

## **Promoting Utility Cycling: Prospects and Challenges from Penang Island, Malaysia**

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### **ABSTRACT**

Penang is arguably one of the most developed and urbanized areas in Malaysia. Like most cities typical of Southeast Asia, Penang experiences significant traffic congestion regularly. When the current government was established in Penang in 2008, it aimed to transform the region into a sustainable state. Among the efforts to achieve this goal was a drive towards cycling as a viable mode of transport, which entailed building cycling infrastructure, staging cycling events, and establishing a bike-share system. Despite these consistent efforts by the state government, utility cycling, or commuting cycling, is still a rare sight in Penang. This paper, therefore, attempts to assess the current situation surrounding utility cycling in Penang Island by highlighting the key factors that either enable or discourage utility cycling there. Data were collected from 25 personal interviews with cyclists and other cycling stakeholders. The findings from this data highlight key issues that will help the state government create an action-oriented path toward better utility cycling, thus fulfilling the Sustainable Development Goals (SDGs).

*Keywords:* Cycling, cycling infrastructure, cycling policy, green transport, sustainable transport policy, utility cycling

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### **INTRODUCTION**

Utility cycling is described, in contrast to recreational cycling, as the use of a bicycle as a mode of transport for practical purposes, such as commuting to and from work, education, shopping, or visiting family and friends (Adam et al., 2020). However, cycling has been proven to have many benefits regardless of its purpose (i.e.,

recreational or utility). Indeed, research consistently demonstrates that cycling, in general, is good for maintaining mental and physical health, the environment, and the economy (Pucher & Buehler, 2012; Shaheen et al., 2013), while utility cycling, in particular, can potentially overcome the problems associated with automobiles, such as traffic congestion, parking-space requirements, and road construction costs (Kumar et al., 2016). Additionally, Willis et al. (2013) highlighted that people who cycle to work are less stressed and feel more relaxed, while Walker (2017, p. xiv) persuasively argued that cycling can lead to a “healthier, safer, equal, happier and prosperous world.” Consistent with other studies, these findings also exemplify that “cycling is the happiest mode of transportation” (Zhu & Fan, 2018, p. 360), and more recently, Te Brömmelstroet et al. (2017) argued that cycling can “develop a sense of place or a sense of society.” In other words, cycling can connect people and society through interactions and negotiations on the roads.

Despite the benefits of cycling, the number of people who opt to cycle to work is small, especially in low-cycling-context countries (Bakker et al., 2016). For instance, many cities in Southeast Asia’s developing countries are still struggling to establish utility cycling as one of their mainstream modes of transport. Several studies on Southeast Asian countries, particularly Singapore, Thailand, the Philippines, and Malaysia, have explored cycling issues, such as the bicycle’s potential as a mobility option

(Bakker et al., 2016, 2017; Jalalkamali & Ghraie, 2012; Kupferschmid et al., 2017), cycling infrastructures and facilities (Castro & Josef, 2020; López & Wong, 2017a; Terh & Cao, 2018), the development of cycling policy (Kumar et al., 2016), and the public’s attitudes and perceptions toward utility cycling (Hashim et al., 2017; Lee & Pojani, 2019; López & Wong, 2017b).

Although many studies examine cycling across communities worldwide, studies specifically examining utility cycling in Southeast Asia remain few and far between. Indeed, there is currently inadequate research into the prospects of and barriers to utility cycling. Furthermore, few studies have been systematically conducted to assess the current situation using qualitative data and information from various stakeholders, especially in Malaysia. Inspired by these knowledge gaps, this paper reports on findings from semi-structured interviews with stakeholders involved in cycling activities on Penang Island, Malaysia. More specifically, this paper aims to highlight the current challenges against and prospects for further encouraging utility cycling on Penang Island.

The paper is organized as follows. The next section describes the study context. The following section outlines which stakeholders participated in the semi-structured interviews and the summary of data collection and analysis methods employed to answer the research objectives. It is then followed by the findings, after which the paper concludes with a discussion of the key lessons learned, limitations of

the study, and an outline of some practical recommendations to assist the local authority in informing programs that promote utility cycling.

### Study Context

Penang is one of thirteen states in Malaysia and is located on the northwest coast of Peninsular Malaysia. It is divided into two parts: Penang Island and *Seberang Perai* (Penang mainland). Both the island and the mainland are connected by two bridges, as well as by ferry services. The capital city, Georgetown, is located on the island's north side and is well known as one of the UNESCO World Heritage sites. Penang Island covers an area of 293km<sup>2</sup> and has a population of 800,000 people (Institute for Transportation and Development Policy [ITDP], 2019). It was chosen as a study area because, like most urban cities in Southeast Asia, it suffers considerable traffic congestion regularly. Despite this, through some of its policies, the state government pledged to make Penang livable and sustainable by 2030. In addition, the local authority, the City Council of Penang Island, has been actively improving the cycling infrastructure there.

Historically, the bicycle has been seen as transportation in Penang. However, over the years, increasingly few Penang residents have viewed it as a mainstream form of transport. There is no comprehensive data on bicycle use for utility there, but it is believed that the modal share for utility cycling in Penang stands at less than 1% (ITDP, 2019). It is not surprising given that Malaysia is

ranked second among the ASEAN countries regarding the greatest number of inhabitants owning private vehicles (897 per 1000 people) (Lim, 2019; Mohamad & Kiggundu, 2007). As noted earlier, one of the major urban issues in Penang Island is traffic congestion. Many factors have contributed to the shift to a car-centric society: the rapid development in Penang Island, such as the boom in industrialization, road and highway construction, and national car policy, as well as high petrol subsidies.

When the current government took over Penang in 2008, it aspired to make Penang a greener, cleaner, safer, and healthier state (DAP Malaysia, 2016). It was a noble ambition on the state government's part; since then, numerous initiatives have been implemented to achieve this goal. One such initiative is promoting cycling amongst the public, as evidenced by the development of cycling infrastructures, such as the dedicated cycling lanes, "sharrows" (bicycle signs painted on roads), and bicycle signboards around the island. The first phase of a 12km cycling lane connecting the Queensbay Mall to GAMA/KOMTAR in Georgetown has been completed. Whereas, the second phase, which includes the cycling and pedestrian spiral bridge to cross from the Bayan Lepas Expressway to the Lebuhraya Sungai Nibong and the Bayan Baru roundabout at the Krystal Point, was completed in 2018. Furthermore, the additional plan in the Penang Bicycle Master Plan 2010 (Majlis Bandaraya Pulau Pinang, 2010) also aimed to construct a cycling path between the Bayan Lepas Free Industrial Zone and

Penang International Airport through the Bayan Baru, which is expected to be completed within the next couple of years.

In addition, there are many cycling events and campaigns organized by the local cycling clubs in Penang. For instance, one of the round-island cycling events has become a yearly occasion to lobby the state government to build cycling infrastructure, including cycling lanes, in Penang. The state government also launched a Friday ride-to-work campaign to encourage people to commute by bicycle to work once a week, using the dedicated cycling lanes to the capital city of Georgetown. State campaigners have also promoted better cycling infrastructure in Penang by providing input, feedback, and recommendations to the state government and the local council. Plus, to further increase awareness of cycling in Penang, the state government has also launched a proper cycling map (Sekaran, 2018).

Penang achieved another milestone at the end of 2016 when the state government launched the bike-share system, which featured more than 20 bike stations located around Georgetown. Moreover, similar to Hangzhou Public Bicycle in China, the local government launched the bike-sharing scheme with similar objectives to tackle traffic congestion (Shaheen et al., 2011). This goal is to be achieved by providing a bike-share system as an alternative mode of transport for the public that offers a solution to the first-and-last-mile problem. The public can rent bicycles at affordable charges and run their errands around town. It

is reported that there are 29 docking stations with 250 bikes available in the Georgetown area, the Gurney Drive, the Karpal Singh Drive, and the Queensbay Mall area (Chiam, 2018). However, critics argue that despite performing relatively well in its first year of operation, the role of the bike-share system as a feeder mode is still underutilized (Kadir et al., 2019).

Furthermore, despite the state government's above-mentioned efforts and initiatives, most cyclists in Penang are still considered to be recreational cycling mostly for leisure or sporting purposes at weekends. In Latin-American culture, "these groups see the bicycle as 'sports equipment' and not as a utilitarian vehicle" (Brussel & Zuidgeest, 2012, p. 194). Commuting by bicycle or cycling to run errands daily is still a rare sight. Foreign labor workers comprise the only group who consistently commute by bicycle on Penang Island. To some extent, perceived social class and status are attached to using a bicycle. Likewise, in many other developing countries, bicycles are often viewed as a transport option for vulnerable groups, while the more affluent groups cycle for recreational purposes (Bakker et al., 2018).

## METHODS

This study applied a qualitative method. Initially, a purposive sample of 30 participants was identified from those involved in cycling activities on Penang Island, but only 25 participants agreed to be interviewed. Purposeful sampling was

used for the local council staff, a bike-share operator, and some cyclists. First, the local council staff consists of two traffic engineers, one assistant engineer, two councilors responsible for traffic matters (both have a transportation and urban planning background), and a mayor (formerly an architect for the council). These participants were responsible for cycling activities and programs, such as planning and implementing cycling infrastructures and organizing cycling events. They were identified on the local council's website and were contacted via email. Second, one bike-share operator in Penang was contacted via email. Third, the cyclists used in the study

were categorized into utility cyclists (those who commuted by bicycle at least three times a week) and recreational cyclists (those who cycled for fun at least twice a week). Fourth, some cyclists were identified from cycling groups on Penang Island. Finally, they were contacted via social media platforms such as Facebook and WhatsApp. Although a list of cyclists was compiled at the outset of the research, the snowball sampling technique was also utilized to add more participants. Specifically, they were asked if they would recommend other potential cyclists after interviews. The final sample was classified into four categories, as shown in Table 1.

Table 1  
*Number of participants*

| <b>Participants</b>       | <b>Number</b> |
|---------------------------|---------------|
| Utility cyclists (U)      | 8             |
| Recreational cyclists (R) | 10            |
| Local council staff (S)   | 6             |
| Bikeshare operator (B)    | 1             |
| <b>Total</b>              | <b>25</b>     |

The rationale behind selecting these individuals is that this study focuses on multiple perceptions and experiences of utility cycling in Penang Island that received less attention in the literature. The demographic of the participants is shown in Table 2.

A total of 25 in-depth interviews were conducted, with semi-structured questions based on an interview guide.

The questions were designed to identify the participants' perceptions of the cycling infrastructure in Penang, including the perceived barriers and facilitating factors related to utility cycling on the island. The following questions, among other things, were explored: Why do you cycle? What makes you decide to commute by bike? Why are you not commuting by bike to work? Do you think the bicycle as a form

Table 2  
*Demographic of participants*

| Participants             | Number |
|--------------------------|--------|
| <b>Age</b>               |        |
| 21–30                    | 4      |
| 31–40                    | 6      |
| 41–50                    | 7      |
| 51–60                    | 3      |
| 61–70                    | 5      |
| <b>Gender</b>            |        |
| Female                   | 3      |
| Male                     | 22     |
| <b>Employment status</b> |        |
| Employed                 | 22     |
| Unemployed               | 0      |
| Retired                  | 3      |
| Total                    | 25     |

of transport is popular in Penang? (Why and why not?) Do you notice any cycling infrastructure/facilities in Penang? Are there any challenges you face while commuting by bike? What do you think MBPP can do to encourage utility cycling in Penang? What can the government, employers, and cycling advocates do to encourage utility cycling in Penang?

The participants were briefed on the study's overview and given a written informed consent form emphasizing their anonymity and confidentiality. On average, the duration of the interviews was between 45 minutes and an hour. Only three participants spoke Malay, while the rest spoke English. All participants gave consent to audio-recorded conversations and have since been de-identified. The recordings were fully transcribed and entered in NVivo Version 12.0. Initial codes were

extracted from the analysis. Codes were then categorized into challenges and prospects for cycling, and themes were identified and organized accordingly in relation to the study's objectives (Heinen et al., 2010; Rios et al., 2013).

## FINDINGS

The following section is structured according to two main sets of findings, i.e., the challenges and the prospects for utility cycling on Penang Island. Several themes within these categories were identified from data analysis. The themes for challenges were identified as a poorly built environment, safety and enforcement, lack of cycling facilities, natural environment, and lack of local authority commitment. Conversely, the themes for the prospects were awareness campaigns and education, a bike-share system, incentives, integration of bikes and transit, better cycling infrastructure, automobile restraint policy, and collaboration with the private sector. In the analysis, both the emic (participants') viewpoint and the etic (researcher's) interpretation are considered (Reid et al., 2005).

### Challenges to Utility Cycling

**Poorly Built Environment.** Most participants agreed that the local council's effort to build cycling infrastructures was commendable. However, opinions were divided regarding whether the existing infrastructures, such as dedicated bike lanes, could encourage utility cycling. Most respondents (except staff) were not satisfied with the current condition of the bike lanes.

Indeed, some utility and recreational cyclists commented that the current bike lanes are “not practical for commuting” because of their poor condition, e.g., uneven surfaces and barriers (i.e., bollards) in the middle of certain sections. Moreover, cyclists from both groups expressed discomfort over sharing the bike lanes with pedestrians:

Furthermore, the lanes are shared between pedestrians and cyclists. I would say the city is not yet ready to build proper cycling infrastructure. A lot more has to be done and to be taken into consideration. (U4)

**Poor Connectivity and Accessibility.** The most significant barrier mentioned by both groups of cyclists was that the dedicated bike lanes along the coastal area were not connected to public places, such as schools, markets, malls, and residential areas. In addition, they claimed that the coastal bike lanes were constructed not for commuting but for recreational purposes. As a result of these connectivity issues, many cyclists from both groups noted that they have to drive to the bike lanes because they do not want to take any risks cycling on the roads alongside other vehicles. Thus, they contended that to encourage utility cycling, “first and last-mile connectivity is important” (R10).

Urban sprawls, meanwhile, are a relatively common problem in Penang. Hence, ‘door-to-door’ utility cycling does not present a convenient option to many people. Furthermore, it is worth noting that

many recreational cyclists, even though they usually cycle for longer distances and in hot weather, will not choose to cycle to work. As U4 opined:

... the distance is the main barrier. Well, in Malaysia, the industrial center and the city center are on different ends; even the neighborhoods are being flocked to one place. Distance does not play a major role for recreational cyclists as they cycle for long distances, but it will take more than distances when cycling to work. (U4)

**Safety and Enforcement.** Another issue that was raised on multiple occasions was safety. For example, participants discussed safety in terms of cycling on lanes shared with other road users, such as drivers of motor vehicles, as explained by U1:

The number of cars is increasing, and the drivers are not cautious enough when it comes to driving, as they are driving at high speed. The car drivers are also not taking cyclists on the road into consideration when they are driving. (U1)

This issue was raised because Penang is notorious for its congestion and its dangerous and aggressive driving behavior. Other participants, meanwhile, mentioned that the lack of enforcement on bike lanes had encouraged motor-bikers to encroach onto the lane, posing a danger to cyclists:

And of course, here I will say that the cycling group is always asking for enforcement. And that in fact, the council

doesn't really care about enforcement. It is very poor enforcement. (B1)

Other safety issues mentioned by participants were snatch-theft and being chased by dogs.

**Lack of Cycling Facilities.** The lack of cycling facilities deters many cyclists from utility cycling. Both groups of cyclists noted that certain cycling necessities, such as bicycle-parking spaces, workplaces' shower rooms, and lighting along bike lanes, do not exist in many places. Without proper and safe bicycle parking, the risk of bicycle theft increases. Participants also emphasized the need for employers to support utility cycling by providing cycling facilities at workplaces. Some recreational cyclists commented that top management supporting utility cycling is crucial. Most the utility cyclists at least have shower rooms in their office buildings:

Do they (employers) provide you with necessities like a shower room, changing room, lockers, and places for you to park your bike? I think all these should be taken into consideration, as well. (R10)

A few participants made comparisons between cycling facilities in Singapore and Penang Island. U7 shared his experiences of cycling in Singapore:

For example, the bike lane in Singapore is very flat and along the way, you can have (there are) cafés for refreshments

and then toilets. Even the toilets have a water refill station. You can refill your (water) bottle there. It's very nice. Along the way is mostly shaded with trees and I find our bike lane hasn't enough trees and is very hot. (U7)

**Weather.** The natural environment—for example, the tropical climate and distance—were commonly cited by participants from each group as the main barrier to utility cycling. The hot and humid weather and the rainy season are certainly challenging for people commuting by bicycle. For instance, U3 pointed out that most people do not enjoy sweating at their destinations.

**Lack of Local Authority's Commitment.**

While some participants, especially local authority staff, acknowledged the state government's continuous efforts to encourage utility cycling on Penang Island, most cyclists were still unsatisfied and expected more. They discussed the lack of commitment from the state government and local authority, despite the common green rhetoric. One of the utility cyclists believed that the local authority could do more and perform better. In contrast, other cyclists contended that utility cycling is not their top priority and that the local authority staff needed to change their mindset by prioritizing sustainable transport agenda (i.e., cycling). Moreover, some participants were critical of the state government's top management for not setting an exemplary model in encouraging the public to cycle to



work. They stated that the local authority's efforts were more akin to "box-ticking," with the state government seen as paying lip service to be a green and sustainable state rather than committing to such a venture:

I guess he (referring to the mayor) is doing something, but I don't think it is enough. He is more of, like, a leisure cyclist than a serious commuter because I think if he does want to be a serious commuter then I'm sure he will say, "I think we need a shower facility in the town or city hall and better bicycle infrastructure." I mean, he will be pushing for it, right, but no? (U3)

By contrast, two of the staff contended that the current mayor always encourages them to use bicycles to run errands or to attend meetings at a short distance.

### Prospects for Utility Cycling

**Awareness Campaigns and Education.** Participants across the board agreed that cycling-awareness campaigns, including cycling events, had contributed to general recognition regarding the importance of cycling. However, opinions were divided between cyclists and local council staff in terms of whether the cycling campaigns and events were designed to encourage utility cycling. Some of the cyclists claimed that they were organized for recreation and sport. However, a few participants noted that annual cycling events, such as Campaign for A Lane (CFAL), organized for ten years, played a crucial role in developing Penang

Island's bike lanes. All participants agreed that a cycling-to-work campaign, initiated in collaboration with the local council, is a strong platform for creating awareness of utility cycling. However, some participants were concerned that, over the years, the campaign has stopped attracting bike-commuting people to work. In addition, participants emphasized the need for education, especially for school children, regarding the benefits of sustainable transport, particularly concerning the bicycle as a mode of transport. Finally, other utility cyclists observed that cycling education could be incorporated into the driving curriculum.

**Bike-Share System.** A few participants recognized the contribution of the current bike-share system in Penang Island, which was introduced at the end of 2016 with 29 stations in Georgetown areas and later expanded to a few other locations, such as Queensbay Mall, Intel, and Summerton. One of the staff mentioned the possibility of increasing the number of docking stations in Penang Island and not necessarily focusing on the Georgetown areas. Some participants agreed that expanding the number of bike-share systems can encourage people to run errands around town by bike.

Of course, we need to improve; we need to encourage more people to cycle. Now (we are) thinking to add more stations. In our future plan, we are going to study the alignment between the bike-share stations. The operator (of the bike-

share) also recommends to us which stretch (location) is suitable. (S3)

**Incentives.** A few participants suggested that monetary incentives, such as cash vouchers and tax rebates, could be a viable option to encourage behavior change. Another utility cyclist added that tax exemptions for employees who cycle to work might be attractive to some people (U2) before pointing out that while cash might be a popular option, it does not necessarily increase utility cycling if cycling infrastructure is not already in place.

**Bike and Transit.** The integration of bike and transit addresses the first-last mile problems. While Penang public transport (i.e., Rapid Penang) permits bicycles on board, only “folding” models are allowed. In fact, “folding” bicycles are only allowed on selected Rapid Penang buses. In addition, another cyclist, U3, noted that public buses should be equipped with bicycle racks to allow for normal bicycles to be transported:

I’ve seen these buses back in [the] States, where you can mount your bicycle in the front or back. To help people with the last mile sort of thing. So, I think that will be quite useful. Also, with [the train system] KTM, they used to allow bicycles but now they don’t anymore. I don’t know why. (U3)

**Better Cycling Infrastructure and Facilities.** Most participants concurred with the view that Penang can be considered

a leading state with regard to cycling infrastructure and facilities. Nonetheless, they agreed that better cycling infrastructure and facilities would encourage more utility cycling, especially for those still “on the fence,” i.e., recreational cyclists. Some of the cycling infrastructure and facilities mentioned by the participants include showers and locker rooms at workplaces and commercial buildings. U4 considered himself lucky because his employer is supportive of those who cycle to work and because casual office attire is allowed. In addition, one of the staff, S6, highlighted the prospects of creating more shaded areas for bike lanes and shower rooms in offices. He noted that utility cyclists should talk to their employers about installing a shower room in their workplaces. Another staff member, S4, remarked that the local authority had mandated a development policy for new buildings to provide bicycle facilities, such as shower rooms and bicycle parking. Indeed, another important but often neglected cycling facility is bicycle parking. U3 stated the importance of securing bike parking in workplaces and public places to encourage utility cycling.

**Motor Vehicles Restraint Policy.** According to the most participants, the greatest issue concerning utility cycling was safety on the roads. It is largely because automobile ownership in Penang is on the rise. Many participants, therefore, advocated an automobile restraint policy and a better public transport system to make the roads safer, especially for utility cyclists.

I would say the policy should be more on us reducing the dependency on cars and giving various alternatives for people to commute, like public transport. In general, the government should come up with an active mobility policy. (U4)

Similarly, the bike-share operator (B1) agreed on a policy to reduce dependency on motor vehicles. However, he added that such a policy could work if there are other alternatives for people to consider, such as incentives and an efficient public transport system. In this vein, some participants described a motor-vehicles restraint policy comprising higher tax for car ownership and fewer fuel subsidies, congestion charges, and higher parking fees. U3 commented:

Maybe parking fees should be higher, congestion charges. This is also to lend a hand to public transport. If you want to reduce carbon emission, heat effect, and traffic congestion, and all of these are really the big cars and the single-occupancy vehicles. I can understand where the car can be useful and everything. I'm not saying ban cars but there are way too many people, able-bodied people, with single-occupancy vehicles. So, we must discourage driving and encourage more public transport, and more cycling. (U3)

**Collaboration with Private Sectors.** Some participants discussed the need for the local authority to collaborate with the private sector to finance some of the necessary

cycling infrastructures and reduce the financial burden on the state government. S6 explained:

We also work together with the private sector. Thank you to people who have taken part in this contribution (bike lane), like IJM. Of course, when we started the lane, it was not so perfect. Eventually, we hope we can improve. (S6)

Two of the participants, U8 and R2, advocated collaboration with the private sector in the form of corporate social responsibility (CSR), such as knowledge-transfer, i.e., private sectors that possess knowledge on cycling can advise the state government and form collaborative programs, such as “adopting a bike lane.”

## DISCUSSION

Normalizing bicycle commuting or utility cycling among locals can be challenging, but utility cycling is feasible for a distance of fewer than 10km. Nonetheless, Heinen et al.'s (2010) study identified similar themes that can hinder utility cycling. These themes are a built environment (i.e., distance, infrastructure); the natural environment (i.e., landscape, topography, weather, and climate); and other variables (i.e., travel time, comfort, safety).

Likewise, many of the concerns that participants raised in this study were in line with the criteria necessary for utility cycling to flourish, i.e., dedicated bike lanes to ensure safety (e.g., separating bike lanes

from motor-vehicle traffic); directness (i.e., fewer detours and no barriers); comfort (i.e., smooth road surface and shaded bike lanes); facilities (i.e., bicycle parking); regulations; cycling promotion activities; and a bike-sharing system (Pettinga et al., 2009; Rios et al., 2013). The findings were also consistent with a survey in Kuala Lumpur documenting that the main barriers to utility cycling were “traffic conditions, driver behavior, road conditions, absence of cycling lanes, lack of public transport and theft concerns” (Bakker et al., 2016; Shokoohi & Nikitas, 2017).

Safety concerns are the main reason people feel discouraged from engaging in utility cycling. As Fishman et al. (2012, 2013) noted, such issues are common in other locations worldwide, such as Australia, the United Kingdom, and North America. For example, Taha (2018) pointed out that respondents in her survey in Penang viewed riding bicycles on shared roads with other motorized vehicles as a challenge. It is not surprising, given that Penang Island roads are always congested, especially during peak hours. According to the Penang Road Transport Department, the registration of new vehicles on the island continues to rise each year, which is particularly alarming when the number of vehicles steadily increases against the total size of Georgetown, which is relatively small compared to other cities (The Sun Daily, 2017). In addition, Penang drivers are notorious for their reckless and dangerous driving. As Fishman et al. (2013, p. 17) have noted, among cyclists, major safety concern is related to “perceived risk of collision with motor-vehicles,” in addition to their fear

of motorists’ behavior due to the virtual non-existence of a bicycle-commuting culture and the lack of workable cycling infrastructure.

Similarly, Shokoohi and Nikitas (2017) reported that the lack of personal safety and the occurrence of traffic crashes were a major barrier to people bike-commuting in Kuala Lumpur. As a result, Malaysia has the third-highest fatality rate from road-traffic crashes in Asia and Southeast Asia, behind only Thailand and Vietnam (Lum, 2019). In response, applying intelligent transportation systems to reduce pedestrian/bicycle crashes may encourage utility cycling (Hadi et al., 2019). Moreover, more stringent enforcement is required to better safeguard cyclists on dedicated bike lanes, especially when motorbikes can easily encroach on such spaces.

### **Recommendations**

The weather, especially the tropical climate, was often cited as one of the challenges to utility cycling (Meng et al., 2016). However, a recent study in Singapore by Lee and Pojani (2019, p. 361) highlighted that high temperatures and heavy tropical rains can be “an important, though not crucial, factor in the decision to cycle.” Perhaps the most convenient option for commuting in a tropical climate, such as Penang Island, is an e-bike (a pedal-assisted bicycle with an electrically charged battery). E-bikes have been well received worldwide for commuting purposes and, to some extent, can overcome the challenges of long-distance commuting or covering

hilly areas (Jackson, 2014; Lee & Pojani, 2019; Strömberg & Karlsson, 2016). They might offer a practical and safe alternative to motorbikes in some circumstances. In many other developed countries, e-cargo bikes are beginning to receive attention as they can accommodate greater loads, such as groceries, and even transport passengers (Riggs, 2016). E-bikes also have the potential to encourage utility cycling.

Cycling for recreation or leisure is popular and vibrant on Penang Island. Many cycling events and cycling groups evidence it. Likewise, as observed by Shokoohi and Nikitas (2017, p. 625), in Kuala Lumpur, “recreational cycling has recently been visible mainly because it has been adopted as a leisure activity by the middle class and practiced mainly within designated and car-free areas, or in residential areas on weekends when traffic is calm and during cycling events.” Hence, it is common to see foreign labor workers commuting by bicycle while the locals cycle primarily for leisure. For that reason, a strong advocacy group for utility cycling is crucial. Furthermore, advocacy for utility cycling should be intensified and mobilized to attract more people to bike commuting. Indeed, Oldenziel and de la Bruheze (2011) argued that social actors are crucial in shaping the social embedding of cycling. To this end, the “bike-to-work” campaign plays an important role in creating awareness of utility cycling and lobbying the state government to create better cycling infrastructure. However, as pointed out by some of the participants, the campaign

is increasingly becoming a recreational cycling body rather than one that encourages cycling for commuting.

In a place where utility cycling is not a received norm, the debate between cycling infrastructure and developing a cycling culture can be endless and is, arguably, a “chicken-and-egg” discussion. For example, the state government introduced a cycling map, known as the Penang Bicycle Route Master Plan, in 2010, detailing the construction of a cycling network around the island. It is advertised as 200km of “bicycle lanes” (Majlis Bandaraya Pulau Pinang, 2010). The use of “bicycle lanes” is a misnomer, however, because not all the lanes are dedicated or segregated bike lanes; indeed, some of the routes are shared with motor vehicles. This returns us to the issue of safety, as discussed earlier.

Overall, Penang’s cycling infrastructure has been regarded as good, but there is still much room for improvement. There is a popular mantra of “build them, they will come,” which follows the notion that if there were an established cycling infrastructure, people would use it. The premise does not seem to apply on Penang Island, in any case. While the cycling infrastructure is in place, the volume of people bike-commuting remains low. For the cycling infrastructure to be fully utilized, the state government and local authorities need to understand the goal of building such a framework, i.e., a cycling infrastructure for utility cycling or recreational cycling. In addition, understanding and differentiating between the diverse types of cyclists are necessary.

For instance, if the state government intends to encourage utility cycling, the built environment must support utility cyclists, i.e., there is a need for a dedicated bike lane to be connected to public places and residential areas. A different understanding of this issue was reflected when cyclists and local authority staff expressed varying opinions regarding the local authority's commitment to encouraging utility cycling. Cyclists (in particular, utility cyclists) expected the government to serve as a role model in providing better infrastructure and other cycling-friendly facilities, such as safe bike parking, well-shaded bike lanes, smooth surfaces, and good street lighting, showers, and locker rooms at workplaces.

On the other hand, the staff, mostly non-cyclists, were satisfied with the existing cycling infrastructure. To effectively support utility cycling, well-trained staff with a high level of commitment, understanding, and skills is needed at the local council. With regards to the notion of the government acting as a role model or leading by example, the Mayor of Odense once pointed out, "If your city is starting from a low level and wants to change the way that people are behaving, my recommendation is that the mayor should lead the way. The most important thing is to start with yourself as a personal example. If it works for you as the mayor, it will work for the city" (Gualdi & van den Noort, 2013, p. 12).

As shown in the findings, it is no surprise that despite enjoying recreational cycling, using a bicycle as a main mode of transport can be inconvenient. It could

be argued that a well-considered cycling infrastructure and an accompanying set of facilities would help transform recreational cyclists into utility cyclists. It is possible because, as Park et al. (2011) documented in their study, more than 50% of utility cyclists in Singapore were once recreational cyclists. In further support of this point, it is notable that many studies reveal that a lack of cycling infrastructure can discourage people from taking up the activity (Akar & Clifton, 2009; Aldred, 2019; Lee & Pojani, 2019; Pucher et al., 2010).

The state government should also consider integrating bicycles (not just folding bicycles) into public transport. It can be addressed by installing bike racks at the front of buses, as has been done in other cities such as Chicago, Toronto, and Portland (Pucher et al., 2011). In addition, a bike-sharing system should be expanded to other areas. Studies have shown that people are not interested in cycling to work if they travel more than 10km each way. Thus, for those who cannot cycle from door to door, integrating bikes and public transport and bike-sharing provides a good alternative. In other words, it can also be a solution for the first-last mile problems. However, public transport must improve its efficiency to attract this option.

As highlighted by the Penang Green Transportation Plan (ITDP, 2019), the key challenges preventing Penang from moving toward green and sustainable transport (including utility cycling) are as follows:

- the pervasiveness of the car culture that supports car ownership, low fuel prices, and low parking fees

- road design that is built to accommodate motor vehicles
- the pervading negative attitude toward walking and cycling.

Dr. Lim Mah Hui, a former local councilor, addressed a local council meeting on the issue of traffic congestion in Penang in 2013. He pointed out that the state government should seriously consider promoting the bicycle as an alternative mode of transport and incorporating it into the Penang Transport Master Plan (PTMP). One of the plans in the PTMP is to build more roads and highways, but this drew considerable criticism from sustainable transport advocates and experts. As argued by López and Wong (2017a), the attitudes of the government and institutions in favoring the car can confer an inferior status on the bicycle. If the state government is serious and committed to fulfilling the Sustainable Development Goals (SDGs) and making Penang a green and livable state, it should strongly support a sustainable transportation and development policy that prioritizes bicycle use. In that case, it should strongly support a sustainable transportation and development policy that prioritizes bicycle use.

### Limitations

One limitation of this study is that participants did not discuss the psychological variables involved in choices regarding cycling, such as attitudes and norms. It is significant because these variables contribute to the non-existence of a utility cycling

culture in a predominantly car-oriented city (Heinen et al., 2011; López & Wong, 2017a; Milković & Štambuk, 2015). There remain perceptions in society that tend to associate car ownership and bicycle use with socio-economic status (Shokoohi & Nikitas, 2017). Gozun (2001) argues the importance of personal attitudes and community values in determining the acceptance of utility cycling in Philippine society. Indeed, some stereotype-based attitudes toward cyclists are still prevalent. For instance, some people believe that cyclists do not have the right to use the roads because “they do not pay for road tax” or because “roads are meant for motor vehicles.” López and Wong (2017, p. 669) exemplify this point in their study, stating that “some drivers showed animosity towards cyclists, particularly where cycle facilities took up ‘their’ space.” As suggested by participants, awareness, education, and cycling training are crucial to solving such problems. However, such efforts continue to be neglected in the Malaysian education system, despite researchers such as Pucher et al. (2011) highlighting the important role of cycling education and training among school children, as well as education of motorists on cyclists’ rights and their responsibilities as fellow road users.

Another limitation is that the interviews were not carried out with sufficient numbers of participants of diverse demographics to generate a greater understanding of the perceived issues. For instance, non-cyclists and female participants were under-represented. Admittedly, efforts were made to recruit more female cyclists and non-cyclists, but they declined to participate.

Given the argument presented above, numerous perceived barriers discourage utility cycling, such as a poor built environment, limited cycling facilities, safety concerns, natural environment, and lack of local authority commitment toward utility cycling. Therefore, to fully integrate cycling into the mainstream transport sector, efforts should focus on improving the built environment and cycling facilities and intensifying cycling campaigns, education, and advocacy.

## CONCLUSION

Indeed, when assessing the current situation regarding utility cycling in Penang Island, promoting cycling for recreation, leisure, or sports is not lacking in Penang. However, more concerted efforts such as providing a better-built environment and human infrastructure must be mobilized to promote utility cycling properly. There is no one-size-fits-all plan for a utility-cycling city, in any case. Approaches must therefore be tailored to local needs and context to accomplish goals. Future studies could further explore this issue by expanding the context of this study, such as by recruiting a larger and more diverse sample of cyclists, government officials, and other relevant stakeholders at the national level.

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