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Urban growth, and transportation in Kuala Lumpur: Can cycling be incorporated into Kuala Lumpur's transportation system?

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ABSTRACT

In recent years, cycling has emerged as an increasingly important consideration for national and local authorities around the world, primarily because of the public's growing awareness about its health benefits and greenhouse emissions reduction. In the last decade, transport related policies in Malaysia and particularly in Kuala Lumpur have been seeking to support cycling as a travel mode, yet, cycling levels in Kuala Lumpur remain low and evidence about interventions are mixed. Data from an exploratory case study is used here to understand the transportation system planning and urban growth of Kuala Lumpur and their impact on cycling uptake, examining current status of cycling facilities in KL, evaluating effectiveness of the cycling interventions, and the attitudes of participants of cycling events towards using bicycle. Using a combination of evidences from existing literature, observation referring to the quality and use of the first bicycle pathway in Kuala Lumpur, interviews with city officials and a survey of people's attitudes towards using bicycle, this exploratory research highlights the challenges that a car dependent city faces in its urban transformation and in promoting cycling, as well as the residents' motivations and deterrents to use bicycle for commuting.

1. Introduction

Cycling is being promoted as a travel mode with the capacity to increase sustainable transportation, mitigate environmental problems and support healthier lifestyles. Studies repeatedly showed that land use, presence of reliable public transportation; existing infrastructure, personal and traffic safety, weather condition and socio-demographic factors have an impact on the willingness to cycle (Böcker et al., 2013; Buehler and Pucher, 2017; Handy et al., 2010; Heinen et al., 2010; Heesch et al., 2014; Pucher and Buehler, 2016; Nielsen et al., 2013; Pucher et al., 2010). However, most of these studies have been conducted in cycling-friendly, western and developed countries like the Netherlands, Denmark and Germany or in other western and developed countries that at least have an adequate standard of cycling infrastructure or they are improving fast (e.g. UK, Australia or US). With the exception of increasing number of bicycling related research in China (as described by Yang et al., 2015) that nonetheless has a clear focus in the distinctive areas of e-bikes (Cherry et al., 2016; Fishman and Cherry, 2016) and bike sharing (Yang and Long, 2016; Zhang et al., 2015), there is very limited literature discussing the opportunities and challenges for embracing cycling in Asia and in particular Southeast Asia, where rate of cycling is low and there is almost no cycling

infrastructure in their cities.

Moreover, although the impact of weather condition on cycling is well documented, they have covered countries with mainly moderate climates or with relatively cold and snowy winters that does not include Malaysia with its tropical climate (Böcker et al., 2013; Flynn et al., 2012; Helbich et al., 2014; Koetse and Rietveld, 2009; Saneinejad et al., 2012; Wadud, 2014). There is only a single paper (Meng et al., 2016) that discusses systematically the impact that tropical weather conditions and weather forecast have on cycling travel behavior in Singapore; however, that was a study looking at established cyclists.

Although cycling is not a common mode of travel in Kuala Lumpur yet, there is some moderate leisure cycling activity in KL, and in theory a vast potential for cycling uptake (Oke et al., 2015). However, it is not the only reason that makes Kuala Lumpur, Malaysia's capital city, an interesting region to study. Since 2009, the problems associated with the growth in car ownership, traffic, reducing car emissions and increasing the quality of life, is the subject of continual debate in national media across Malaysia (Bunnel et al., 2002).

In 2009, during the United Nations Climate Change Conference in Copenhagen, the Malaysian government along with many around the world, made a commitment to reduce by as much as 40% its greenhouse gases by 2020. In recent years, a number of policy initiatives have been

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launched to promote sustainable mobility, because of its economic benefits. Recently, particular attention paid to cycling because of some cycling advocacy groups and its well-documented health and environmental benefits when replacing short motorized trips (de Nazelle et al., 2011; Buekers et al., 2015). Mäkinen et al. (2015) argues that in the short term, the implementation and effectiveness of transport policies depend on urban form and, in the longer term, urban planning is influencing transport demands and its greenhouse gas emissions. Simultaneously, transport policies affect urban form as transport infrastructure investments change the relative accessibility of locations in urban areas, as they changed the accessibility in Kuala Lumpur during the past decades.

In this paper we review the urban growth of Kuala Lumpur and the development of its transportation system in relation to the local government's growing commitment to promote commuting cycling as well as people's perceptions of cycling. It can add to existing literature about cycling, as KL is a car-oriented city with no established cycling facilities and/or culture and it is interesting to see whether Malaysians will choose cycling as a means of travel. Specifically, this paper presents in its first part a desk-based review looking into Kuala Lumpur's urban growth and transportation system. Attention then turns to policies and the programs/interventions targeted at promoting cycling. Through an exploratory case study research including: interviews with city officials, observations of the first cycling pathway in Kuala Lumpur and also a survey of resident who are participating cycling events, this paper highlights the tensions and conflicts of a city transformation, and identifies some of the factors that could hinder and others that could promote cycling to be a legitimate travel option in the future development of the city. The findings of this study contribute to a deeper insight of challenges in a city with very low rate of cycling to stimulate commuting cycling culture from people's perspective as well local authorities

2. Case study: Greater Kuala Lumpur

2.1. Development pattern

During the past three decades, Malaysia has experienced considerable economic and social transformations that have triggered massive and rapid urbanization; 75% of the population lives in urban areas (World Bank, 2015; Teriman et al., 2009).

Since the early 1990s KL has undergone a reorientation process from being a federal capital to becoming one of South-East Asia's most prominent, modern and sophisticated cities (Bunnell et al., 2002). Its current identity however is dictated not only by economic growth and significant social and physical transformations but also by some of the highest levels of urbanization and motorization. These changes have led to the sprawl of KL's population towards the southern part of KL, leaving most parts of the city center for businesses. The city center has witnessed therefore an unprecedented reduction in its population due to out-migration to the more affordable residential districts (Barter, 2004; Shuid, 2004). Literature showed urban density, distribution of centers of activity, and the degree of mixed land-use, influence the choice of transport modes (Cervero, 2002; McIntosh et al., 2014). The urban growth of KL has been based substantially on planned townships that have been developed in the British post-war new towns model style. As such the neighborhoods are car-oriented in their layout and their centers of activity rarely coincide with public transport nodes. In 2010, KL had one of the lowest densities among East Asia capital cities that increased commuting distance and support driving private cars (Kamba et al., 2007; Morikawa et al., 2003; Aditjandra et al., 2013). This trend provides evidence to Teriman et al. (2009) suggestion that compact urbanization and transit-oriented development has been less successful in Malaysian cities when compared to other cities in Asia.

2.2. Car ownership, streets' network and transportation system

Economic growth has been accompanied by a rapid rise in private car ownership (361 cars per 1000 people in 2010) according to Mat Yazid et al. (2011). In contrast, the share of public transport in cities has continuously declined from 34% in 1985 to 20% in 1997 and is now closer to 10–12% (Kuala Lumpur Structure Plan, 2017). This is partly influenced by a national strategy, promoting the two domestic automobile manufacturing industries – established in 1981 and 1993- and the idea that owning a car gives freedom, prestige and demonstrates a superior socio-economic status (Lim and Lee, 2012; Mohd Shariff, 2012). The increasing domination of the car in Malaysia is responsible for the significantly high Malaysian levels of carbon dioxide emissions per capita that according to United Nations Development Program, in 2007, were 114% higher than the average for countries in East Asia and Pacific and 88% higher than the global average for all middle-income countries (Senbil et al., 2009). However, there were no major government policies focusing on the promotion of active and clean transportation within the country until recently (Kari and Rasiah, 2008). Furthermore, the lack of interest to control car usage and inability to widen existing arterial roads, especially in Kuala Lumpur, led to increase demands for the existing infrastructure, and construction of more highways, which is an act ultimately promoting higher speeds and bigger volumes of cars (Almselati et al., 2011). Fig. 1 provides modal split figures for the current traffic versus the targeted modal split for year 2020 for a scenario where Kuala Lumpur will be a sustainable city. There is official statistical available for cycling and walking trips.

The preoccupation with the car as a precondition of modernity has generally resulted in the omission of walking and cycling in urban planning (Jones, 2012; Kamba et al., 2007). Transport solutions to respond to this problem led to large-scale road projects, and to the construction of expressways that were promoting high-speed and high-capacity vehicle flow. The Klang Valley stands out among Asian urban areas for having the highest level of expressway length per person (68 m per 1000 people), much higher than any other city in Southeast Asia, and similar to many Canadian and western European cities (Ong et al., 2012). However, the rail network is only 15 km per 1 million populations while most large global cities have over 40 km per one million (Kuala Lumpur Structure Plan, 2017; Lim and Lee, 2012). This extra road capacity combined with the subsidized price of energy that increased the affordability of conventional fuel made private cars the main travel mode in Malaysia (Indati and Bekhet, 2014). Figs. 2 and 3 provide transport network maps for Klang Valley and KL respectively.

Mass transit systems are often seen as playing a key role in helping a city to move away from car-oriented trends, and motivate people to walk and cycle at least for short trips. The Malaysian government provides a public transportation system including buses and a Light Rapid Transit system, which is modern and covers over 200 km of

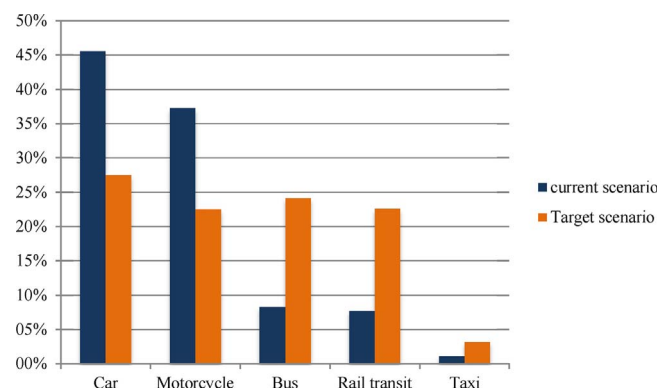


Fig. 1. Current modal split versus targeted modal split for 2020 (adapted by Chiu Chuen et al., 2014).

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