-ministry initiative (with the LTA and Tampines Town Council) to look into this issue. The result has been a trial of legalizing footway cycling (in Tampines New Town only). The Tampines Footway Cycling Trial began in June 2007 and is currently being evaluated. An announcement of the outcome is imminent at the time of writing.

The philosophy behind the trial is to recognise that most bicycle use is on footways, that enforcement to put a stop to this seems unlikely and would seem unreasonable to many people. It is important to note that the trial is not really of footway cycling as such (people are cycling on footways anyway) but of whether legalising it can help open opportunities (such as education and localised infrastructure) for addressing the various problems (and problem locations) that arise from pavement cycling.

An investigation of the results has shown some success in reducing conflict with pedestrians and improving cyclist behaviour. Despite some strong public hostility to the trial, an opinion survey revealed a surprising degree of support for extending legal footway cycling in Tampines (according to a presentation at a 'Townhall' public meeting on the trial, held in Tampines, 9 June 2008). Whatever the result, various dilemmas

regarding footway cycling will remain and this is likely to be a central controversy over bicycles in Singapore for many years to come.

4.5 Bicycle Parking and end-of-trip facilities

With exception of bicycle parking at Mass Rapid Transit (MRT) stations, provision of bicycle parking in Singapore is scarce and not of high quality. Most of the parking that does exist tends to be of the old-fashioned 'wheel-bender' variety. Despite a lack of a serious 'bicycle pollution' problem, it is commonplace to see signs restricting or forbidding bicycle parking in front of buildings.

Neither bicycle parking nor other end-of-trip facilities, such as showers or lockers, are required by planning and building codes issued by Singapore's planning agency, the Urban Redevelopment Authority (URA).

4.6 Motorized bicycles

Motor-assisted bicycles came under stricter regulation from the beginning of 2005. Petrol powered bicycles were banned. Electric bicycles were required to be certified by the LTA as meeting their new requirements of having no more than 200 Watts of power and of shutting down automatically when the bicycle reaches 25 km/h (Straits Times, 1 Oct. 2004 'Banned petrol-powered bicycles'). The number of electric motor assisted bicycles is apparently rising but they are not yet a significant percentage of the bicycles seen on the streets (as they are in some Chinese cities for example). Singapore law does not require bicycle users to wear helmets. However, since 2005, riders of motor-assisted bicycles have been required to wear a helmet. In addition, riders of motorised bicycles must be at least 16 years of age. Details of these rules are available on the LTA website.

4.7 Bicycles and public transport

As seen above, official policy towards bicycles as urban transport is at its most positive when focused on bicycles as a feeder mode to public transport. As discussed earlier, the

two main public transport operators, SMRT and SBSTransit, both install bicycle parking at most MRT stations and some bus interchanges (some in collaboration with LTA). Although, the quality of this parking is not high, it is quite plentiful. The Land Transport Master Plan 2008 includes a plan for trial improvements to the quality of bicycle parking at MRT stations.

In early 2008 a trial commenced of allowing foldable bicycles onto MRT trains and buses at certain times and under certain conditions. There is now some debate over whether the conditions being imposed are too restrictive. In practice, folding bikes had actually been allowed onto public transport vehicles for some time.

4.8 Bicycle Sharing Attempt

A bicycle sharing scheme, called Town Bike, operated in four neighbourhoods beginning in the year 2000 There were two phases. In the first, from 2000 to May 2003, bicycle were available free of charge to members. This phases was started by outdoor advertising company Capital City Posters (CCP). In return, CCP had free use of advertising panels in the localities served.

In the second phases, the scheme was bought by NTUC Income, a major insurance company which also runs Singapore's largest carsharing company. At first this phase required both membership fees and a usage fee of 50 cents per half hour, in order to encourage judicious use and discourage the bikes to be held for long periods by members. Both phases made use of smart cards to access the bicycles at their ports. In the first phases it was reported that close to 1,000 members had paid a token $10 membership fee for access to 200 bicycles (Straits Times, 19 Aug. 2003 'Income revives bicycle-sharing in four estates').

It is unclear whether the scheme is still operating. The website has not apparently been updated since 2006 and the scheme has not expanded beyond the original four areas, as had been envisaged in 2003. Despite the apparent failure of bicycle sharing to thrive in

Singapore, it is interesting that this was tried, given the recent success of 'second generation' bicycle sharing systems, most notably in Barcelona and Paris.

4.9 Anachronistic laws regarding bicycles

I have not seen a systematic study of this, but it would appear that some legislation regarding bicycles in Singapore may be outdated or inappropriate. There is a need for more investigation of this issue.

An example is a requirement for bicycles to ride as close as 'possible' to the left side of the road. This is unfortunately poor advice. 'As close as possible' to the side of the road is frequently not the safest or wisest location, depending on traffic conditions. This rule, if observed, would encourage kerb hugging and swerving in and out around obstacles, such as parked cars, and in and out of bus bays. It may also encourage motorists to be hostile to bicycle users who claim a little more space in situations where safety requires it.

4.10 Comment on institutions associated with bicycle policy

A number of government agencies have a role in bicycle policy and practice. None has taken the lead on bicycles as transport however. In particular, the key agency for urban transport, the Land Transport Authority (LTA), has been slow to take much interest in bicycles as a mode of transport. The LTA is a statutory board under the Ministry of Transport. Its approach in practice appears to mirror the attitudes discussed in Section 4.1. However, the slightly more positive treatment of bicycles in the Land Transport Master Plan 2008 may be a sign that the LTA may be beginning to take bicycles a little more seriously.

We have already seen that several other agencies have also taken bicycle-related initiatives. The most prominent are NParks, the Traffic Police, and certain Town Councils. In addition, the main urban planning agency, the Urban Redevelopment Authority (URA), plays a role, somewhat behind the scenes in shaping the urban fabric

into which bicycles may (or may not) fit. Similarly for the Housing Development Board (HDB) which is responsive for planning and managing so-called 'public housing', the state managed housing estates that house around 80 percent of the population. To some extent, the Ministry for Community Development Youth and Sports (MCYS) also has some role, through overseeing the National Sports Council. Cycling as a sport (or sports) comes under its purview.

Despite the relative lack of enthusiasm for bicycles as transport at high levels in MOT and the LTA, nevertheless bicycle policy would probably benefit from a clearer leadership role from the LTA. Currently, there is no specific bicycle unit within the LTA, nor any specific person designated as having responsibility for bicycle policy. The other agencies mentioned above would benefit greatly if they could turn to the LTA (where the transport engineering expertise is) for advice and clear guidelines on policy and design questions. Currently no such guidelines apparently exist. The author of this report has recently argued (on the 'Cycling in Singapore' blog and in a presentation on 8 June 2008 at Tampines Town Council, which was reported in the press) that Singapore needs a dedicated agency to coordinate bicycle transport policy and that this entity would be best framed as a bicycle unit within the Land Transport Authority.

5 Civil Society and Bicycles

One factor in the relative neglect of bicycles as urban transport in Singapore may be the lack of strong bicycle lobbying groups. For many years, the only organisation championing cycling and cyclists was the Singapore Amateur Cycling Association (SACA) which is affiliated with the National Sports Council and has as its primary mandate the development of sports cycling. Nevertheless, it has done much good work over the years providing cycling education in schools and beyond. It has also played a role in representing the cycling community when government agencies or others have needed a civil society body to engage. However, SACA's primary mandate focused on sport has discouraged it from taking on any vigorous lobbying role on behalf of practical transport cycling or even recreational cycling.

In 2004, a society known as the Safe Cycling Task Force (SCTF) emerged with a mission to promote improvements to the safety of cyclists in Singapore. An early burst of activity subsided quickly. In 2006 the group was revived. As of now it appears to still be active but without great momentum. It remains to be seen if SCTF can develop into an effective bicycle transport advocacy organisation. SCTF had a recent success in persuading the LTA to erect bicycle awareness signs at locations popular with recreational on-road cyclists.

There are several online outlets and communities that include elements of bicycle advocacy or at least discussion of policy. 'Togoparts' is a large internet community devoted to cycling in Singapore, especially for serious recreational cyclists. It does host advocacy and organising from time to time. The 'Cycling in Singapore' blog provides news and views with a focus on bicycles as transport (the author is one of the writers). A number of other blogs focus on bicycles and bicycle policy regularly, including recently, one of Singapore's most popular blogs, 'Mr Brown'.

In addition, there are numerous clubs, both formal and informal, large and small, for every kind of sporting and recreational bicycle activity.

6 Conclusion: Untapped Bicycle Policy Opportunities

We have seen that there has been relatively little official encouragement of bicycle use in Singapore. Nevertheless, practical bicycle use for transport purposes in Singapore is not negligible and may even be increasing after a long decline.

There appears to be a core niche role for bicycles in Singapore's urban fabric. Most practical cycling appears to be at low speed, for short trips (well under 4 km), using cheap bicycles, but by quite a wide cross section of society. Only about one third of Singapore's households own a car and in the state-managed housing estates (built and run by the Housing Development Board, HDB) that house about 80% of Singapore's

residents, the rates of car ownership are a little lower still. HDB estates are also compact and densely built up. In this context, a large proportion of non-work trips (and a good proportion even of work trips) must be short and within easy cycling distance, even at a very gentle pace. For someone without a car or motorcycle, a bicycle is often the fastest and most convenient mode for trips of between 1 and 4 kilometres. A significant number of people in the flatter parts of Singapore have apparently discovered this bicycle niche. However, official transport policy has tended to focus on the mass movement of people during the busiest times and over longer distances. It has therefore tended to miss the potential importance of bicycles and their potential strength in serving this niche of trips. The exception is the recent increase in effort to exploit bicycles as a feeder-mode to public transport.

The officially-stated belief is that a network of routes for bicycles cannot be developed because of land scarcity and because bicycles must not be allowed to interfere with the central priority of providing for mass movement in space-efficient public transport. However, it is not clear if there has ever been any systematic investigation of the truth of this belief or the assumptions behind it. Such claims have been made many times but, to my knowledge, never with any clear evidence to justify them. This view will certainly strike international bicycle infrastructure experts as odd, since the space-efficiency of providing for bicycle transport, relative to provision for cars, is usually seen as a positive.

Bicycles, with their high space-efficiency relative to cars, could be seen as potentially most appropriate in serving short trips in a space-constrained context like Singapore's. Furthermore, bicycles are usually seen as serving a set of trips that complement public transport and which are not easily served by buses or trains. Arguably, space constraints provide arguments for, not against, stronger efforts to include bicycles in the transport network. Despite Singapore's anti-car reputation, the lion's share of road space is devoted to high-speed mixed traffic dominate by private cars. It is therefore plausible that a safer network for cycling could be provided in Singapore, through space reallocation, speed management, and shared-space techniques, without expanding road rights-of-way and with either no change or even a net gain to the overall carrying capacity of each corridor.

Urban transport policy in Singapore has generally not taken bicycles very seriously. However, despite this neglect, cycling has not died out. In fact, it appears now to be growing in importance again. However, a lack of appropriate policy settings makes such an increase problematic for everyone, since the system as it is currently designed cannot easily accommodate increasing numbers of bicycles. There would appear to be a strong case for the land transport authorities in Singapore to take the potential role of bicycles more seriously, in order to transport them from a problem into an opportunity.

7 Acknowledgements

Thanks to research assistant, Ms Ngaim Shin Shin, for tracking down many of the documents cited here and for taking some of the photographs included in Appendix 3.

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APPENDIX 1. Data on Mode Shares of Singapore Work Trips

Table A1 Usual mode of transport to work for resident workers 2005

	Workers	Workers %
Total	1647292	100.0%
walk only	125294	7.6%
bus only	360571	21.9%
private bus only	88833	5.4%
MRT only	165914	10.1%
Car only	377759	22.9%
taxi only	22368	1.4%
lorry/pickup only	42921	2.6%
motorcycle/scooter only	75660	4.6%
others only	25921	1.6%
MRT + bus	248072	15.1%
MRT + car	10699	0.6%
other combinations of 2 or more modes	103281	6.3%

Source: Department of Statistics 2005

Table A2 Usual mode of transport to work for resident workers, 2000

	Workers	Workers %
Total	1482579	100.0%
no transport required (walk or work at home)	90298	6.1%
public bus only	370062	25.0%
Private bus only	98784	6.7%
MRT only	127838	8.6%
Car only	351553	23.7%
taxi only	18412	1.2%

lorry/pickup only	31689	2.1%
motorcycle/scooter only	70865	4.8%
others only	17796	1.2%
MRT + bus	205869	13.9%
MRT + car	6583	0.4%
other combinations of 2 or more modes	92830	6.3%

Source: Department of Statistics, Census 2000, Statistical Release 4)

Table A3. Modal split for home-based-work and home-based-school from the LTA's In HIS 2004

Main mode	*Home based work*	*Home based school*
Car/van	32.0%	15.0%
Motorcycle	6.2%	0.9%
Bus	29.2%	47.2%
MRT/LRT	20.4%	10.6%
Taxi	7.3%	1.7%
Walk only	3.8%	24.0%
Cycle only	1.1%	0.6%

Source: George Sun, Deputy Director, Research & Statistics, Land Transport Authority, Singapore.

APPENDIX 2: Bicycle issues as discussed in the Budget Debate in Parliament, 6 March 2008

Hansard (Singapore). Parliament No: 11, Session No: 1, Volume No: 84, Sitting No: 12, Sitting Date: 2008-03-06, Section Name: BUDGET

ESTIMATES OF EXPENDITURE FOR THE FINANCIAL YEAR
1ST APRIL, 2008 TO 31ST MARCH, 2009 (Paper Cmd. 2 of 2008)
Order read for consideration in Committee of Supply [7th Allotted Day].

...

Ms Irene Ng Phek Hoong (Tampines):

Sir, I would like to declare that I am the Patron of the Singapore Amateur Cycling Association.

More people are cycling for transport and for leisure. This is to be encouraged. Cycling ensures a healthier population, reduces pollution and provides for a more affordable and sustainable transport system. It also provides a cheaper and convenient travel option for residents to reach key nodes within their neighbourhood, such as the markets and schools.

LTA is the leading land transport policy agency, but there is a sense that it has been reluctant to provide leadership in developing bike-friendly infrastructure and policies, or to take bicycles seriously in general. Its moves towards facilitating the use of bicycles have been tentative and piecemeal at best. The LTA should put in place a more coherent and integrated policy towards bicycles as part of the urban transport system, instead of ad-hoc measures and trials. I would urge the LTA to commission a study to examine how busy and congested cities, such as Paris, Chicago and Paris, integrate bicycles seamlessly into their transport system.

While LTA recognises that cycling is a transport option, it does not seem to have a clear stand on it. Does it encourage the use of bicycles or does it merely tolerate it? Can the Minister state clearly his position? It will make a significant difference in policy as well as on public attitudes towards cyclists. For instance, Norway aims to raise bicycle traffic to at least 8% of all travel by 2015, double its current level, while Sweden hopes to move from 12% to 16% by 2010. Paris has put thousands of low-cost rental bikes throughout the city to cut traffic and reduce pollution. Copenhagen has doubled its spending on biking infrastructure over three years, and Denmark has also increased spending on bike lanes on roads. Just this January, the UK government announced that it will invest 140 million pounds over the next three years to boost cycling nationally. The

new funds will allow half a million school children to take up cycling training, built 250 "safe Links to School", connecting around 500 more schools to the National Cycle Network, and create 10 Cycling Demonstration Towns in England. In Chicago, its Mayor cycles to work, setting the example for the city, which released an ambitious new bike plan to make all of Chicago's streets safe and convenient for cycling. The Chicago Transit Authority's network of buses and trains also accommodates bicycles.

...

The Minister of State for Transport (Mrs Lim Hwee Hua): (in reply):

Sir, let me now turn to cycling.

We recognise that cycling provides an additional, if not alternative, mode of transport, especially for intra-town travel and to key transport nodes, like the MRT stations and the bus interchanges.

To promote greater use of public transport, LTA will be implementing several measures to facilitate cycling. Better bicycle parking facilities at the MRT stations and bus interchanges in housing estates will be provided. The bicycle parking facilities will be sheltered and more optimally designed for supporting and securing the bicycles. A one-year pilot will be carried out next year at the MRT stations cum bus interchanges at Pasir Ris, Tampines and Yishun. This pilot will allow LTA to gather feedback so as to better understand the usage patterns and needs of the cyclists before extending the facilities to all the other MRT stations.

LTA, together with the public transport operators, will also launch a six-month trial from mid-March 2008 to allow cyclists to carry their foldable bikes on board trains and buses.

However, we have to recognise that given our land constraints, it is not feasible to provide a comprehensive set of dedicated cycling tracks or cycle lanes island-wide, which is what Mr Teo Ser Luck has suggested. We have to ask ourselves if this is the best way to make full use of our very limited road space. The issue is not whether cyclists have a place in our public transport system, but how do we allocate space amongst competing users that will best make use of our very limited land.

Ms Ng would know that in May 2007, the Traffic Police and LTA, together with the Grassroots Organisations at Tampines, started a one-year trial to allow cycling on pedestrian footways in Tampines. The outcome of the trial and the feedback gathered will also help us to determine how

best to meet the needs of both cyclists and pedestrians within our land constraints. This would include addressing the enforcement issues and infrastructure needs.

The LTA will work with other agencies to leverage on NParks' nation-wide Park Connectors Network to enable cyclists to get to public transport interchanges more easily. Where feasible, new paths or expansion of existing walkways will be undertaken to achieve that.

As for Ms Irene Ng's suggestion to look into developments in other cities, yes, certainly LTA will continue to study their experiences. However, it is important, Sir, to remember that we would need to tailor the experience of overseas cities to our local context.

In facilitating cycling, safety is always a priority, both for the cyclists as well as for the pedestrians. Following a pilot in Changi, LTA will, from March 2008, install appropriate signs to alert motorists of the presence of cyclists along frequently used recreational cycling routes such as those in the West Coast and the Thomson areas. Apart from this initiative, the Traffic Police will also continue to conduct annual road safety campaigns, talks and exhibitions on how to use our roads safely.

APPENDIX 3. Photographs

Photo by Ngiam Shin Shin

A Park Connector. Photo by Ngiam Shin Shin

One-way streets make wrong-way cycling very tempting. Photo by Paul Barter

Bicycle parking at Al-Junied MRT station. Photo by Paul Barter.

Common road designs such as this have ignored the presence of bicycle users on the roads.

Photo by Paul Barter.