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Attitudes towards active mobility in Singapore: A qualitative study

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ABSTRACT

Active modes of transport (i.e. walking and cycling) are being encouraged in many countries. Singapore is advocating strong efforts to attract more users to travel by walking and cycling and thereby achieve ‘car-lite’ travel. To attract users towards a certain transport alternative, it is important to understand their current perceptions and attitudes towards it and accordingly develop a suitable transport network and related schemes. This paper employs two qualitative techniques, focus group sessions and one-to-one interviews, to gain a deeper understanding of adults and elders perceived advantages, disadvantages, concerns and opportunities to promote walking and cycling in Singapore. It was found that users are comfortable with the walking infrastructure, but they expressed that more can be done to improve the cycling infrastructure including provision of wider paths and parking facilities. Overall, more positive attitudes were registered towards cycling than walking. Work incentives such as flexible working hours are preferred by users to promote walking and cycling. Education to all road users (pedestrians, cyclists, and motorists) was mentioned as a key initiative to increase safety and effective sharing of facilities.

1. Introduction

Countries are rapidly evolving and adapting to today’s globalised and competitive world. This is most prevalent in the field of transport. An area where authorities and researchers are advocating substantial efforts is to develop sustainable and efficient transport networks. Around 1960s, private car usage was in vogue. Yet, the negative aspects of motorisation rapidly became hard to tolerate. The number of traffic accidents increased, air and noise pollution intensified, and people had more sedentary lifestyles (Tolley, 1990). In response, mass transport and active modes of transport, mostly walking and cycling, began to be promoted. Active mobility helped to reduce the negative aspects on motorisation and encouraged people to undertake some physical activity (Pucher and Buehler, 2010; Song et al., 2013).

Singapore is a small and densely-populated country – 716 km² land area and 5.47 million habitants (SINGSTATS, 2014; Tham, 2014) – which is focused on developing an eco-friendly and inclusive transport system using the limited land space available efficiently. A world class public transport (mass rapid transit (MRT) system and feeder buses) has been available since 1991 for inhabitants to travel around the island (LTA, 2015b). The mode share of public transport is relatively high, with a 44% daily usage on average, and 63% during peak periods (CLC and ULI, 2014; Meng et al., 2014). In addition, different types of infrastructures and facilities are provided for pedestrians and cyclists.

Walking is currently used for 22% of daily trips (LTA, 2011) and cycling only between 1% to 2% as a principal mode of transport (Cheong, 2016b). Further improvements on the active-mobility network are planned as part of the national agenda to foster “car-lite” travel among inhabitants.

Travelling by active modes of transport (i.e. walking and cycling) is affected by a series of factors, including the built environment and users’ perceptions of these modes (Easton and Ferrari, 2015; Koh and Wong, 2013). Provisions for walking and cycling, locally and elsewhere, are most of the times focused on increasing safety and convenience for the users. In addition, several policies exist to encourage users to make use of these modes for short trips or for constituent stage (s) of longer trips. However, in contrast with provisions for motorised transport, especially public transport, provisions and policies for active modes are rarely set to be “market-oriented” and able to compete with motorised modes of transport. It is understood that public transport usage entails the usage of active modes for the first/last mile (FLM) stages of trips from stations to home, thus providing users with the benefits derived from walking and cycling. It is worth mentioning that with efforts to enhance public transport service, FLM travel distances are getting shorter and shorter. To determine strengths and weaknesses of the active-mobility transport network, it is essential to understand travel behaviour, attitudes, and needs of pedestrians and cyclists for prevailing conditions. Such knowledge can help policymakers and

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authorities to evaluate the level-of-service of current active-mobility network. In addition, it can be used to: (1) estimate the importance of service improvement from users' perception; and (2) develop transport schemes, infrastructures, and policies, aimed to increase the "market share", i.e. number of pedestrians and cyclists.

Most research studies agree that environmental characteristics of the neighbourhoods play a big role in "shaping" the travel behaviour of pedestrians and cyclists (Cervero et al., 2009; Kemperman and Timmermans, 2014; Lewicka, 2005). In addition, some affirm that specific programmes and policies can help to motivate changes in transport usage, especially if these are targeted at specific groups and if users perceive that the provided infrastructure meets the required level-of-service (Dell'Olio et al., 2014; Tolley, 1990; Zuniga, 2012). Research has also highlighted that engineering approaches, such as infrastructure provision, needs to be coupled with advertising and promotion to maximise their benefit. With these "soft" approaches, the goal of an active commuting culture and a lively society can be reached much faster (Ibeas et al., 2011; Methorst et al., 2010; Pucher and Buehler, 2008). Thus, a deeper understanding of current and potential users' attitudes and perceptions towards active mobility can help researchers and authorities to develop suitable transport schemes and attractive infrastructures for active mobility (Bordagaray et al., 2015; Hume et al., 2009; Ibeas et al., 2011; Nair, 2016). However, measurements of attitudes and perceptions have been shown to be a challenging task (Alton et al., 2007; Beirão and Sarsfield Cabral, 2007). For example, features such as perception of safety and satisfaction are difficult to quantify and these vary a lot from user to user (Cervero et al., 2009; Mfinanga, 2014).

This paper presents an alternative to measure pedestrians' and cyclists' (adults and elders) perception of built environment and policies that are focussed on active mobility. It addresses factors that encourage/limit active mobility; perception of the walking and cycling infrastructure; and schemes to improve the overall active mobility experience. Information is collected corresponding to a qualitative study involving focus group sessions and one-to-one in-depth interviews, conducted among adults and elders in Singapore. Findings are of immediate application to several projects being developed to foster car-lite travel in Singapore. Following this introduction on the ground situation, some key issues and gaps found in the literature are highlighted. Then, the methodology for developing the qualitative study is described. Afterwards, results are presented followed by discussion of the findings. Finally, conclusions, including transport policy recommendations, are presented in the last section.

2. The local (Singapore) context

With Singapore's small and densely-populated land area, efforts to reduce private vehicle usage while at the same time meeting the transport requirements of the population is a challenging task (URA, 2011). Singapore adopted Certificate of Entitlement (COE – around 50,000 SGD (approx. 35,900 USD) per vehicle per 10 years (LTA, 2017a)) and the Electronic Road Pricing (ERP) systems to reduce private vehicle ownership and usage. The COE is related to vehicle registration for a period of 10 years, with the COE price being based on a bidding system that is controlled by the authorities to limit the overall number of vehicles able to be registered in any one period. ERP on the other hand is charged when vehicles enter a designated area. ERP cost varies by location and time of the day to help to distribute traffic and relieve road congestion (Meng et al., 2014). A principal effect of these two schemes is that many Singapore inhabitants are not able to access a private car. Whereas, pedestrians and cyclists are also drivers in many countries, this is not the case of Singapore where there are around 8 people per car (LTA, 2015b).

Singapore operates a world class public transport to meet its transport requirements. The MRT currently has 178 km rail and 142 stations island wide (LTA, 2016), in addition to a (mostly feeder) bus

network serving the shorter-range travel between transport nodes and the residences. The public transport system is run on a distance-based fare from 0.79 SGD (0.57 USD approx.) to 2.67 SGD (1.93 USD approx.), i.e. transport fare is determined on the total distance travelled regardless the number of transferred stations or modes (MOT, 2012). For this reason, sometimes a short bus ride after a long MRT ride can even be free. The efficiency and accessibility of the public transport system explain its high mode share (Meng et al., 2014; CLC and ULI, 2014).

Moreover, pedestrian infrastructure development has received strong attention since the early days of Singapore nation-building (LTA, 2011). Pathways are provided along most roadways. Pedestrian crossings and overhead bridges are also common infrastructures. In addition, shelters are provided within a radius of 400metres from MRT stations and at areas with high levels of pedestrian traffic, such as schools and health facilities. As for cycling, the construction of the Park Connector Network (PCN) in 1992, as means of providing recreational off-road cycling facilities, helped to "revive" cycling (when cycling mode share was close to zero) (CLC and ULI, 2015; Koh and Wong, 2012). Today, cycling takes up between 1% to 2% as a principal mode of transport (Cheong, 2016a,b). However, authorities' efforts to further increase cycling mode share are tireless. To date, bicycle parking facilities, 300 km PNC and similar length off-road intra-town cycling paths, and cycling transport infrastructure modifications for 11 towns (called cycling towns) to ensure harmonious co-existence of pedestrians and cyclists are being introduced. In addition, cyclists are allowed to carry foldable bicycles onto the MRT during off-peak periods (Ibrahim, 2003; Wee, 2009).

In Singapore, most traffic signals are oriented to pedestrians and/or motorised users. Cycling traffic signals are most commonly found at demarcated cycling paths and cycling towns. Cycling signals and signs encourage cyclists to keep to the correct paths and to care for other users, with messages such as: "watch out for pedestrians", "dismount and push", etc. To provide for vulnerable road users, special zones i.e. School Zones (SchZ) and Silver Zones (SilZ), have been introduced in areas of high number of children and elders (LTA, 2013, 2014b). These special zones entail the application of several signs and road features and markings to: (1) induce motorists to adopt more prudent driving behaviour; and (2) encourage active mode users, especially children and elders, to handle themselves with care around these zones and on the roads in general.

Regardless the transport provisions, congestions and crowding at MRT trains and buses frequently occur, particularly during peak periods (7:00–9:00 and 17:30–19:30 h). To ameliorate this situation, the Land Transport Authority (LTA) has introduced the "Travel Smart" Scheme in 2014. This scheme encourages companies to create flexi-travel environments (LTA, 2014a). Employees of companies that have pledged to this scheme and companies themselves can obtain rewards based on a point-based system, with more points assigned to trips made during off-peak periods and fewer points to trips during peak period. Preliminary results have shown that around 12% of the employees modified their travel behaviour to travel during off-peak periods (LTA, 2014a). To date, not many companies participate in the Travel Smart scheme, and in general the programme is more focused on trips by public transport. Points are assigned per km travelled (by public transport, walking or cycling), which makes the scheme much more attractive to public transport users than to pedestrians or cyclists who only travel a few km each trip.

The main campaign to promote walking and cycling in Singapore is the "walk cycle ride". This programme encourages walking and cycling as FLM travel modes and it primarily promotes the usage of public transport (LTA, 2017b). Interestingly, while several recommendations for safety and respectful behaviour on roads have been applied for pedestrians, and especially cyclists, not many schemes or campaigns are implemented to promote walking or cycling in Singapore. Herein, authorities and stakeholders could measure feasibility of implementing

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