From government-led behaviour change to bottom-up understanding: the transition to low-carbon transport on motorcycles in Taipei, Taiwan.

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Abstract

Taiwan's prevailing motorcycle usage has been widely discussed in relation to urban air quality. As Taiwan's policy-makers seek to reduce mobile pollution sources in cities, the large number of petrol-powered motorcycles within cities have become a major target to be addressed. In addition to promoting public transport usage, the shift of petrol-powered motorcycles to electric ones has been one of the goals that the Taiwan government has vigorously implemented in recent years. Many scholars have studied motorcycle issues in Taiwan, however their suggested directions are mostly top-down promotion methods such as persuading riders to change to electric vehicles, providing subsidies to use lower-carbon transport modes, expanding the public transport system, or encouraging people to change their individual travel behaviours.

My research examines the issue theoretically and practically from social science theories of practice and mobility and in-depth interviews with Taipei and New Taipei City motorcycle riders to understand the motorcycle practice from the bottom-up. In light of this, I aim to provide a nuanced understanding of the motorcycle low-carbon transition in Taiwan rather than focus on the top-down promotion of government-led behaviour change. This study uses in-depth interviews to understand the issues, to complement existing discussions on large-scale structural change or assessing practitioners' thoughts and needs quantitatively. For the transition process, looking at the practitioners' ideas in-depth and building a diverse discussion

of perspectives differing from the direction of existing research and policy trends is crucial and valuable.

The theoretical contribution of my research is to provide a different context in the research field of mobility and sustainability, which thus far has mostly focused on cars and their daily use. Since motorcycle usage is relatively popular in Asia, for many Asian countries, motorcycles are a central issue that needs to be faced in the low-carbon transport transition. Practically, my results illustrate aspects that policy-makers need to pay attention to during the low-carbon transport transition for Taiwan's motorcycle riders, such as the significance and influence of the motorcycle culture deeply embedded in Taiwanese society. My findings indicate that a 'tough' approach to transition through laws and regulation, or 'soft' approach through persuasion are both on their own not sufficient. Rather, a low-carbon mobility transition for Taiwan and beyond needs to strategically pay attention to every aspect of the change in practice, respect the meanings of the practice possessed by the practitioners, and handle the inclusion of practitioners carefully during the transition process. Attention to practice is also important to prevent disadvantaged groups of people from being affected by further inequality in the transition process, and to maintain the justice of the transition on the pathway to a low-carbon transportation society.

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Chapter 1. Introduction

Taiwan has had a prevalent motorcycle culture for years. According to the Ministry of Transportation and Communications' statistics (2021), there are approximately 14 million petrol-powered motorcycles registered. Taipei City and New Taipei City in Taiwan have a well-developed public transport network; despite this, there are still three million registered petrol-powered motorcycles. In order to reduce the mobile pollution sources in the cities, electric motorcycles have become one of the solutions to increase air quality in urban areas. The Taiwanese government has promoted electric motorcycles in ways that have not been effective enough in the past. In recent years, electric motorcycles have been included again in policy implementation. In 2017, the Taiwanese government intended to stop the sale of petrol-powered motorcycles from 2035, but the policy was cancelled two years after its launch. Although the policy was cancelled, the Taiwanese government still advocates the purchase of electric motorcycles or the utilisation of public transport to reduce air pollution in urban areas.

In light of this, my research seeks to utilise in-depth interviews of motorcycle practitioners to understand the following key aspects to consider in a low-carbon transport transition for motorcycle riders:

(a) to understand the importance of the social and cultural background of Taiwanese motorcycle culture derived from the motorcycle practice, and to look at the interface between *mobility and sustainability* in a non-Western context;

(b) to explore the disconnect between the Taiwanese government's aspirations for low-carbon transport and the lived experience of petrol-powered motorcycles for these practitioners; and to provide a more nuanced possible transition pathway from a bottom-up angle in a way that is qualitative yet can provide in-depth recommendations for policy and practice across the low-carbon transport transition period;

(c) to examine a central concern of inclusion and a just transition for motorcycle riders during the transition progress to a low-carbon transport society, and to illustrate the difficulties that motorcyclists may face in the process of the low-carbon transport transition in Taipei City and New Taipei City.

Before entering the research content, the first chapter provides my research aims to emphasise the focus of the research – what is the gap between policy-makers and practitioners regarding low-carbon transition policies; how important is Taiwan's motorcycle culture in influencing practice change; and where are the potential injustices during a low-carbon transport transition. The second chapter provides a brief overview of the context of this case study, discussing the aspects of mobility and sustainability from a non 'Western' context. I understand the low-carbon transport transition for Taiwan's motorcycle practice from three aspects. First, I start with a brief introduction to the fundamental development of Taiwan's motorcycles, introducing the related history and the development of the motorcycle industry. Second, I review Taiwan's research directions for motorcycles, electric motorcycles and low-carbon transport that are currently discussed in the existing literature. I extract the key topics of Taiwan-related research on motorcycle-related issues and identify the perspective my research wants to explore and supplement for these topics. Existing research may overlook some in-depth understandings of social and cultural factors that drive people to keep riding petrol-powered motorcycles. Finally, this chapter introduces the low-carbon transport transition for motorcycle-related policies, especially the 2035 policy to stop selling petrol-powered motorcycles, policies for petrol-powered motorcycles promoted in Taiwan from the past to the present, the obstacles these policies encountered, and the policy-makers' planning direction after the cancellation of the 2035 policy.

The third chapter reviews the main theories that constitute this research. In discussing the transition of practices, a key thinker like Shove (2010) explains the influence of how practice theory could act in the process of the low-carbon transition. From the social practice perspective, she believes that one needs to be careful not to transfer or put too many responsibilities on individuals during the transition process. As the low-carbon transition is a systematic change, many considerations need to be taken into account. When the focus is too personal, it weakens the status and role of decision-makers in the transition process. The practices shaped by practitioners could illustrate that the transformation of every practice is wide-ranging and complex. Viewing the issue through social practice perspectives could provide decision-makers with additional context to the top-down considerations they have already taken. More concerns may hence need to be noticed during a low-carbon transport transition process.

The importance of mobility is then discussed. Cresswell (2010) argues there are meanings

embedded in mobilities. He points out that mobility is not just a point-to-point movement, and people may not make decisions about moving rationally. Fulfilling ones' mobilities may link to complex social and cultural connections and maintain people's relationships and interactions. Therefore, in the process of a low-carbon transport transition, the significance of these mobilities cannot be overlooked. Moreover, whether they are low-carbon transport users or practitioners before the transition, their status in society should not be excluded, no matter what their roles are. In the discussion of mobility justice, Sheller and Urry (2006) point out that mobility justice should be considered not merely to improve the transport system, since the inequality of people's mobilities may be affected by a broader political, social, and cultural background.

In the process of low-carbon transport transition, it is crucial to be aware that the implementation should be careful not to fall into a situation of electric vehicle 'lock-in'. Henderson (2020) puts forward a warning on the development of electric vehicles. He argues that many countries have invested significantly in the transformation of electric vehicles but that there has been too little questioning about this development. If the energy generation is still based on fossil fuel, then the development of electric vehicles will fall into the lock-in of a path dependency relying on fossil fuels (Chou & Liou, 2020; Henderson, 2020). The inequalities are already seen in the promotion of this transition. Sheller (2018) also points out that the most affected groups will be those relatively disadvantaged groups of people. Furthermore, I argue in addition to the importance of top-down policy promotion, the understanding provided by the bottom-up practitioners is also crucial. I seek to bring out this topic through the approach of in-depth knowledge of practitioners' lived experiences with more diverse and practical views. Hence the centre of my research discussion is guided by the inclusive and pluralistic view of environmental pragmatism.

In the fourth chapter, I explain the research methods I have adopted. I first introduce the theoretical framework of my research. As mentioned in the previous paragraph, my research is mainly based on practice and mobility theories, and discusses mobility justice in a low-carbon transport transition process with a pluralistic perspective. I then further explain the research area I adopted and the reasons for choosing a qualitative method. Next, I conduct in-depth interviews in order to gain a deeper and richer understanding of the motorcycle practice in Taipei. Following this, I illustrate my data collection approaches and processes. After the data is collected, I talk about the method I utilised for collation, transcription, coding processes,

and my data analysis through thematic analysis to come out with the five main themes of my findings. I also explain the matters that I pay attention to in the process of collecting and analysing the data, such as whether it conforms to the research ethics and being careful during the translation and transcribing procedures to keep the meaning of the interviewees' responses much as possible. Nevertheless, I list the potential research limitations of my research approach at the end of this chapter.

The presented findings in the fifth chapter are mainly shaping the motorcycle practice through Taipei's motorcycle riders' narratives. I seek to demonstrate a possible pathway to systematically evaluate practitioners' perspectives and daily experiences of motorcycle low-carbon transport transition issues. Through a thematic analysis for the collected data, the findings were sorted out according to five themes: (a) socio-cultural context: motorcycle culture shaped by motorcyclists' experiences; (b) awareness of government policies; (c) intention to change transport mode; (d) environmental debate; and (e) low-carbon transport modes. In order not to make this chapter too descriptive and weighted too much towards simply presenting the responses of the interviewees, I add my brief reflection on all the extracts, which links to my theoretical framework with a short discussion in every theme. I also illustrate the commonality in responses shared by the participants, where they can support or differ from each other's responses. Shaping Taiwan's motorcycle social and cultural context by the interviewees' narratives in the way that this research explores could link back to my theoretical implication and echo different respondents experiencing similar practical experiences.

For the sixth chapter, I go further with a systematic and structural discussion on the findings of the previous chapter and develop three aspects that need to be paid attention to during the process of low-carbon transport transition for Taiwan's petrol-powered motorcycles: (a) meanings of motorcycle riding; (b) change of motorcycle practice and (c) inclusion for motorcycle riders. First, the significance of motorcycle culture should not be overlooked in the process of advocating low-carbon transition. This is an essential foundation for shaping the motorcycle practice, and the meanings it possesses are also likely to be treated with little value and have been easily taken for granted within a transition. Secondly, the transition process needs to be considered from different angles rather than from the purely top-down focus which current policy-makers emphasise. Hence, my research seeks to provide viewpoints from a bottom-up angle to Taiwan's motorcycle low-carbon transport transition issue. My

discussion the practice change comes with a combined changing mechanism linking Watson (2012) and Spurling, McMeekin, Shove, Southerton and Welch (2013). Lastly, when turning to lower-carbon transport mode, it is crucial for decision makers to take the status of disadvantaged groups of people into account, and be careful of the potential of disadvantaged people falling into social exclusion during the decision-making process. Decision makers should open the opportunities to listen to the opinions of all parties, make prudent decisions and implement policy consistently.

The seventh chapter briefly concludes my establishment of a deeper and broader understanding of the transport choice of Taiwanese motorcycle riders through my research findings. I sum up my research implications theoretically, methodologically and practically. Theoretically, I extend the understanding of mobility and sustainability from a non-Western context and provide a social practice angle for Taiwan's policy-makers and research which focuses more on individual and industrial changes. Methodologically and practically, I provide a qualitative approach by conducting in-depth interviews for Taiwanese motorcycle riders to take care of practitioners' perspectives in the low-carbon transport transition from a bottom-up understanding, in a way that can provide suggestions for policy-makers. I illuminate the practitioners' daily experiences that decision makers may not notice. From the findings of participants' awareness towards the policy, I emphasise that it is central for the government to ensure their policy implementation is executed with trustworthiness, transparency and consistency. The findings show that the people's attitude towards low-carbon transport transition-related policies is positive, but that only the implementation of reliable policies can enhance the confidence of the people. The policy-makers should realise the low-carbon transport transition process is a long-term journey that should be happening with many more conflicts and adjustments in the future.

Chapter 2. Overview – contextual background of Taiwan's motorcycle culture

2.1 Introduction

The image of the 'Motorcycle Waterfall' (Figure 2.1) shown in the cities category for the 2018 National Geographic Travel Photographer of the Year contest triggered the research motivation of this study. I have been used to the existence of motorcycles in my daily life. However, maybe because its existence is ordinary for me and people who live in Taiwan, there are few opportunities for us to take a good look at the significance of its existence and the importance of Taiwan's development as a motorcycle culture. This chapter briefly start from the context, development and history of Taiwan's motorcycles, and then explore why motorcycles are so prevalent in Taiwan according to the existing research. The second section sorts out the main aspects of motorcycle issues in the research field of Taiwan, to build a general understanding of Taiwan's research focus on motorcycles and bring out the aspects of my research that I want to explore and supplement. Furthermore, the last section provides the background of implementing policies of the low-carbon transition of Taiwan's motorcycles so far, especially the topic of promoting electrification of petrol-powered motorcycles.

Figure 2. 1 Motorcycle Waterfall (source: M. Chak, 2018)

2.2 A brief history of motorcycle culture in Taiwan

This section starts with a brief introduction of the development history of Taiwan's motorcycles. The early development of Taiwan's motorcycles can be traced back to the 1940s to the 1950s. In the beginning, these two-wheeled vehicles relied on imports and were expensive. They were mainly purchased by a small number of people. People primarily used bicycles and three-wheelers. Until the economic take-off in the 1960s, due to the increased demand for mobility, the need for cargo functions of motorcycles increased. With the government's goal of economic development, motorcycles were turned into a livelihood tool for the people. Later, under the promotion of policies, the development of industrial technology and market demand increased. Participants in the production of motorcycles have also increased, and motorcycles have gradually become the main means of transport. In the 1990s, domestic brands were launched successively, and they have begun to be exported with outstanding results (Huang & Hsiao, 2009; Hung, 2010; Lai & Lu, 2007; Lai, 2010).

The traffic types of many Asian countries are mostly mixed traffic with motorcycles, such as in Malaysia or Vietnam, and Taiwan (see Figure 2.2) is no exception (Hsu, Sadullah & Dao, 2003). These countries are also facing the expansion of motorcycles much faster than cars (Lai & Lu, f2007). And in these Asian countries, motorcycles are mainly used for daily commuting, which is very different from Western countries, where motorcycles are primarily used for recreational purposes (Eccarius & Lu, 2020; Hsu et al., 2003). The characteristics of motorcycles travelling in mixed traffic means they are relatively vulnerable as road users (Chang & Lai, 2015). Also, because the road design is car-oriented, Hsu et al. (2003) point out that because of the way motorcycles ride in mixed traffic, where motorcycles have to share the spaces with cars, riding a motorcycle is the most dangerous mode of transport whether in Taiwan or other Asian countries.

Figure 2. 2 Mixed traffic with motorcycles in Taipei (photo taken by the author)

In addition to the abovementioned safety issues when riding a motorcycle, motorcyclists also have a high exposure time to air pollution while riding. However, because of the benefits of this travel mode, the number of users continues to increase and has developed Taiwan's unique motorcycle culture (Huang & Xiao, 2009). Taiwan's environment has also shaped the formation of this motorcycle culture; Chang and Lai (2015) mention that the weather in Taiwan, the high population density and mixed housing and business make Taiwan very suitable for motorcycles. In addition, motorcycles have the characteristics of being approachable. They are small in size, with ease of operation, wide use (such as cargo function or short and medium-distance travel), high manoeuvrability, more affordability than cars, efficient fuel consumption, and a number of maintenance and service bases for motorcycles (Chang & Lai, 2015; Hsu et al., 2003; Huang & Hsiao, 2009; Lai & Lu, 2007; Yang, Cheng & Huang, 2020).

Chang and Lai (2015) point out that even when Taiwan's economic development has brought the numbers of car ownership to a significant increase, it did not affect the utilisation of motorcycles. There is often such an assumption that as the country's economy grows, the number of motorcycles will decline (Hsu et al., 2003; Hsu, Tsai & Lin, 2007). Japan is an example of a decline in motorcycles due to an increase in average income (Hsu & Lin, 2007), but this result is not found in Taiwan. Hsu et al. (2003) say the vehicle ownership in Taiwan is one car and more than one motorcycle per household. This situation also shows that the reasons for using motorcycles are not closely related to replacing cars. The authors also

mention that although there are a lot of advantages of motorcycles, the main reason for the high ownership of motorcycles is unclear. However, this is also one of the points that my research wants to explore. In addition to the above advantages mentioned in most studies, what is the significance of Taiwan's motorcycle culture from the daily experience of motorcycle practitioners? Are there any hidden connections between motorcycles and motorcycle practitioners?

Many studies have summarised the low-income groups and the reasons for the use of motorcycles as a causal relationship and think that low-income groups have a higher correlation with the use of motorcycles (e.g. Chang & Lai, 2015 or Chang & Wu, 2008). Yet continuing the previous paragraph, the report by Hsu et al. (2003) reminds us that on average, every household has one car and more than one motorcycle, and that 70% households have both a car and motorcycle in Taiwan. This shows that the statement above, which believes that motorcycle riders are mostly low-income groups, may not be conclusive enough. Still, it cannot be denied that the more affordable prices are more likely to trigger low income people to purchase motorcycles. The point raised here is that the lower cost of motorcycles could be an important factor, but could not be the main reason for bringing motorcycles to be popular.

Chang and Lai (2015) argue that the development speed of public transport[1] does not seem to keep up with the expanding pace of motorcycles or cars. Take Taipei for instance, where even though the public transport network has a certain scale and degree (this will be explained more in Chapter Four), the number of motorcycles is still vast. This number includes not only the original residents riding motorcycles in Taipei but also those who have moved to this capital city to work and shipped their own motorcycles up to Taipei. From the aspect of traffic planning, perhaps, as Chang and Lai's (2015) research states that the development speed of public transport cannot meet the rapidly rising demand of people's travel, there are fewer restrictions and not enough control from the government on motorcycles. Lai and Lu (2007) argue that the government is not regulating motorcycle riders for many problems such as congestion, travel safety, or emissions due to some political considerations. In addition to the various advantages of motorcycles, these contexts have improved the additional competitiveness of motorcycles and resulted in private vehicles having an advantage over

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[1] White (2016) summarises that public transport can include buses, metro, coaches, railway and internal air and taxi modes which provides transport systems for the public to utilise. In the case of the scale of Taipei in my thesis, the public transport modes discussed in the thesis are primarily buses, railways and MRT (Mass Rapid Transit).

public transport (Chang & Lai, 2015; Lai & Lu, 2007).

The aforementioned brief introduction of Taiwan's motorcycle industry development and its benefits might show important factors that have increased people's willingness to use motorcycles. However, the relationship between motorcycle riders and the motorcycle culture has not been discussed a lot yet. The discourse of motorcycles in Taiwanese society possesses the same angles as car use mentioned by Maxwell (2001). Maxwell (2001) points out the utilitarian benefits of cars are well recognised, and the meanings of this means of transport are embedded in the relationship between society and culture. He says the daily use of cars possesses deep connections among people socially and culturally, which is complicated and close to life, but the meanings of car use are often overlooked and do not even exist in the thinking of decision makers. Miller (2001) points out that 'cars' are not merely tools but have become a vital part of how humans shape their cultural environment. The role of motorcycles in Taiwan is similar to how Miller describes cars, and also reflects Maxwell's (2001) point in that motorcycles have in Taiwan developed and played an important part in forming the social networks, interactions, and associations between people, and already shape a 'motorcycle culture' in the country. The meanings of motorcycles might also constitute and connect to Taiwan's unique motorcycle culture, and it might be able to respond to Hsu et al.'s (2003) uncertainty for the reason of the popularity of motorcycle use in Taiwan.

Yet compared to cars, in terms of social or environmental issues, the discussion of motorcycles in Taiwan's research or policy does not seem as positive compared to its benefits. Except for the above-mentioned traffic or pollution emission issues, for example, Kao (2010) mentions that motorcycle riders are easily stigmatised in Taiwanese society - they are often given a negative image like drag racing in Taiwan's news or advertisements. Also, Ho (2017) mentions that the car symbolises progress and represents freedom and rights and individual autonomy. He says cars are not only a vehicle but a product of cultural technology. Ho (2017) even emphasises that it would be strange to criticise the popularity of cars. However, he only describes the existence of Taiwanese motorcycles as a persistent problem that needs to be solved. Taiwan's motorcycles and cars seem to have a massive difference in the 'vision' he perceives. This makes me wonder whether the angle of this discussion from Ho (2017) is too top-down to look at the most popular means of transport in Taiwan, and gives a motivation in my research to look for the meanings of the motorcycle culture in Taiwan.

2.3 Motorcycle related research in Taiwan

Hsu et al. (2003) point out that although motorcycle riders have long been regarded as a vulnerable group, most of Taiwan's past research and policies still focus more on cars than motorcycle issues. However, since motorcycles are the most dangerous transport mode in Taiwan (Hsu et al., 2003), the bulk of research could be found related to traffic safety. Hsu et al. (2003) mention that almost everyone has seen a motorcycle-related traffic accident in Taiwan. They state that motorcycles have been developed in Taiwan for decades, but it was not until 1994 that Taipei City began to test the effect of wearing helmets, and wearing helmets became mandatory as a national policy began in 1997 to reduce the deaths caused by motorcycle accidents. While it is beyond the scope of this thesis to systematically review all research in English and Mandarin around motorcycle related studies, the following broad categories are apparent in the literature. These research topics include safety e.g. helmet use (Keng, 2005; Lam et al., 2020; Tsai, Wang & Huang, 1995), or traffic injuries (Jou, Yeh & Chen, 2012; Liang et al., 2015; Lin, Chang, Pai & Keyl, 2003); regulations e.g. helmet use law (Chiu, Chu, Chang, Lui & Chiang, 2011; Chiu, Kuo, Hung & Chen, 2000; Tsai & Hemenway, 1999); motorcycle ownership (Hsu et al., 2007; Lai & Lu, 2007); travel behaviour or habits (Chang & Lai, 2015; Chen & Lai, 2011; Chang & Wu, 2008); traffic development e.g. traffic management or design (Hsu et al., 2003); marketing strategies (Chang, 2013; Lee, 2016; Tu & Jeng, 2002); industrial development (Chang, 2014; Huang & Hsiao, 2009; Wu, 2013); and environmental pollution e.g. motorcycle emissions (Chen et al., 2003); commuter exposure (Tsai, Wu & Chan, 2008); and noise exposure (Chang, Lin, Yang, Bao & Chan, 2012).

Compared with petrol-powered motorcycles, the research into electric motorcycles has many similar research directions but has been focused on battery design. The research on electric motorcycles in Taiwan includes the following wide research topics: engine battery design (Hwang, 2012; Lin, 2000; Tso & Chang, 2003); battery stations location plan (Lin, Liu, Yang & Lin, 2021; Pham et al., 2019; Wang, 2007); product design (Chen, Chang, Wu & Liu, 2020; Chou & Hsiao, 2005; Wang, Chen & Tan, 2019); purchasing intention and willingness (Chiu & Tzeng, 1999; Wu, Wu, Lee & Lee, 2015); marketing (Khanna & Chan, 2020; Wang & Seidle, 2020); user experiences (Huang, 2020; Lee, Huang, Wu & Lee, 2018); transport policies (Hwang, 2010; Yang, 2010); travel behaviour (Chen, 2015; Eccarius & Lu, 2020); and environmental pollution (Hsieh, Chang, Yu & Wu, 2018; Wu et al., 2021).

As the above research shows, most of the research encourages petrol-powered motorcycle riders to switch to electric motorcycles, public transport, bicycles, or walking; recommends people to change their travel habits and behaviours; advocates building more green transport infrastructure and increasing subsidies; and calls for policies to be more stringent restrictions on motorcycles. Research on low-carbon transport in Taiwan is mostly focused on green transport policies and strategies (Ho, 2017; Trappey et al., 2012) and the development of low-carbon transport infrastructure (Chien & Hu, 2020; Li, 2012; Lu, 2016). Existing research mainly examines the motorcycle issue from a top-down angle and individual-level change. Chang (2019) argues that the solely policy-led approach to the low-carbon transition of motorcycles is restrictive, and decision makers need to consider that the petrol-powered motorcycle transition is a structural issue that requires a systematic change (Chang's [2019] research will be discussed more in Section 3.1.5).

This section has briefly shown the research on motorcycles or electric motorcycles in Taiwan is mainly focused on the most profoundly relevant safety issues. Research into the performance of the vehicle or the design of the battery has gradually been developed after the development of electric motorcycles. In conjunction with policy promotion, consumers' purchasing intention in the market has also become the research object. In recent years, environmental issues have gradually become a popular topic of discussion about the relevance of air pollution and motorcycles. However, there are few aspects of the importance of motorcycle culture while facing the low-carbon transition[2]. Instead, the motorcycle issues are treated as a problem to be solved. Despite this, there are also a few studies, such as Kao (2010), regarding the negative images of motorcycle riders being portrayed in Taiwan's news or advertisements, such as that they like drag racing. He proposes that the stigmatisation label on motorcycle riders is because it will be a more convenient management strategy politically. Another insightful research is from Chang, Giaccardi, Chen and Liang (2017), who put motorcyclists as their interviewees and asked professional actors to convey motorcycles' daily life. By doing this, they convey the important relationship between motorcycles and the riders. The motorcycle culture may not be a major central research direction in Taiwan's low-carbon transport scholarship, but it is the most relevant and practical research direction to explore

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[2] The reduction of carbon emissions to create a lower-carbon society through a fundamental transformation of energy, mobility, and buildings to a more energy efficient and sustainable form based on renewable energy rather than fossil fuels is the main aim of low carbon transition (Bulkeley, Castán Broto, Hodson & Marvin, 2011; Geels, Berkhout & van Vuuren, 2016). My thesis discusses the low-carbon transport transition for petrol-powered motorcycle riders in Taiwan, which can help build a smoother transition process in the transport sector, especially for motorcyclists, in Taiwan.

the motorcycle practitioners' everyday lives.

2.4 The 2035 policy to stop selling petrol-powered motorcycles

In order to reduce air pollution in the city, except for the exhaust standard for petrol-powered motorcycles set by the Taiwanese government, a major low-carbon transport strategy for petrol-powered motorcycle users is to encourage them to change to electric motorcycles. Since 1998, the Taiwanese government has proposed the 'Electric Motorcycle Development Action Plan' to develop Taiwan's electric motorcycle industry. In addition to government investment in the development of electric motorcycles, there were subsidies for purchasing. However, the products could not meet customer needs due to poor product performance, price, poor battery technology, inconsistent quality, and inadequate maintenance of these electric motorcycles which reduced the enthusiasm of customers quickly (Hung, 2010; Hwang, 2010; Tai, 2005; Tso & Chang, 2003; Wu, 2018). The Taiwanese government tried again in 2009 to promote the 'Electric motorcycle industry development promotion plan', but it was also not able to be popularised due to insufficient battery technology and charging stations, and the cost of electric motorcycles being too high to meet the customers' needs. This resulted in the failure of the market of electric motorcycles (Hwang, 2010; Lee, 2013; Wu, 2018).

The Executive Yuan[3] set several policy targets according to the 'Air pollution control action plan' proposed by the Environmental Protection Administration announcement on December 21, 2017. One of the goals is to fully electrify commercial motorcycles by 2035 (joint execution by the Ministry of Transportation and Communications, the Ministry of Economic Affairs and the Environmental Protection Administration), which means that the sale of petrol-powered motorcycles will be banned (Environmental Protection Administration, 2017; Executive Yuan, 2017). Even though the past two policy pushes and subsidies had been ineffective due to factors such as poor performance of electric vehicles, the sales volume of electric vehicles had risen sharply this time compared with the previous promotions. Research studies mention that one key reason is that electric motorcycle manufacturer Gogoro made a breakthrough at this stage, whereby the battery performance and technology has been improved, and the way to charge the vehicle has been introduced a more convenient battery swap system for electric motorcycles (Ho, 2017; Pham et al., 2019; Yang et al., 2020).

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[3] The Executive Yuan is the highest administrative executive branch of Taiwan, and the Ministry of Transportation and Communications, the Ministry of Economic Affairs and the Environmental Protection Administration are second-level government agencies affiliate to the Executive Yuan.

However, in March 2019, the Minister of Economy told the press that there would be a suspension of the 2035 policy. In the same year, the Executive Yuan stated that it would postpone the goal of stopping selling petrol-powered motorcycles in 2035. The government pointed out that although the government's policy is to prevent air pollution, as long as petrol-powered motorcycles can meet the air pollution exhaust standards, starting from 2020, both electric and petrol will be implemented in parallel (Figure 2.3). On the one hand, the government will encourage manufacturers to develop high-quality and low-polluting petrol-powered/ electric motorcycles; on the other hand, the government also provides basic electric motorcycle training for traditional motorcycle workers (Executive Yuan, 2019). However, due to the fuel-electricity parallel policy, the subsidies for the Phase Seven exhaust standard motorcycles [4] increased the sales of petrol-powered motorcycles in 2020, unexpectedly, reaching a new high in the past 25 years. This had an impact on the sales of electric motorcycles, and the subsidy funds were mostly used up. Moreover, the Environmental Protection Administration announced that it would stop subsidising Phase Seven petrol-powered motorcycles from 2022 (Ming-Han, 2021).

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[4] According to the Regulations of Subsidy of Replacement of Old Motorcycles with New Ones, the Phase Seven exhaust standard petrol-powered motorcycle refers to the non-heavy motorcycles that comply with the emission standards for new vehicle models that have been implemented on January 1st, 2021 in accordance with Article 6 of the Air Emission Standards of Mobile Source, and have obtained exhaust emission certification from the central competent authority (Laws & Regulations Database of The Republic of China, 2020)

Figure 2. 3 The president of Executive Yuan Su Tseng-Chang (2019) (the man in the picture) highlights the idea of "Taking care of the lungs and also taking care of the industry" which proposes from left to right: (1) subsidies for those who change from old petrol-powered motorcycles to Phase Seven exhaust standard petrol-powered motorcycles; (2) subsidies for those who buy electric motorcycles; (3) tax reductions for those who purchase electric motorcycles or replace the one petrol-powered motorcycles with the new ones. (Source: Su Tseng-Chang's Facebook post)

The Ministry of Transportation and Communications surveys motorcycle usage every two years to collect opinions from motorcyclists about related measures, e.g. 'Does the motorcycle user agree to the mandatory installation of ABS (anti-lock brake system) or CBS (combined braking system) on new motorcycles in the future?', for reference in traffic policy. The biennial questionnaire appeared to be an opportunity for policy-makers and motorcycle users to interact. However, in the 2017 and in the 2019 survey, inquiries about any 2035-related policies were not found (the 2035 policy started from the end of 2017 and was cancelled in March of 2019). In the use of motorcycles survey reports of 2017, 2019 and 2021, merely one question related to electric motorcycles covers people's intention to buy electric motorcycles (The MOTC's Department of Statistics' Motorcycle Usage Survey, 2017, 2019, 2021).

Although 2035 is a national policy, the role of Taipei City can be used as an example to other cities in Taiwan. As the capital city, Taipei City is also the first region to implement many

policies. Taking motorcycle-related regulations for instance, such as wearing helmets, a trial law was passed in Taipei City requiring motorcycle riders to wear helmets in 1994 (Chiu et al., 2011), three years earlier than the national regulations. Furthermore, for the motorcycle parking fee, the Taipei City Government began to promote the city's four-stage motorcycle charging policy in 2019 and is planning to gradually expand the range of motorcycle parking fees in Taipei to reduce people's intention of riding motorcycles in Taipei. The Taipei City Government cooperates with motorcycle companies to promote shared (electric) motorcycles such as WeMo Scooter, iRent and GoShare in the meantime. Regarding low-carbon transport for motorcycle riders to take, the city government implements not only the shared motorcycles but also optimises the green transportation (e.g. Mass Rapid Transit, Bus routes, bicycle lanes, pavements) to increase the utilisation rate of green transport, and also promotes 'Green Friday'[5] to advocate people to change their travel behaviour to green transport (Department of Transportation, Taipei City Government, 2021; Environmental Protection Administration, 2020).

2.5 Conclusions

Given the concerns over the socio-cultural context mentioned above, the existing research in Taiwan and beyond might overlook some of the less quantifiable yet still crucial social and cultural factors to reach my first research aim that can explain the influence of motorcycle culture for people to choose to ride motorcycles. Furthermore, regarding policy implementation, it is perhaps unsurprising that the Taiwanese government has attempted to focus their goals on persuading citizens to change their transport mode by ways such as subsidies in order to live a greener and healthier life. Yet, the fuel-electricity parallel policy has led to an unexpected result in an increasing wave of people buying Phase Seven exhaust standard petrol-powered motorcycles in 2020.

As my second research aim is to explore the disconnect between Taiwanese government's aspirations for low-carbon transport, and the lived experience of petrol-powered motorcycle transport for citizens, I try to look at the motorcycle low-carbon transition in Taipei from a

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[5] The Taipei City Government announced that in order to move towards a sustainable city, and Friday is the peak time for people to go out, the Taipei City Government has set every Friday as a Green (transport) Friday, and encourages people to take action to change their travel behaviour. On Friday, people can collect points for cash by taking public transport (Department of Transportation, Taipei City Government, 2016).

bottom-up angle. From theoretical dimensions, it is essential that the previous scholarship in Taiwan brought out the economic and quantitative dimensions of individuals' transport choices, but it is also crucial to understand this issue in more depth. To do so, I will utilise social science theories of mobility and practice to understand the social and cultural context surrounding motorcycle usage; and in-depth interviews to discover what the key factors from practitioners' daily experiences are for people who might persist with motorcycle travel. Through doing so, I aim to highlight potential problems or unjust situations the practitioners might face during the transition process, in order to answer my third research question.

This chapter has provided a brief background to Taiwan's motorcycle issues, motorcycle-related research, and the promotion of motorcycle electrification policies as a prelude for a general understanding of the context of Taiwan's low-carbon transport transition issue on petrol-powered motorcycles in recent years. The next chapters will go further into theoretical application on this issue, and into findings and discussion of the narratives given by the interviewees.

Chapter 3. Literature Review

Given the concerns over socio-cultural context raised in Chapter Two, the existing research in Taiwan and beyond might overlook some of the less quantifiable yet still crucial social and cultural factors that influence why people choose to ride motorcycles. This Chapter hence reviews key literature underpinning the research and draws out the theoretical contribution of the research. I explore the meaning of embodying the practice of motorcycle riding and discover the perspective of social practice theory for low-carbon transport transition in the first section. Then I draw in the literature on mobility to understand the importance of people's mobility and their rights of access in cities. Finally, I bring in environmental pragmatism as a means of balancing theoretical and practical points of view in environmental debates and hence linking the theoretical and practical outcomes of the study (Figure 3.1). The theoretical framework develops an approach that is able to reflect the richness and complexity of the real world, in a way that can offer both conceptual insights and also integrate with low-carbon transport transition strategies.
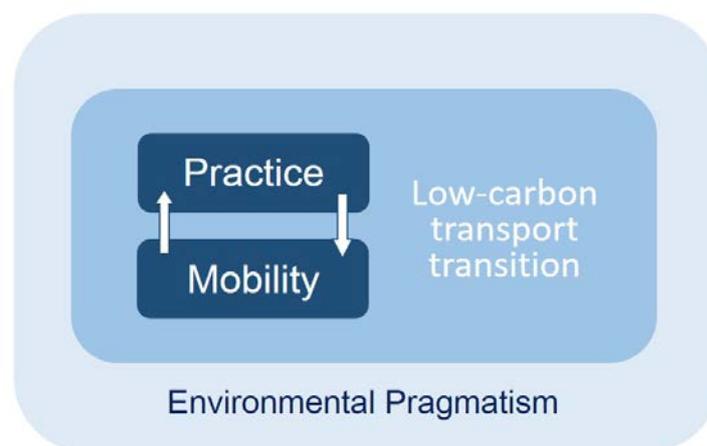
Figure 3. 1 Theoretical structure

3.1. Practice theory

3.1.1 Introduction

This research engages with the theory of practice to understand the low-carbon transition of transport modes, shifting specifically from the practice of petrol-powered motorcycles riding to other lower carbon transport modes (e.g. public transport or electric motorcycles). Our everyday life is built up by practices driven by various mobilities (Cass & Faulconbridge, 2016),

and the resources/energy that we consume daily are part of practices that build up our everyday life (Spurling et al., 2013). Practices are therefore central for a sustainable society. In view of this, I draw in social science understandings of practice as an interpretive framework to understand the practice of motorcycle riding in Taiwan. The understanding through the daily living experiences of motorcycle riders could shape and construct the contextual background of Taiwan's motorcycle culture. As the motorcycle riders are carriers of this practice, their narratives could build meanings and outline the significant Taiwanese motorcycle culture.

This section starts from understanding what elements could constitute practices and secondly discuss how practice theory might be helpful for a change to happen. Thirdly, I talk more in-depth about the 'change' in low-carbon transport transitions and the role the practice theory could play. And finally, I build a perspective which could be different from the dominant research or policies about low-carbon transport transition of the petrol-powered motorcycle in Taiwan. The prevailing research and policies in Taiwan are more from a top-down angle, such as technological fixes or behavioural change (e.g. Chang & Wu, 2008; Chen & Lai, 2011). There is not much in the Taiwanese context from a practice theory angle talking about the low-carbon transport transition or even utilising this examination on motorcycle research. My research does not argue a bottom-up perspective would be better than a top-down solution. Rather, I provide a point of view from practice theory angle to complementary current policy, which operated from a top-down angle yet was cancelled in the second year (which was in 2019) after the policy was announced while there were still 16 years to go till the scheduled targeted year (2035). My research argues that the solution for Taiwan's low-carbon transportation transition still requires technical interventions and policy leadership, but that these may stand a greater chance of being effective if they are linked with the wider insights that are brought by practice theory.

3.1.2 Elements for practices

The theory of practice is most directly applicable to understand and narrate daily ordinary happenings (Watsons, 2012). Cass and Faulconbridge (2016) state that every practice is unique, our daily lives are built by practices temporally and spatially, and every practice is socially connected to one another and woven together. To build a sustainable society, it is crucial for policy interventions to provide an approach which is designed comprehensively and

considers carefully the idea that society is composed of practices, which themselves are carried and performed by people (Shove, Pantzar & Watson, 2012). A practice can consist of constitutive elements that depend on each other. Key thinkers of social practice for sustainable policies like Shove et al. (2012) raise the idea that it requires a number of elements to form a practice, proposing three elements that are integrated actively into practices: material, competence, and meaning. These three elements compose the existence of a practice. Materials include objects, tools and infrastructures. Competence refers to the knowledge and skills to perform practices. Meanings of practice include cultural conventions or socially shared meanings (Shove et al., 2012). These three elements do not just purely exist, to form practices, the practitioners need to be able to reach the materials; they also require to evolve their skills for carrying the practice; and to know the social or cultural meanings connect to the practice (Cass & Faulconbridge, 2016).

To identify the practice of petrol-powered motorcycle riding in Taiwan, we could consider that: the materials of this practice could be motorcycles, roads, or petrol stations, etc.; being able to ride or maintain motorcycles could be the competences for carrying this practice; and thirdly, the meanings of this practice such as being able to ride a motorcycle could be as a symbol of independence or identity (Cairns, Harmer, Hopkin & Skippon, 2014) for example like travelling elsewhere by themselves (see Figure 3.2 for elements of the practice of motorcycle riding). Practices could be meaningful when they are associated with activities (Cass & Faulconbridge, 2016), like working, meeting, or going to school. Shove et al. (2012) continue to clarify the importance of enquiry into how the links between these three elements are made, sustained or damaged, as a way of understanding how practices appear, persist, shift, or no longer exist. A key point from the above for the elements composing practices, making a practice exist and meaningful is that people are *doing* it. Our social world is constantly reproduced by various practices performed by people.

- Objects: petrol, petrol-stations, helmets ,etc.
- Tools: motorcycles
- Infrastructures: roads

Material

- Knowledges and skills to perform: riding rules, riding skills, driving licence, etc.
- Maintaining and repairing vehicles

Competence   **Meaning**

- Cultural conventions
- Socially shared meanings: independence, identity, relationships, etc.
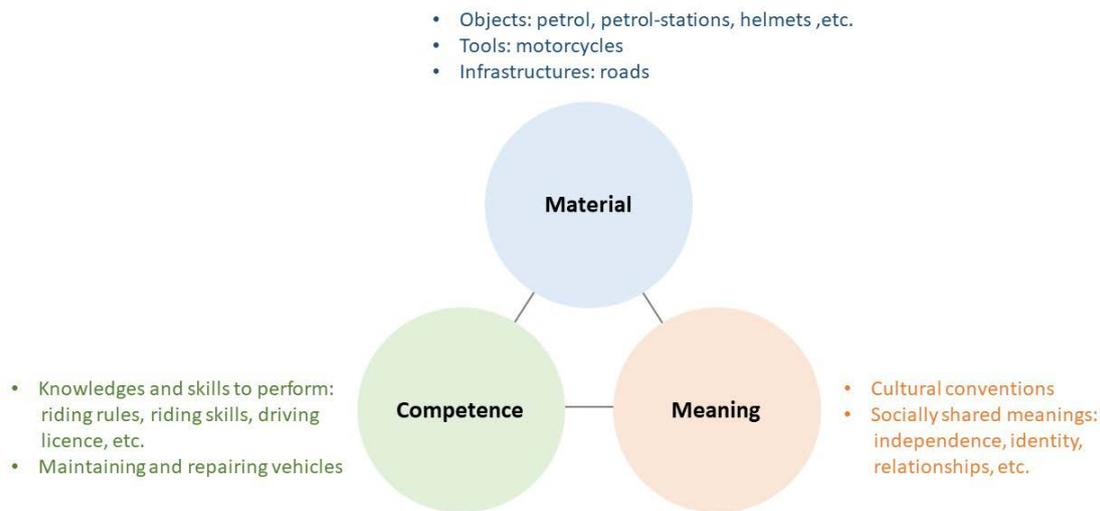
Figure 3. 2 Elements of the motorcycle practice, modified from Shove et al. (2012)

Watson (2012) emphasises that from a practice theory angle, when people are doing things, they are simply performing practices, and thus that our understanding should not be limited or simplified to individual attitudes or choices. For the role of individuals in practices, they are carriers or hosts of practices. Theories of social practice focus not on the individual behaviours, but on the wide ranges of many practices that practitioners carry (Hui & Walker, 2018; Shove et al., 2012; Spurling et al., 2013).

Spurling et al. (2013) offer a practice perspective for the policy intervention about sustainable transitions, and their discussions on transitions will be reviewed more in section 3.1.3 and 3.1.4. They regard practice as an entity, and argue that individuals' behaviours are mainly various performances of diverse social practices. They state that peoples' behaviours embody social phenomena (e.g. socially shared meanings) rather than simply being the expression of individuals' values or attitudes. They argue that individuals' behaviours are like 'the tip of the iceberg' (Spurling et al., 2013, p. 8). This indicates that individuals' behaviour has little influence on practices, and could lead to too much responsibility being laid on individuals' behavioural change for transitions, even though the influence of individuals' behaviour is too limited. Scholars argue that if the focus of change is placed on people's choices, there is a danger of thinking that these choices are derived from personal attitudes, which leads to putting pressure directly on people at an individual level (Shove, 2010; Spurling et al., 2013; Watson, 2012). What is more, Smith and Stirling (2018) emphasise that the scale of   long-

term changes associated with innovation are too large to put as a burden on small-scale individual actions.

Shove (2010) also emphasises that behaviours are shaped by external factors, and that policy designers and researchers should place more focus on these external factors. This angle provided by practice theory is unlike dominant approaches that focus on individuals' behaviour change while facing climate change issues. The thinking of decentralising individuals (Watson, 2012) brings out a different perspective and possibilities in low-carbon transitions. The following sections will discuss how social practice theories can help discover and complement policy plans to be more effective from a social and qualitative standpoint for transitions.

3.1.3 Practice for changing

This section discusses the potential fields or processes that could be understood as suggestions for making a change, assessed from a practice theory perspective. Although practice theory may be classified as a thinking that focuses on small aspects of everyday living, there is still room for policy intervention within practice theory and the approach can also clarify systemic changes in transport (Watson, 2012). For example, Spurling et al. (2013) point out that targeting social practices could be a more open way for sustainability policy design than narrowing down to behaviour or technical innovation alone. Labanca and Bertoldi (2018) argue that most current policy plans limit their focus to stimulating technology substitutions or changing individuals' behaviour about technologies that encourage people directly or indirectly to purchase the provided technical solutions for transitions. Instead of researching behavioural change, Labanca and Bertoldi (2018) take social practices as their analysing focus and suggest a systemic policy intervene. Therefore, it is important for this research to understand how practices may be changed, and to find out the motivations of motorcycle riding and discover more sustainable transport approaches for Taipei in depth. In light of this, drawing inspiration from pertinent literature such as Watson (2012) and Spurling et al. (2013) could help to map out a transition between practices, such as from petrol-powered motorcycle transport to just and equitable low-carbon mobility.

Regarding practice for change, I focus here on two texts based on elements of practices from Shove et al. (2012) on change from a social practice angle. The first is Watson (2012), who

discusses how the elements of practices could be changed. The second is Spurling et al. (2013), who raise several examples on how a practice perspective can complement policy intervention approaches. Watson (2012) illustrates that three crucial mechanisms could cause practices to change. First, the elements consisting the practice can make changes. Second, the population of 'carriers'/ 'practitioners' of the practice can change. Third, the way in which one practice bundles together with another is significant for changes since practices are related to other practices (Watson, 2012, pp. 4-5). Watson (2012) indicates that if we imagine a practice can be dead or alive, the success of practice to be maintained will rely on its recruitment, since practices are interdependent but also compete with each other for many factors, such as time, space, or money. Even safety and convenience are their competing field. Taking cars and bicycles as an example, Watson points out that cars substituted bicycles for various uses, meanings or motivations. Furthermore, according to his argument, Watson believes that due to the characteristic that practices are bundled together, there is a potential arena for policies or research that could be utilised as a bridge to conduct a systemic change (Watson, 2012, p.5).

Spurling et al. (2013) introduce social practice thinking to examine several practices for sustainability policy in their work, including a road transport analysis. Linking back to section 3.1.2, as Spurling et al. (2013) regard practice as an entity, they focus on shifting the idea from current sustainability policies focused on changing individuals' behaviours, to targeting on moving our daily practices to become more sustainable. They utilise three re-frames for policy intervention for change which are: (1) re-crafting practices by changing their composing elements to turn current practices to become more sustainable; (2) substituting practices with existing or replaced ones to uncover more sustainable practices to satisfy peoples' needs; and (3) changing the ways practices interlock with different practices. They suggest that an effective intervention should simultaneously be happening in many kinds of elements (Spurling et al., 2013, p.27).

A brief comparison of suggested ways of change from the practice theory angle of Watson (2012) and Spurling et al. (2013) is listed in Table 3.1. There is significant commonality between two of the three aspects of change proposed by each text. Both propose changing the elements which make up a practice; and both propose intervening at the point where practices connect and exist together. There is, however, one area in which the two texts diverge. Watson (2012) sees the importance of the size of the population of practice carriers,

and thus argues that the intervention point should be aiming at recruiting, which may need practitioners to make a decision to change and/or the designers to provide other practices to recruit these people shifting practice. On the other hand, Spurling et al. (2013) suggest a substitution of practices, which shows more reliance on providing or creating other practices by policy designers for practitioners. Whilst these two descriptions seem different, and the Spurling et al. (2013) suggestion seems to overlook the preferences of practitioners, common to both is that there is a need for 'other practices' to support change. This indicates a similar way of thinking on the idea that there needs to be a new replacement for previous practices.

Table 3. 1 Comparing the changing mechanism of Watson (2012) and Spurling et al. (2013)

Watson (2012)		Spurling et al. (2013) Three re-frames	
1	Elements can change	1	re-crafting practices
2	Population of practitioners can change	2	substituting practices
3	Bundled practices can change	3	changing interlocked practices

To discuss further, Watson's (2012) second mechanism considers the action of attracting shifters, this suggestion merges the idea of building better (and thus more attractive) practices to draw practitioners to join, which includes contextual thinking and consideration from the practitioners' angle. Going back to the idea that the people here are just a host for practices, it could thus be argued that practitioners' motivations for choosing other practices rather than their original one could depend on the choices that are made available. The 'choices' raised here are from a supplied background instead of choices made by practitioners' behaviour. Therefore, it would be worthwhile to understand the practitioners' thoughts on these practices, in order to build substitute practices that are more closely aligned to the kind or context of practices that are suitable for practitioners to carry. Accordingly, one of the contributions of my research is to engage with practitioners in Taipei to understand their motivations and build further suggestions based on their narratives for substituting low-carbon transport practices, for the case of changing from petrol-powered motorcycle riding to other lower carbon transport modes in Taipei.

Instead of listing mechanisms of practice changing, Mattioli, Anable and Vrotsou (2016) also evaluate the changing of car dependence practice from a social practice theory perspective. They utilise three levels of understandings to examine our current world: a macro level, a micro level and a newly developed angle of understanding on meso-level. They point out that both macro and micro angles are popularly utilised by policies currently, for the macro

understanding of seeing society as a whole on examining the built environment of urban planning, and the micro level of understanding the need to pay attention to crediting individuals. They build a meso-level aspect to modal change on car dependence practice, the advantage of which is that when the macro and micro levels of environments are difficult to change, a new scale of level can be used to intervene. Moreover, they state that viewing the world structurally and contextually could be linked back to Shove's (2010) argument discussed in Section 3.1.2 about the importance of having background knowledge in the way of examining the change.

No matter whether changing from the composed elements of practices such as Watson (2012) and Spurling et al. (2013), or from a structural thinking of a meso-level understanding of practice by Mattioli et al. (2016), the above has raised the idea that there is a body of research working on transitions from a practice perspective. However, most of this work is discussed in a Western context. Following on from the travel mode of car dependence mentioned in the above paragraph, the next two sections will explore how a practice theory perspective can intervene in the low-carbon transport transitions process, and how Western research focused on cars as a transport modal shift may relate to a low-carbon transport transition from petrol-powered motorcycle practice in contexts such as Taiwan.

3.1.4 Practice and low-carbon transport transitions

The previous sections have reviewed the elements that compose practices and how practice changes can occur. This section moves the focus specifically on reviewing changes during the process of low-carbon transport transitions, to connect the theoretical thoughts to the case of Taiwan's petrol-powered motorcycle practice change. Whilst there appears to be a body of research utilising a social practice theory angle to examine transport transitions as mentioned above, there are still voices calling for more efforts in applying the idea of social practice method in transport research (Cairns et al., 2014; Watson, 2012).

In addition to the kind of different modal change in history, such as cycling to driving and back to cycling, current policy and research consideration has been developed toward the field of making petrol-powered kinds of vehicles into a lower carbon mode. As Watson (2012) indicates, there is a need for transport to conduct an essential transition due to its heavy reliance on fossil fuels. However, he points out that most beliefs are laid in technical change,

which would act as a very limited intervention. From a transition to low carbon society point of view, to draw in a bigger picture of the society, we can observe the energy structure the transport system is embedded in. The impetus of low-carbon transport transitions could be traced to and influenced by the bigger society-based structure of energy transitions.

Regarding energy transitions, Labanca and Bertoldi (2018) see the limitations of present energy sustainability policies that are focusing on energy efficiency improvements (EEIs) behaviourally or technologically. Indeed, Watson (2012) points out that the interventions, for instance technological innovation or infrastructures, for transport low-carbon transitions are all interventions into practices. Moreover, Labanca and Bertoldi (2018) raise the point that policy designers assess the energy performance quantitatively, hence, they believe a social practice approach could provide qualitative perspectives and show the societal meanings and competencies (Labanca & Bertoldi, 2018; Shove & Walker, 2014) for a practice transition.

From the social practice theory perspective, whilst it is crucial that individuals are involved in changes of behaviour and practice towards sustainability, Shove et al. (2012) criticise that current policies may place too much weight and too much expectation for action on the level of the individual, due to the conventional ABC model (attitudes-behaviours-choice). Shove (2010) argues that framing changes in terms of attitudes (A) driving individuals' behaviours (B) and leading to individual choices (C) reduces practice change to a matter of individual actions. In turn, Shove, Pantzar and Watson (2012) argue that the ABC model diminishes the role of the government and policy and over-emphasises what the individual can do. Both individual- and policy-led approaches need to happen together to transform to sustainable practice (Hargreaves, 2011; Shove, 2010).

The pattern of governance interventions such as education, persuasion and incentives for encouraging people to make better or more rational decisions to live in a more environmentally friendly way and to break habits might be limited. These are actually approaches aiming at or 'nudging' individuals' behaviour change (Cass & Faulconbridge, 2016; Shove, 2010; Watson, 2012). However, 'nudging' individuals has been critiqued and shown to be an outdated and narrowed way of thinking (Ewert, 2019). Therefore, it is argued we have to find other complementary ways to reduce the burden of emphasising human's behaviour and to provide suggestions for low-carbon transport policy interventions for Taiwan and other places like it. The direction of the country's plan (see Chapter Two) has mostly fallen into this

myth and still seems to follow the mode of the ABC model to persuade petrol-powered motorcycle riders to change their practice with promotions, shifting transport via incentives, or educating people to live in a greener way. Policy intervention could therefore provide a way to build a sustainable society. Yet in order to achieve this transition, it must be designed comprehensively. Under a rapid increase of urban population and growth of the economy, if public transport is poorly-developed, as the price of motorcycle is relatively cheaper than for cars, motorcycles may be an alternative way for travel and to embody mobility (Chen & Lai, 2011; Evans, O'Brien & Ch Ng, 2018).

There are limits to what can be achieved by solely changing what people do, yet practice theory can provide fuller understanding and insights which may support a struggling transition progress. As the 2035 policy to stop selling petrol-powered motorcycles in Taiwan was cancelled only two years after its announcement, its failure should require an examination of the way policy intervenes instead of transferring the responsibility of the failure of the policy to people's complaints about this policy (Yin, 2019). For shifting to a low-carbon transport mode, Cass and Faulconbridge (2016) analyse different commuting practices through the three elements of practice theory (Shove et al., 2012). Cass and Faulconbridge (2016) suggest that the present societal structures limit the existence of competencies and meanings which would influence people's action of shifting their transport mode, and hence that in order to deal with this constraint, policy implementation is necessary. Rather than only building up new policies, for Taiwan's case, if the government still plan to create *another* target year for phasing out petrol-powered motorcycles in the future, relatively speaking, a more important and practical way should be build a more integrated approach and arrange the existing strategies for a holistic low-carbon transport policy rather than simply create a new target (Cass & Faulconbridge, 2016, p.2). This line of thought can also link to arguments from Watson (2012) and Spurling et al. (2013) for practices to change. Applied in the context of motorcycle riding in Taipei, a move towards low-carbon mobility could involve: (a) elements in practice changing, e.g. changing the type of motorcycles like moving from petrol-powered to electricity; (b) the amount of practitioners changing, e.g. motorcycle riders shifting their travel mode to low-carbon transport; (c) increasing the functionality of substituted low-carbon transport travelling modes; and (d) change in how the practice bundles with other practices, for example riding could be linked to commuting, shopping, or travelling. A practice theory approach could also provide an insight for the 2035 policy whereby instead of directly cancelling the policy, reviewing a better integrated approach for the current policy could be more practical.

As Watson (2012) says, since practices are performing and happening in locales, it is crucial and more efficient to aim the interventions in locales. Solutions tailored to local conditions would be an important key to improving the progress of the transition. The following section reviews literature with regard to the importance of acknowledging the local venue of where the practice happens to enhance the quality of transition, and reviews how some Taiwanese research engages with low-carbon transport transitions for motorcycles.

3.1.5 Low-carbon transport transitions of motorcycle riding in Taiwan

To increase the effectiveness of the integrity of policy design, it is vital for policy designers to consider locally. As Evans et al. (2018) suggest, feasible solutions to urban sustainability should pay attention to adapting to locales and countries themselves. Linking back to the previous point that motorcycles may be a potential alternative way for travel, petrol-powered motorcycle riding could be cheaper than taking public transport. Cheaper motorcycle purchase is a strong attraction for people to choose this travel mode rather than cars, even with the well-developed public transport in Taipei. It is also important to consider that although public transport infrastructures/systems/networks may not be viewed unfavourably in Taipei when talking about economic and affordability dimensions, the cost of riding a petrol-powered motorcycle could also be lower than taking public transport on a daily basis.

As mentioned in Chapter Two, literature in Taiwan on motorcycle transitions to lower carbon transport modes has laid more attention on cutting down the emissions of the vehicles (Sheu & Hsu, 2006; Wang, Chiang & Shu, 2000) or effects on drivers/riders in a quantitative manner (Chang & Wu 2008; Chen & Lai 2011). This literature from the transport dimension shows the transition of motorcycle in Taiwan focuses more on technical solutions and the importance of changing behaviour. Chen and Lai (2011) for instance, mention four factors that influence transport mode choice of motorcycle usage in their research: (1) travellers' socioeconomic characteristics such as income; (2) modal attributes like travel time; (3) psychological factors related to travellers' intention and habit; and (4) contextual factors which are based on public transport. Moreover, other than these factors, Chen and Lai (2011) regard motorcycle riding in Taiwan as a long-standing habit which will be the most difficult part for motorcycle riders to change their travelling mode, with a similar idea shown in Chang and Wu's (2008) research. Chen and Lai (2011) conclude that the push and pull strategy for the policy designers should be improved by banning some motorcycle usage and enhancing public transport development.

Although their research suggests the most important improvement and difference between Taipei City and Kaohsiung City is due to the degree of public transport development, this comparison may fall into a limited examination which neglects the question of why, if both places have well-organised public transport systems, do many people still choose motorcycles? For the case of Taipei City and New Taipei City, as the background of these two cities was explained in Chapter Four, we can understand that there is a large population commuting from New Taipei City to Taipei City daily by motorcycles, and the public transport system in New Taipei City is better than Kaohsiung (take the MRT system for example, there are 12 lines across New Taipei City and 3 lines in Kaohsiung City). There are still many motorcycle riders in New Taipei City and this is the aspect I would like to explore more. Given the concerns over socio-cultural context raised above, the existing research in Taiwan and beyond might overlook some of the less quantifiable yet still crucial social and cultural factors that can explain why people choose to ride motorcycles.

In addition to the aforementioned top-down research on changes at the technological level or at the level of how to influence peoples' behavioural change, Chang's (2019) research shifts the focus away from this and brings the idea of systemic change on the 'persistent problems'[6] to Taiwan's motorcycle transitions research. He utilises the level of socio-technical regimes to examine the strength of the motorcycle regime's existence in Taiwan by Multi-Level Perspectives (MLP)[7] and suggests that through the socio-technical landscape of low-carbon society and industrial transformation, both landscapes could put pressure on the existing motorcycle regime and create a possibility to allow innovation to have the opportunity to break through this persistent problem and reduce the carbon emissions and air pollution caused by the motorcycles. Chang (2019) points out that the recent rising industry of electric motorcycles could be a niche to shake up the current motorcycle regime for change.

Current literature has however not examined Taiwan's motorcycle low-carbon transport transition from a social practice angle, whether in English or Mandarin literature. Therefore,

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[6] Chang (2019) illustrates that the persistent problem is a structural problem, involving a wide range of issues, and they interact with each other, applying to Taiwan's huge petrol-powered motorcycle regime, it has created carbon emissions and air pollution, two significant issues. He argues that how to suppress motorcycles' gas and material emissions has not only become a key issue for Taiwan to move toward a low-carbon society, but also is an important issue to public health.

[7] Geels, Sovacool, Schwanen and Sorrell (2017) propose Multi-Level Perspective for socio-technical transitions: niches in innovations, socio-technical regimes and external socio-technical landscape. There are structural differences between these three levels and they are affected by each other.

a practice approach may be valuable to complement existing theoretical contributions in this field. Watson (2012) has pointed out that there are tensions between practice theories and socio-technical transitions methods such as the Multi-Level Perspective due to their ontological cognition (Watson, 2012 p.5). For instance, he says that the practice theory may be criticised as a limited approach for examining a bigger structural transition since practice theory focuses mainly on daily doings or doing things locally (echoing back to Section 3.1.3). The approach of practice theories may be unclear for large-scale transitions (Geels, 2010). However, Watson (2012) argues that any systematic changes must come from changing practices. Through the understanding of daily practices, the accumulation of the changes of practices could lead to a larger structural change. Therefore, applying this idea to Chang's (2019) suggestion made by an MLP approach, my research takes a different angle on understanding the practice of motorcycle riding in Taiwan which has not yet been explored. The motorcycle itself is an example of small doings which are practiced by practitioners, and at the same time is culturally embedded in society.

In addition to considering the transition of motorcycles through its elements as mentioned in Section 3.1.3, here I would like to raise an idea that the barriers petrol-powered motorcycles practitioners face may have great overlap with what car drivers would encounter. There is research assessing car dependence from social practice perspectives e.g. Cairns et al. (2014) or Mattioli et al. (2016), but not much on motorcycles. However, these two practices share many elements such as the same road infrastructures, petrol stations, and even some of the driving rules. Therefore, in addition to the car dependence issue addressed in much Western literature, Taiwanese people face an additional difficulty with motorcycle dependence issues. They may reduce their car dependence yet shift to motorcycle riding and for motorcycle riders, they may want to change to cars for many reasons and so forth. Furthermore, the problems faced by cars cannot be directly applied to motorcycles, and it is difficult to utilise the idea of meso-level perspective raised by Mattioli et al. (2016) on modal change for car practice on motorcycles. Applying a specific level to examine a particular practice might lead to an unequal situation. For example, focusing only on the meso-level of motorcycle usage reduction may lead to claims of injustice or unfairness if the built environment (like transport infrastructures) still exists for car practices.

Theoretical approaches to practice could hence be applied in the context of motorcycles in Taiwan to think about what the practice of riding a motorcycle represents, and how the

practice of riding is embedded in Taiwanese society more extensively. Grounding the research in practice theory allows us to critically evaluate low-carbon transport policy in Taiwan by taking the standpoint that motorcycles are not merely vehicles moving on the streets, and instead possess the meanings of the practitioners embodying the practice of motorcycle travel. Apart from discussing the process of transition and the social practice examination angle for the transition, the electric motorcycle niche that Chang (2019) points out is rising in Taiwan's market, hence the policies related to electric motorcycles should be a central topic to explore. Recalling the policy of strongly promoting electric motorcycles discussed in Chapter Two, on the road to low-carbon transport transitions for vehicles, Henderson (2020) illustrates that there are social disadvantages to the development of electric vehicles such as mobility injustice or social exclusion (this will be discussed more in the Section 3.2.2 and 3.2.3) and that policy designers should pay more attention to these inequalities instead of rushing for progress.

3.1.6 Conclusion

The starting point of this research is not to see how individual behaviour affects practitioners' choices, but how the entire social system can provide choices. The former is a small-scale personal choice; and the latter is a collection of choices that people can choose, and then through understanding the demands from the practitioners, adjust the social system for low-carbon travel modes. This study uses the reasons behind practitioners' choices to shape the structure and context of the motorcycle system and culture to understand what these practitioners need to carry these practices, such as insufficiency of infrastructure or lack of confidence in new practices. This approach is similar to Cass and Faulconbridge (2016), who shape and examine car practice through discovering practitioners' narratives.

Motorcycle riding practice can help practitioners to complete many other practices in daily life, such as shopping, travelling, or even simply wandering. Thus, the generation of habits and dependence on motorcycles is what most of the top-down policies would like to deal with. As Cass and Faulconbridge (2016) mention, practice theory does not examine materials extensively because lots of traffic policies have done so already, such as expansion of the transportation network, parking spaces, etc. They emphasise that practice theory pays more attention to the understanding of competition and meanings. As Watson (2012) argues, meanings, competencies and purposes in practice could also be created as an innovation.

However, through the actual user experiences of the practitioners, it is also important to understand the new practice materials research, since all elements of practices are mutually influencing and connecting.

It is important to reiterate that I do not claim practice theory is the only approach which can help to understand and enable changing of transport modes. Therefore, the meso-level approach by Mattioli et al. (2016) may also be valuable. However, the MLP method by Geels et al. (2017) or Chang (2019) for motorcycles in Taiwan may work at large societal scales when compared to the examination made by social practice angle, and as such may also require the practitioners' experiences to fulfil a better system because they are users of the system. The social practice perspective could perhaps be more able to take into account various aspects of choices. In practical terms, through the context shaping of practitioners and their understanding of this practice, it is possible to not only examine the issue from top-down but also from a bottom-up view. As Cass and Faulconbridge (2016) illustrate, social practice theory framework could provide a method to explore issues from practitioners' own experiences which could engage with both micro and macro scales. It is also important to recall the idea of practices being bundled together raised by Watson (2012), which could be a potential bridge for policies or research to be utilised for a system change rather than focusing on a single issue or level.

People need to fulfil their demands through daily practices, and achieving practices requires the power generated through practitioners' mobility. All practices are accompanied by mobilities of the carriers when they happen. Therefore, when discussing the low-carbon transport transition of motorcycles, it is important to discuss the role of mobility in this practice. The following section will explore the importance of mobility and the crucial role it plays in the low-carbon transport transition.

3.2. Mobility

3.2.1 Introduction

Continuing from the previous section, practices can complete practitioners' many demands, and these needs will cause practitioners to repeatedly create practices, which are mostly daily routines and mundane activities (Watson, 2012). Sheller (2018) points out that practices can be large or small, but the process of conducting practice requires mobility to make it happen. Practice can also perform mobility, and a person having mobilities can also connect various elements in practices – for example, a motorcycle, a road, or a cyclist. In addition to having skills to ride a motorcycle, the rider must have mobility not only in their own bodily mobilities, but also being able to move through places. Mobility can complete the practice instead of only being the product of a practice. When we think in this way, mobility is not an individual-level phenomenon (Cass & Faulconbridge, 2016, p.4)

Scholarly thought in sociology and human geography argues that mobility is necessary and important for living, and plays a vital role for humans to experience social and cultural networks (Cresswell, 2006; Urry, 2016). The meanings that mobility possesses are crucial, since they will provide the completion of practices and ownership of mobilities. When people own mobilities, they are able to freely access their needs to meet their demands. People may ride a motorcycle for commuting, and commuting can be more than just going to work or moving from point to point (Bissell, 2018). Because practices are bundled together, if someone undertakes the practice of motorcycle riding, more than one single practice may be done. The practitioners could also finish other practices together such as shopping, commuting, or taking children to school, etc. Since every doing needs the support of mobility, continuous mobility can complete many practices. Fairness and equality in ability to fulfil demands, even the most basic ones, are the key concern of mobility justice.

I aim to explore the low-carbon transport transition of Taiwan's motorcycles. In addition to understanding the importance of motorcycle riders for transport or general mobility access, equality in the process of low-carbon transport transition is also a critical consideration. How to design a transition plan and make sure that fewer people are excluded is important. The transition of electric vehicles is becoming a global trend, which seems to be the path that every country will follow (Jeekel, 2018). Bringing in Taiwan's transport policy for petrol-powered motorcycles, Taiwan has also advocated switching to electric motorcycles in recent years, and

the aspects that need attention will also be discussed in this section.

3.2.2 Why is mobility important?

Practice elements constitute a contextual background, and mobility is the key power of connection and execution of each element to build up practices. Practitioners need different amounts of mobilities to perform practices. (Adey, 2006) describes the world as 'in-flux' and being built and re-built again and again by countless movements (Adey, 2006, p.90). Sheller and Urry (2006) new mobilities paradigm emphasises that the connections between people and with the world by mobilities could tale various forms such as people's movements, objects' physical movements, imaginative travels, virtual travel and communicative travel (Sheller & Urry, 2006; Urry, 2016). As Cresswell (2010) illustrates, people and objects worldwide travel at different scales, and these mobilities all possess meanings. For instance, mobility enables social practices to happen, which could connect people, especially those at a distance, to maintain their networks (Urry, 2016).

Cresswell (2006) discussed the difference between movements and mobility in his book <*On the Move*>. Cresswell (2006) illustrates that movement is mobility without meanings, and hence that mobility is not only about simply moving from point A to point B but also focusing on understanding what happens and the meanings between or link point A and B (Cresswell, 2006, 2010; Sheller, 2018). However, as Sheller (2018) points out, one of the most common ways in designing transport is based on cost-benefit analysis (CBA) and seeking to build an efficient transport system for cars from a utilitarian angle. CBA cares about the efficiency from moving A to B, and the utilitarian approach on which CBA relies detaches the inner or broader meanings of the mobility and regards the travelling context such as streets as a 'blank canvas' to move across (Sheller, 2018, p.23). Bissell (2018) raises the importance of considering activities through a mobilities perspective, arguing that mobilities thinking lights up the way of viewing different practices. He utilises the example of commuting which is not as simple as we thought, since there are various practices that build up people's every day moving to work or school. In other words, commuting itself contains multiple meanings instead of only achieving the one purpose to move without any meaning in between home and destinations. This will be discussed more in Section 3.2.4.

In Cresswell's <*On the move*>, he provides three essences of mobility: (a) mobilities as pure

motions; (b) mobilities as meaningful movements and (c) mobility as a way of being in the world. Cresswell describes this first dimension of mobility (mobility as pure motion) as something that can be observed and modelled. As regards mobilities as meaningful movements, Cresswell explains that travelling from A to B could represent something important or powerful, e.g. being able to move or having immobility in life. Thirdly, mobilities as a way of being in the world reflects the idea that mobilities are experienced and embodied differently from people, and in view of this, the way people practice mobility could bring out meanings of mobility. Furthermore, Cresswell says that mobility is a way of being in the world and people on the move are having different characters such as men and women, cyclists, or refugees, etc., and they should not be regarded as simply people or moving objects.

Nevertheless, Cresswell and Merriman (2011) raise the focus on the complementary nature of practice and mobility, arguing that being mobile is central for people to experience the world through conducting practices. The mobility we have could build practices and connect various spaces and fulfil the meaning of different peoples' embodied practices to make different 'spatial stories'. Furthermore, embodied mobile practices weave with many issues politically, culturally, economically and environmentally (Cresswell & Merriman, 2011, p. 5). Linking to Bissell's (2018) argument that things people do influence their transport choices since different experiences make different decisions, the process of decision making could happen while being mobile in different environments. Transport choices can hence be emotional as well as rational decisions. Hence, choices of mode of transport may not be a 'rational' decision.

I aim to understand how these emotional, social and cultural factors inform motorcyclists' decision making about their way of transport. Especially under the context of the Taiwanese government attempting to persuade motorcycle riders to change their mode of transport, it will be important to understand their embodied experiences on the move. The deeper knowledge within practitioners of the practice of riding a motorcycle could provide better insights into the various aspects being considered, and offer policymakers empirical resources to guide their decision-making process. Therefore, it is also important to consider the practitioners – motorcycle riders - while viewing the practice of motorcycles. Cresswell and Merriman (2011) raise the concept that it is crucial to think from the perspective of irrational choices of practitioners for carrying out mobilities. They discuss the value of these irrational choices and travelling spaces, and not viewing the time spent moving purely as time-consuming. Following Cresswell and Merriman's (2011) discussion about how transport

geography has overlooked the meanings that happen in-between movements when planning transportation, Middleton (2011) also points out that generally in urban and transport policy, analysis tends to be based on the assumption that people make rational choices and rely on set journeys. The basis of transport policy and earlier design is based on the rational choice model to maximise travel utility and predict people's needs, and then evaluate the economic rationality to invest in transport infrastructures (Cass & Faulconbridge, 2016). Such analysis lacks attention to people's experiences when moving.

As Dennis and Urry (2009) argue in the context of the transition to a new car system, which could be an example for reflecting on the change of a motorcycle system, the new vehicle system needs to be as effective and influential as the previous one, yet must have the same degree of importance as the former system's role. They point out that our current car can reach a diversity of people's needs economically, aesthetically, emotionally, sensuously and socially (Dennis & Urry, 2009, p. 64). Therefore, linking to the previous paragraph that choosing the way to ride a motorcycle to travel may not merely involve rational decisions about cost-effectiveness or time-efficiency, it could also contain the enthusiasm for motorcycles, the close relationship with the vehicle, the feeling of riding motorcycles moving in the cities or strengthening the social networks etc., which the plans of new travel system for targeting motorcycle riders should consider.

Cook and Butz (2018) state that mobility justice seeks to strengthen theories of social justice and integrate mobile ontology into social justice. From a mobility angle, all things in the social and natural world are in motion (Cook & Butz, 2018) and structured into continuously interacting networks of relationships (Law, 1992). Therefore, mobility justice seeks to move away from social justice's 'sedentarism' which is insufficient for understanding how social relations are created and shaped by (im)mobilities, and that these (im)mobilities can lead to unjust social relations (Cook & Butz, 2018). Sheller and Urry (2006) argue that mobilities are essentially uneven, differential and unequal in society. Reflecting an increasing concern in social science studies of the environment with matters of justice, it is argued that looking to the mobility of a society can help us understand if people can equitably access the 'activities, values and goods', people have to access their social networks to prevent being excluded from the society (Cass, Shove & Urry, 2005, p. 540 & 548). Indeed, issues around access to low-carbon transport are gaining interest as part of thinking around a just transition (Healy & Barry, 2017; Schwanen, 2020). In this context, seeking to understand just mobility and a 'just

transition' refers to the importance of managing a low-carbon transition for our case study in a way that does not leave behind or further disadvantage already poor or precarious members of society. To this end, a well-organised transport network should arguably be covered equally to all citizens, or this will intensify the marginalisation of already disenfranchised citizens (Cass et al., 2005, p. 539). The discussion of low-carbon mobility transition will be brought out more in Section 3.2.6. The following section will start to focus on justice, firstly in terms of mobility justice.

3.2.3 Right to move – politics of mobility

Following the discussion in Section 3.2.2 about the importance of mobilities, as the previous section mentioned mobility is required while people have to do things or to maintain their social network. This section continues to discuss people's right to move. People's rights in life may be discussed a lot in various fields such as education, residence or medical services. However, the rights for people to move, their mobility and accessibility is also crucial, especially for those who are transport disadvantaged (Jeekel, 2018). Urry (2012) points out that the travelling experiences for people's journeys were not previously recognised widely, and hence mobilities thinking helps to find out how embodied experiences create people's daily living and seek to understand why someone can move. This section raises the attention for people's right to move, especially in my case study of motorcycle riders in Taipei.

Power in mobility

Continuing the importance of mobility aforementioned, there are meanings from moving from point A to B, and there are dynamic factors that can influence movements to happen. As Cresswell (2010) put it, mobility is wrapped up in power. Therefore, moving from place to place is never free and mobilities are always constrained by rules or governed, which is never equal e.g. there are differences between, for example, genders, classes or races. (Sheller, 2018). Cresswell (2010) utilises six facets to discover the politics of mobility – (a) reason of travel; (b) speed of travel; (c) rhythm in travel; (d) the routes of trips; (e) the feelings/experiences of travel and (f) frictions in mobility. These six ideas picture the integrity of all aspects of mobility to let us know the reason before movement, what happens between every journey, and when the mobility stops. Understanding these six facets, could be helpful for designers to consider and take into account while mapping the travel networks.

Jeekel (2018) states that the current dominant transport policy-making tries a lot to avoid exploring designs in-depth, and focuses limitedly on traditional economic and engineering frames, i.e. they only want to build an effective system in appearance, which will lead to many problems (Jeekel, 2018, pp. 189-191). Under this designing idea, Ho (2017) argues that a smart transport system would be the key to urban development, and the urban development framework determines people's travel behaviour. Yet, these dimensions could overlook the knowledge from practitioners' experiences and reduce the importance of the users of this system if the designers rely on quantitative data mainly (Sheller, 2018). In addition, the idea that a transport network could be designed based on quantification models indicates that the network seems like a hollow existence. The analysis of a space-oriented designed transport system may be spatially effectively planned to connect spaces. However, it may be missing the idea that the creation of space is stacked with many activities happening together, and it is not a pre-given element (Massey, 2005). Therefore, this brings out that mobilities are political, and that the mobile activities or networks are produced and woven by all elements of this network simultaneously (Sheller, 2018).

Right to move

Sheller (2018) proposes that it is central to consider mobility justice for people's right to move. She points out that the transport justice often focuses limitedly on transport alone, which makes it difficult to solve the fundamental problem. Sheller illustrates that according to the idea of transport justice, it will consider narrowly, for example, to reduce vehicle use and push people to utilise public transport or other lower carbon modes, which is not enough. Sheller (2018) considers equitable access to transport as an extension of Henri Lefebvre and David Harvey's idea of seeking spatial and social justice for citizens in the city and Edward Soja's efforts on fair resources distribution. Not merely focusing on seeking the right to enter a space, such as a city street, Sheller proposes a broader angle of mobility justice that seeks recognition, participation, deliberation, and procedural fairness. She asks key questions about who is able to perform mobility rights and who does not have the ability to mobility and why. The inequality would be influenced or as a result of the political, social or cultural context, hence merely a material improvement of the transport system is insufficient.

In the context of this study, even if it is known that the transport system in Taipei City and New Taipei City is well- designed from a technical point of view, assessing mobility through a

social science lens also requires us to consider if most of the citizens can reach the transport network easily and fairly to allow their everyday movement. Moreover, referring back to Chapter Two on policy in Taiwan, nudging people to change their travel modes could be insufficient to achieve the transitions. Understanding the practices connected to the transport system thoroughly, both spatially and contextually, and knowing what people want and need, could help to improve the progress of low-carbon transport transition to maintain a good life across all sections of society.

Sheller (2018) argues that uneven networks comes from some sacrifices and lead to the imbalanced right to the system users, especially those 'kinetic underclass' or 'mobility poor' (Sheller, 2018, p.6). She illustrates that powerful groups hold higher usage rights to possess public space in cities, and they even could affect decision making. Other than those powerful groups of people, others or especially the poor will have a higher potential to be excluded, marginalised and unable to move freely as they do. Sheller also mentioned that pedestrians have higher risks, such as those who die of motor vehicle crashes and have higher exposure to hazards such as air pollution than those in cars. Bringing in the role of motorcycle riders here, from the distance to the air pollutants in traffic, they actually suffer higher risks than pedestrians since they are closer to the petrol exhaust pipes. Furthermore, motorcycle accidents have become the largest case of all types of vehicles in Taiwan since 2006 (Ministry of Transportation and Communications, 2014). Moreover, linking back to Chapter Two, related research of motorcycle riders' exposure to air pollutants in cities is quite prevalent in Taiwan. Sheller (2018) points out that those who perform the transport modes other than car drivers are likely to have less attention or consideration from institutions of power. This is the case for motorcycles in Taiwan as well (Liu & Chao, 2022).

Both Henderson (2020) and Sheller (2018) state that the kinetic elites in the travelling environment are relatively rich and find it easier to move than others. Even though they are not a large proportion of travellers, they are more likely to gain freedom of movement and speed (such as VIP channels). Their mobility will be comparatively time-saving and in line with their requirements. However, their dominant mode of transport is mostly energy-intensive, such as luxury cars or private jets (Sheller, 2018; Henderson, 2020). Henderson (2020) raises that the importance of the travelling freedom of other modes of travelling, for instance, walking, cycling and those who take public transport, which should be put into consideration (Henderson, 2020, p.14). Under Taiwan's context, besides these mentioned modes, the large

portion of motorcyclists' rights should be getting more credit and consideration than they have gained by far. The growing amount of cars is reducing the moving spaces across cities, hence the current world dominant travel mode – cars – have taken over most of the travel spaces in cities and lead to a widespread commuting problem of congestion (Bissell, 2018). With the high traffic accident rate and the urban mobility space cut down by cars, as well as the surrounding air pollution environment, the mobility experience of Taiwanese motorcycle riders does not seem to be an enjoyable travel mode in this view. This is why this study aims to understand what the reasons are for motorcyclists to still choose this mode of transport in such an environment.

Accessibility

Mobility justice focuses on discussions about fairness, equity and social inclusion of the world's flow, which is based on an egalitarian concern (Sheller, 2018). Although Sheller emphasises that mobility justice should go beyond the transport focused evaluation, for the picture of the case study of this research on motorcycles, I would still start with some of the discussion from transport disadvantage scholars to understand the sphere of travel modes. For social exclusion in terms of transport, accessibility is a key consideration terrain. The point of discussion falls on if people lack access to the system which can fulfil their daily social activities or demands such as access to health services, works or recreational facilities (Hine, 2016). Therefore, the limit of access would mean these transport disadvantaged people cannot obtain their daily right to maintain good health conditions, earn a living, or even keep their relationship with friends and families (Cass et al., 2005, pp. 543-553).

It is crucial to discover the hidden social exclusions in a transport system. When changes in society have impacts on some people, which may lead to social exclusion (Byrne, 2005), the affected group of people may not be able to fulfil their rights or access to resources, e.g. an unemployment or employment crisis may have profound effects for people in middle/older age groups. Cass et al. (2005) point out that most scholars on social exclusion focus mainly on the key idea of 'access', and have not afforded as much consideration to a mobile perspective. Cass et al. (2005) conclude four different dimensions of access within a society: (1) financial components, such as the ability to own/buy vehicles and also have communicative access, where policies can assist disadvantaged groups with subsides, such as for elder people or students; (2) physical components, e.g. obstacles in the physical environment which increase

the difficulty for access or any constraints for moving; (3) organisational components, whether public transport is organised accessibly for those who do not own a private vehicle; and (4) temporal components, such as if the transport service can meet people's needs whenever they want to access. Cass et al illustrate that insufficient access could bring problems. According to the report *Making the Connections: Transport and Social Exclusion*, there will be fewer job opportunities for young people if they do not have a driving licence, it will be harder to reach their education if they cannot afford the travelling fees, and there will be fewer possibilities to maintain good interactions with families and friends (Cass et al., 2005, p.540).

The fairness in transport and mobility is mainly about financial fairness, such as whether users of the transport system are paying reasonably and whether these costs make the service well-functioning (Jeekel, 2018). People in a transport system are treated differently, and then it causes injustice. For instance, cyclists and pedestrians in cities are exposed to the air pollution produced by traffic. Yet the current transport systems tends to support and give priority to cars with uneven spatial distribution, and other transport mode users have to bear the environmental and social burdens from cars (Gössling, 2016). The spatial competition and demand in the city are greater than the demand in rural areas. People moving through cities will need a place to stop for a rest or to park. People or their vehicles hence also need their spatial right to park (Cresswell & Merriman, 2011).

The dominant transport system of cars can also affect the land-use plan, but a large part of the population is excluded from using this system. The possible reasons may come from the aforementioned four dimensions from Cass et al. (2005), yet these people also require to make a living through being mobile in cities. Therefore, making accessibility sufficient is more important than focusing on the functionalised transport system, even though the difficulty of sufficiency different from individuals' experiences requires different degrees of access. This is the question that needs to be discussed and focused on in traffic design (Jeekel, 2018, p.191). Mobility and accessibility may at times correlate with one another (Adams, 1999; Musselwhite & Haddad, 2010); ; but these two ideas discuss issues from a different scale and perspective. For instance, except when mobility is defined merely as the ability to undertake physical movement from A to B, as discussed in Section 3.2 mobility is something that can be political, meaningful and sustainable. Accessibility, by contrast, mainly examines if people can reach opportunities (Adams, 1999; Musselwhite & Haddad, 2010).

However, after discussing transport inequality, it is important to recall how Sheller (2018) said that mobility justice should go beyond transport. On the topic of Taiwanese motorcycles, it can be found that when discussing the motorcycle issue or transition, simply considering the practice of motorcycles is not enough to complement the transition. In addition to the practices bonded together as discussed in Section 3.1.2, a larger scale of transition considerations is needed. In the new transition transport system, consideration must also be given to prevent these motorcycle practitioners from becoming a large group at risk of social exclusion. As Chang and Wu (2008) argue, economic factors are a key consideration for motorcyclists, indicating that the motorcycle rider may be in poor financial condition. For the mobility part, in addition to the four dimensions of access by Cass et al. (2005), the flow of information is also central to transition. For instance, in the process of Taiwanese motorcycle transition, it may be important to consider whether the public clearly understands the 'information' provided by the policy designers, if the quality of communication between them is effective, and whether policymakers consider procedural justice carefully and comprehensively and include the participation of disempowered groups. Just as importantly, local and experimental knowledge should be integrated into the design process, as the experience of practitioners is an important source of knowledge in urban policy and governance (Anguelovski et al., 2020; Jonsson & Lundgren, 2014; Sheller, 2018).

Good mobility can mitigate a certain degree of social inequality. The practice of commuting can be seen as one of the closest practices which, although it seems to be a small scale activity conducted by individuals, is also a large scale activity which considers the society as a whole is an important object of discussion (Bissell, 2018). The next section will discuss the importance of commuting and see commuting is not merely a way to go to work or study.

3.2.4 Commuting and emotion in mobility

Commuting occupies a lot of time for most people every day, and linking back to the image of the 'motorcycle waterfall' in Taipei during rush hour in Chapter Two, there is a need for me to leave a space to view the meaning behind how the motorcycle practice carries the commuting practice. Since commuting is not a simple everyday movement, most people think of its problems such as overcrowding and oppression of mobile space in cities, and hence the process carries a lot of feelings (Bissell, 2018). Although most Western research and discussion of related topics focuses on cars, in Taiwan, motorcycles are equally as important as cars. In

addition to assisting many people in daily commuting, they can also complete many practices, as cars do. In Mattioli et al.'s (2016) research, some of the reasons for the difficulty in getting rid of car dependence mentioned are cargo function and escorting children. Under the Taiwanese context, motorcycles similarly fulfil this role and assist people's daily routines and practices.

Commuting is often viewed traditionally from a financial or economic perspective to assess if it is a time-saving commute. When starting from these economic viewpoints, commuting time has only been valued in terms similar to cost-efficiency, and if the commuting time takes too long, it will be regarded as a manifestation of a waste of time, where this period of time could be utilised better (Bissell, 2018). However, it is interesting to examine this issue from a different angle, where for the same distance of travel, public transport may take twice as long to reach the office compared to driving. But in this double time period, commuters can fully use their time to arrange what they want to do. In contrast, for self-driving commuters, even if they are travelling with relatively less time, they have to focus on driving during the entire journey. On the contrary, time seems to be better used by those taking public transport (Cass & Faulconbridge, 2016). In the process of commuting by public transport, time may not only be practically used to do what the commuters want to do, such as reading but also can be applied mentally, for instance, Bissell's interviewee told him that it is an important process for her to utilise such a commute time to feel she is getting ready to go to work before arriving her office (Bissell, 2018). Bissell argues that it can be seen from this angle that the economic perspective to examine commuting is limited, as it will overlook the dimensions of commuters' lived experiences, perceptions and how can they manage the commuting time instead of regarding it as a 'dead time'.

From the observation of commuting, we can see that this practice can show a lot of emotions on the move. Many people sharing their commuting experience often have negative emotions and perhaps with some specific descriptions, such as it is like 'hell and nightmare' or the feeling of being sandwiched in the subway (Bissell, 2018). In the process of commuting, more than only being moving objects that are considered to be non-emotional, commuters may feel the above-mentioned emotions on the move. The reason for choosing a commuting way may also be influenced by many reasons. They may be different gender, class, material privilege, or financial stress and so on (Bissell, 2018). Lyons (2004) points out that the choices for commuting may not be relying on rational or cost-effective decisions. They are indeed far

more than these two factors. As Cresswell and Merriman (2011) argue, people are moving only because they want to do, or some might have to move if they do not want to such as refugees (Sheller, 2018). These people are out of the scope of the scientific way to evaluate their motivation; in other words, their mobility is conducted in a way that would perhaps appear to be simply irrational. Moreover, it is probably difficult to influence the commuter with a push and pull strategy. Taking being stuck in traffic as an example, the commuters will not regard it as a problem, instead, they tend to wait and endure until the unpleasant situation to finishes (Hage, 2009). Unexpectedly, even though commuters are in an air polluted environment moving through the traffic, during the travelling time in rush hours, they may have these two chances in a day to feel 'peace and quiet' and that they are taking control of this day (Abler, Adams & Gould, 1971).

Emotions may affect commuting choices irrationally, and there are influences such as different places and times where people will also make different choices. Nevertheless, people's commuting ways could also be changed gradually from time to time (Bissell, 2018). Therefore, even one practice could bear so many factors or rich meanings behind it, not to mention what countless practice-carrying mobilities could stand for. In addition to being a 'result' of choice, the process of commuting is also full of meaning. For example, it could be connecting many practices, such as grocery shopping after work before heading home, or as with many tasks in a day the practitioner is on 'autopilot' (Middleton, 2011). Even if people move in this condition, the numerous meanings behind commuting are hard to neglect.

After discussing mobility by taking the example of commuting that is closest to the people's daily practice, we have understood that embodied mobility could represent many meanings. These aspects are all important to be considered while planning what a transport system, a new/lower carbon transport system, or a transition should bear in mind. Therefore, the literature review will move on to view how societies reach sustainable mobility and the topic of low-carbon transport transition, applied to perspectives from mobility justice.

3.2.5 Sustainable mobility?

It is crucial for this section to discuss how to make the low-carbon transport transition in a way that not only brings the environmentally focus but is also socially just, to understand the process with regard to how to keep people's mobility working well in the meantime with lower

emissions. A just transition matters in this sense because it is often the least empowered members of society who rely on older forms of transport (Henderson, 2020). Most low-carbon transport transition research focuses its discussion on cars, both from Western academics and in Taiwan. This section takes this as an example to bring out the perspectives of how Taiwan's motorcycles can become sustainably mobile in the transition process.

Due to the oil price being continually low, Dennis and Urry (2009) point out that the car system is treated as a very natural existence in our current society, and even locked-in as a system. Dennis and Urry (2009) state that the current car system seems very stable and not easy to be changed. They illustrate that it is important to remember the car system is not a singular system since the system is reproduced through the current economic, social and technological networks. Instead of challenging the car system as Dennis and Urry (2009) do, Ho (2017) not only describes that the cultural symbolism of cars represents freedom, power, and individual autonomy, but also praises that the car's culture has a certain degree of nobility. Under the car civilisation, they are not only vehicles for human activities. Take car licenses for example, which can represent a symbol of adulthood. People's satisfaction with driving a car can gradually increase, and cars are regarded as necessities of life, hence it will be strange to criticise the popularity of cars, according to Ho (2017). The way in which Ho (2017) argues for cars' existence is undoubted, which compared to the motorcycles' role in Taiwan illustrated in Chapter Two, shows a marked difference.

For a post car system, Dennis and Urry (2009) propose the conditions of creating a potential new system for cars to slow down instead of replacing the dominant car system immediately, and the new system should be flexible, freely and continue people's mobility without relying on the energy-intensive system. Dennis and Urry (2009) emphasise that the central point for a car system to change is not considering the car itself, instead, the key should be focused on the connections of what car system is built, for instance, people, materials, transport infrastructures and social context. Furthermore, there are many ongoing developing renewable energy systems at present, such as hydrogen-powered or biofuel vehicles. It is important for the new system to reach effectiveness like the car system, in other words, the new system should be designed based on people's need for cars from many dimensions economically, aesthetically, emotionally, sensibly and socially (Dennis & Urry, 2009, p. 65).

However, Jeekel (2018) states that technology and globalisation is the central developing idea

for modern western societies, thus while the societies look for solutions to problems, the main field that would be utilised is tending to be technological fixes. Take petrol-powered transport, for instance, changing to electric driving gradually become the mainstream or the route for low-carbon transport development across the world (Jeekel, 2018, p.152). Policy planners with a 'technological fix' perspective tend to set policy goals like targeting to change petrol-powered vehicles to electric ones in a settled year. Yet, a country with a clean energy system should not only rely on few specific goals such as petrol-powered cars to be displaced by electric cars. The transition should be planned with a bigger and comprehensive picture, for example, the sources of energy, the production of the vehicles, or the disposal of the vehicles, which will ultimately take the issue to the dispute of energy debate (Jeekel, 2018).

Compared with making people's behaviour change, technological innovations such as the creation of electric vehicles (EVs) are relatively painless for users (Bergman, Schwanen & Sovacool, 2017). Therefore, the growth of EVs has increased significantly in recent years, and the development of EVs has become a trend. EVs even have political support on promoting green energy to reduce carbon emissions. However, the development of EVs seems to grow too fast with not many critical studies (Henderson, 2020). Henderson (2020) suggests EV development ought to slow down and make more trade-offs before getting themselves into a lock-in status, because it may produce many problems that any new system will face. For instance, he illustrates that although cities are suitable for the development of EV networks, systematically designing dimensions such as charging stations is easier to set up than in rural areas. With many upcoming charging stations to be built, this also means that EV networks require space in the city, which may bring out new conflicts as well. The construction of a new transport infrastructure does not mean it is a solution for the current problems, because there will be different scenarios or restrictions from time to time. The construction of infrastructures would contain political considerations. Even if it has been determined that the entire city will start to build EV charging stations, there will be more problems that need to be solved, such as the allocation of stations, that will need to be evaluated or even negotiated. Ensuring the process is kept fair is important, which shows that the emergence of new systems will have certain complexity (Bissell, 2018).

From the perspective of mobility justice, the risk of EV is that when the vehicle needs electricity, the electricity price will be a focus. This will affect many kinetic underclasses, who may face more burdens, and their accessibility difficulties will increase, such as being banned

from entering spaces. Taipei City has an example of spatial prohibition for petrol-powered motorcycles, in that a traditional market bans the entry of petrol-powered motorcycles in order to transform itself into an environmentally friendly traditional market (Chen, 2020). Henderson (2020) takes the low-income clusters in the United States as an example, and he points out that not only do they absorb pollution from cars, but their accessibility to public transport is also very low. Due to this, there are many difficulties obtaining employment or daily necessities for them, resulting in uneven mobility. Therefore, in the process of transit to EV, how to help the kinetic underclasses to change would be a key sphere to assess (Sheller, 2018; Henderson, 2020).

Furthermore, Henderson (2020) argues that there is a lack of confirmation on the transfer of carbon emissions data in the scholarly and industry literature in addition to mobility injustice. For instance, the carbon emissions of EVs seems to be hidden, and their carbon emissions are actually produced in other places. Henderson (2020) emphasises that the relevant blueprint for the EVs' emissions discussion is very vague. Although countries may appear proud of their EVs' development which helps the carbon emissions in cities to decline, often the emissions and environmental impacts are offset to producing locations elsewhere. In other words, from a global or country scale perspective, the carbon emissions are still being produced elsewhere if the electricity for electric vehicles is mainly generated from coal-burning (Hofmann, Guan, Chalvatzis & Huo, 2016). This is the reason for adding a question mark to the title of this section. It is very important to always question and think critically in the process of pursuing transformation.

Recalling Taiwan's context from Chapter Two, Taiwan's government is promoting electric motorcycles to replace petrol-powered motorcycles in recent years. However, mainstream literature has focused on discussing on the improvements on green transportation infrastructures/electric motorcycles, or encouraging people to change (e.g. Eccarius & Lu, 2020; Trappey et al., 2012), similar to the example raised by Middleton (2011). Middleton (2011) takes the UK's sustainable transport policy as an example, where the government encourages people to use public transport and cut down the usage of private vehicles, which causes congestion in London. They promote the 'benefits' for people to move by walking or cycling that can be a 'healthy' travel mode. The focus of this promotional dimension shows they have people choose a healthier way to move in a rational way.

Ho (2017) praises the experience of Germany from Buehler and Pucher (2011) and believes that the most feasible way for Taiwan's low-carbon transport transition is to 'tame cars', such as using taxes and regulations to make driving more expensive and using funds to promote public transportation, cycling and walking. Furthermore, he argues that these alternatives must be improved until they can replace cars, rather than eliminating cars. Ho (2017) emphasises that Taiwan's transport policy has never considered the bicycle system, so a friendly bicycle environment is insufficient in Taiwan. Ho (2017) does not pay much attention to the motorcycle part in his book. Even though he is discovering the low-carbon transport transition in Taiwan, he focuses mainly on cars. Ho (2017) devotes only one section to petrol-powered motorcycles, and he suggests that the Taiwanese government should use policies to guide the elimination of obsolete motorcycles. He believes that the lack of rapid replacement is due to insufficient market incentives, and that the Taiwanese government should consider increasing taxes on obsolete motorcycles so that the people will tend to accelerate the elimination. Ho (2017) argues that it is difficult for the Taiwanese government to change 'motorcycle culture' immediately, at least the Taiwanese government should try to guide motorcycles to use 'non-polluting' electric vehicles. It is surprising that Ho (2017) considers the car's culture has a certain degree of nobility, yet he defines motorcycles as a 'scourge' (Ho, 2017, p.169).

Western studies and their lessons in sustainable transport are valuable experiences. In addition to learning according to the experience of various countries, it is worth linking back to what Henderson (2020) mentioned previously, that we could not switch to an electric vehicle world too quickly. Moreover, the transition must also pay attention to the need to adapt to local conditions. Ho's (2017) book advocates many good examples from 'Western' countries, but according to his suggestions, he explores how to tame cars in the entire book, but only has a small section to talk about the plight of Taiwan's motorcycles. This lacks the background of Taiwan's motorcycle context, which with a large number of motorcycles, is in the process of learning from other countries. Therefore, the significance or effectiveness of this learning may not meet the needs of Taiwan, and the rights and interests of the people who ride motorcycles or other transport-poor people may be overlooked. It is more likely that Ho's (2017) suggested process of taming cars is too biased towards cars in a low-carbon transport transition process which takes cars as the only leading actor, with this biased transformation resulting in the damage to the rights of the motorcycle riders and unjust mobilities.

There is a need for society to realise that making a change requires continuity, and the process may take a long time to conduct since the system is complex and hard to predict. Since sustainable development covers a wide range of societal, economical, technical or political factors, the transition process itself will require continuous adapting and gradually developing (Bissell, 2018; Dennis & Urry, 2009). Spurling et al. (2013) put that the transport modal shift may have nothing to do with policies at all. Due to the systems being bundled together, the designers may need to consider the connections between people's practices.

3.2.6 Conclusion

In this mobility section, I started by understanding the meanings behind mobility and following the importance of mobility justice. Literature shows that practitioners need different levels of mobilities to conduct their daily practices and also maintain their social networks. The mobility around us is not an abstract existence, and as per the argument from Cresswell (2010). Mobility is full of meanings rather than just pure movements. We should bear in mind that different people embody different travel experiences, which may occur due to their feelings or their environment, which is central to their travel experiences. And with these various differences, their decisions could be not all rational in a way that travel mode models could predict.

This section also understands that the relationship between mobility and practice is an interrelationship. It is imperative for people to feel free to have their mobilities to complete practices and everyday doings. However, after understanding deeper the society and bringing in the reality of mobility globally, Sheller and Urry (2006) argue that mobilities are political and essentially unjust. It is required to ensure people's access to keep their daily networks going and not to become excluded, especially for the mobility poor (Cass et al., 2005). Discussing the process of mobility justice can understand people's right to move and people's right to access spaces through different mobilities, whether they are public facilities, medical institutions, or people's leisure venues. This is key for progressing a low-carbon transport transition.

Furthermore, when designing a low-carbon transport transition for Taiwan, in addition to borrowing from successful cases in other countries, it is important not to forget that the immediate local context should be put into consideration. Even though the dominant transport

mode in Taiwan is the car system as most Western research focuses on, it is hard not to notice the reality of the 14 million motorcycles in Taiwan. Yet, most of the literature in Taiwan seems to find motorcycles are merely a kind of problem that should be dealt with, but through aiming primarily at car centred solutions. Therefore, I aim to understand more about what motorcycles mean to Taiwanese people and the practices and mobility it carries to Taiwanese people's everyday life to access their daily demands.

The next section will view whether environmental values could play any role in the process of low-carbon transport transition. Rather than seeing if environmental values could assist people in better fitting into a low-carbon transport transition, I aim to focus more on analysing from the angle if the pro-environmental way of persuading people is as an effective a way as the policymakers expect.

3.3. Environmental pragmatism

3.3.1 Introduction

As the above review shows, the core concept of practice theory is to focus on changing from the system level of the society and to de-centre individual behaviour change. It is also crucial for the policy to work together with individuals on the way to shift to low-carbon transport. The 2035 policy focuses on environmental protection with many encouragements and promotions for petrol-powered motorcycle riders. Policymakers hope to utilise the idea of being more environmentally friendly and living a healthier life to act as the driving force for people's low-carbon transport transition. However, in terms of understanding environmental issues, are there any discrepancies between policymakers and practitioners? Have these different voices been noticed by the policymakers? In this section, I want to focus on whether policymakers have simplified the voice of the people. For example, the importance of people's perception of the environment may differ from each other; moreover, it may also be different from that of policy-makers.

People's perspective on environmental issues needs to be understood to know what context shapes their values toward the environment. Therefore, this section starts with a general understanding of the relevant background of Taiwan's low-carbon transport transition. Every practitioners' embodied and living experiences are different, and this reveals that different lived experiences might lead practitioners to have various environmental perspectives. Therefore, policy-makers need to bear in mind to take different perspectives into account and with more conversations with the practitioners while planning a low-carbon transition process for the environmental good. In the second part of this section, I will illustrate the perspective of environmental pragmatism for this low-carbon transport transition issue in Taiwan.

3.3.2 Contextual background for motorcycles' low-carbon transport transition in Taiwan

Chapter Two provided the context of Taiwan's motorcycles and policies of promoting the low-carbon transport transition for petrol-powered motorcycles. This section explores what Taiwanese scholars' research focus on motorcycles in the low-carbon transport transition has been, and what they found the obstacles to the transformation of a low-carbon society to be in Taiwan. Chou and Liou (2020) argue that one of the difficulties of Taiwan's current low-

carbon transitions is that the past development has put economics first, the short-term results may be significant, such as Taiwan's economic miracle in the past. Yet, this developing dimension may overlook many issues in the long run, such as damaging the environment without analysing ahead or ignoring workers' rights and lead them to face risks in their working environment.

Chou and Liou (2020) challenge the difficulties of Taiwan's transformation in their research. They point out that Taiwan relies heavily on high-carbon industries and high carbon energy. Moreover, the availability of cheap water prices and electricity prices has deepened peoples' dependence on energy consumption with little caution. This context has led to development in Taiwan for at least nearly half a century that has established models and paths that are difficult to extract from the situation of a carbon lock-in (Chou, 2017; Chou & Liou, 2020). However, even if the development structure of society is deeply affected by high-carbon industries or high-carbon energy. According to Hsiao's (1990) survey, Taiwanese people's environmental consciousness about environmental problems has risen since the 1980s. Chi and Hsiao's (2003) environmental awareness survey in 1999 that Taiwanese people have shown their supports for environmental justice conceptually. In Chou and Liou's (2020) research, they observe in public surveys conducted in 2012 and 2015 that the public in Taiwan has consciously raised its awareness of climate change-related issues.

Chou and Liou's (2020) results state that the Taiwanese public thinks economic development will not conflict with environmental conservation. The Taiwanese public also conveys the willingness to support the transition of paying more for energy-consuming, such as higher taxes or higher electricity bills (Chou & Liou, 2020). Chou and Liou (2020) believe that the public is already conscious of related environmental issues and the price for low-carbon transition to happen, but the Taiwanese government should plan the policies not just with endless empty talks but with a clear roadmap. They criticise that Taiwan's transition policy planning is not clear enough, and the process is not transparent. Chou and Liou's (2020) suggest these two points should be improved and can make the public more capable of the implementation of relevant policies in the future.

Chen and Chao (2011) raise that the main development policy direction of the transportation sector is how to reduce the use of private vehicles and increase the usage of public transport. However, they point out that the biggest characteristic of private vehicles is that they are relatively faster and more comfortable than public transport for users. Therefore, it can be

said that it is a more convenient way of travelling. They point out that the impact of this will be more significant in areas with underdeveloped public transport systems, which would be less possible for private vehicle users to change their travel mode. They argue that because there is a stable environment for private vehicle users to keep the same travel mode repeatedly, this will derive into a habit. They state this habit is just an action that naturally occurs to accomplish their many purposes like commuting. Chen and Chao (2011) argue that based on habit as the starting point for analysis, a stable environment can help certain travel modes last longer, but if we link back to the previous two sections, Chen and Chao's (2011) argument may overlook that different modes of travel have different practices. Their focus seems to make the meaning of practice or mobility unimportant, because in their analysis, the reason why practitioners move is only to accomplish their purposes, and the movement they discuss here is merely to link between points.

However, the research of Chen and Chao (2011) found out that Taiwanese motorcycle riders would be more willing to change their travel mode to the public transport system than car users. Therefore, they suggest that public transport planning should be prioritised in marketing or promotion for the motorcycle group. Since their riding habit seems less strong than those who drive a car, it would be more effective to encourage motorcycle riders to switch to public transport mode. They propose that public transport fares can be reduced or even free at a certain period of time to attract the motorcycle community and 'cultivate' the habit of taking public transport for motorcycle riders to achieve transformation. The suggestion that Chen and Chao propose seems to put too much focus on 'habit'. A key concern here is that it would be too personal on an individual level, as Shove (2010) discusses. On the other hand, I argue that this focus will be monotonous or idealistic. The limited set of restrictions makes Chen and Chao's analysis overlook the various situations that may be faced and need to be dealt with in the process of travel mode conversions, such as the consideration of transition justice or the meaning of being mobile. The discussion merely on people's habits of travelling will be too restricted and not sufficiently take into account underpinning social and cultural factors.

As mentioned in the previous sections, Ho (2017) regards the motorcycle in Taiwan as a disaster, and Chang (2019) sees the motorcycle problem as a persistent problem that needs to be solved in a social systemic transition. Even if not seeing the motorcycles as a negative existence, from Ho (2017) and Chang's (2019) arguments, petrol-powered motorcycles in Taiwan's low-carbon transport transition still require a lot of effort to complete the switch to

other lower-carbon modes of travel. In addition, the transformation requires long-term work and improvements, and the process also requires many participants to carry out the process. Whether it is the regime systemic change proposed by Chang (2019) for the motorcycle's low-carbon transport transition in Taiwan or the transition that Chou and Liou (2020) raise to pay attention to when moving forward to a low-carbon society, both have provided helpful views to understand a large-scale structural change. Although shaping the motorcycles into a 'problem to be solved', for me, it is too much to put the responsibility on practitioners or the physical existence of the motorcycles.

3.3.3 More conversations

Based on the structural transition research outlined above, my study continues to see a more specific and closer bottom-up discussion of living experiences for the motorcycle practice practitioners in the low-carbon transport transition process in Taiwan. I argue that the process of low-carbon transport transition should remember to avoid excessive personalisation of responsibilities and must bear in mind that the perspectives of practitioners are required to be seen under the systematic transition. Rather than being limited to practitioners being affected by their long time habits or the result of their behavioural choices (such as Chen and Chao [2010]), the pluralism of values held by environmental pragmatism supports a more diverse angle for building up the thinking in this research and for reconciling the competing perspectives of individual responsibility versus structural change. Pluralism seeks to embrace multiple values and allow them to co-exist, and argues all kinds of values should be freely expressed in the society. Thinking in this way could also show that pluralism brings connections and difference of opinions and ideas (Brush, 2020; Katz & Light, 1996). Nonetheless, because of the embracing of diversity by pluralism, the pursuit of practical solutions is often the priority. As Bernstein argues, "What matters, however, is how we respond to conflict" (Bernstein, 1989).

When discussing pro-environmental issues, researchers may possibly lead the discussion to the changes in behaviour or the obstacles encountered when changing behaviour into pro-environmental issues, whether these are structural or psychological obstacles (Gifford, 2011). When practitioners choose a certain travel practice, rather than saying that they all have the same 'habit' or a habit that needs to be changed as mentioned in the above literature, I would like to bring in the idea that riding a motorcycle is possessing many more meanings than simply being a habit. The reasons of choosing this travel mode may be far more complex than a habit or a reasoned behaviour that comes from different backgrounds, life experiences, or

preferences. Environmental pragmatism tries to bring the practical and political connections to environmental ethics thinking; and to supplement the gaps between environmental theorists, policy makers and the publics (Katz and Light, 1996). Minteer and Manning (1999) state that in order to tackle environmental problems, environmental pragmatism emerged as a practical tool for environmental ethicists. Focusing more on experiences and hold in mind that the world is changing all the time; environmental pragmatism aims not to pursue an exact standard or certainty of solutions, but to emphasise it is more crucial to find out what is insufficient and how to make life better (Parker, 1996).

The perspective of this research is to extract the advantages of the welcome communicating space provided by an approach grounded in environmental pragmatism, which seeks to provide moral pluralism to environmental philosophy by not focusing on theoretical disputes but more practical policy-making (Brush, 2020). When we look at the differences produced by different values of practitioners' various life experiences, these differences seem far from consistent, but they represent diversity. And the more diverse the discussion, the more tolerant our society can be. Brush (2020) mentions that a moral pluralism approach is more humane and can meet the pursuit of social inclusion to consider various voices, especially minorities or disempowered groups, in the process of a low-carbon transition. Approaches which seek to reconcile a diverse range of perspectives in this way may not appear effective in the short-term, but may prove effective in initiating longer-term change. For instance, from Gross' (2007) case study of an environment dispute of a wind farm development, creating opportunities for communities to participate, providing communities with sufficient information, listening to communities' voices can increase communities' acceptance and lower down the dispute. Another example is that an urban renewal case had stuck for many years in Taipei City; three households disagreed with cooperating on the relocation. Thus, the engineering corporation decided to send an application to Taipei City Government to conduct the demolition by force. However, during the review of the demolition case by the city government, the engineering corporation and the city government continued to explain to the last three households, with negotiation and listening to their appeals. Finally, the authorities obtained their consent before the compulsory demolition case had passed; as a result, all 203 households agreed to the renewal and relocation project, and the engineering corporation also withdrew the pending demolition application (Taipei City Urban Regeration Office, 2020). As Brush (2020) states, long-term negotiation and debates are also a manifestation of democratic progress.

Furthermore, environmental pragmatism researchers believe that there is no single way to solve problems because the real world and society are too complex, and the problem-solving process is continuous and adjustable (Brush, 2020; Katz & Light, 1996). Countries may be graded on the level of economic development; however, Brush (2020) emphasises that the process of accepting diversity and dissent in a country is also representing a civil and democratic status. Brush states that when we view dissensus as normal and come along with it, society can be more respectful in the long run. This approach can also be responsive to how to make mobility transitions more environmentally sustainable and socially just, which is what Sheller (2018) proposes to achieve.

3.3.4 Conclusion

Under the framework of the administrative goals of Taiwan's environmental policy, the promotion of the 2035 policy focuses on replacing the old petrol-powered motorcycle with new ones with lower-carbon emissions. The policymakers utilise the slogan as 'taking care of the lungs as well as the industry' (Su Tseng-Chang, 2019), showing the desire to achieve economic development and reduce air pollution together. The issues of air pollution and public health improvement, plus providing subsidies for replacing vehicles, are used to attract petrol-powered motorcycles to change. In the introduction to Taiwan's background in Chapter Two and the literature reviews in this section, we have seen that existing studies have involved socioeconomic and psychological modelling formulations for travel mode (Chang & Wu, 2008), habits and reasoned factors for travel mode choice in Taiwan (Chen & Chao, 2011; Chen & Lai, 2011), regimes systematic for Taiwan's low-carbon transition (Chang, 2019) and structural change for low-carbon transition in Taiwan (Chou & Liu, 2020). It can be seen that the overall development has shifted from personal responsibility to a larger system or a larger structural level change. This has responded to Shove's (2010) point of moving the attention away from the individual level, which meets what my research seeks.

However, these studies mainly adopt a top-down perspective. Even though many of them use questionnaire surveys, the limited structured questions and quantitative research methods make it harder to see this issue from the bottom-up angle. My study illuminates the flow between the top-down and bottom-up perspectives, and understands Taiwan's petrol-powered motorcycle transition from a standpoint that has not been discussed extensively yet. I hope to open more conversations within this topic through the picture outlined by the colourful embodied experiences of practitioners, guided by the inclusive and pluralistic view

of environmental pragmatism. The fairness, diversity, and possible objections within a transition process need to be increasingly recognised, to explain the value of different values that may be produced by practitioners toward the same environmental issues or policies. Guiding my research and analysis through the lens of environmental pragmatism can be helpful here in order to ensure that the voices of minority groups can also be heard to implement procedural justice, social inclusion and mobility justice in a low-carbon transition.

Chapter 4. Methodology

4.1 Introduction

This chapter begins with an explanation for laying out a qualitative research design for my research topic, and the reason that I selected in-depth interviews as a technique to collect the narrative materials of motorcycle riders in my research area of Taipei City and New Taipei City to answer my research questions. By starting with the bottom-up thinking of practitioners, the aim is not to focus on changing practices from the individual level. Instead, the analysis aims to see how people regard the low-carbon transport policy and motorcycle culture. To achieve my research aims of assessing motorcycle riders' perception towards the low-carbon transport policy and the environment, and gaps in the systems from a bottom-up angle, I chose in-depth interviews with a semi-structured interview guide to conduct qualitative data collection. I demonstrate further in this chapter why in-depth interviews help answer my research questions and illustrate how I recruited the participants for my research.

Through the findings from in-depth interviews, my research utilises an inductive approach of thematic analysis with five generated themes from a two-stage coding processes to sort the collected data systematically. I apply critical discourse analysis in order to identify key themes whilst connecting with broader social, political, environmental and economic contexts in Taiwan. I aim to draw out new theoretical insights into the practice of riding a motorcycle in a country and cultural context which has not yet been explored in-depth in the scholarly literature. My findings were structured and interpreted by putting narratives in-between analysis of daily experiences, the social context of practice theory, and the importance of mobility. Findings were integrated and synthesised based on extracts from participants' life, experiences and decision-making on their transport mode along with their narratives to lessen data fragmentation in the next chapter. The final part of this chapter will bring out an overview of how I deal with ethical issues in my research and will illustrate limitations of my study.

4.2 Research philosophy

When it comes to environmental issues, environmental risks are both social and technical. Social science is capable of making contributions to environmental issues because there are social factors connected directly or indirectly to risks such as pollution (Wong & Lockie, 2018).

For low-carbon transitions specifically, to deal with climate change by shifting from a high energy consumption system to a more sustainable one, social science scholars have developed different conceptual approaches including practice theory (Spurling et al., 2013; Watson, 2012); multi-level perspectives (Geels et al., 2017; Liu & Chao, 2022); or a combination of approaches working over different scales, such as economic models and integrated assessment models (IAMs), social-technical transitions and practice-based action (Geels et al., 2016).

I propose a different ontology from the research of Geels et al. (2016), who see practitioners as individual actors with different perspectives, and locate the practice-based action approach in low-carbon transitions within an interpretivist ontology. By contrast, I treat the practitioners as carriers (Shove et al., 2012; Spurling et al., 2013) within a practice, who make practice change happen. The interpretivist argument that it is critical to understand what people take for granted and to acknowledge their existence (Goldkuhl, 2012) could help me to understand from a bottom-up angle how practitioners share their diverse lived experiences, which for me is the truth and reality. I regard practitioners' experiences as vital information that can help to make a practice change happen in a smoother and more appropriate way.

As mentioned in Section 3.3, to respond to the low-carbon transport transition for motorcycles in Taiwan, my research takes an environmental pragmatism approach to evaluating motorcycle practice and people's daily motorcycle riding experiences, with a view to using this enquiry to inform thinking on what acceptable and appropriate outcomes for the motorcycle transition may look like in practice. A key focus of my research from a pragmatism perspective is seeing the world as an ongoing process and constantly changing. Pragmatism constructs the research design around critical thinking that aims towards outcomes that work best for the problems under study, but at the same time does not seek to prescribe or 'close down' the range of possible outcomes or discourage novel and innovative outcomes (Goldkuhl, 2012). Therefore, there is no one 'solution' for environmental issues, only appropriate methods which can continue to deal with a continually changing world. The epistemology of my research is actually in line with Geels et al. (2016). We both understand the complexity of reality and seek flexibility in the policy-making process, not utilising a single policy to solve problems. The only notable difference is that Geels et al not connect to environmental pragmatism. It is important to point out this difference due to the epistemological orientations of pragmatism and interpretivism. Pragmatists construct knowledge mainly for improving and changing practices,

whereas interpretivists mainly seek for understanding and creating knowledge itself (Goldkuhl, 2012).

Goldkuhl (2012) argues that although qualitative research could often be linked to interpretivism, whereas pragmatism may be encouraged by utilising a combination of research methods (Yvonne Feilzer, 2010), pragmatism can play an important role in qualitative research as well. A combination paradigm of pragmatism and interpretivism is workable (Goldkuhl, 2012; Goles & Hirschheim, 2000). Goldkuhl (2012) points out that scholars show they form their research orientation with 'intervention', 'action' and 'change', without clearly placing their research design within a pragmatism paradigm. Goldkuhl takes the example of Braa and Vidgen's (1999) research, which utilises three dynamics - positivism, interpretivism, and intervention - to build their research framework for research into an information system. While Braa and Vidgen (1999) put 'change' and 'intervention' in their research framework, they did not explicitly link it to a pragmatist paradigm. Geels et al. (2016) similarly situate their proposal of practice-action approach with an interpretivism ontology, but do not make the connection that making a low-carbon transition through what they call 'learning-by-doing' is itself what a pragmatist looks for. The purpose of raising these examples is to show that pragmatism and interpretivism can work together. Each of these paradigms can be a basic paradigm, and incorporate elements from the other (Goldkuhl, 2012).

My focus is on the reality, the lived experiences that need to be understood, and the underlying meanings behind the motorcycle practice. Therefore, in order to understand the meanings in practice and the mobility within the practice. I utilise a case study of lived experience (interpretivism) to establish the elements of change in motorcycle practice and the crucial ideas that need attention during the low-carbon transition, such as the electric motorcycle system, and improve (pragmatism) the smoothness of the transition process and reduce the unfairness that may be encountered in the transition. Understanding the practice of motorcycles from an interpretivist perspective and dealing with the low-carbon transport transition issue for the practice in a pragmatist way could be more suitable to frame my research paradigm than only utilising a single paradigm. The approach of my research is thus to take a bottom-up starting point to discover practitioners' daily experiences that construct the context of the practice, rather than presuming what the practice should be or look like. I then aim to gain the lived experiences from practitioners to construct the knowledge of a motorcycle practice and understand what the elements are in the practice. Through doing so,

the intention is to see what angles and considerations might be missing in current research or policy-making, and create bottom-up knowledge that can supplement the current low-carbon transport transition for motorcycles in Taiwan.

4.3 Research design

The theoretical framework of my research utilises practice theory (Shove, 2010) as a core way of thinking to examine the practice of motorcycle riding and understand motorcyclists' thoughts and lived experiences on low-carbon transport. This practice approach is also used to discuss further the disconnection between the practitioners (motorcycle riders) and the Taiwanese government's aspiration for low-carbon transport, especially electric motorcycles. Furthermore, my research seeks to use practitioners' narratives to see the importance of the meaning of mobility associated with the practice, or how it relates to their social and cultural networks (Cresswell, 2010; Urry, 2016). Echoing Section 3.3 on environmental pragmatism, I aim to open a deeper understanding of and conversation on the practice of motorcycle riding to achieve the plural and inclusive discussion perspectives of environmental pragmatism. These three main theoretical foci underpin the research design (see Figure 3.1) of my study, and provide an approach to develop a bottom-up understanding of the low-carbon transport transition for the practice of motorcycle riding in Taipei.

As Cass and Faulconbridge (2016) mentioned, a qualitative methodology itself can offer breadth and depth in transport research, rather than testing pre-determined factors that influence people's travel modes. It provides a way to illustrate the reasons behind people's actions and practices. There is a gap in research in Taiwan for studies that use in-depth interviews to understand the views of motorcycle riders on low-carbon transport and their daily experience. I am looking for the rich narratives of this issue instead of seeking statistically representative data. In order to answer my research question of seeking to understand the lived experience of motorcycle riders, I utilised semi-structured interviews with open-ended discussions (Bryman, 2016) to help my research questions start with a clear direction to the interviewees and ensure my interview conversations remains focused. This approach also allows the interview process to be flexible and allow the responses of practitioners to frame the issues. Meanwhile, open-ended discussions within the interviews provide insight into aspects of practice that I may have overlooked. This chapter also explains how I designed my data collection technique of in-depth interview questions prior to fieldwork.

The thematic analysis borrows some elements from the critical discourse analysis approach that allows us to see issues of power. Van Dijk (1993) mentions that critical discourse analysis seeks to know, reveal and resist the inequality in society. A critical discourse analysis approach may yield valuable insights into how Taiwan's low-carbon transport strategies may inadvertently further disadvantage the already worst-off. Specifically, those who rely on petrol-powered motorcycle transport. In-depth interviews for my research could be regarded as a good opportunity for the participants to speak about their daily experiences of relying on petrol-powered transport and facing the transition to a low-carbon society. Critical discourse analysis pays significant attention to discourse access and social cognition for ordinary people (Van Dijk, 1993). In my case, these ordinary people are the motorcycle riders in everyday life, due to Taiwanese society being used to the role of motorcycle riders. Motorcycle riders may face problems or hidden possible inequalities in the process of the low-carbon transition that the society has taken for granted (Bryman, 2016). The perspective of critical discourse analysis can help to illuminate the problems faced by motorcycle riders during the transition (Ietcu-Fairclough, 2008) and provide decision-makers with new insights and draw attention to factors that may not have been considered previously. Nevertheless, the level of power that motorcycle riders hold seems not proportional to their number. This disparity between the number of riders and the power they hold will be an interesting angle to analyse and discuss further in the following chapters.

4.4 Location selection of Taipei City and New Taipei City

The value of a case study is it can provide a real-life context (Yin, 2009) for my research, which whilst not necessarily statistically representative is nonetheless valuable for contributing to a theoretical understanding with practical insights. A case study of Taipei's motorcycle practice and its relation to the low-carbon transition is helpful for other cities, not only in Taiwan but also worldwide, to learn from. Castree (2005) argues that case study research shows the diversity of the world and can be utilised to illustrate the heterogeneity of cases from different scales. Although every case study is unique and may happen in different locations, the cases are also connected. The case study of Taipei can thus yield insights for those seeking to understand low-carbon transitions that are appropriate to particular practices, regardless of whether the practice is similar or if they are located in a similar geographical location. More specifically, the case study exemplifies how a practice approach can be used in one specific context and for one specific practice to identify gaps or assumptions in existing policy and

research, and thus to make policy and practice recommendations. Both the insights and recommendations, and also the technique and conceptual approach, can subsequently be adopted and adapted by those working in other settings. This echoes Goldkuhl's (2012) point that for pragmatists, efforts towards local improvement or local interventions are also crucial to contribute to an overarching body of knowledge that can be useful for other cases. My data collection was conducted in the research areas of Taipei City and New Taipei City in Taiwan. As Taiwan's capital city, Taipei City is geographically surrounded by New Taipei City (Figure 4.1), and these two cities have built a twin-city environment by transport links through not only roads but also public transport (Li, Liu, Liu & Li, 2016). A large part of Taipei City and New Taipei City is separated by rivers (mainly the Tamsui River system, see Figure 4.2). The population of these two cities is around 6.57 million, with an area of 2,324 km^2 (Dept. of Household Registration, M.O.I., 2021). The famous image of the 'motorcycle waterfall' (Figure 2.1) was taken from one of the bridges connecting Taipei City and New Taipei City – Taipei Bridge. During rush hours, a large number of motorcycle commuters flood into Taipei City from New Taipei City via these bridges every day. Therefore, the scene of the motorcycle waterfall can be seen across many places in Taipei. This restriction has caused the road use space during the commuting time in Taipei to be even more limited, and there will be a certain degree of congestion, especially near every bridge.

Public transport in Taipei is well-organised and developed earlier as a leading city compared to other cities in Taiwan (Chen and Lai, 2011). In addition to enormous bus networks in these two cities, the Taipei Mass Rapid Transit (MRT) has expanded widely (Figure 4.3). A single journey ticket costs NTD 20 – NTD 65 (£0.54 – £1.74) depending on the distance, a reasonable fare compared to many cities worldwide. There are discounts on transfer to other public transport modes such as buses or YouBikes. YouBike is a self-service public bicycle rental system, there are many YouBike stations across Taipei (Figure 4.4), and the stations can be found outside MRT stations, schools, or parks etc. (Figure 4.5).
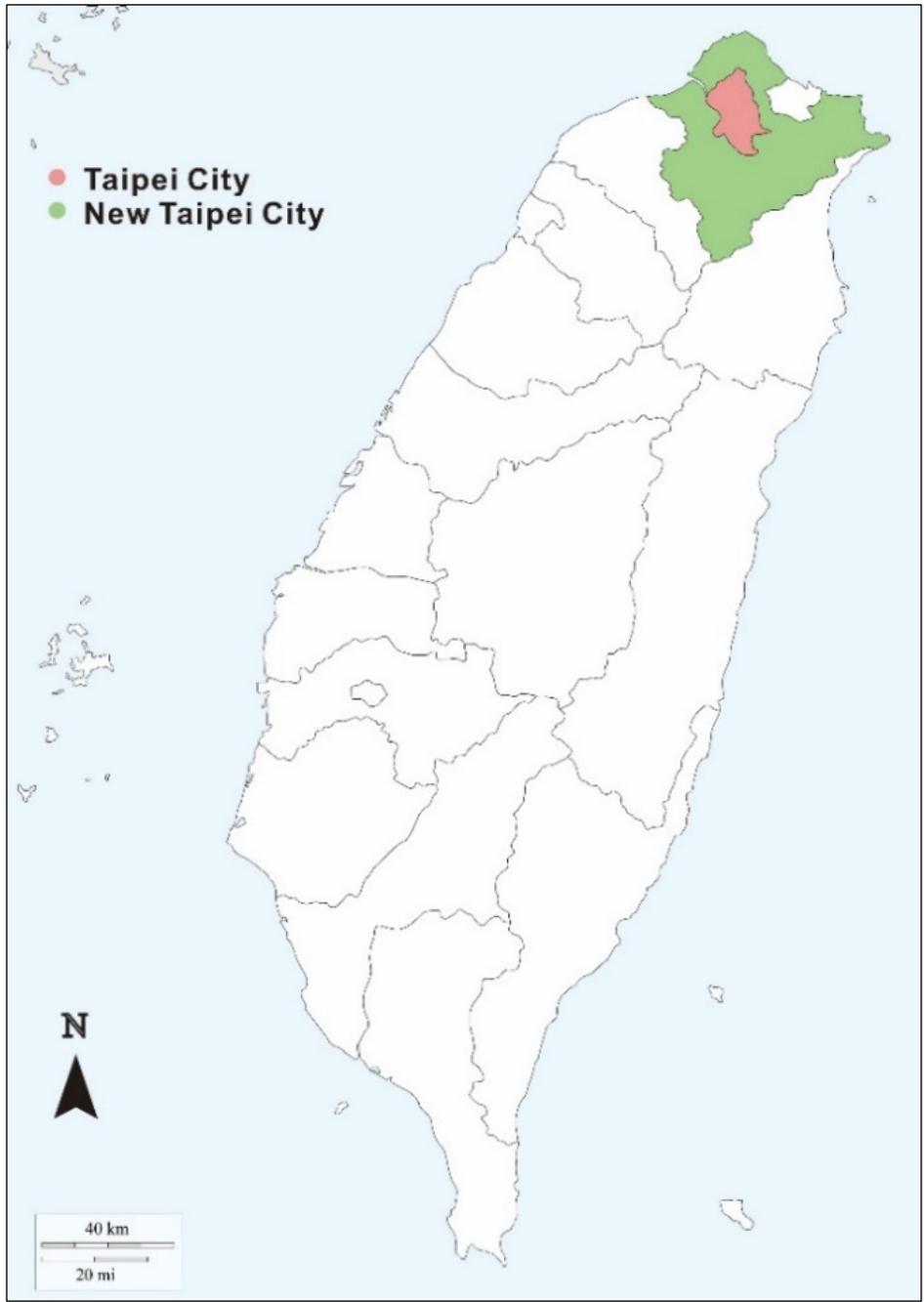
Figure 4. 1 Location of Taipei City and New Taipei City within Taiwan
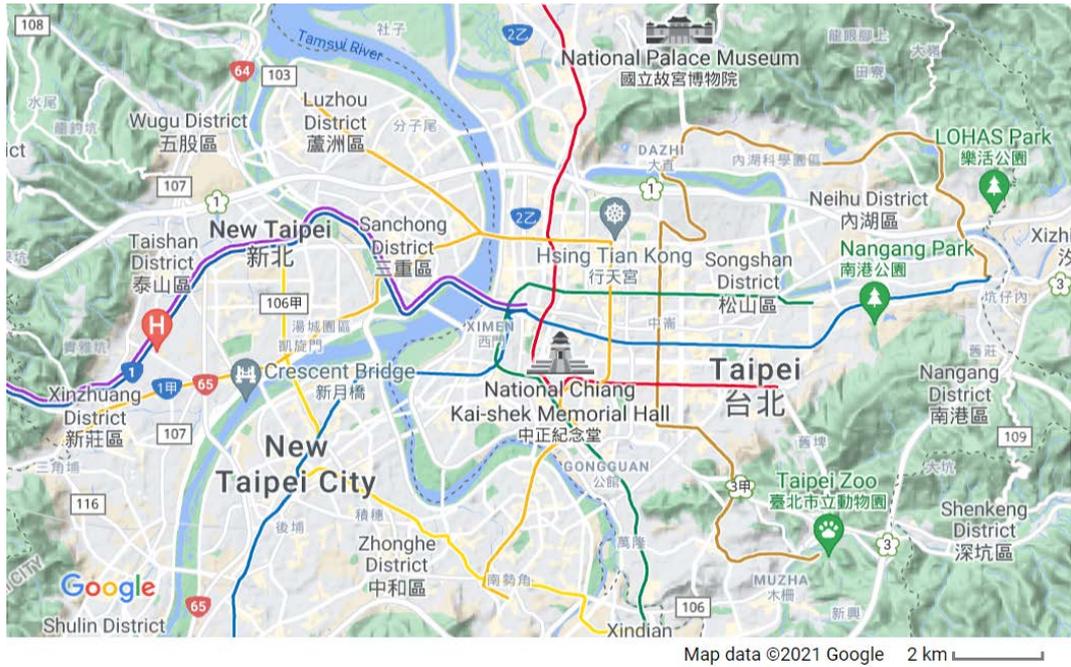
Figure 4. 2 Tamsui River system cutting through the cities

Figure 4. 3 Taipei MRT Stations
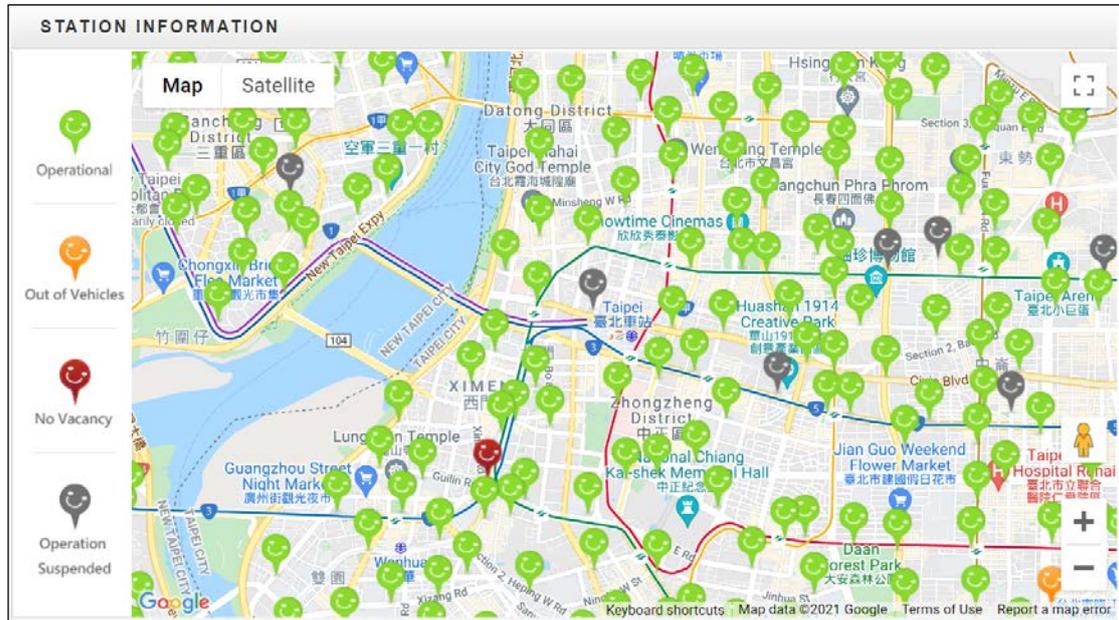
Figure 4. 4 Taipei YouBike Stations
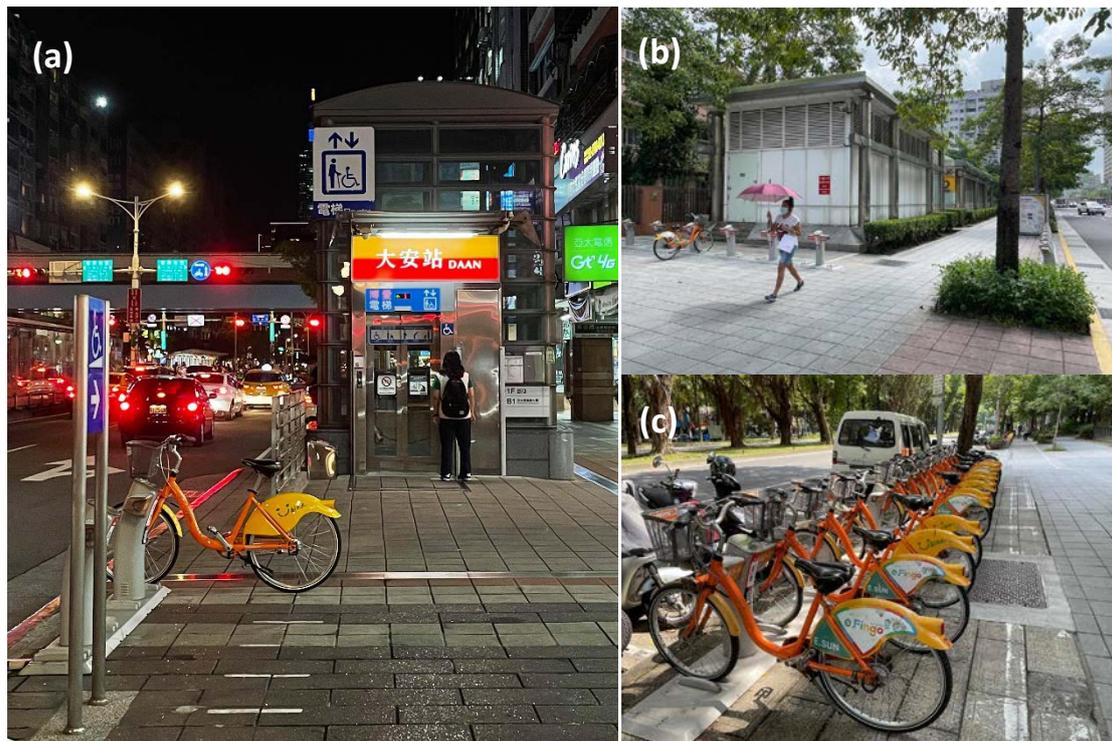
Figure 4. 5 YouBike stations outside MRT stations' exit (a and b) and a university (c) (photos taken by friend of author)

The initial motivation to start my study in Taipei City and New Taipei City was from seeing the image of Taipei Bridge's motorcycle waterfall, which connects these two cities. Following on from this, the reasons for me to choose the issue of motorcycle riders and sustainable transportation as my research area are: firstly, despite the above mentioned well-developed

public transport system, there are still around 3 million registered petrol-powered motorcycles (Ministry of Transportation and Communications, 2021). Secondly, due to the role of Taipei City as Taiwan's capital city, linking back to Chapter Two Taipei is the city where regulations will first be implemented ahead of other cities in Taiwan often. For instance, the rules of wearing a helmet, and charges to use parking grids started in Taipei first. Therefore, providing suggestions to the case of Taipei could also offer other cities in Taiwan experiences and learning points.

The meso-level for what the case of Taipei could bring out is that it could be an example for other countries which are confronting motorcycle and sustainable transportation issues, mostly in Asia, such as Malaysia. Finally, for the macro-level, the case of Taipei in the low-carbon transport transition could provide an example for countries that are undergoing a transition across the world. Different contexts can also use practice theory and mobility theory to understand and construct transport practices from a bottom-up angle and listen to different voices. Recalling the theoretical contribution of my research that there are few discussions of motorcycles from a practice theory angle, I utilise social practice theory to provide a different perspective from practitioners' daily experiences to examine the low-carbon transport transition process. The mobility justice of practitioners also needs to be considered, as mobility justice care about both equality and social inclusion regardless of the type of transport or cultural background used.

4.5 Methods

Using interviews in qualitative research

Continuing my discussions in Chapters Two and Three, there is not much research either in Taiwan or globally using in-depth interviews to understand the lived experience of motorcycle riders and their role in low-carbon related issues. However, a small sample of people who are familiar with the context and are able to provide rich, in-depth information are more important than statistical representativeness. For instance, Schyfter (2009) conducts in-depth qualitative interviews as a methodological example of how motorcyclists can be interviewed in Costa Rica to understand their motorcycle riding experiences. As the aim of my research interviews is to obtain bottom-up in-depth information, the in-depth interviews adopted a more conversational style and focused on asking participants to narrate their lived experiences of

motorcycle travel awareness of the policies and pro-environmental actions. I, therefore, conducted in-depth interviews to elicit participants' motorcycle riding experience narratives and their awareness of the 2035 policy and perception of the environment. In addition, the interviews sought to provide an interpretative context on how society is discussing motorcycle and low-carbon transport policy-related topics in Taiwan from a bottom-up angle, obtaining information richness (Hennink, Kaiser & Marconi, 2017) to understand this practice.

I utilised the semi-structured interviews with open-ended discussions (Bryman, 2016) to begin my research questions in the interviews. The semi-structured interviews guide me with a direction of asking questions and remind me of keeping the focus on the topics of discussion during the conversations with interviewees. An open-ended discussion carries my interview questions with the flexibility to talk and follow up in more depth based on what interviewees said. Furthermore, using the method of semi-structured interviews could help achieve what Patton (2014) argues, that a qualitative researcher should build a framework to guide respondents to talk about their depth perspectives and narratives.

The semi-structured interview guide is shown below (Figure 4.6). These questions were developed based on review of previous literature, a basic understanding of the motorcycle issues in Taiwan derived from online research, and my own lived experience and knowledge of Taiwan. However, due to the news that the 2035 policy was going to be cancelled, which was released in the middle of the interview process, the topics covered in the interview were explained slightly, but the main topics on the interview guide remained the same. I asked one more question that: *the '2035 policy' will be cancelled soon, do you have any thoughts on this?* In order to explore the awareness and perspectives of the interviewees toward related policies, the cancellation did not affect the content I was looking for. Instead, the interviewees' responses to the news that the policy was being changed can themselves give insights into what participants feel is a necessary and appropriate policy direction or course of action.

Semi-structured interview guide

1. 基本資料（性別/年齡）
   Basic information (Gender/Age)
2. 騎車多久了？騎乘原因/目的/用途 多久騎一次
   How long have you been riding a motorcycle? Your riding reasons/purposes?
3. 在騎車之前所使用的交通方式是？例：大眾運輸/腳踏車/車子/其他
   是否有更換，更換的原因是？
   What kind of transport mode did you take before you ride a motorcycle? E.g. by public transport/
   bicycle/car/others
   Have you changed? Reasons?
4. （針對燃油機車者）不選擇大眾運輸工具 or 其他相對低碳交通工模式的原因是？
   (For petrol-powered motorcycle riders) Why don't you choose public transport or other lower-carbon
   travel methods as your transport mode?
5. 目前政府（中央、地方）皆有對轉換電動機車有所補助，您對這項政策知道多少？您覺得對您會
   有甚麼影響？
   At present, the governments (central and local) have subsidies for changing to electric motorcycles.
   How much do you aware about this policy? How do you think it will affect you?
6. 您對（推動）電動機車的看法是？您覺得這項政策帶來的優缺點是？
   What's your perception of (promoting) electric motorcycles? How do you think about the strength and
   weakness of this policy?
7. 請問甚麼影響因素（能）促使您更換成電動機車？您願意改變嗎？
   願意 – 原因是？；不願意 – 原因是？
   What reasons/factors could influence you to change your transport mode to electric motorcycles?
   Are you willing to change?
   If YES – Why? If NO – Why?
8. 空污問題這陣子是個很熱門的話題，您有過深刻感受嗎？
   Air pollution is a popular issue recently, do you have any feelings about this?
9. 請問您對這項政策以環境/健康之名導向推動的看法是？
   How do you think about the policy being promoted in the name of improving environment/health?
10. 您對於環境的看法是？請問您覺得環境對於您的意義是？請問您覺得環境有甚麼價值？
    How do you view our environment? What do you think the environment means to you?
    What value do you think the environment has?
11. 騎機車對您來說有什麼意義嗎？您會覺得機車太多破壞市容嗎？台灣的騎機車文化您覺得代表了
    什麼特色？
    The meaning for you to ride a motorcycle? Do you think too many motorcycles could deteriorate
    cityscape?
    How do you think about the motorcycle culture in Taiwan represents?

Figure 4. 6 Semi-structured interview guide

Patton (2014) points out that open-ended discussions can help to investigate in-depth responses about participants' experiences, perceptions, opinions, feelings, and knowledge. Therefore, utilising open-ended discussions within the interviews provides insight into aspects of practice that I may have overlooked. Meanwhile, I was careful to keep my language clear and easy to understand for interviewees while discussing and let the participants speak on their own terms. The interviews were taken in Mandarin and Taiwanese[8].

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[8] In addition to Mandarin, which was promoted in Taiwan by the National Government of the Republic of China in the past, the languages spoken in Taiwan include Taiwanese, Hakka and Aboriginal languages. Taiwanese language can also be called 'Taiwanese Minnan' and 'Taiwanese Hokkien' (Yeh, Chan & Cheng, 2004). According to the Ministry of Science and Technology's survey that nearly 70% of people in Taiwan think they can communicate effectively in Taiwanese (Minnan), but the survey points out that the Taiwanese language is more commonly used in people over 60 years old, and Mandarin is widely used in daily life languages of other generation (The Ministry of Education, 2018).

Recruiting participants

As raised by Bryman (2016), the goal of finding interviewees is to be able to answer my research questions and what I want to know (Patton, 2014). My research is looking for the rich narratives to give both theoretical insight (on practice theory) and practical insight (for Taiwan and other nations with a motorcycle culture, and I investigate whether people's ideas are synchronised with the trend of policies. I sought to investigate the diversity from peoples' perspectives towards the related policies in the process of low-carbon transition of Taiwan's petrol-powered motorcycles – before and after their change. Therefore, the sampling targets would be in line with the two major roles before and after the low-carbon transport transition process: petrol-powered motorcycle users, and former petrol-powered motorcycle users who changed to electric motorcycles or lower-carbon transport modes. The following (Table 4.1, for full details of interviewees see Appendix I) is the list of interviewees coded with random letters and their basic information:

Table 4. 1 List of interviewees

Interview number	Interviewee code	Gender	Age	Petrol-powered motorcycle	Electric motorycycle	Public transport
1	H	Male	37	V		
	W	Female	29			V
2	N	Male	55+		V	
	E	Female	55+		V	
3	C	Male	43		V	
4	L	Male	39		V	
5	B	Male	29		V	
	P	Female	31	V		
6	M	Female	57	V		
7	F	Male	31		V	
8	J	Male	30	V		
9	S	Female	35	V		
10	D	Male	21	V		
11	A	Female	29			V
12	Y	Female	25	V		
13	G	Male	22	V		
	I	Male	22			V
	K	Female	22			V
	Q	Female	28			V
14	T	Male	31		V	
15	O	Male	40+	V		

(Notes: interviews were conducted with 21 participants in total, and each participant is assigned their own 'interviewee code'. The 21 participants were interviewed across 15 interviews, and each interview has an 'interview number' as shown in the table.)

The approach I utilised is snowball sampling. I made initial contact with a small number of people relevant to the research topic and then used these to establish further interviews with other possible interviewees (Bryman, 2016). Since it is impossible to interview all the petrol-powered motorcycle riders or electric motorcycle riders in Taipei City and New Taipei City, snowballing was an effective approach when it is difficult to obtain sampling frames (Bryman, 2016) as people will continue to shift from being petrol-powered to electric motorcycle users over time. Snowballing is an effective way to target electric motorcycle riders or those who have recently transitioned, in the absence of any kind of formal platform or society that would allow me to easily access these kinds of respondents. There is also a possibility for people to change their travel modes constantly or move out or in from the two cities of Taipei and New Taipei. Moreover, the technique of snowballing is not looking for representative (Bryman, 2016) but diverse data, which is what my research expects.

My interview invitation methods were roughly divided into the following ways: inquiries through social media such as Facebook Messenger and LINE, direct face to face verbal inquiries, asking for other potential contacts from the existing interviewees, or the interviewees actively mentioning who can be interviewed as a follow-up.

Data collection

After introducing the recruitment process in the previous section, this section continues illustrating the process of my data collection. I brought the following research tools to every interview: semi-structured interview guide, digital voice recorder, notebook and pen, mobile phone and camera. Each interview lasted between 30 – 100 minutes. Regardless of the length of each interview, the interviewees had answered all the semi-structured interview questions. I did not set any time limit for the interviews, and the process was controlled by my observation of the interviewee's own willingness to share more. For example, after the interview was done, when I turned off the recorder, the interviewee came up with new ideas and opened a related conversation again and wanted to share more thoughts with me. So I asked for their agreement immediately and then turned on the recorder to continue the topic. The research ethics will be discussed later in Section 4.6.

Some slight corrections were made during the interviews. For example, for the first interviewee, I looked at the headings from the interview guide and followed them in order,

but found that the process was rather blunt, and the interviewee would want to look at the interview guide directly and reply to questions on the guide one by one. This action might lose my original purpose of allowing him to discuss in an open-ended and conversational way. So I changed a little by reducing the number of times I referred to the guide in the second half of this interview and looked straight at him after asking him questions. The respondent then also became less restrictive than previously. In the subsequent other interviews, although I would also take the interview guide, it would not be a paper version. I had the interview guide file uploaded to my mobile phone instead, and reduced the number of times of reading the questions from the guide. To allow the interviewees to feel that this is a conversation with me, I expected that doing this could enable them to share their lived experiences easily, yet the process is also maintaining its rigour. I informed the interviewees that the interview would be recorded at the beginning. After obtaining their agreement, I would put the recorder next to us and start the interview more comfortably with more eye contact and take down the notes at the same time. I continued to make some adjustments during each interview to make sure the conversation environment was free to talk to and be aware of the places that would be more suitable for the next interviewees.

In the data collection process, the point at which I stopped any further interviewing was when I the content/meanings/ideas/concepts in the interviews became similar and began to reappear. Most crucially, I understood that the point for me to stop further snowball sampling is when the data I collected had helped me understand the key ideas of the issue, and had hence reached saturation (Hennink et al., 2017). The critical factor that prompted me to stop recruiting further participations was not the frequency of participants' repetition, but that the content they provided already reflected what I had heard and repeated some of the key insights for my research questions (Hennink et al., 2017). During this process of my interview and within the limited fieldwork time, following my interview guide, I reached the saturation of what I needed to know and of what is useful for answering my research aims.

In addition to conducting the interview itself, I also collected relevant important information shared by the participants, such as photos. The interviewees shared their stories and photos of their motorcycles (for example, Figure 4.7a) or took me directly to their motorcycle to see in person. I asked for their agreement for taking pictures (for example, Figure 4.7b). An interviewee enthusiastically told me that when he commuted to work the next day, he would take pictures of his inconvenient commuting in the traffic and provide to me as a reference

(for example, Figure 4.7c). The photos he provides could demonstrate the experiences that the practitioner has and can help me understand how he feels by his words and these images. I also went to the place where the motorcycle waterfall picture was taken to take some photos and record some videos (Figure 4.7d) to experience how it feels to get this close to so many petrol-powered motorcycles, the endless flow of traffic and the smell of gasoline exhaust in the air. Visiting the scene in person allows me to learn more about the experience of the interviewees, such as the feeling of travelling in traffic. The extra collected photos are not used for analysis but are supportive materials that can be integrated into interviews for the readers who are not familiar with the Taiwanese context, making it easier to understand.

Figure 4. 7 Collected motorcycle photos (photos taken by the author)

Reflexivity

Maintaining the traditional form of using the semi-structured interview guide is a useful approach for the in-depth interviews since it allows me to stay in the frame of the questions that need to be asked and makes me looks professional. However, during the interview, I found that although the printed interview guide can help me clearly know the next question, I encountered the interviewee directly answering the question in the first interview I conducted, which lost the open-ended discussions I pursued. I made immediate adjustments at the moment, because I found that when my attention returned to the printed interview guide, the interviewee would also be influenced by me to turn their attention to the interview guide. Due to the interview guide for me being simply a reminder, I decided to ask questions without it

and kept the dialogue running more smoothly in the interview. I only reviewed the interview guide to see if there were any missing questions at the end of that interview. This way also made the interview run more smoothly and made the conversation with the interviewee less restricted. I then changed to electronically placing the interview guide in my mobile phone notes for the rest interviews. During the interviews, I also let the interviewees know clearly that I put the interview guide in my mobile phone, so they would not feel I was being rude when I checked the phone. I would know at the same time to confirm whether I have asked all the questions from the electronic interview guide, and the conversations were kept fluid and could reduce the pressure in the interview process while I had more time to make eye contact with my interviewees, to let them know I am listening rather than just asking questions.

4.6 Data analysis – inductive approach

Inductive approach

My analysis utilises an inductive thematic analysis (Braun & Clarke, 2006) to identify five themes along with several subthemes under each theme from the narrative materials of participants/motorcycle riders' daily stories (Figure 4.8). I illustrate interviewees' viewpoints iteratively to support my analysis to improve the understanding of their living experience and outline the Taiwanese social and cultural context. In order to connect the collected data to a broader context and to see what kind of social and cultural context influence practitioners' daily experience, the analysis was interspersed with critical discourse analysis (Van Dijk, 1993), which provides a critical contextual examination on links among practitioners, social systems, and decision makers to explore the latent disconnection among these actors. This critical perspective to examine the data provides me with a way to discover if the decision makers have less attention towards, do not realise, or even ignore the possibility of the emergence of inequality and injustice during their decision making process towards building a low-carbon transport system, and if they can achieve a just transition to a low-carbon transport society. An open-ended interview approach, linked with inductive analysis, places the emphasis on interviewees' own reactions and responses, rather than the prior assumptions I might be bringing to the data. This reduces the danger of simply repeating or reinforcing factors I identified prior to the interviews, and opens up the possibility for new insights and points to emerge that might not have been considered in existing policy or quantitative research.
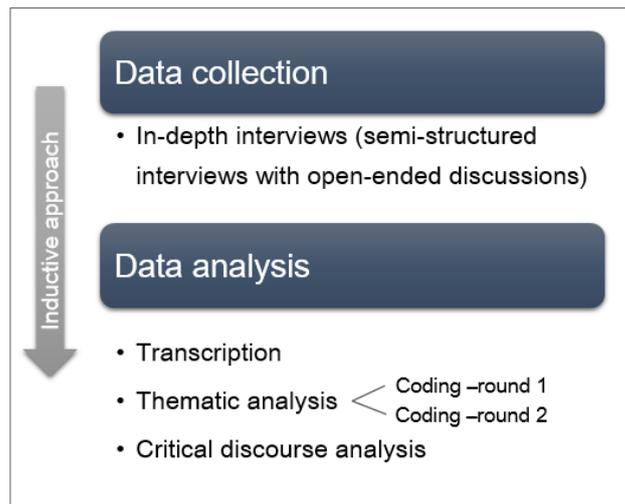
Figure 4. 8 Inductive approach

An inductive thematic analysis for examining the narrative materials can be an approach to reflect reality and consider both latent and manifest content. It stays as close as possible to the meanings in the data and focuses on people's perspectives and experiences with a higher level of interpretation than description, and it allows me to code my data set diversely (Braun & Clarke, 2006). My data analysis process follows Braun and Clarke's (2006) six phases of thematic analysis: (1) Become familiar with the data; (2) Generate initial codes; (3) Search for themes; (4) Review themes; (5) Define and name themes connect to the broader social, political and economic context in accordance with a critical discourse analytic approach; and (6) Produce a report. In the absence of a substantive body of empirical research into the practice of mobility in Taiwan and cultures like it that can be relied on for analysis and interpretation, it is valuable to adopt an analytical stance that pays as close attention as possible to the meanings in the data and people's own expressions and articulations.

Thematic analysis process

Before phase one, I transcribed the spoken texts that were in Mandarin and Taiwanese into written Mandarin (see Appendix II for one interview transcript sample in written Mandarin). In order to ensure the content of the quotation remained neutral (Patton, 2014), during the transcribing process, I carefully maintained the integrity of the text and retained the most complete responses from the interviewee. I transcribed the interviews verbatim into Mandarin and noted the respondent's reaction such as laughter or any unsaid message marked in square brackets (Gawlewicz, 2016). More details about translation and transcribing will be illustrated in the next section. At the same time, I noted down initial ideas during the transcribing process.

These notes (see Figure 4.9 point 1, 2, 3 and 4 in black coloured printed words) were my first round of coding which was based on my semi-structured interview questions with broader topics – basic information, transport choices, policy and societal issues, and social and environmental values. For phase one, since I am the interviewer, the process of transcribing was my second time to go through the whole data set. This process helped me to get familiar with my collected data. I could be aware of newly-surfaced information that I did not notice as much while conducting the interviews.

In order to understand how a practice emerges, persists and changes (Shove et al., 2012) and apply the theories on shifting petrol-powered motorcycle riding to low-carbon transport utilisation, the initial wide range of codes was broken down into various topics in phase two. For phase two, the second round of coding began from here. I coded the data content in written Mandarin systematically with coloured pens on printed paper and sorted data into coherent and meaningful groups (Figure 4.9 and Figure 4.10), organising data based on theories of practice and mobility theories and sorting them thematically in phase three.
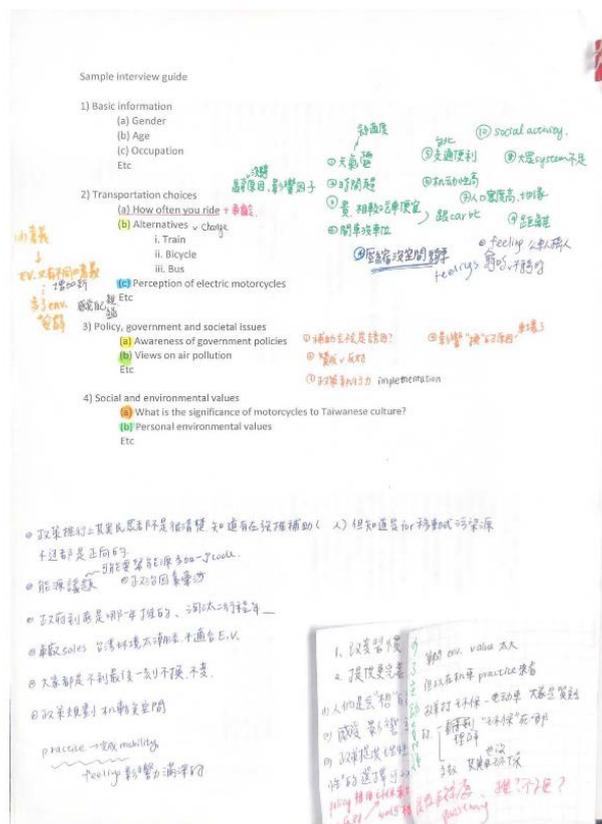
Figure 4. 9 Illustration of the codes being grouped into themes – Coding guide page – the materials were coded in Mandarin systematically with coloured pens, and all the emerging codes are on this coding guide page coloured in groups and accompanied with some of my initial notes.
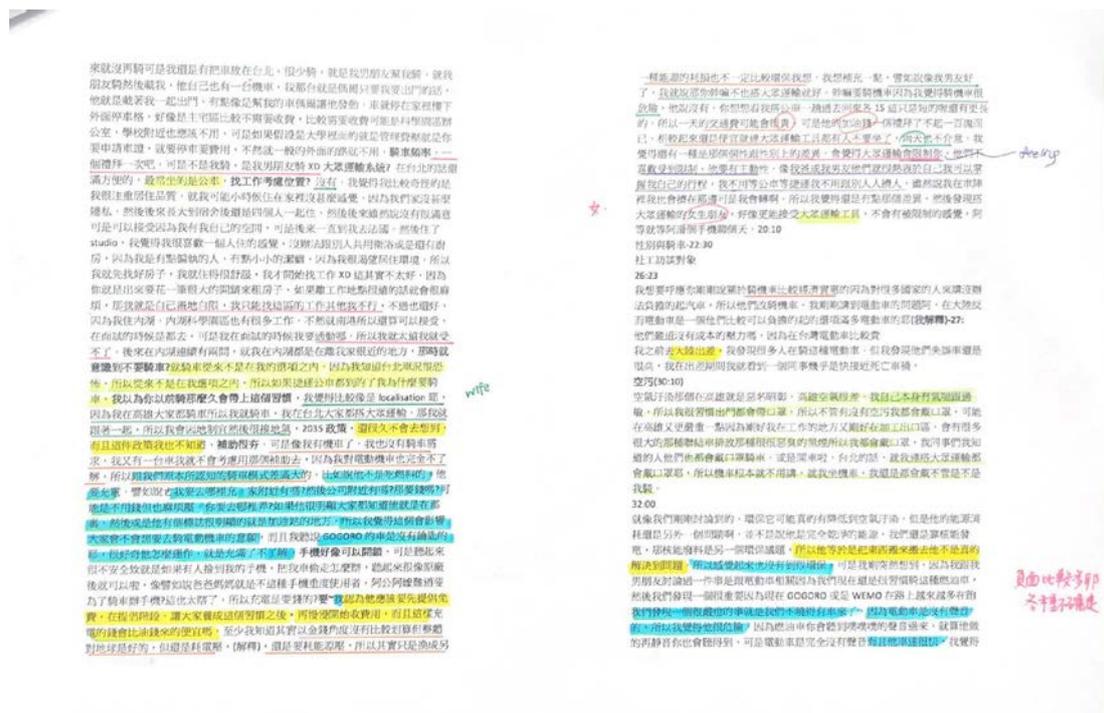
Figure 4. 10 One example page of the transcript that the responses were coloured and coded in coherent with the coding guide page. For instance, the blue colour stands for the perception of electric motorcycles.

In phase three, I sorted various codes into potential and relevant themes, and I kept as many details as I could to collate them together. To understand how a practice appears (Shove et al., 2012), I developed the codes according to the basic information of interviewees (including their transport modes and frequency of using it) and potential factors that influence them to ride a motorcycle. To know how practice persists, I developed the codes into the significance of motorcycle culture, meanings of motorcycle, and their feelings while being mobile (Bissell, 2018; Cresswell, 2010; Shove et al., 2012) in Taipei. Before a practice could be changed, in this case, petrol-powered motorcycles riders shifting to low-carbon transport, I developed codes on interviewees' awareness of the policy, their views on air pollution and electric motorcycles, and their perception of environmental related issues, as a means of understanding how the motorcycle practitioners think of the possible new practice (low-carbon transport) to come. For a practice to shift, I coded the themes about the intention for these practitioners to change, and the reasons of those who have already changed and those who do not want to make a change (see Appendix III for samples of each theme in written Mandarin).

In phase four, I re-read the data to check if the coded data are fitting in each group of categories. In phase five, I refined themes and made a final decision on the appropriate names of each theme and sub-themes. During phase five, I started to think beyond the text to connect

the content to a broader social context to see hidden messages about injustice that could show where the transition process is unjust or makes the practitioners excluded from the society. In phase six, I undertook the data analysis of the findings that linked back to my research questions. It was not until this stage that I translated the coded content to written English for writing up the findings that are presented in the next chapter. I undertook the translation at the moment I required to analyse the theme.

Transcribing and translating

Studies have pointed out that the results of searching for categories using original Mandarin transcript and English translations version are not significantly different (Chen & Boore, 2010; Twinn, 1997). Similar to what Chen and Boore (2010) did in their research, I did not translate all the collected data from Mandarin to English for analysis initially. I transcribed the interviews verbatim in Mandarin, and I also coded and generated themes in Mandarin and translated the themes after and then extracted the content I needed for each theme, and discussed them as previously mentioned in phase six of my thematic analysis. This approach is also in line with the critical discourse analysis process, where only the required quotes and specific paragraphs would be extracted but not the entire transcript (Bryman, 2016). Tsai et al. (2004) mentioned that in the process of qualitative interview translation, it is important for researchers or translators who understand the culture to do the translation because it can improve accuracy and validity. They also point out that some words in different languages may not be literally translated.

For my position in this research, the worry of not understanding Taiwanese culture can be removed because this is the environment in which I grew up. Moreover, if I encountered phrases/words that cannot be literally translated. I repeatedly choose the expression that is closest to the original meaning and use a square bracket behind for more explanation. For example, 'cuttlefish motorcycle' refers to vehicles that emits black and stinking smoke in Taiwan. Indeed, this English word has already appeared in English news in Taiwan (FORMOSA NEWS, 2018). As another example of language, in response from an interviewee that said the air pollution makes her become a 'black person' by the time she returned home. The utilisation of the words here does not intend any racism or offence. What she is talking about is the 'dirt' or getting dirty. If selecting this specific quote only out of her conversation, it would lose the chance to see the entire picture of what she is saying. Therefore, the quotation I included is

what she said before and afterwards to show the context - she said because when she came home, if she is not wearing a mask while riding a motorcycle on that day, the air pollutant attached to her face would make the tissue become black or dirty.

In addition to the challenge of translating Mandarin to English, that there may be no corresponding words. Twinn (1997) mentioned that the grammatical structure of Mandarin and English is also different, for instance, there are no tenses and personal nouns in Mandarin. Therefore, I also handle this carefully and repeat proofreading for the translations. The translation process suggested by Chen and Boore (2010) requires two translators to translate and proofread each other to increase the validity. However, as Twinn (1997) argues, a one-translator translation will be more consistent and maximise the reliability of the data analysis. Also, Tsai et al. (2004) raise the importance of including a translator who understands this culture; hence, utilising a single translator translation for my research could meet what existing scholarship says and can also finish the translation under the research framework of limited time and expense.

Besides, for the translation of 'motorcycle', I chose to use motorcycles instead of scooters for the following reasons. Firstly, the 2035 ban on selling petrol-powered motorcycles is not only for petrol-powered scooters; moreover, the number of registered motorcycles includes scooters and motorcycles (in Taiwan, to translate every type of registered motorcycles from Mandarin literally, there are: small light motorcycle, ordinary light motorcycle, ordinary heavy motorcycle, large heavy motorcycle - yellow plate and red plate), so the usage of motorcycles can more broadly cover the types of vehicles. Second, in the English literature, the number of instances of utilisation of 'motorcycles' in Taiwan is more than that of scooters. This may be due to the fact that Taiwanese people have been getting used to using the word motorcycle, or I might raise another possibility that there might be a wrong use of the word for a long time whereby Taiwanese people think scooters are also called motorcycles. Although 'scooters' is being used more often in more recent studies, I would like to bring back the first reason again, since understanding the practice in my research refers to broader usage of 'motorcycles'. In fact, one interviewee's motorcycle is not a large heavy motorcycle, but its appearance is far from a scooter (see Figure 4.7b). Lastly, the picture - 'motorcycle waterfall' in the selection from the National Geographic's annually competition caused the motivation of this research, and it also uses the term 'motorcycle'. In order to seek consistency in the context, motorcycle is used across the thesis.

In the translation process, following Gawlewicz (2016), in addition to keeping all the original responses, hidden emotions, pauses, repeating their own words, or even the sound made when they are thinking, such as 'um' were all kept. The interviewee's words could be specific and unique in the Taiwanese contexts, such as 'pull six away and park one in', I would clarify this with the respondents in the interview so that this could be recorded on the transcript. Or the 'cuttlefish motorcycle' example where the cuttlefish word may only be understood by Taiwanese people but not other language users. In addition to clarifying this meaning through the conversation with the interviewees during the interview, I would mark the phrases/words in a square bracket after the quotes.

Furthermore, if the respondent left unsaid words (Gawlewicz, 2016), said something where the semantics might need more explanation, used abbreviations, or mentioned a specific regulation; I would mark them in a square bracket or put the detailed regulation in the footnote for clearer understanding to read. There were even some interviewees who responded directly in English. I would also mark that the interviewees here directly used English to respond, what the word is that they borrow from English. If specific English terms are used differently from English users but are widely used locally, I also mark them clearly. In findings, if I want to extract a paragraph for analysis but the respondent's response is more verbose or less specific to the question, I would mark [...] to remove the content that less relevant or display the respondent's response from the current captured paragraph is, in fact, more than just these few sentences. The other parts of the response are less relevant and omitted, but they all appear in the Mandarin verbatim transcript.

4.7 Ethical considerations and research limitations

A standard practice within the School of Applied Social Studies which was a self-assessment of ethical issues review was been undertaken within the University prior to commencement of research. Following Bryman's (2016) ethical principles for social research, my research respects and ensures the participants' willingness during the recruiting and interviewing process of interviewees. Interviewees were freely to decide whether they would like to join the interviews or not without any pressure, they could also ask to stop the interviews if they asked to. Before each recording, the interviewee would be asked for consent before I pressed the recording button. As long as there was a recording, I would inform my interviewees. When I

was taking and utilising any picture of their motorcycles for my research, these actions were all done with their consents. The images that appear in my research including motorcycle plates, car plates, or people's faces were all edited and blurred to protect personal information.

Even though none of the interviewees was concerned about the content of their responses to be seen in my research or told me that they did not wish to disclose their personal information, I still endeavoured to protect personal privacy in interviews, personal information and record of interviews by soliciting the permission of every participant. The recruited participants' personal information is safely kept and were all identified with random letters during analysis. My research does not pursue and avoids asking participants' highly personal and sensitive information. In spite of this, my research aims and questions still are designed with great attention to prevent any physical or mental harm for participants. Nevertheless, my research was strictly executed with honesty and always made clear and exact and to provide respondents with any unknown or vague information. The participants all knew the purpose of my research.

All responses during the interviews have been rigorously considered and would not be excluded despite their negative or unexpected content. I, with my own educational background, had social science research experience in Taiwan before, and hence am familiar with local ethical procedures and also social/cultural norms. The results of my research are kept transparent, and I paid a lot of attention not to distort or take the respondents' words out of context. To keep my research results practical, the aim is not only to provide bottom-up suggestions to the policy-makers but also to share the findings with practitioners interested in further results. The findings in my thesis or any further published works on these collected interviewed data will all be shared with my participants for those who had informed me they would like to know my further research results or those who later asked me for an update on how my analysis was going.

The non-representative sampling strategy I adopted may exclude the exploration of factors that could influence practice and values such as occupation, age, or income; and which could have been explored through a representative sampling approach. The sampling approach I took may also make it difficult to compare results with other existing studies, most of which conducted quantitative surveys which sought to sample potential influencing demographic or socio-economic factors in a representative way, such as in Chang and Wu, (2008) or Hsu et al.

(2007). However, I pursue a bottom-up angle understanding of the richness of practitioners' life experiences to construct the motorcycle practice and discover underlying meanings. One reason for doing so is to make a distinction to existing research. Another reason for a sampling strategy that would allow me to elicit practitioners' life experience is to try to reduce the likelihood of making assumptions about demographic or socio-economic factors that may affect practitioners' decisions, and to avoid taking too much of the respondents' personal backgrounds into the analysis. These factors are important to analyse travel decisions, but removing this filter can help to foster a less biased perception of respondents as 'carriers'. While a small part of the conversation during the interviews still asked for some personal information relating to demographics or socio-economic status, such as age, this was mainly to see how long they have been as the carrier of the practice.

The research area was undertaken in Taipei, so the interview conducting process was relatively limited as I am based in Aberdeen. I was fortunate to have two opportunities to go back to Taiwan to conduct the interviews and collect useful information. I got two weeks to conduct all the interviews in Taipei on the first visit. Although there were time constraints, available and in-depth information was collected. The interviewees were also very cooperative and enthusiastic about helping my data collection to be completed successfully. In addition, because I speak Mandarin and Taiwanese, understanding Taiwanese may be a limitation for researchers who are not familiar with Taiwanese even if they grow up in Taiwan. Some interviewees were surprised that I could interview with them in Taiwanese fluently. They have moved to Taipei from Southern Taiwan for a long time, and they think that it is getting more difficult to find the younger generation to speak Taiwanese in Taipei.

Some of the interviews were taken during interviewees' lunch break during working hours, and there was one interviewee who wanted to share more, so the interview was divided into two sections, and another appointment was made at her most convenient time. The second visit to Taipei was a month after, and the time that I was able to do the research was very short. Since I was aware that the interviews collected in the first visit were sufficient to answer my research questions, I pondered what I could do in this short time frame - visiting Taipei Bridge and experiencing in person was the decision I made to get a closer understanding about the scene. Visiting the site in person could also inspire my ideas. One point is that since I was taking the MRT to go to the Taipei Bridge, I also observed the commuter usage on the same route at the same time, and noted that on public transport was also crowded. I also took photos of a

Gogoro battery swapping station and observing how users change their batteries. This extra information, as I mentioned in Section 4.4, can be integrated it into my findings to supplement the interview analysis.

One uncontrollable limitation was that the 2035 policy happened to be cancelled in the middle of the interview period, and I might have needed to change my semi-structured interview questions. However, I discovered immediately that due to my research questions being aimed at motorcycle riders' daily experiences and their perspectives toward the policy, this news was in fact also a turning point for me to observe practitioners' thoughts on such a sudden change. Even since the completion of the interviews, the policy direction has undergone further adjustments, which will still not affect the results of the use of interview materials. Although there are research limitations raised above, my data collection process went well, and I was also fortunate to complete conducting my interviews before encountering the pandemic.

Chapter 5. Findings

Given the aim of understanding the lived experience of petrol-powered/electric motorcycle riders in Taipei City and New Taipei City and the disconnect between Taiwan's aspirations for low-carbon transport, the data analysis of in-depth interviews with 21 participants in total across 15 interviews (see Table 4.1) in Taipei were coded randomly and compiled into five themes: (a) socio-cultural context: motorcycle culture shaped by motorcyclists' experiences; (b) awareness of government policies; (c) intention to change transport mode; (d) environmental debate; and (e) low-carbon transport modes. Findings are interpreted and integrated with interviewees' narratives according to the practitioners' daily experiences in this chapter.

5.1 Theme One: Socio-cultural context: motorcycle culture shaped by motorcyclists' experiences

This section begins with the social and cultural background of basic knowledge of Taiwan and for the research's focus research area of Taipei City and New Taipei City. In line with the research aims to understand the broader social and cultural context informing motorcycle riders' actions, Theme One was developed into three subthemes: (a) being mobile in Taipei City and New Taipei City; (b) meanings of motorcycles; and (c) significance of motorcycles' culture, which are constructed through the daily experience of motorcycle riders. In addition to relying on the overview and literature chapter to present the local context that the interviewees live in, according to their narrative, this section builds and outlines the socio-cultural context as understood by the practice of their motorcycle riding. To be more specific, respondents' answers can reveal what kind of the environment they live in, how they interact with the environment, and what sort of issues they are facing with the life in the cities.

5.1.1 Being mobile in Taipei City and New Taipei City

City transport environment

The analysis of this subtheme was broken down into three topics under the Taipei context, namely city transport environment; natural, societal, and cultural factors; and feelings on the move. Firstly, the analysis of the cities' transport environment talks about how motorcycle

riders travel around the cities, sense and carry out their mobility through the daily practice of travelling or commuting. With a population of 23 million living over an area of approximately 36,000 km^2 area, Taiwan's significance of high density (Chang & Lai, 2015) not only leads to people's housing type of tall buildings but also influences the lack of spaces for living and being mobile for residents in the city centre. The idea of Taiwan as a small island with high density was discussed by many interviewees; *Interviewee J* also pointed out this characteristic while replying to the question about the transport environment in Taipei. The cities' transport environment reduces the spaces for the residents to travel, and ironically seems to result in lessening commuters' distance between each other, it badly generates friction between commuters in an unpleasant way at the same time:

> *"Before I started to ride a motorcycle, I didn't feel deeply, I only thought that Taiwan is a densely populated place. Then, you don't need to drive wherever you want to go in Taipei, in the beginning, my understanding was like this, but after I rode a motorcycle, I felt that many motorcyclists are immoral." (Interviewee J)*

Motorcycles are not the only mode of transport in the city. In addition to motorcycles, respondents' views on other modes of transport, such as driving or taking public transport are also valuable and informative. Regarding the transport network in Taipei as a whole, instead of seeing every different transport practice as an individual network, will be helpful while looking through the insights of people who do not choose a low-carbon transport mode. The data shows that commuters, even if they ride motorcycles, also praise the public transport system in Taipei, such as *Interviewee S* and *Interviewee F*. *Interviewee F* grew up in a different background but has moved to Taipei for several years. In comparison to his own experiences before while being mobile in another city, he has noticed the differences and a better system that Taipei possesses compared to other cities in Taiwan.

> *"In terms of Taiwan's environment, a motorcycle is really a convenient tool. After all, it doesn't mean that other counties and cities could be like Taipei because Taipei's transport is so well developed. You can go wherever you want to go by various choices of public transport. I think this may be a problem about urban development in Taiwan, many places in Central or Southern Taiwan are hard to reach by buses. It turns out that you have to ride a motorcycle or even drive a car." (Interviewee S)*

"The younger generation in Taipei may be more familiar with public transport than our age. They have these infrastructures since they were young, so they just utilise it. As far as I know, there seems to be a large proportion of young girls in Taipei who don't even consider having motorcycle licences. Instead of thinking it's unnecessary, they never think about having it! It probably because of the reason that public transport is convenient in Taipei. I also think compared to Kaohsiung, these two cities' travel habits are quite different. I'm not sure what's the situation outside of Taipei, but Taipei 's public transport system is developed relatively earlier and had more resources than others is for sure, so the public transport in Taipei is really great." (Interviewee F)

While many think the public transport system is convenient, there are still others who think public transport coverage is not yet extensive enough in Taipei. A sound public transport system may not on its own be sufficient to move commuters away from motorcycles. Even if the public transport system is well designed; it still cannot become the only mode for residents in Taiwan.

"The existing transport system is unable to support Taiwan citizens' transport needs. If there are no motorcycles, there will be a disaster." (Interviewee H)

Also, as someone who grew up in Taipei, *Interviewee J* is very familiar with the mode of utilising low-carbon transport (not only the public transport system but also the sharing bike system). It was not until *Interviewee J* changed his commuting mode to ride a motorcycle because of a new commuting destination of his new job that he found out the public transport system in Taipei is still insufficient for him. Furthermore, *Interviewee J* is not the only example that shows that the commuters do not find the limitations of the public transport system until they need to use it, *Interviewee T*'s response supports this as well:

"I ride motorcycle for commuting use. Regarding to Taipei's public transport system, take the MRT for instance, my route to work in Neihu needs to take a big circuit. It may take an hour for me to take the MRT to go to work, but I only need 20 minutes to commute by the motorcycle." (Interviewee J)

"I think outside of the metropolitan area, once you were 18 years old, you will go to obtain the motorcycle licence because the travelling condition is not as convenient as Taipei, so

you must ride a motorcycle. Although the public transport construction has improved in Taipei, the overall MRT (Mass Rapid Transit) system is still under construction. The buses or MRT could not take you wherever you want to go, you may occasionally want to go farther than you usually commute or places you've never been to, even places where public transport is hard to reach. Thus, this inducement still makes me want to have my own vehicle." (Interviewee T)

The previous extract reveals that different living experiences have different perceptions of the transport facilities in the same area, which also reflects the importance of considering the design of the coverage rate of a transport system. Whilst Taipei's public transport system is broadly perceived to be effective (Chen and Lai, 2011), the responses from participants when discussing their daily practices suggest the system is not so functional for all sectors of society. There are still a number of people who will find it inconvenient for their personal circumstances, and this becomes a reason for continued motorcycle use. The coverage rate of a transport system should not be just effort on developing a more extensive range, but also understanding the demand for the usage and penetration within this range. This may explain why the respondents are able to acknowledge the benefits of public transport, whilst it fails to meet their personal needs.

By understanding how commuters think of the *functionality* of the public transport system they can use, we can also see that the importance of a transport system is not based on coverage, but how functional it is for those who need to use it. My analysis is not going to put too much attention on how to improve the quality of public transport, such as the argument from the research of Chen and Lai (2011) and Lai and Lu (2007). Function may be more important in determining usage decisions. As Cass et al. (2005) state, looking at the mobility of society allows us to understand if there is equal access to a well-designed transport network across all of society. In the case of Taipei, the persistence of motorcycle riders, as borne out by official statistics and also the stories told by interviewees here, indicates that the city's transport network may still require improvements. Furthermore, it is important that a transport system should be spread equally to all citizens, or this will lead to problems of marginalisation of a range of people. This is in line with Jeekel's (2018) study on inclusive transport, which seeks transport and social equity for providing a needed perspective on discussing the reason why and who is excluded from transport planning. Therefore, linking back to the literature review, an examination of whether the transport system is well-built is

essential not only for seeking for a more efficient way for saving time on travelling, but also for understanding if all members of a society have equal rights to mobility and everyday movement to reduce the potential of social exclusion argued by Cass et al. (2005).

Natural, societal, and cultural factors

Secondly, choosing the mode of being mobile in Taipei could be influenced by natural, societal, and cultural factors. In addition to the small land area, weather is a natural factor which is uncontrollable, with a subtropical climate - not only warm temperature, as it also rains a lot in Taipei and more than southern Taiwan. There is even a different willingness of travelling or being mobile by motorcycle between Taipei and Kaohsiung because of the weather. *Interviewee F* said that because there are many sunny days in Kaohsiung, compared to Taipei's humidity, he would be more willing to ride a motorcycle in Kaohsiung:

> *"I think transport habits of people in Taipei and Kaohsiung are different while growing up ... the weather is different, the population is different. In Kaohsiung, it is always sunny and it's not likely to rain. You are more willing to go out by motorcycle, and if you go out [by motorcycle], you can find a parking space easily. You can park everywhere [in Kaohsiung], unlike Taipei, parking spaces are full ... Sometimes on raining days, you don't even want to ride a motorcycle to get wet in the rain, and to find a parking space." (Interviewee F)*

The raining days or cold days could influence motorcycle riders to take public transport as it is less troublesome (as *Interviewee L* indicated), but also because of this, there is concern about whether buses or the MRT will be full of passengers. *Interviewee Y* argued that a lot of people will decide not to ride motorcycles and then it will be too crowded on public transport which makes her feel uncomfortable and prefer to ride:

> *"I sometimes take the MRT or buses because of the weather, when I am too lazy to ride [a motorcycle], when it rains or when it is cold, or when I suddenly want to take a walk." (Interviewee L)*

> *"I'll still ride [my motorcycle], because it takes a long time to wait for the bus. And the MRT, everyone will take public transport because of the rain, and it will be very crowded.*

It's better to ride a motorcycle by myself." [Interviewee Y]

According to the above extracts, the factor of weather could influence not only people's willingness to ride a motorcycle, but also their willingness to take public transport, which could echo back to the different personal circumstances mentioned in the previous topic. However, there are still examples of changing their transport mode from motorcycle riding to public transport because of the hot weather. This will be discussed more in the third topic. Based on interviewee's responses of why they started to ride a motorcycle, the most common societal reason is because of their commuting demand. *Interviewee J* and *Interviewee M* indicated that there was no need for them to ride a motorcycle before their working places changed, both of them used to take public transport or cycling to go to their previous work. Yet, when it is difficult to reach their new offices by public transport, motorcycles become a help:

> *"Because I had no needs before, my previous jobs were all close to my home or close to the MRT station, but there is some distance to the MRT station from my current job, and also far away from my home. Thus, I started riding a motorcycle from three years ago."*
> *(Interviewee J)*

> *"I used to ride a bicycle, after getting married, I came here [New Taipei City] to work. I have to ride [a motorcycle] every day to work … because the transport to the work place is inconvenient." (Interviewee M)*

Both interviewee M and Interviewee J shifted to ride a motorcycle due to their new occupation place being difficult to reach by low-carbon transport modes. In addition to this, many employers also require employees to have a motorcycle riding licence as a job requirement in Taiwan. This has become a cultural factor, and the motorcycle culture will be discussed more in Section 5.1.3. A notable consideration for motorcycle riders is time factor, as *Interviewee C* repeatedly told me that *"ten minutes by walk and three minutes by motorcycle"*. Which is appropriately described by him of his experience and mood when he goes out; with this thought it will be much more difficult to think about a 20 minutes motorcycle riding compare to an hour's MRT riding. *Interviewee J* stated more specifically about the time that he can save by riding a motorcycle while commuting, compared to taking public transport:

> *"It's much faster for me to ride a motorcycle, that is, commuting time can be reduced by*

two-thirds. If I take the MRT, it may take an hour, but if I commute by motorcycle, it takes

only 20 minutes, so this is the main purpose of me using a motorcycle." (Interviewee J)

Linking back to the first topic of the transportation environment in Taipei, which is lacking of spaces for both residents and commuters, the motorcycle's advantage for time saving is that it is small enough to weave through a traffic jam. Also, many commuters living in New Taipei City commute to Taipei City daily, Interviewee T for example. Not only referring the key factor of time difference, he also pointed out the consideration of cost has an important role to affect people's decision-making. Commuting by riding a motorcycle is cheaper compare to other modes of travel in Taipei, no matter cars (see the response of Interviewee W & H below) or public transport (see the response of Interviewee F below).

"It's definitely more cost-effective to own a vehicle, because the public transport is about NT$ 100[9] a day for my commuting. It's about NT$ 100 a day if not using a student EasyCard. I think the cost is a bit high, it's far less to ride your own motorcycle. In addition, the time difference between these two [transport modes] is quite big, a single trip [for me to commute by the MRT] takes more than 1 hour ... it's almost two and a half hours for a return trip." (Interviewee T)

"Driving in Taipei is very expensive [Interviewee H: Expensive!], and is not easy to park, thus, in comparison, motorcycles are better." (Interviewee W)

"I still ride motorcycle every day unless it rains, I may change to buses ... riding a motorcycle is cheaper than taking buses, which saves a bit more money than taking public transport." (Interviewee F)

When people start to work they choose a more affordable method for their daily commute, they might be students who just graduated from schools or those who moved to Taipei freshly and seek a job. As the capital city of Taiwan, Taipei possesses the most opportunities and resources across Taiwan, attracting people from the cities or counties outside of Taipei to come no matter whether to study or work in the city. According to the responses from interviewees, I also noticed the differences of travelling modes between Taipei and other parts of Taiwan. For example, *Interviewee E* is from Chiayi, a county in southern Taiwan, for her life experiences

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[9] Exchange rate for converting New Taiwan Dollar to Pounds is 1 TWD ≒ 0.026 GBP.

in the past, she remembers riding motorcycles in the south will be more convenient because the coverage of public transport is insufficient:

"We all ride [motorcycles] in the south … It's [riding motorcycles] actually more convenient for us in southern Taiwan, because if you want to ride to the Chiang Kai-shek Memorial Hall from here, [as the same distance] maybe we don't have a bus [route] there [in Chiayi]. Taichung depends, but Chiayi doesn't. If you don't have [bus routes] in a short distance, you just have to ride a motorcycle or drive a car." (Interviewee E)

Therefore, there is a continuation of habit of those who lived in Southern Taiwan before, who already are very used to travelling by a motorcycle as *Interviewee E* indicated above. Riding a motorcycle might be a reliable option for them to travel and adapt the living environment in Taipei. This also indicates how a practice could persist (Shove et al., 2012). If a practice continues to exist, and people are more reliant on it, it will need more time and strategic effort if the government aims to shift users to other practices. The living experiences in the south also influence people who live there for a while. Interviewee H had studied in Kaohsiung, a city in southern Taiwan, for a few years. He said riding a motorcycle is a habit that he brought to Taipei after he moved here:

"Transport will be inconvenient! Without a motorcycle, I can't move to the next classroom after class [at Zhongshan University in Kaohsiung]. I came to Taipei and continued riding [motorcycle], but it is not like Zhongshan [University] where it is a necessity of life, here it is a tool to increase life convenience, but not a necessity." (Interviewee H)

In addition to achieving the need for commuting to work, there is another important societal factor for people to ride motorcycles, which is maintaining their mobility to experience their social and cultural networks and relationships with friends and families (Cresswell, 2006; Urry, 2016). In the following analysis factor, here the interviewees talk more about the influence from friends and peers. Although *Interviewee D* and his friends grew up in New Taipei City, and could be more used to taking public transport compare to those from other cities, for him and his friends, they prefer to seek flexibility and without worrying about the restrictions on operating hours of public transport:

"I usually hang out with junior high school classmates, we live nearly [in New Taipei City],

which [riding motorcycles] is the most convenient [way] for us. Take Taipei City for instance, we can easily decide where we're going now, and then where next [by riding motorcycles]. If you take trains or the MRT, there might be no trains after some time, like it will be inconvenient after 12 a.m., you'll probably have to take a taxi [home]."
(Interviewee D)

Interviewee L gave me an interesting and realistic story of an activity that happens to most of the university students in Taiwan, which is joining a singles mixer to meet new friends from other departments or other universities. In many cases, there is an activity called 'draw a [motorcycle] key'. Because of this popular event and other kinds of activities such as a night out (e.g. riding motorcycle together during night time and to see sunrise at the beach or mountain area), sometimes in Taiwanese students' university life having a motorcycle seems a normal thing. *Interviewee L* continued presupposing a situation relating to a low performance electric motorcycles that were manufactured by a traditional big manufacturer – Kymco - and the perception of the motorcyclist one might have if riding such motorcycle during a meet:

"Kymco is! Their approach only wants to keep the existing market, they don't want to make any adjustments. I can't see what they want to adjust, because their body cover and all of the parts [of the motorcycles] just becomes – okay! This is an electric motorcycle – but I don't want to ride it at all. If you're a university student, it's super embarrassing to ride that thing! If you go out for a singles mixer and you're at 50 km/h or 60 km/h, perhaps it can reach 65 km/h, so? It might be able to reach a 65 km/h tensely and run 30 kilometres, for 200 kilometres ride you have to buy an extra battery, don't you think this is really ... Hey, the girl behind me [at the back seat] wait for me, my motorcycle is running out of battery. It must be super unlucky to draw this guy's [motorcycle] key [laugh]."
(Interviewee L)

For the purpose of maintaining the networks with friends and family members, not only the transport infrastructures are developed differently in different area but also the gender differences sometimes influence practitioners to make different decisions of travelling. *Interviewee F*, who is from Kaohsiung, stated that according to his experiences he found that people growing up in Taipei and Kaohsiung have quite different travel modes due to the developed infrastructure. He also observes an obvious characteristic of gender differences,

especially girls growing up in Taipei are usually not riding motorcycles or even thinking to get a driver's licence:

> *"I think transport habits of people in Taipei and Kaohsiung are different while growing up … there is the public transport in Taipei. People who are younger than us may have these things since they were little, so they just go and use it. As far as I know, a large portion of young girls in Taipei seems to not have [a motorcycle]. They don't even consider having a driver's licence at all. This is not to say they think they don't have to use it so it's non-essential, but they don't even consider it, probably because of the convenient transport. Anyway, when I heard this I found the traffic habits [in Taipei] may not be the same as Kaohsiung. I'm not sure about other [places] outside Taipei, but of course Taipei's transport development is relatively earlier and with more resources [than other cities]. So the traffic in Taipei is great!" (Interviewee F)*

Interviewee A's response can also provide an insight into the area differences and gender differences on motorcycle riding in Taipei. *Interviewee A* is from Taichung, a city in central Taiwan, and she studied in Kaohsiung for several years and moved to Taipei for work. She made different decisions of travelling mode in these cities. Different from *Interviewee H*'s experience, who brought the habit when studying in Kaohsiung to Taipei, although she also used to ride a motorcycle in the south, she has totally changed her habit of moving in Taipei. For her, her practice of motorcycle riding had shifted to take public transport. She utilised the word 'localisation' (in English) of her adjustment to the different living environment:

> *"I think it's more like localisation. Because everybody rides motorcycles in Kaohsiung, so I ride. People are taking public transport in Taipei, then I follow along. I'll adapt local conditions." (Interviewee A)*

Feelings on the move

Thirdly, understanding practitioners' feelings on the move in Taipei can help to examine the practice of motorcycle riding in a lively way instead of seeing this practice as a simple daily routine, and energising the elements with the emotions and moods of this practice (Shove et al., 2012). The narratives of interviewees' feelings on the move could be presented in four types of feeling: their feelings about speed, safety, space, and smell. Some of them are positive

and some of them are at the opposite end of the spectrum. *Interviewee J* described his positive feeling when he is riding his motorcycle:

> *"It can go to many places, sometimes it's faster than cars, and you can often switch lanes, like when I commute, I may really be much faster than cars." (Interviewee J)*

The advantage of the speed of motorcycle could be faster than cars or buses but could also be a dangerous shortcoming. The situation where a motorcycle can be quicker than a car while travelling is mainly due to its much smaller size than a car, which allows motorcycles to weave through the city centre. Sometimes, the reason they have to speed up is not only for the purpose of getting faster to arrive their destination, it may be because they are competing for a riding space (Figure 5.1), which makes this faster feeling become negative. A compressed space for motorcycle riding could cause safety concerns. *Interviewee Y* said, if she rides too slowly, it may cause a traffic accident to happen, and her sister even stopped riding motorcycles in Taipei:

> *"I just ran into this situation yesterday that I had to overtake as soon as possible, otherwise a bus will come over. I had to squeeze through the gap, and then I rode through it very fast, but there's a passer-by walking through the road without looking, this happens a lot. If I don't hurry [to overtake], I will die [laughs]. Taipei has a lot of buses, and they appear in all the lanes, so we can only ride in the middle of cars, because you don't know when the bus will come near you. You can only ride in the gap between the cars, sometimes there are bicycles on the road, not on the sidewalk ... my sister rode a motorcycle in Southern Taiwan, but she stopped riding it in Northern Taiwan [Taipei], she thinks it's dangerous." (Interviewee Y)*

Figure 5. 1 Lack of riding spaces in Taipei City (photo taken by Interviewee J)

Creating riding spaces in the cities by speed seems not a fair way for motorcycle riders to access the city, and they may even be targeted as reckless riders because of their actions of weaving or squeezing through the traffic jams. Although *Interviewee J* enjoys the faster moving feeling than cars, this does not mean that the traffic condition for his commute is enjoyable as well. He has a positive perspective of using a motorcycle, but not the same feeling to the traffic congestion. When he encounters traffic congestion, the previous positive feeling will turn into a bad one, because of a lack of space:

"When I commute, I actually can't ride smoothly, which is really terrifying … you know the double yellow line in Taiwan to distinguish the direction of the road, I often ride to the other side of the double yellow line (Figure 5.2), sometimes I will be reported, that is, taxi [drivers] will report you … started in January this year [2019], you have to attach your personal information if you're reporting someone, and no one reported me anymore. Otherwise, I was reported one to two times per month regularly. Because we couldn't distinguish large vehicles, cars or motorcycles on different lanes, and then everyone had to head to Neihu from Taipei City [centre] during the commuting time. In this process, people will all be jammed." (Interviewee J)

Figure 5. 2 Weave through a traffic jam (photo taken by *Interviewee J*).

It is worth noting that when motorcycle riders are weaving through the street, most of them are not very satisfied with their right to use the road space. This is not an isolated case. Equitable access to the city should be concerned by those responsible for designing the traffic plan (Jeekel, 2018), and the consideration should not only happen on paper but also be applied in practice. While thinking to build a sound public transport system, perhaps city traffic planners have considered the right for citizens to access the public transport, yet, it is also important to consider the effects on other practices like motorcycles. The traffic planners should be more careful and think if it is a just way to directly cut down motorcyclists' riding spaces in order to force them to change, moreover, the number of targeted recruiting practitioners of motorcycle riding is huge. According to interviewees' response, the reduction of space for motorcycles has generated more rebound and friction among the traffic in Taipei. *Interviewee J* is even influenced strongly to break the Act to gain for riding space, or needs to be struggling on weaving through the lanes, otherwise he will be stuck in the middle of the traffic. *Interviewee S* described the situation of her commuting from New Taipei City to Taipei City as like fighting a war. The congestion during rush hours every day makes her feel negatively, the commute is no more a simple moving process from A to B, the motorcycle riders have to create their riding spaces by themselves:

> *"For instance, from my home to Ximending, first, there are two lanes, which are shared by buses, cars, and motorcycles ... Assuming that there are two buses at the same time, then you can only get stuck behind them. The conditions of two lanes are like this, it may*

be better, if for three lanes, it'll have others [vehicles] come from left and right sides. Fortunately, I don't have to ride on that, like fighting wars every day [laughs]." (Interviewee S)

The motorcycle riders in Taipei are not only having to create riding spaces during commuting, but they also need to find a space to park their vehicle after their commute. The advantage of the smaller size of motorcycles makes it easier for them to find a parking space than cars in Taipei, yet the lack of parking spaces turns this advantage into a difficult task that might need to be tackled every day. *Interviewee S* thinks the compression for the motorcycles in the city could show the attitude of the government is unfriendly to motorcycle commuters. In addition to the riding spaces, the situation of a lack of parking grids is already a normal difficult problem in Taipei:

"Many [motorcycle] parking spaces have been cancelled now, I don't know if they've changed to car parking zones or even no parking grids have been painted at all ... Part of this intention may be to let everyone take public transport, or maybe they want to reduce the traffic flow, I don't know. However, I think this is actually very unfriendly to [motorcycle] commuters." (Interviewee S)

This normal situation of motorcycles needing parking spaces has created a survival skill for motorcycle riders to have - moving motorcycles, moving other parked motorcycles and make a parking space for your own motorcycle. This will be discussed in Section 5.1.3 from the interview of group No.13. Will the reducing of parking spaces be one of the effective methods for the city to head to transition to a low-carbon transport system? It seems that the practitioners of motorcycle riding are more willing to endure the inconvenience at present rather than change their travelling mode. The intention that could probably influence people to change will be discussed further in Theme Three.

One more negative feeling which could be magnified is the hot temperature due to Taiwan's subtropical climate, and in recent years, it could be more severe because of the urban heat island effect. Moreover, Taipei's basin topography increases the difficulty for air pollution and hot temperature to spread out, and petrol-powered vehicles are one of the contributors (Lin, 2010). *Interviewee L* indicated the obvious and uncomfortable feeling of the experience of riding a motorcycle during Taiwan's summer time:

"When it's summer time and you're waiting for the traffic lights, what's your feeling when you stop in the traffic jam? Your [carbon] emissions, don't you think that the internal combustion engine system of fuel is a very scary producer of carbon emissions, one of the most serious source of what it calls urban heat island effect in the city? … This is a major factor of [contributing] the urban heat island effect." (Interviewee L)

There are pros and cons of riding motorcycles and these factors also influence practitioners' feelings, both positive and negative, while riding. As per the above extracts, even the interviewees who do not like the feeling of travel by motorcycles, are still riding. It is as if these uncomfortable situations are normal occurrence and have no effects on them. However, the negative feelings of safety and hot temperature on the move in Taipei have influenced *Interviewee A* and *Interviewee W* to change their travel mode.

Interviewee A had sent her motorcycle to Taipei when she started to work here, yet because of the safety concern, she thinks Taipei's traffic is like a chaos and so never rides her motorcycle and chooses to take public transport to commute. For the weather issue, instead of riding a motorcycle as *Interviewee W* did when she was studying in Tainan, a city in southern Taiwan, she changed to take public transport after she moved to Taipei. She also specifically pointed out that girls are concerned about an uncomfortable moving environment:

"One consideration for girls is that when the weather is hot, you'll be exposed under the sun, why don't you take the transport? You'll have the air-conditioning, it's more comfortable … And also like taxis, Uber, you don't need to have a motorcycle near you to feel secure." (Interviewee W)

In sum, although many interviewees showed they have negative feelings while moving in Taipei, some of them may rather not ride motorcycles under this condition. Interestingly from the findings, the two cases (*Interviewee A* and *Interviewee W*) whom had changed their practice were female, yet there are still many people willing to endure discomfort and keep riding it for daily commute. Taipei seems not an ideal environment for motorcycle riders, in terms of lacking of spaces for access and poor air quality. Except for the uncontrollable natural factors mentioned in the second topic, the lack of space is a result of traffic planning. The strategy of reducing motorcycles' spaces, both for riding and parking, to make them change

their travel mode seems to be intense. Even though some practitioners were successfully forced to change, many of them would rather endure motorcycle riding as long as they can. This may not only generate more initial problems (e.g. safety issues like motorcycles weaving through a traffic jam erratically), but could probably lead to social exclusion to a certain extent by creating an unfriendly environment for motorcycle users. This in turn may disadvantage those who can only afford ride motorcycles.

Why do the uncomfortable conditions of the hot temperature, poor air quality, lack of spaces, and safety issues not make people give up motorcycle transport? The intention to change to other travel mode will be discussed more in Theme Three. The following section brings out the meanings of motorcycle culture in Taiwan first to talk about what the meanings are behind this vehicle, and for what kind of reasons it may be hard for people to refrain from using motorcycles.

5.1.2 Meanings of motorcycles

The subtheme 5.1.1 shows that because of the environmental, natural, and socio-economic factors, people 'choose' to ride motorcycles, which is from their demand after consideration. These are also meaningful factors between the practitioners and the vehicles from a practical dimension. The practitioners have considered a transport mode that can help them to keep their daily living operating smoothly, whether for work or for maintaining the relationships with friends and families. This subtheme talks about the meanings of motorcycles in more depth, and these meanings deepen their connection of riding a motorcycle with emotional links (Dennis and Urry, 2009), whether it is about the action of riding or for the vehicle itself.

Mobility independence

Regarding the question of when the interviewees started to ride a motorcycle, and why, in addition to the previous sections which talked more about the need to start this practice or to use a motorcycle, here I bring out the concept of why the interviewees want to ride in the beginning. At the age when people can ride a motorcycle in Taiwan, it also represents a spiritual symbolism of growing up (Interviewee W) and mobility independence (Interviewee H). Some young people expect that they are being able to ride motorcycles 'officially', such as *Interviewee Y*, who felt excited about finally becoming 18 years old and went to take the exam

of motorcycle riding immediately on her 18th birthday.

"At least in high school, being able to ride a motorcycle is something like I grew up, or it's cool if I have a motorcycle compared to my classmates." (Interviewee W)

"I think it represents you have a certain extent of autonomy, just like [owning] the first car in American movies. When your mobility is greater than you move by feet, it means a lot!" (Interviewee H)

"I don't know why everyone wants to ride a motorcycle when they are 18 years old, is it a symbol of turning to an adult? I have many friends who went to take the driver's licence of motorcycles when they turned 18 … in my last semester of high school, when I reached 18 years old … I went to take the test! I rode to school immediately after passing the test, I remember it took one hour from my home to school by motorcycle." (Interviewee Y)

The symbol of adulthood of whom can start riding a motorcycle from the age of 18 has revealed that there is a link between the rider and motorcycle riding. The action of being able to ride a vehicle contains the meaning of autonomous control of movements. This means that the practitioners have the ability to reach further destinations on their own, and also means that they can achieve more things and attend more activities. The action of riding a motorcycle creates a meaning of mobility independency, and there is also an emotional link between the practitioners and the vehicles. The above has paid more attention on the meanings of the riding process, the following focuses more on the link between the vehicles and the practitioners.

Emotional links

Under a simple question about what is the meaning of their motorcycle, Interviewee T, Interviewee F and Interviewee A all convey their feeling while discussing about scrapping their old motorcycles. Interviewee F and Interviewee A felt emotional while they had to scrap their old motorcycles because they had been accompanied by the vehicles for a while. Interviewee A even treated her old motorcycle as a friend since it had been being with her through many phases of her growing up.

"Because I feel that my motorcycle accompanies me to many places, up to the mountain and down to the sea. I think I'll feel [sad] if it needs to be scrapped." (Interviewee T)

"The motorcycle I eliminated previously I felt pretty upset to see it leaving. I also took pictures [of it] … I used to talk to the stuffs before I throw them away [laughs]." (Interviewee F)

"I think it's like a partner, a family member … I even named it 'AWESOME' (see Figure 4.). I treated AWESOME like my good friend. When I was riding it, I always told it: You are awesome! And pat its head … It was very sad to sell it for scrap, I even shed tears …. So AWESOME accompanied me through many important moments in my life. For example, me riding the motorcycle for the first time, practicing volleyball [after classes], riding to the class at Art College. It accompanied me through many important moments in my life, so it is a friend and a family member of mine." (Interviewee A)

Figure 5. 3 Interviewee A's AWESOME before scrapped (photo taken by Interviewee A)

The link between practitioners and motorcycles also have different effects according to the people around them. At first, the motorcycle's meaning to Interviewee Y was not much until she was influenced by her girlfriend and her father. She was influenced by her girlfriend, who changed her perception, after her girlfriend gave the motorcycle a name. Another precious reason to deepen the emotional connection between her and the motorcycle is because this was left to her by her father after his death. With these emotional links, now the riding

experiences are more touched and enjoyable for her, she sometimes speeds her motorcycle up a bit to feel the wind:

"In fact, I can be infected by my girlfriend [in many things]. She says that you'll have feelings when things are named. This seems true [laughs]. So she helped me named my motorcycle called Beihui … and there is a change. I used to think it's just a means of transport, after naming it, I feel that it's working so hard for me [laughs]. A more special point is, because it was purchased by my father before he passed away … I have a feeling of this that it was left by my father. Plus, it has a name now, and has been with me for so many years, and there are some scratches on it. It followed me from Chiayi to Kaohsiung to Taipei, I sometimes enjoy riding a motorcycle to feel the wind blow, and sometimes I'll speed up a bit. [At that moment], I just think you people who don't know how to ride a motorcycle, and will want to overtake them. It's soothing ..." (Interviewee Y)

Interviewee J was influenced by his grandfather and a movie character, which is a case showing an emotional link of his childhood dream effected by his grandfather that has developed into having an enthusiasm for the vehicle itself. He showed his motorcycle and introduced the type of this motorcycle to me enthusiastically (which was just parked outside the interviewee venue where we met, see Figure 5.4) and explaining how inconvenient this kind of motorcycles could be, but he is willing to endure this. Rather than enduring a long time commuting by public transport, he is more willing to endure the discomfort of riding it:

"When I was a child, I liked watching movies like Superman, the character inside the movie was very cool while riding that kind of motorcycle. It can depend on different terrain [to adjust]. For example, when climbing a hill, you use a lower gear and then you use a higher torque, although the speed is slower, you can go uphill very steadily. I was influenced by television [and movies] when I was little, I just feel those are handsome! On the other hand, because I was raised by my grandfather, he also rode that kind of motorcycle. This influenced me to think this kind of vehicle is good. It is true that we have a lot of inconvenience of riding this kind of motorcycle, like you can't put a raincoat or you can't store your helmet [in the motorcycle trunk], but I am willing to bear these inconveniences in order to ride it. Thus, I think the value of it to me may have some nostalgia in the beginning. No matter whether it's because of my childhood or my grandfather … Thus, I think it, indeed, the meaning of it probably has a little more spiritual

bond.” (Interviewee J)

Figure 5. 4 Interviewee J's dream type motorcycle (photo taken by author)

Moreover, the feeling could be magnified when a possession has transferred to others but is not being treated well. *Interviewee Q* shared her experience when she saw how her younger brother takes care of her motorcycle, she could not stand how dirty it was, and so she took the motorcycle for a clean even though she had already given it to her younger brother:

"I actually have feelings of my motorcycle when I saw my younger brother treat my motorcycle like that, I really wanted to kill him … He used to cherish his own motorcycle before. [For me], I will wash and wax my motorcycle, I used to be very serious about it in Kaohsiung, and then my younger brother was very good to his own motorcycle, too. And after he crashed his motorcycle and rode mine, he never cares about it at all. I asked: are you going to wash the motorcycle? He never did! I remember I gave him the motorcycle for about half a year, and I even rode it to wash and then let him continued to ride. Afterwards, I just gave up." (Interviewee Q)

In order to pursue the childhood dream of motorcycle riding imagination, Interviewee J not only bought his dream type of motorcycle but also prepared his own nostalgic outfit of wearing a leather jacket and a retro helmet. The practitioner is no more a simple practitioner who makes the practice happen. These elements are like adding a vitality to his practice of

motorcycle riding, he is not only riding it only for a daily commute. It also shows that riding a motorcycle constitutes a part of his experience of life, the emotional links are more meaningful for his life, not just for his riding:

"Like I [also] bought a leather jacket! I will wear a leather jacket and a retro helmet, and then pursue the feeling of the old time on the road. There are some people in Taiwan they ride hand-made motorcycles, or they will transform their motorcycles into that look. That is very expensive, because it is all made by hand. However, for that group of people, when they step on the clutch and smell the fuel, that's their life. If you have a chance, you can ask two-stroke motorcycle [riders], they have that kind of sesame oil smell. It stinks and smells like a drug, but some people enjoy it a lot. Thus, for some certain minority groups, riding motorcycles is riding the meaning of a nostalgic feeling." (Interviewee J)

Trends and vehicle enthusiasm

The electric motorcycle brand Gogoro, had caught this point and developed it into a marketing strategy that people may have passion about stylish objects, and tried to create a newly eye-catching appearance vehicle to attract customers. *Interviewee L* shared how his friend collects especially the first version of Gogoro at home. The collector would rather keep the vehicle at home than riding it out to let it get wet in the rain, and he emphasised that the collector only does this for the specific first version of Gogoro. Different from the case of *Interviewee J*, who enjoys to have a nostalgia ride, the case of *Interviewee L*'s friend shows a different meaning of owning a motorcycle:

"There were not many people buying the first version of Gogoro, because the seat cushion is very small, it just a very fancy motorcycle, yet the whole motorcycle is a boutique … I do have some motorcycle fan club friends, [take one of them for example], he really puts a motorcycle [Gogoro first version] at home! He just puts it at home after wiping, and only ride it out if there's no rain. He puts it at home when it rains. I said: 'my god, you are crazy [laughs]! That is very special, but for this kind of rich people, over ten thousand TWD are basically [nothing] … he just bought one more collection, the concept is like this." (Interviewee L)

Because it is very different from the electric motorcycles in the past, no matter the appearance

or the performance, the release of Gogoro electric motorcycles creates an effect that attracts some kinds of people who are looking for trendy objects. For the question of why the interviewee changed to ride a Gogoro, except for other reasons that *Interviewee F* decided to change to ride a Gogoro (which will be discussed more in Theme Three and Theme Five), he especially pointed out that he can imagine that some people buy Gogoro for looking cool, but that is not the inducement for him. On the other hand, *Interviewee B* is a typical example for this circumstance, he longs for experiencing the latest and most fashionable products. His old motorcycle and new Gogoro are examples.

"There's one point I don't really care about, I know many people think it's cool to ride a Gogoro, but I think I bought it is for my own transport. I'm not riding it to show you guys. However, I guess there are quite a lot of people want to show off about their Gogoro." (Interviewee F)

"At that time, seldom people rode Gogoro. It was relatively new and trendy … I rode a Wild Wolf at the beginning, it's really cool! (Interviewee P: And unplug the muffler of the exhaust pipe) [both laughs] I love motorcycles … I pay a lot of attention to taking care of the motorcycle that I ride at the moment, I think men will all do the same." (Interviewee B)

A high performance electric motorcycle with a chic appearance has brought a lot of attention and increased the desire of consumers to purchase it. Gogoro also holds activities to provide the public with the opportunity to experience the feeling of riding it. According to Interviewee L's response, he is fond of both the appearance and actual riding experience, so it seems that Gogoro has successfully reversed the old types of electric motorcycles, the perceptions of the unsuccessful old types electric motorcycles will be discussed in Theme Five:

"A marketing staff in their [Gogoro] company will create a group. For example, on Saturday, we're going to Baisha Bay. And then we had 20 motorcycles [Gogoro] … you can bring one of your friends to come and experience a quiet ride together. That's super cool! 20 Gogoros passed quietly on the road, at that time, we all thought 'God! This is awesome!' Because other people's motorcycles are super noisy … I think the riding experience is just like changing ordinary transport mode to an alien technology suddenly." (Interviewee L)

Utilitarian value

In addition to the various meanings mentioned above, many interviewees consider that the reasons for choosing to ride a motorcycle are high price-performance ratio and convenience, so they regard motorcycles as a simple means of a transport mode. Compared with the emotional links, here there is a practical relationship with the vehicle which could also be linked back the subtheme 5.1.1. The socio-economic factor influences their decision, and they pay more attention to the value of objects, such as *Interviewee D, Interviewee I, Interviewee K* and *Interviewee T. Interviewee H* explained that what he really cares about in his motorcycle is the value that can be converted into money. For *Interviewee W*, she only cares whether the motorcycle is still functional, if the motorcycle is still working normally and able to help her move. *Interviewee C* expressed concisely that the motorcycle is just a consumable tool for travelling.

> *"I personally think all vehicles are just a tool, I don't have any feelings. On the contrary, I feel that the more tattered your motorcycle are, the less it will be stolen, and the lower the cost. It doesn't matter if the motorcycle was replaced if I was given another motorcycle, whether it's good or bad. But if I lost the motorcycle and the value of the motorcycle, of course I will be sad. I will be sad about the [price/cost] value of the motorcycle rather than the object itself."* (Interviewee H)

> *"For the motorcycles, I only care if it's still working … my first motorcycle was more [cherished] at the beginning, in the first month, I cared whether there is any scratches. But after a period of time, I will be more relaxed, and might forget about it quickly [laughs]"* (Interviewee W)

> *"Convenient! It's just a tool, a time-saving tool [for me]."* (Interviewee C)

Even if practitioners see their motorcycles are merely with utilitarian value, we can see from the above interviewees' description that there are also useful meanings. Whether it is emotional link, material desire or practical usage, these meanings highlight the value of motorcycle culture, and make this culture more consolidated. Since not only its material characteristic brings convenience to the practitioners, but its humanity characteristic generates dependence from the practitioners.

What has also been demonstrated in the personal experiences that the participants shared with me is how close their relationship and interaction with their travel method is in forming their mobility. Meanings of motorcycles derived from the outer environment and the inner feelings, the urban and socio-economic environment pushes practitioners to choose a more cost-time-effective mode for travelling; and the inner emotional links and the desire attracts young practitioners to begin their motorcycle practice. Both the meanings of motorcycle practice or mobility have enhanced the motorcycle practice and made it become a profound culture within Taiwan's society. It is understandable that the number of people riding motorcycles continues to rise, resulting in a thriving motorcycle industry.

5.1.3 Significance of motorcycles culture

Motorcycles have been fully integrated into Taiwanese peoples' daily lives, even though the aforementioned riding environment, weather, traffic conditions, air quality and comfort level in subtheme 5.1.1. It is uncomfortable, oppressive and even dangerous to ride a motorcycle in Taipei, which echoes Hsu et al.'s (2003) statement. However, Taiwan's unique terrain and perception of travel distance has led to people relying on motorcycles, and also be part of strengthening this culture. The deep rooting of the motorcycle culture has been internalised in the daily life of the people of Taiwan to only choose riding a motorcycle when they move. Therefore, people who travel in cities by motorcycles rarely think in what way can they arrive their destination, as with Interviewee Y sharing her experience of job hunting, the convenience of the location of jobs has never be her consideration. And for Interviewee I, due to the fact that public transport in Southern Taiwan has developed slower and the lane area is more spacious than Taipei for people to move, most people who grow up outside Taipei are more likely and used to riding a motorcycle. Thus, Interviewee I said it very hard for him not having a motorcycle in Taipei to move.

> "I looked for a job first and then an accommodation. I never considered the way of transport, because I have a motorcycle [laughs] … the motorcycle was left at home [in Chiayi] and no one rides it, so I transported it up [to Taipei]." (Interviewee Y)

> "I really want a motorcycle, I want 10 motorcycles or 200 is also fine [laughs] … I am from Tainan, I can't live without a motorcycle. I must have a motorcycle to live. I've been living without a motorcycle for almost four years. Oh! My motorcycle [cry out loud]! If everyone

still remembers, my birthday is this Saturday, you can also prepare a motorcycle as my gift." (Interviewee I)

Under this significant culture, it is quite normal to have a driver's licence of motorcycle riding when you reach 18 years old. Interviewee A described that having a motorcycle riding licence is not a must but more like a preparation. For example, some parents will ask children to get a motorcycle riding licence when they become 18, some job requirements specify employees must have the ability to ride a motorcycle, and some are preparing it for entering the university life. People will have a high possibility to need to ride a motorcycle in the future, no matter the social activities when they go to the university or start to work. Interviewee T concluded that people outside of Taipei have a higher opportunity to ride a motorcycle, and that taking a licence exam when people reach 18 years old is a common thing to do.

"I think it's usually because of parents, ordinary families in Taiwan will ask you to get the driving licence of motorcycle once you are 18 years old. They prefer to keep for possible future use I think. I took the test first even though I didn't have a motorcycle then." (Interviewee A)

"Going to the university after high school means you have to get some licences, like driving or motorcycle riding." (Interviewee C)

"I think outside of the metropolitan area, once you were 18 years old, you will go to obtain the motorcycle licence because the travelling condition is not as convenient as Taipei, so you must ride a motorcycle." (Interviewee T)

Given the fact that the land area of Taiwan is small and leads to small spaces for people to move within it, the high mobility of motorcycles is also a key influencer which helps people to weave through traffic much more easily. Interviewee K shared why she thought that the high mobility is an advantage of motorcycles, she said *"Super convenient! You can arrive at shops' entrance directly."* From her reply, it can be seen that the reliance on motorcycles is very high, and Taiwanese people are used to the definition of convenience meaning they can arrive just in front of the stores or places. Motorcycles' flexibility and high mobility compares to the public transport which has less constraints. As Interviewee D and Interviewee Y said they can make a decision immediately whenever and wherever they want:

"I usually hang out with junior high school classmates, we live nearly [in New Taipei City], which [riding motorcycles] is the most convenient [way] for us. Take Taipei City for instance, we can easily decide where we're going now, and then where next [by riding motorcycles]. If you take trains or the MRT, there might be no trains after some time, like it will be inconvenient after 12 a.m., you'll probably have to take a taxi [home]." (Interviewee D)

"Sometimes it's more convenient [by motorcycles] to go somewhere unexpectedly, like once my sister suddenly called me and asked me to take her to go whatever places." (Interviewee Y)

Returning to the issue of finding parking spaces for motorcycles in Taipei, what is also notable is that the motorcycle culture also brings out a riding etiquette. In the discussion of Interview group No. 13, they talked about how difficult it is for motorcycle riders to find a parking space in Taipei City and how they adapt to this difficulty. Finding a parking space in Taipei seems a small thing, yet it is especially close to practitioners' daily experiences and feelings. Moreover, the riding/parking etiquette even caused safety incidents before. Interview No. 13 is a group of postgraduates, Interviewee G grew up in Taipei; Interviewee I is from Tainan; Interviewee K is from Chiayi; and Interviewee Q is from Taichung. Through their discussion, it also shows there are varying riding environments across Taiwan, and they can also reflect the situation of how are they trying to adapt to the riding environment in Taipei which is a bit different from Southern Taiwan.

Group 13
Interviewee Q: "It's difficult to find a parking space, I think this is the problem in Taipei. Because if you are in Taichung, there is no such problem."
Interviewee K: "Exactly! The parking problem!"
Interviewee G: "But it's much better than cars."
Interviewee Q: "I think Taipei is really annoying, even it's difficult to park bicycles."
Interviewee I: "You can't keep the thinking that I have to park and have to find a place to park. You have to hold the idea that I just want to park my motorcycle here, and then move all the other motorcycles away."
Interviewee Q: "Move six away and move one in? What's the sentence for it?"
Interviewee I: "Pull six [motorcycles] away and park one [mine] in. Last time I was

at Guanghua [technological and electronics market], I really saw someone was pulling six away and park one in! Moreover, every motorcycle was already parked closely, he moved each of them [quickly] just like launching a missile – he kicked this motorcycle's centre-kickstand first and then did the same to other two near it – It [the parking spaces between each motorcycle] was super narrow! Incredible!"

Interviewee K: "I have a classmate will move people's motorcycle, too. He estimates how many motorcycles he has to move [while he's parking] every time."

Interviewee G: "If you want to ride a motorcycle in Taipei, you have to learn the skills of moving/pulling motorcycles, otherwise it will be difficult for you to park. Because it is too difficult to find a [parking] space that is just sufficient for your motorcycle."

Interviewee K & Interviewee Q: "That's so true! It's really annoying!"

Interviewee G: "We have no choice, there's not enough parking spaces [for motorcycles]."

Interviewee Q: "But, do you know it's impolite to move other people's motorcycles?"

Interviewee G: "We don't have other choice."

Interviewee I: "Who will care about you?"

Interviewee Q: "People think this is rude in Taichung."

Interviewee G: "Because you can find [parking spaces] in Taichung."

Interviewee I: "Because it's no longer a question of politeness in Taipei, you're going to be late for work!"

Interviewee K: "Exactly [laughs]!"

Interviewee Q: "But it's really rude to move other people's motorcycle!"

Interviewee K: "Correct, we don't move other people's motorcycle in Southern Taiwan, either."

Interviewee I: "There's no need to move motorcycles in Southern Taiwan."

Interviewee G: "But people in Taipei are very used about their motorcycles have been moved."

Interviewee Q: "Since you move other people's motorcycles, too."

Interviewee G: "Well, since people move other's motorcycle, then just move it … I will move someone's motorcycle, too. Everybody has a tacit

understanding.”

Interviewee I: “But some people put thumbtacks on it [to avoid other people move their motorcycle].”

Interviewee G: “Oh, it’s on the news before! When you have to move someone’s motorcycle, you have to lift the back seat handle that is someone deliberately stuck a row of thumbtacks underneath [the handle]. I’ll check it first before I lift.”

Linking back to Chapter Two that although too many motorcycles have been regarded as a problem, from the perspective of the interviewees (the riders) themselves, people who hold the above point of view may be surprised that the practitioners of this practice do not treat the motorcycles as a problem. *“Where is the problem?”* Interviewee F replied to me when I asked do you think motorcycles are a problem in Taiwan? He continued to explain that he thinks every country has its own suitable mode of transport, and most traffic modes in Taiwan are relatively moderate compared to other countries. One may question whether riding a motorcycle is sufficiently environmentally friendly. However, for motorcycle riders, Interviewee T conveyed that it seems that motorcycles are being targeted as urban air pollution makers.

“No, I don’t think so. Take the United States for example, the public transport there is terrible, that is, you can only take a plane or drive a car to cross cities or cross states … Compared to Europe, of course, their transport is great. Their railways in each country can connect together. What’s more, many cities may also have a lot of development of underground or rapid transit system. Relatively speaking, [transport development in] Taiwan is quite moderate, and I don’t think a lot of motorcycles will represent something [bad].” (Interviewee F)

“I personally feel that there’re so many motorcycles in the city, it’s not right to accuse them as the main culprit of air pollution. It’s just that the government wants to throw probably the most general citizens to the wolves ... Because I usually ride a motorcycle, I don’t think it’s a problem. I think probably Taiwan itself is already used to this lifestyle.” (Interviewee T)

Not only Interviewee F, but other interviewees also think motorcycles are not a problem,

regardless of whether the city is untidy, with poor air quality, or being regarded to have a lower degree of development. They find its characteristic as a part of Taiwan's culture and think they are a suitable travelling mode for living in Taiwan. The interviewees also shared their own experiences about visiting other countries comparing Taiwan's environment, especially referring to the size of Taiwan's land as being small and crowded. In view of this, most people have to find a travelling mode suitable for living and moving in this narrow space.

"To be honest, I don't think it's because of the habit, and I don't think other countries really are neater. High population density countries in general, those highly developed cities I don't think they are neater because there're no motorcycles. Right, while I was in London … there're still in a mess, cars are parked randomly. Relatively speaking, Taiwan's motorcycles are already an established culture. You can't restrict people to stop riding it. It is a must for you, so no matter how ugly they are [for the appearance of a city], they are still a must. It is this city, this country's characteristic, that here has many motorcycles." (Interviewee L)

"I think it's actually a characteristic, like the roads are wide in the United States, and the distance between each state is very far, thus people tend to drive. However, the reason why so many people in Taiwan ride motorcycles is because of our terrain [is small], and the needs of real life, therefore, [we] create a culture like this … I think the convenience of motorcycle riding is difficult to be replaced, and it will also cause your living habits." (Interviewee J)

"I think this is a great invention [laughs], I think if all of our motorcycle riders are converted into car [drivers], you would think this is a disaster. If you simplify it to the emission [problem], because cars' emission rate is much higher than motorcycles, so I don't think any problem here, this is our advantage. You might think that higher-latitude countries cannot ride [motorcycles], but lower-latitude countries do have this advantage. There are a lot of motorcycles in Italy, and there is no such thinking of advanced or not advanced. It just happens that the higher-latitude countries as a whole seem to be a little more advanced than the lower-latitude countries. Thus, I think motorcycles are really good, same resources needed for two people, such as spaces, manufacturing, or [producing] pollution are much less than cars, so I think it's positive." (Interviewee H)

Such a deeply rooted and daily happening motorcycle culture, in addition to the benefits and convenience of the travel mode of motorcycle riding, has led to connections between the practitioners and the vehicles in this day-to-day interaction movement. The mutual relationship between motorcycle riders and motorcycles has also strengthened this motorcycle culture, and brought out some meaningful connections between these two. No matter what kinds of policy is being planned for these motorcycle riders, it should all be considered from a bottom-up angle. Take the perception of the 'problem' for example.

The 'problems' which the government is trying to deal with are, from motorcycle riders' viewpoints, sometimes not a problem at all. It is positive if the original intention of the environmental policies are implemented to produce environmental benefit and if the market and economic atmosphere still supports this intention. One should be careful that there might be a group of people could not afford or join the transition process at once when a transition is being promoted. If the intention of policies and the market has had a negative effect on peoples' transport methods in the name of environmental friendly, people those are unable to make a change immediately may be socially excluded from their access to the city. Will motorcycle riders think they are being targeted? Is the shift of motorcycle practice to low-carbon practices in Taipei happening with a fair process? What are the perceptions and feelings of motorcycle riders toward this? There will be more discussion on these issues in Theme Two on the policy awareness and Theme Four on the environmental dimension.

5.1.4 Conclusion

According to interviewees' narratives, the subtheme (a) provides the outline of motorcycle riding environment in Taipei, which may not be comfortable and with friction. The small land area of Taiwan is a background factor resulting in Taiwan's narrow travelling spaces and influencing Taiwanese people to prefer to choose to ride a motorcycle to travel. However, even though the natural land area is small, according to the findings, the riding and parking spaces are being constrained in Taipei, which leads to the access to the city by motorcycles become more difficult. Although the riding environment in Taipei and New Taipei City is not comfortable, the practitioners are still willing to endure and ride motorcycles rather than choosing the public transport. Even if the public transport system appears to have been well developed in Taipei City and New Taipei City, it may not appear as well developed when experienced through people's daily practices. A 'good' transport system 'on paper' may not be

a good transport system in practice.

The socio-economic factor that informs motorcycle riders' action, flexibility, is a key reason for the prosperity of motorcycle culture that most of the interviewees mentioned. Also, the high price-performance rate attracts those who need to commute and travel with a more affordable price in the city. The practitioners also convey a less negative perception about the existence of or problems associated with motorcycles that were raised in recent years. Not because they do not care about the issues that may cause by the motorcycles, but they choose not to subject their vehicles to any kind of stigmatisation. They think it is a characteristic of Taiwan's travelling environment instead of seeing it as a problem to solve.

According to subtheme (b) and (c), the findings also captured how participants think about the meanings of their mobility of motorcycle riding and the importance of Taiwan's motorcycle culture while being mobile in Taipei. The findings showed that motorcycle riding is not only a means of transport, but also has many meanings behind it – a symbol of growth, connection with family, friends and society, or those who are passionate about the material, which strengthen the existence of motorcycle culture. These meanings of the mobility help the practitioners to maintain their social and cultural networks by the practice.

With these uncomfortable riding environments and as a contributor of a mobile source of the air pollution problem that the policy is trying to deal with, the interviews went on to ask the practitioners of their awareness of government policies on motorcycles. Their perspectives will be analysed in the next section – Theme Two: awareness of government policies.

5.2 Theme Two: Awareness of government policies

The context of the practice provided in Theme One mentioned that the central government considers too many motorcycles to be a problem, which will pollute urban air quality and enhance the heat island effect (Lin, 2010). In 2017, Taiwan's central government aimed to stop selling petrol-powered motorcycles by 2035 (see Section 2.4). This theme shows the perceptions from the interviewees about the 2035 policy. Before the announcement of the cancellation, the interviewees were only asked questions about their viewpoints on the policy. After the news pointed out that it was about to be cancelled, the interview questions not only asked them if they were aware of this policy but also mentioned the news of the cancellation. Although the context shifted during the interview period and the interviewees had not been asking the exact same questions, I still got comparable and valid insights into how the interviewees thought about government policy.

Regardless of whether the 2035 policy is cancelled or not, citizens' feelings towards changes in the planning and implementation of policies are also important because it will affect people's confidence in deciding to change their practice. In other words, how many people will be willing to commit to changing their own practices and behaviours if the policies are not stable? At the same time, if the policy-makers believe that persuasion of people is the priority and think that insufficient changes from the public will slow down the speed of the low-carbon transition, this way of top-down thinking will instead affect the possibility of transition and could fail to understand the needs of practitioners.

This theme is divided into three sub-sections to understand how much the interviewees are aware of the relevant policies and their views. The first sub-section considers if the interviewees know the policy or not; the second understands the interviewees' viewpoints on policies and the top-down approach by decision-makers; and the third sub-section of findings brings out the problems of the top-down approach with the interviewee's bottom-up perspective, and further points out that the fundamental solutions should be linked to the adjustment of the entire national energy plan.

5.2.1 How much do the interviewees know about the 2035 policy?

There were 21 interviewees, 14 of whom knew that relevant policies were being promoted,

and 7 of whom did not know. Of the 14 interviewees who knew about the government's policies for electric motorcycles, most of them knew but were not familiar with it. They did not know the more detailed purpose behind the promotion. For example, most of them knew there were subsidies for changing electric motorcycles due to the government's strong promotion, but they did not know that they will stop selling petrol-powered motorcycles by 2035. And since some of them were not clear about the policy, the interviewee (such as Interviewee C) even asked me more about this policy.

"I know this but not knowing very detailed." (Interviewee W)

"I only know about the policy that we have to change [to electric motorcycles]. There are people saying on the Internet that some people may need to find new jobs. All the traditional motorcycle shops are required to look for new jobs. But, [to be more specific about the policy] do we have to change to that [electric motorcycles], or it stipulates that they [petrol-powered motorcycles] cannot be sold?" (Interviewee C)

There were also interviewees (Interviewee L, J, T and O) who knew about this policy quite clearly, and knew the news that the policy was going to change. Unlike other interviewees, they were sensitive to this policy and even actively mentioned it in our conversation. For example, Interviewee L immediately told me that he saw the news last night saying that the policy was about to stop. Nevertheless, although Interviewee T said that he only had a general understanding of the policy, he also noticed the policy is going to be changed before I asked, and thought it was related to the upcoming election.

"… Still not sure yet, it may be fully electrified and selling electric motorcycles after 2035, but this does not mean that you can't ride a motorcycle produced before 2035. If you ban completely straightaway, people will have a backlash … Thus, it should be able to continue [riding general motorcycles], it's just that the petrol-powered motorcycles cannot be sold. The policy should be like this." (Interviewee O)

"Isn't it cancelled? I saw the news yesterday and they had already cancelled it … I don't remember I saw it this morning or yesterday. It just made me feel a big exclamation mark [surprised]!" (Interviewee L)

> *"I know the government's policy roughly ... because I still wanted to buy a petrol-powered motorcycle at first, my commute distance is very long, and I was thinking that the electric motorcycles might be a bit [inconvenient] ... I have noticed it [the policy was cancelled], but I think this is because of the election [laughs]?" (Interviewee T)*

Many interviewees did not know about this policy. Still, they knew that the electric motorcycles were strongly promoted and had many subsidies, such as Interviewee Y, I and K. Even they did not know about the policy, some interviewees thought that the goal of this policy was positive after hearing my explanation of the aim of it. Alongside a number of sensitive and interested interviewees, there were also interviewees disinterest in the policies to support electric motorcycles. These included Interviewee Y and M, Interviewee Y thought that as there is still a long time to 2035, it has no effect on her at present:

> *"I don't know, but I know that electric motorcycles are being promoted. I don't think there will be any impact. You can still ride a motorcycle, it has no impact on me." (Interviewee Y)*

> *"I don't know, I only know that there are various subsidies." (Interviewee I)*

> *"I don't know, I know they are promoting electric [motorcycles]." (Interviewee K)*

> *"I don't know about it, if so, it would be the best, and good for the air quality and quieter." (Interviewee M)*

Although not many respondents knew the 2035 policy clearly or even did not know at all, most of them were aware of the subsidies. This shows the government's efforts to promote subsidies, yet can this effort help people change their original transport mode? This will be discussed more in the next theme. After knowing how much the interviewees knew about the policy, we now further understand and discuss their viewpoints on this policy. Returning to the first impression of Interviewee M mentioned above, even though she knew not much about the policy, after hearing it, she considered the purpose of this policy is very good because it can improve the air quality of the urban environment. This kind of viewpoint will be discussed more in the next section, especially the interviewees' views on the implementation of the policy will be discovered in more depth, as well as the factors that could influence the

effectiveness of the implementation of the policy.

5.2.2 Viewpoints towards the policies

In terms of the perception towards the 2035 policy alone, the interviewees gave positive feedback to the policy of halting the sale of petrol-powered motorcycles, which echo Chou and Liou's (2020) research that Taiwan's public is willing to support the transition. All interviewees felt that this was a good direction and development. It was mentioned in the previous section that there are many uncomfortable feelings related to riding motorcycles in Taipei. Although the riders are willing to endure, the negative feelings such as poor air quality give the riders (such as Interviewee M abovementioned and Interviewee E) a positive attitude towards reducing air pollution and low-carbon transport policies. Interviewee J also mentioned, *"From my standpoint, I also hope that the government should control these."* For Interviewee B, who already changed to an electric motorcycle to pursue a trendy vehicle, because he is used to and likes using this mode of transport, he even more agrees with the policy promotion.

"The policy is good, it's good to eliminate the vehicles which are too old. The air pollution is severe ... because we often have motorcycles passing by here, the smell is really heavy, smells bad." (Interviewee E)

"I think it [the policy] is very good, because I'll just ride the electric motorcycle after, I won't change back to a petrol-powered motorcycle." (Interviewee B)

Interviewee F also mentioned that many people could not switch a new vehicle immediately, for example, if there is financial pressure. Even if the policy has been promoting subsidies, there is no need to replace a new vehicle for those who do not need it. This point will be discussed more in the next theme. Yet, Interviewee F affirmed the government's original intention and believed that low-carbon transition policies take time due to the process of the policy implementation. Policies need continuous adjustments during the promotion process, and the needs of the people require time to be taken into consideration.

"… I think the original intention is good, and how do you deal with the needs of these people and how to make adjustments may still take time." (Interviewee F)

Lack of interaction

Interviewees thought that the original intention of the 2035 policy is good. The perception is mostly positive and shows the public is aware it takes time to promote transitions, and that the policies can be adjusted step by step. It is only the process and method of policy implementation that caused the interviewees' negative feelings. For instance, they thought the process of promoting policies lacks interaction with people, such as lack of relevant education, popularisation, and communication. As Interviewee H said, *"I don't think there is much education in this area."* The idea of education needs seems to be a more top-down approach to help people understand the relevant policies. Yet, it can also show how people do not understand what policy intends to achieve, or what problems and difficulties they may encounter in transition progress. It also shows that even if the policies mostly want to adopt top-down influence methods, such as strengthening publicity for behaviour change or perhaps school education, for instance, the *Transportation Energy Saving and Carbon Reduction eBook* by Department of Education (2011), a large number of people who use the transport system have left formal education. Thus, it may also be important for the policy designers to think that education also needs to encompass related settings into the societal context as well as formal school education. Furthermore, the publicity and promotion of electric motorcycles should attract the public not only in terms of price reduction, but also allow the public to learn about the concept of carbon reduction while being exposed to policies.

The most mentioned aspect of insufficient interaction is the lack of communication. Interviewee L mentioned that a policy that lacks communication is easy for people to misunderstand and be unresponsive to, resulting in doubts and negative perceptions and losing confidence in the policy. As Interviewee S said, people will be sceptical about the policy, because they only receive the core message that they need to change their transport vehicle, and no other details. She emphasised that the policy should be presented more clearly and transparently.

> *"Of course, you can also say that the government's communication is not enough, there are lack of forums or other related … This is what I think civil society organisations are important, because after my communication with citizens, the implementation of policies will be relatively painless. People will not think why this policy suddenly came, [or it would be] just like the Air Pollution Control Act suddenly appeared, and then everyone will think*

– Are you asking us to change our vehicles now? " (Interviewee L)

"Everybody has their doubts about it [the promotion to change to electric motorcycles], if you [the government] are not doing this transparently, how can you [the government] know people's uncertainty? You [the government] only ask people to change, then people will think what's the meaning behind it and what price would we pay?" (Interviewee S)

It can be seen from the findings that people's emerging feelings are not mainly about the policy goals or intentions, but the acceptance of the policy implementation. When the policy implementation process is strongly top-down, people can only receive the information – that there is a need to change the vehicle, or that they only hear that many electric motorcycles are subsidised. But is there a chance for them to truly understand the motivation behind these policies?

Lack of consistent policy

"I think it's a good policy, but the supporting measures must be planned well." (Interviewee G)

"I think it's not bad, the electric motorcycles, but I think the overall supporting measures must be prepared well." (Interviewee K)

Many interviewees thought that although the purpose of this policy is good, it seems that the supporting measures of this policy are imperfect from what they can understand (see Interviewee G and K above). Interviewee H mentioned that although the government strongly advocates electric motorcycles, it is not that easy for everyone to change the means of their travelling, as it also needs more relevant infrastructure, such as the expansion of charging stations. When people cannot 'see' the related facilities of electric vehicles in the living environment, the insufficient matching plans would turn people against buying electric vehicles. This is the thinking of Interviewee M, who said that when a new industry/transport vehicle appears, she is more willing to wait and see first, make observations and wait until the entire industry is stable before considering a replacement of her own vehicle.

"[When] the government started to promote it, like the policy we just mentioned, there

will need a lot of background. For example, the establishment of battery stations." (Interviewee H)

"Our old thinking is that something that has just come out is like an experimental product. It must be expensive and costly repair parts. It is not cost-effective, I'll wait until it becomes steady ... Like how many years has it been released? I think people are more aware of it and their repair parts should be a bit cheaper, and more common. That's our old thinking." (Interviewee M)

Based on the infrastructure development and more stable industries mentioned by Interviewee H and M, it can be seen that when practitioners can 'see' these new choices in their living environment, they could feel that these new choices can 'catch' those who prepare to change. This in turn could increase the trust of practitioners for this new practice, thus the feasibility of a transition of low-carbon transport mode can be improved. We know that the policy cannot be perfect from the beginning, and it takes time to promote and constantly make corrections. Furthermore, a successful transition should be a cooperation between the policy designers and practitioners. There will be frictions during the process, but these are materials for modification for both sides learn how to adjust and change together. The findings show that if most interviewees agree with the motivation of this policy, then this can become a core value of low-carbon transition. What is needed is to work together to create a better environment, not for a specific group of people (in the case of this study petrol-powered motorcycle riders) to be perceived as the culprit in creating the pollution and singled out as the only group who need to make changes.

Increase market choices

A lack of coherent policy will affect subsidies for electric motorcycles. For example, under the promotion of the current policy, there are not many manufacturers that one can choose from in the market, and there are even situations of the market being dominated by one company. Regarding this, Interviewee D also mentioned that a small market would make him think that he is like a lab rat. He felt that the system was immature and was stepping back from buying an electric motorcycle, no matter if there is a subsidy.

"If the time lasts longer, like until 2035 or after, maybe there will be a lot of manufacturers at that time ... If the market becomes larger, there will be no such monopoly, and the price

may be more reasonable. What's more, I feel that this kind of technology now is a bit like a lab rat, because it is not very mature." (Interviewee D)

Passive execution

Perceived incoherence of policy also made the interviewees think policy implementation was passive. Interviewee J believes that the government's execution is too gentle, and it seems that it is only waiting for the people to accept it slowly, and when the time is long enough, people will slowly change, which is like waiting until one wants to change.

"… The mentality of the government is actually negative to improve this thing. That is, I [the government] know that I can't influence you [petrol-powered motorcycle riders] now, but I give you this kind of idea and educate you in this way, the expectation is that when you want to change motorcycles after three, five ,or ten years, you will choose electric vehicles. [The government] Use[s] a more gentle way to do the promotion, but if you say at this stage, this moment, you need to make some changes, then the implement of government's efforts are not enough." (Interviewee J)

Following up on Interviewee J's thought, Interviewee F mentioned that if the government provides more help in eliminating old motorcycles and the choice of connecting new motorcycles, he believes that people would be more inclined to accept the transition. After all, people are accepting that the motivation of the government wants to improve the air quality. Interviewee F also mentioned people must also learn to accept the views and ideas of low-carbon transport transition, and the two sides (the policy planners and the practitioners) must cooperate to facilitate the low-carbon transport transition.

"… It depends on how people accept this, if everyone has a consensus, like, well, the government can help me eliminate this thing, maybe the level of acceptance could be better. Then people may also be willing to accept the statement that the government's original intention is to solve air pollution ... and I think many things are actually like - it's impossible to solve all problems by a one-time decision. You'll have some plans at the beginning and then slowly modify them when you encounter different situations. It is impossible to say that you can solve everything with one idea, so I think everyone has to accept this concept that there is no perfect thing, there are problems no matter how."

(Interviewee F)

Except for needing help from the government, Interviewee S said that the policy was unclear, which confused her. She said that the policy promotes not only electric motorcycles but also introduces new options for petrol-powered motorcycles, and she thought that "the general petrol-powered motorcycles also have many other options" and are more diverse than electric motorcycles. Promoting both makes her doubt the government's attitude toward this policy. The Taiwanese central government not only promotes subsidies for the replacement of electric motorcycles, but also provides subsidies for petrol-powered motorcycles, aims to eliminate two-stroke motorcycles, and provides subsidies to those who change to electric motorcycles or the Phase Seven exhaust standard petrol-powered motorcycles. Compared with two-stroke motorcycles, the carbon emissions of the Phase Seven petrol-powered motorcycles are indeed much lower. Perhaps it is a reasonable situation that will occur in the transition to low-carbon transport, so that people can continue to maintain their practice and ride lower carbon emission petrol-powered motorcycles. However, it cannot be denied that this makes the public confused. At this point, people are more likely to choose the petrol-powered motorcycles with subsidies that are already relatively familiar, in comparison to the electric motorcycles with insufficient supporting measures and an immature network. This may also lead to the result mentioned in Section 2.4 of the sales of petrol-powered motorcycles reaching a high number in 2020.

> *"They [the government] also said that there will have some plans for this year's new style [petrol-powered] motorcycles, then I feel [confused] like are you intending to promote the new style [petrol powered] motorcycles or the electric ones? ... Instead, I think the new things that are more often promoted are for the petrol-powered motorcycles not the electric ones. (Interviewee S)*

The above has discussed the passive execution of the government through its lack of practical support and unclear focus. Furthermore, Interviewee T believes that the promotion of transition is too much to point the finger at the petrol-powered motorcycles as a major culprit in the air pollution problem. He even thought that after placing the responsibility on the petrol-powered motorcycle riders, the government does not seem to bear any responsibility.

> *"I don't think it's the real prime culprit of air pollution, it's just that the government wants*

to throw the most trivial thing of general public to the wolves." (Interviewee T)

Political intervention

The passive execution of the 2035 policy can be seen from another aspect: policies are interfered with by politics. In Taiwan, policy promotion is often easily affected by elections. In order to gain more support from voters, the ruling party sometimes postpones or cancels controversial policies. Environmental protection aims have similarly been changed after the opposition party won the election (Grano, 2015). The 2035 policy also reflects this trend. The interviews were taken in March and April 2019, and the 2035 policy was cancelled in May 2019 after being promoted from 2017. The Taiwanese presidential election, which would be held in January 2020, coincided with the cancellation of the situation mentioned above. It is difficult not to make associations with political interference. The interviewees' reaction confirmed there must be a political intervention in the progress of the 2035 policy execution.

When I asked Interviewee T – "*Did you notice that the news that the 2035 policy might be cancelled?*" - He replied with a helpless smile, *"Yes, I have noticed this information, but this should be because of the election."* When interviewee L responded to this news, he said, *"I think they are testing the water,"* and then I asked further – *"Do you think it is related to the election?"* He answered me undoubtedly, *"Of course, what else! It's just populism, populists are very happy."*

> *"[Regarding] the ban on the sale of petrol-powered vehicles, they still want to sell it because it's the best-selling thing. Because they don't want to change. … there is another point that goes back to what I just said which is the votes [the president election in January 2020]! Because they will lose the votes in southern Taiwan, it's troublesome, so they said it [the 2035 policy] will be suspended … So I said that 2035 petrol-powered [vehicles policy] is all political interference, I think it should be a pretty close guess, which is terrible!" (Interviewee L)*

Interviewee M even pointed out that she is not surprised that this policy is facing cancellation. She believed that there are too many issues in Taiwan when it comes to drafting a policy or law, meaning it would likely fail due to political factors. She even thought that the works that politicians do are no more than window dressing, and they consider getting more votes as the priority. She said that such a political environment is ugly. However, Interviewee L also

helplessly said that the policy's promotion still need to rely on politicians because the reality is that they do have influence. He also thought that promoting a good policy in Taiwan is difficult to be evaluated from a neutral angle, because people label you accordingly to which policy you support, and use this to assume you support the political party which raised this policy.

> "That's unquestionable, they're just saying! Like there're problems of drunk driving, when it really comes to the legislation, some legislators just run away. They all just pay lip service. This is ugly, like the politics you mentioned, and there's collusion of interests … Have you ever heard about the vote issue? Most of them say a lot and cheat and then run away." (Interviewee M)

> "I have seen a lot of respectable elders to speak out, those people are really voicing for environmental issues. However, you still have to rely on politicians to deal with it, you can't do it on your own to reverse these policies, and it will eventually become a political factor. The political interference, and then the media or the opponents will automatically link you [and a specific political party] together." (Interviewee L)

From the interviewees' views on the policy, it can be seen that if the promotion of a policy is not smooth, from the angle of the practitioners, it might be that they have insufficient information, which creates barriers and then makes people hesitate to change. People will engage inconsistently with unstable policies and new practices, and would rather be conservative and wait and see instead of being a 'lab rat' at the outset. Ironically, the interviewees were not surprised by the cancellation of the 2035 policy. It seems to have become a normality that the environment in Taiwan is difficult to promote policies. Although there are good intentions, the interviewees also made it clear that even if they recognise the motivation is good to reduce the air pollution problem, they think the root of the problem relates to the unbalanced national energy policy.

5.2.3 Energy allocation

Focus shifting
The 2035 policy, aiming to stop selling petrol-powered motorcycles, made the interviewees feel the focus was shifting. It is a fact that there are a large number of motorcycles, but this

does not mean that they have to take responsibility for all air pollution in the city. The policy actually makes people feel: why does the government want to ban us from these small-scale emissions instead of starting with the large-scale emissions? Interviewee J mentioned that although reducing of the number of petrol-powered motorcycles in the city could perhaps help people really feel the air is better in our living environment, if the country still uses coal to generate electricity as the main source, is it really more environmental friendly? Although the policy's purpose seems to be to provide benefits to the environment, Interviewee T and L pointed out that when everyone converts to electric motorcycles, people also need electricity, and that they also need to burn coal to generate this electricity:

"Assuming we are still basing on coal power plants, when consuming the electricity, for instance, the coal power plant in Yunlin or wherever else [in the countryside in Taiwan], the air there is dirty. However, our actual feeling [of the dirty air] is less [when living in the urban area]." (Interviewee J)

"When you think about it [riding an electric motorcycle] carefully, you would discover that you are still consuming electricity. When using the electricity, you are still burning coal!" (Interviewee T)

"I think this part is difficult to compare, but I know that there are a lot of data [shows] that if your city or country is still using coal for electricity, using electric motorcycles will not be more environmentally friendly and will not reduce air pollution." (Interviewee L)

Intuitively thinking, of course, the emissions of petrol-powered motorcycles in cities are a major concern of air quality, and because there are a lot of riders, many people can experience poor air quality during travel (link back to Section 5.1.1). It is easy to fall into thinking that these petrol-powered motorcycles are the reasons for the air pollution in the immediate surroundings. However, the findings show that the practitioners traced the source of the power source for electric motorcycles, finding that the purpose of policy promotion seems to be less clear-cut and questioning if transitioning to electric vehicles really is for the benefit of our environment. Before the government's energy policy has dealt with the issue of burning coal, planning to reduce the number of petrol-powered motorcycles only makes practitioners feel the government is shifting the focus, echoing the previous topic showing the passiveness of this policy execution. Nevertheless, this can be linked back to Henderson's (2020) argument

that if the main energy generation is still coming from coal power, the emissions are simply offset to producing locations outside of urban areas. Another important point to note is that practitioners think the policy is passive because the price of petrol is far lower than other transport methods.

Low petrol price

The policy promotes the cessation of the sale of petrol-powered motorcycles, which represents the desire to reduce the number of petrol-powered motorcycles, and influences people to change to electric motorcycles or take public transport. However, the government's promotion of subsidies for purchasing electric motorcycles or encouraging the public to take more public transport (such as 'Green Friday' in Taipei) does not seem cost-effective for motorcycle riders. The subsidies of electric motorcycles seem to be attractive and can also enable motorcyclists to maintain a similar practice of travelling. Yet, a big reason why the motorcyclist sticks to the original mode of travel is that it is cheap. Not only are motorcycles cheaper to buy than cars, but also the cost of refuelling every day is cheaper than electric motorcycles or taking public transport. This has built a difficult threshold to pass for the transition – if one wants to change to a low-carbon transport mode, one needs to spend more money to support this mode. Interviewee L mentioned that the contradiction of policies made him feel that the government is basically punishing people who want to be environmentally friendly.

> *"I used to discuss with people very often that there is a problem with our oil price. Yes, the low oil price cost me less than NT$ 5 for a two kilometres ride, but I had to spend NT$ 15 to take a bus, why should I do this? You don't have an incentive for people to take public transport, but you also ask citizens to do this to reduce carbon emissions. Isn't that like I am the person who wants to care about the environment, and then I take a more environmentally friendly transport, but turned out to be punished? Why should I have to spend more money? This is that you [the government] are punishing people who want to be friendly to the environment, and the more unfriendly I am to the environment, the more convenient I will be and save more money …" (Interviewee L)*

Under the name of granting subsidies, have the government ever thought that it may place more burdens on the public? Being environmentally friendly should be practically improving

people's living environment and caring for their feelings during the transition process. What Interviewee L is saying here can reflect the argument that when people need to spend more money to obtain a better quality of living environment or maintain the conditions for daily survival, people will prioritise maintaining conditions for daily survival. Practitioners may only think that changing their practices is disturbing or a punishment in the way Interviewee L mentioned.

Better energy policy

Following on from the points raised above, the most fundamental solution to the air pollution problem should be to readjust the national energy structure. Practitioners also want to know transparent data such as – will the country's carbon emissions will really be lower if electric vehicles are used? As Interviewee S asked, no matter how much the government says they are going to increase the proportion of renewable energy, it would be helpful to let the motorcyclists know how much carbon emissions can be reduced if they are changing their vehicles. It could increase people's understanding more effectively. Otherwise, while the country is still using coal power generation, it is difficult for the practitioners to believe that there will be any improvements by their change in practice.

> *"But I have a question, even if I reduce mobile pollution sources [by motorcycles] today and I increase the electricity pollution sources [from the power plants], what is the ratio [difference]? Because I think no matter what you do now, there will always be pollution sources. The important thing is how you [the government] are going to deal with this? If you're not considering that whatever you do there will always be pollution sources, it's useless to promote anything else, no matter wind power, hydraulic power, or even nuclear power." (Interviewee S)*

The formulation of the policy should be more comprehensive rather than targeted. This is especially so given that as the 2035 policy did not have many supporting measures and only refers to the cessation of the sale of petrol-powered motorcycles, it would inevitably cause a bad impression among the public. When a decision only appears to made because of air pollution and without wider explanation, it may be harder to influence people to support a vague goal. This led to Interviewee S to think that as pollution would be produced in any way, she would expect more information on how the government plans to respond to the bigger

question of how emissions are reduced overall regardless of the source.

Although the government requires that the latest phase of the newly launched petrol-powered motorcycle has fewer carbon emissions than the previous phases (according to Interviewee O), yet both promotes and subsidises electric motorcycles and petrol-powered motorcycles. Perhaps such a transition period is necessary – at least the latest phase of petrol-powered motorcycles are much cleaner, but the 2035 policy was ultimately cancelled in May 2019, which even might not have entered the core transition period and failed to continue. The decision undoubtedly gave people further doubts over what the right course of action ought to be. Even if people supported the low-carbon transport planning, it is easy for the practitioners to feel at a loss if relevant policies will continue to be unstable in the future.

5.2.4 Conclusion

In this theme, I further discussed the perspectives of the interviewees. Respondents believed that lower-carbon transport is overall a good thing. Linking back to Section 5.1.3, compared with the policy-makers who regard motorcycles as a problem to be solved, practitioners do not tend to see motorcycles as problematic. Under their idea of not thinking too many motorcycles is a problem, respondents also maintain a positive attitude towards low-carbon transport at the same time. This could be a reminder for the policy-makers that publics can hold opposite beliefs at the same time, and that setting policies as an 'either-or' decision may not be the most effective way to engage with society. There should perhaps be a more comprehensive adjustment and improvement, rather than a policy that focuses on eliminating petrol-powered motorcycles, which makes the motorcycle riders feel that they are being targeted.

Nevertheless, the political interference in Taiwan's policy execution environment makes the policies unstable and reduces the public's confidence in policies. This also disappoints the public's positive attitude towards the policy. This in turn leads to some people wanting to wait for the entire industry to stabilise before making a decision, and many hoping to wait until the last point possible before changing their practice. These points illustrate clearly that when most people make decisions before they change their practice, they tend to want to have a clear and stable environment for them to change. Furthermore, the findings show that people did have little confidence about the 2035 policy, and it turned out the policy was cancelled

eventually. This may deepen the distrust that already existed among the people's thinking. These findings show that the continual politicisation and cancellation of policies reduce the public's trust in strategies for low-carbon transitions. In order to gain public support for behaviour changes, incremental alterations to existing policies may be more effective than repeated radical alterations.

5.3 Theme Three: Intention to change transport mode

After understanding the interviewee's views and awareness on the 2035 policy in the previous theme, we can find that the feedback on the policy of stopping the sale of the petrol-powered motorcycle from increase the air quality is positive, but only if the policy is clearer and stable, and is not liable to change at any time. Thus, practitioners can feel the action of changing is practical, reliable, and meaningful, instead of merely an empty gesture. In addition to top-down policies that must be solid and credible, the focus of the promotion was on environmental protection and with subsidies for the replacement for petrol-powered motorcycles. It was stated in Section 5.2.3 that people thought that this approach has the possibility of shifting focus away from the continued reliance on coal-fired electricity production.

This theme explores what the factors that can affect practitioners to change in Section 5.3.1 are; and further bring out the effect of the vigorous promotion of subsidies in Section 5.3.2 and examine whether they can effectively influence practitioners to make changes.

5.3.1 Factors that could influence change

When asking the interviewees what influencing factors may lead them to change their motorcycles, firstly, most of the interviewees think that if their motorcycle can still be repaired, they just repair it. If their motorcycle is still workable, they continue to ride the original one, such as *"my motorcycle has not broken yet, my motorcycle can still be maintained"* (Interviewee P). Similarly Interviewee A and C said they repair their motorcycles until they are not serviceable, and then they will consider the new motorcycle options.

> *"If the [repair of] current motorcycle can't be done, and I must change the motorcycle, I will want to change. I'll change only if it's necessary." (Interviewee A)*

> *"I replaced it last December, because it was too old and broken, and I didn't want to repair it anymore. So it was scrapped and replaced with a new one ... of course that motorcycle has been repaired many times. It should be around 27 or 25 years." (Interviewee C）*

Needing a replacement

Needing to change the vehicle is the most direct and practical reason for considering an electric motorcycle. Interviewee L mentioned that the new electric motorcycle is very attractive to him (see Section 5.1.2), but it was also because his motorcycle was already old and needed to be replaced, and then he started considering a replacement. On the other hand, based on Interviewee T's own consciousness and personal experience, he realised that electric motorcycles are the future transport trend. But this was also the main point that he considered when his motorcycle was too broken to be repaired. When it was necessary to change to a new travelling vehicle, he converted his personal knowledge into ideas and then made a plan to change to an electric motorcycle.

> *"When I was in my third year at the university, I bought a second-hand four-stroke motorcycle and rode it in Taipei. That one was 20 years old, so it was very old. Then it happened that Gogoro was going to come out and it was advertising. [At that moment], I thought oh my god in my mind, there are such things as electric motorcycles in the world!" (Interviewee L)*

> *"My old motorcycle happened to be broken soon [even after repairing]. The owner of the motorcycle shop told me that I might have to scrap this motorcycle in the near future. This is the main reason [that I changed an electric motorcycle]. At that time, when I was choosing the new motorcycle, I asked myself that if I am still riding a petrol-powered motorcycle within 10 years ... I thought this thing [petrol-powered motorcycles] will be eliminated after 16 years [because of the 2035 policy], and for my next 10 years, if I still ride a petrol-powered motorcycle, it seems to be a bit 'low low' [laughs]. ["Low" here is describing a person has a terrible taste in Chinese English] (Interviewee T)*

Becoming mandatory

Interviewee J, who loves motorcycles with a manual transmission, said that he will only change to the electric motorcycle when the government stipulates that they must be replaced, otherwise his priority will always be his dream vehicle. Interviewees W and S show that their examples are relatively passive, they do not have a particular choice, but they prefer a stable status quo. They were more willing to wait until the last minute, such as it when becomes a mandatory regulation, before making any change to their means of transport.

"If it's not broken you won't change it. Thus, if one day I must change to ride an electric motorcycle, of course I will find it inconvenient when my motorcycle hasn't broken." (Interviewee J)

"… agreeing with this [policy] is different from actually doing it. If I belong to the kind of very passive person, I will not do it unless there is any policy to stipulate this." (Interviewee W)

"My mom has rode her motorcycle for a really long time, it's been there since I was in high school. Her motorcycle just happened to be on the list that needs to be eliminated [two-stroke motorcycle]. It seems that in this year or last year, the government announced [eliminating] the two-stroke motorcycle …, but she thinks if it's still work, she'll keep riding it. My family is holding on to the last moment that if we really have to change." (Interviewee S)

Pursuit of material satisfaction

Thirdly, there are also a group of people, similar to Interviewee J's preference for high-performance motorcycles, but with more of a focus on pursuing their favourite items. They like to pursue new trends. Interviewee B is one of them. He likes to choose cool motorcycles, he chose one that he thought was cool while choosing a petrol-powered motorcycle. He even re-equipped his old motorcycle (Section 5.1.2), but as time went by, that motorcycle became old, and the new trend of electric motorcycles attracted his attention. He knew not many details about the policy, and the reason motivating the replacement of his motorcycle was his trend sensitivity and yearning. There are many practitioners of this material orientation pursuing the newest and the most fashionable type of vehicle, Interviewee B is not an isolated case. Interviewee C jokingly said that even after the subsidies, an electric motorcycle is still more expensive than a petrol-powered motorcycle, so in fact, the subsidies were not the main factor that could affect him to buy. He could not afford a Tesla, but at least he could buy an electric motorcycle and experience the addiction of the new trend.

"Because I think my motorcycle is too noisy [laughs]. Gogoro was very new and trendy at that time. It happened that my friend bought it too. He bought it earlier, he bought the first version. Then I bought the S version when it was just released." [Interviewee B]

"... it's still more expensive. I just thought that I've never ridden an electric motorcycle, and I can't afford a Tesla [laughs], thus, I bought a Gogoro to have a try." (Interviewee C)

New options

This point makes us wonder, if there is no Gogoro in the market today, or if the old kind of electric motorcycles described by Interviewee L in Theme One are still on the market, will people's willingness to change be the same as before? There are new choices emerging, which enable practitioners to see new electric motorcycles that are different from the past old ones. Interviewee L also shared his experience that in the past, a friend he knew chose electric motorcycles in order to protect the environment, but it brought many inconveniences in life. His narratives show that the electric motorcycles' new options have provided a lot of impetus for the 2035 policy, compared with past experiences promoting electric motorcycles.

"At that time [when I bought my Gogoro], in fact, no matter what motorcycle you buy, as long as you change to an electric motorcycle, there is a subsidy originally. It has nothing to do with Gogoro, but no one wants to buy those kind of old electric motorcycles [laughs]. Only elderly people or those kind of hard-core people who think electric motorcycle can change the world would buy. Oh! I had a roommate riding a Chunghwa electric motorcycle, but the battery is the kind that needs to be unplugged and carried upstairs to charge. And then you can ride it overnight, and the battery would running out for around 30 kilometres ride with a speed about 40 km/hr. You can overtake him by riding a bicycle easily, and you can laugh at him when you running next to him ... so of course even if they gave you subsidy or money, you still will not buy it. It sucks [laughs]! (Interviewee L)

Trend

Fifth, while the policy promotes low-carbon transport for motorcycles, electric vehicles with better performance have gradually appeared on the market. The rise of electric motorcycles can be expected, and such trends in the societal atmosphere also have an impact on practitioners. As above, Interviewee L and T both mentioned that they thought most about switching to an electric motorcycle when they needed to change their vehicle anyway, but that

the future transition to electric vehicles is inevitable. They were also aware that the world is in the process of a low-carbon transport transition, thus when they need to change to new vehicles, choosing electric motorcycles is more in line with the long-term plan.

> "My job works on environmental issues, I know that the electric [vehicles] industry is the upcoming trend. I am not saying that it may always be this [electric vehicles industry], it is a must to utilise the electric way to replace current transport during the transition process" (Interviewee L).

> "... when I was choosing the new motorcycle, I asked myself that if I am still riding a petrol-powered motorcycle within 10 years, it seems ... I will think this thing [petrol-powered motorcycles] will be eliminated after 16 years [because of the 2035 policy], and for my next 10 years, if I still ride a petrol-powered motorcycle, it seems to be a bit 'low low' [laughs]. ["Low" here is describing a person has a terrible taste in Chinglish] (Interviewee T)

Vehicle performance

According to the findings, the biggest difference between the past electric motorcycles and the recent electric motorcycles is probably the performance improvement. In the past, the slow speed of electric motorcycles and the trouble of charging caused the impression that most of them were ridden only by the elderly (discussed in Theme One and Theme Five). According to Interviewee L's statement: "no one wants to ride that," and today's electric motorcycles even make riders feel the performance is better than petrol-powered motorcycles at the same price. Interviewee T also found that the performance impressed him after the trial ride. A brief discussion here about performance improvement also enhances people's desire to change (the perceptions of electric motorcycles will be discussed further in Theme Five).

> "No one wants to buy those kind of old electric motorcycles [laughs]. Only elderly people or those kind of hard-core people who think electric motorcycle can change the world would buy ... You can overtake him [who rides an old kind of electric motorcycle] by riding a bicycle easily, and you can laugh at him when you running next to him." (Interviewee L)

> "I originally wanted to select a petrol-powered motorcycle, but with the government's

subsidy, the price of an electric motorcycle is almost the same as a petrol-powered motorcycle, or even lower… I bought the [Gogoro] S2 version, and then it costs around NT$ 60,000. This price could only buy a more general and basic petrol-powered motorcycle, not the kind with better horsepower or better performance. So after my test ride, I felt as if the performance of electric motorcycles [Gogoro] at this price is much better." (Interviewee T)

Wait until the new system become stable

Although the various reasons discussed above may affect the change of practitioners to electric motorcycles, the fundamental factor that affects most practitioners' replacement is still from the first factor – the timing of when they need a replacement. Thinking back to the topic of the promotion of the policy in Section 5.2.2, we may therefore question whether providing subsidies for both electric *and* petrol motorcycles is in fact reducing the incentive to switch to an electric motorcycle. Interviewee M is an example of getting a petrol-powered motorcycle subsidy to replace her original two-stroke motorcycle. She mentioned that her consideration for changing the motorcycle was that the new practice was not mature enough. She plans to wait and see until the stability of the new electric motorcycle network has improved. Interviewee D mentioned that he does not want to be a lab rat at this stage to buy an electric motorcycle.

"Our old thinking is that something that has just come out is like an experimental product. It must be expensive and costly to repair. It is not cost-effective, I'll wait for it to become steady … That's our old thinking, but younger generations are different. Young people like to buying trendy vehicles, they want to find the newest ones. We are more conservative, and I will only buy it when they are stable … When I bought this motorcycle, it was subsidised and bought to replace my two-stroke motorcycle … They [Interviewee B and P] asked me to buy that [Gogoro], because there were few people riding that, I didn't have that much trust in it." (Interviewee M)

"… I feel that this kind of technology now is a bit like a lab rat, because it is not very mature, maybe it will be very mature after a while." (Interviewee D)

Linking back to the interviewee's viewpoints on the 2035 policy, the policy support is

insufficient, and the above replies did not seem to directly mention that the subsidies affect them to switch to an electric motorcycle, because they can also get subsidies even for the purchase of petrol-powered ones. What influence did the electric motorcycle subsidy, which was strongly promoted by the government, seem to have on the interviewees? More will be discussed in the next section.

5.3.2 The effectiveness of incentives

As mentioned in the previous section, the consideration of switching to electric power at the time when the interviewee needs to change motorcycle anyway is the most direct and practical reason for shifting practice. If at the same time they can benefit from government subsidies, the subsidised new electric motorcycle option is an attraction. Take Interviewee T for example. While he was weighing up the future trends, he also found that because the subsidy allows him to buy an electric motorcycle at a similar price, the electric motorcycle at this price is more efficient than a petrol-powered one. This enabled him to change his mind about buying a petrol-powered motorcycle, and because the subsidy has a limited validity period, Interviewee T also recommended his younger brother, who also wants to change his motorcycle, to consider this option.

> *"I originally wanted to select a petrol-powered motorcycle, but with the government's subsidy, the price of an electric motorcycle is almost the same as a petrol-powered motorcycle, or even lower. I'm from Miaoli, but I bought it [Gogoro] from a friend in Taoyuan [Taoyuan's subsidy is higher], so the price is really lower than a petrol-powered motorcycle. I bought the [Gogoro] S2 version, and then it costs around NT$ 60,000. This price could only buy a more general and basic petrol-powered motorcycle, not the kind with better horsepower or better performance. So after my test ride, I felt as if the performance of electric motorcycles [Gogoro] at this price is much better. I recently told my younger brother to change as soon as possible, since isn't 2019 the last year with subsidies? As his motorcycle is also 17 years or 18 years old, and I think it's better to change as soon as possible if he needs." (Interviewee T)*

Through Interviewee T's case, from when he needed of replacement to finding options to completing the purchase, and when he made recommendations to his brother after knowing that he has a need, it can be seen that the influence of the subsidy occurred during his search

for options. For these people needing a motorcycle, the strong encouragement of the policy actually has some effect. Subsidies promoted a wave of purchases in the past few years (Gogoro Press, 2019). Interviewee M's friends bought the electric motorcycles with subsidies, and Interviewee C could only buy a colour, which he did not like, of the electric motorcycle before the subsidy decreased in the year after his purchase time. Interviewee F's choice was also because his motorcycle was broken and needed to be replaced, and the subsidies seemed to be helpful for him to replace one electric motorcycle. The sales of electric motorcycles actually increased more than before, although when compared to the sales of petrol-powered motorcycles, there is still a lot of room for improvement.

"Last year's subsidy differed greatly from this year's, there was a shrinkage … that's why I was forced to choose the silver colour of it [Gogoro]. Only silver colour can be delivered, other [colours] are still being manufactured, and have not been listed. It needed to be listed to apply for the subsidy of the year, thus I could only chose silver Gogoro. Many people exchanged it [Gogoro] at the end of last year, and also because they said the subsidy will definitely decrease, thus, if people were considering changing to the electric motorcycles, they needed to make a decision quickly at that time." (Interviewee C)

"This motorcycle is newly released and then subsidised. Combing these factors together, and I could also buy it by instalments, so I changed to it." (Interviewee F)

The subsidy is influential only for those who had already decided to change an electric motorcycle. The subsidy can be one of the incentives or benefits obtained after motorcyclists have decided to purchase the vehicle. It is difficult for the subsidy to be the main factor that causes people to change. For those who had no need to change their vehicle, the subsidy is meaningless or even inappropriate. Through Interviewee W and J's replies, it shows that perhaps the direction of policy advocacy can be more targeted. In order to stimulate people's purchasing, promoting subsidies to all people may actually mean that those people who do not need to change their vehicles miss the purpose of this policy – a transition to a low-carbon transport society. People may simply think that replacing electric vehicles is irrelevant to them, or that changing new vehicles is another big expense (for example, Interviewee Y). People whose current motorcycles are still working well or are not riding a motorcycle may therefore miss the recognition of moving to a low-carbon transport system in the transition process.

"You [the government] want people to spend money to change a new motorcycle, yet they just don't have that budget for buying it." (Interviewee W)

"If the motorcycle is not broken, why do I need to pay such a large cost? This is a point where I feel indifferent to the government's promotion ... I think the subsidy is not that influential, the purpose of a subsidy is allowing me to utilise it when I need to change my motorcycle, there is an incentive for people who need to change [their motorcycles to an electric one], but the subsidy is completely meaningless for those who don't need to change." (Interviewee J)

"No, I don't have that money, I haven't become financially independent. Those costly luxury items are not what I would consider." (Interviewee Y)

So what do interviewees need if they think the subsidy is not effective enough? In fact, there is another big reason that people think the subsidies can be increased. People think that the price of electric motorcycles can be reduced again (the more the better indeed), but in reality, it is true that the subsidies can be helpful to reduce the cost of electric motorcycles and the cost of taxes. However, how effective it can be is another issue that needs to be discussed. After all, the cost of replacing a new motorcycle is not small. Interviewee C shared that his friend still chose a new petrol-powered motorcycle due to price considerations. More price reductions and extension of the subsidy period is what Interviewee C believes can provide a more friendly choice for people who want to replace motorcycles in the future, especially for those with low incomes (such as young people who have just started to work). Because the core reason that affects their decision on vehicles is the price concern, a lower cost to complete their transition will be their first choice.

"It is environmentally friendly, but if it is more expensive … Now everyone puts their eyes on money, NT$ 80,000 with a difference of NT$ 20,000 is still a lot, not a million TWD with NT$ 20,000 price difference. Like my classmate, he also wanted to buy one [electric motorcycle] but at last he bought a traditional one, at the same time as me [buying the Gogoro] ... the price is also a big consideration. Thus, if you [the government] are promoting them, you may require the cooperation with the manufacturer, or extend the payment deadline, like instalment plans. Not everybody can afford it, if it cost around NT$ 80,000 and most people who ride motorcycles they only with [NT$] 22K salary, how can they take out NT$ 80,000? They just go and get a NT$ 60,000 or maybe a smaller CC

motorcycle that may cost around NT$ 50,000 or 45,000. They could get one with this price, [for them], they are all the same as just a vehicle for transport. They may not care if it's environmentally friendly enough, you have to survive first!" (Interviewee C)

Continuing Interviewee C's words that people have to survive first, Interviewee O echoed this point of view. He said that changing to a brand new motorcycle is not a small amount of money, it is really a lot of expenses for a regular worker. Moreover, the price of motorcycles has also increased year by year, so in order to maintain daily movement, there are not many options people can choose. People can only reluctantly spend the expenses for a commuting motorcycle, linking back to what Interviewee L mentioned in Section 5.2.3, because it costs people more if they take public transport.

"How could a salaryman like us buy a motorcycle that is so expensive ... After all, the price of a motorcycle is too expensive. In the past, you can buy a motorcycle with the price around NT$ 40,000 to 50,000, but now it costs more than NT$ 60,000. The more expensive ones are up to NT$ 100,000, I don't know why it is this expensive." (Interviewee O)

However, Interviewee L mentioned that, in fact, when Gogoro launched its second-generation electric motorcycle, the price has been lowered, and the motorcycle body has been improved to make it more suitable for storage. With subsidies, the result of the sales was good. The manufacturer has observed that the market needs could be affirmed. He even mentioned that there were many people who needed to replace their motorcycles, and what they cared most about was how much subsidy they could get. As mentioned by Interviewee C, the consideration for his replacement is that the government subsidies are decreasing year by year. If the government aims to promote a low-carbon transport transition, the original targeted year to 2035 is 18 years away from when the policy was enacted in 2017, yet the subsidies have been decreasing year by year. If the subsidy period is so short, what effect did the government wish to see?

"The second version sold quite well, I think it's because it's in line with their [the consumers] demands, besides, I think the price has dropped a lot. The price drops to NT$ 70,000 or 60,000, and then after add the subsidy, it will be 40,000 or NT$ 50,000. It is difficult for you not to change to it, and if you're about to eliminate a two-stroke

motorcycle, you can get more subsidy. So I remember at that time, the question that most people asked was how much subsidies can I get while they first entered the stores … It depends on your household registration … at that time, the highest subsidy was in Taoyuan." (Interviewee L)

Among the subsidies that have been declining year by year, the government also provides other small benefits, such as no charge for parking electric motorcycles (Intelligent electric vehicle industry guiding promotion plan, Industrial Development Bureau), which seems to be a small bonus for electric motorcycle riders (for example, Interviewee L was surprised when he found that there is no need to pay the first time he went to park). However, linking back to Theme One's travel environment in Taipei, whether it is riding spaces or parking spaces (pull six away and park one in), the motorcycles' spaces have been reduced all the time. The incentive of free parking for electric motorcycles seems contradictory, since there are actually not enough parking spaces for motorcycles.

"There's no parking fee for Gogoros in Taipei City, so you don't need to pay wherever you park. At first time, I forgot about this, I took the bill to [a convenience store] to pay, everyone was queuing, he [the clerk] beeped, he said you don't need to pay, what are you doing? [I said] Sorry! Sorry! And then I left [laughs]… Of course it sounds very good, but it's not really a big incentive for people with petrol-powered motorcycles, they won't switch to electric motorcycles just because they don't have to pay for parking, there should be other better ways [for encouraging people to change to electric motorcycle]." (Interviewee L)

Recalling what Interviewee M mentioned previously, she would rather wait and see before considering electric motorcycles, and she hopes to wait until it becomes more stable because she thinks the components are costly at this point. Except for the immature system that makes her hesitate, the price (which not only refers to the motorcycle itself but the price of maintaining to ride an electric motorcycle) would be high because it is a new system. She estimated that it must not cheap for the maintenance and daily running costs, and it will incur too many expenses for her.

"Our old thinking is that something that has just come out is like an experimental product. It must be expensive and costly repair parts. It is not cost-effective, I'll wait

for it becomes steady ... I think people are more aware of it and their repair parts should be a bit cheaper, and more common. That's our old thinking." (Interviewee M)

Some critics (Tsai, 2020) believe that people mostly change to electric motorcycles for subsidies, and that once there is no subsidy, people will stop purchasing electric motorcycles. They think the key impact for people to buy electric motorcycles is not the product capability but the price. Understandably, the critics hope that the subsidy will not be reduced when they make these claims. If they concluded that electric motorcycles are not competitive without subsidies, this may be too biased and ignore the factors that may affect people to make a change. This idea is also dangerous as it may influence policy-makers to continue to believe that subsidies are the only powerful policy to persuade people to change. Subsidies are important and can definitely push people to change to an extent, yet, there is the risk of putting all the eggs in the same basket, as promoting subsidies is not the only thing the government can do. Of course, the more subsidies, the better. No one will say no to the subsidies delivered to their door. However, through the findings, the key issue is still whether the people have demand and an adequate level of trust in the new system. It requires time for people to replace their old vehicles. It is very possible that people who are interested in electric motorcycles and are willing to replace them in the future, but do not need them now, may lose opportunities with subsidies after. Therefore, the subsidy must be matched in line with long-term planning, instead of shortening the time limit to make the people feel that this is a limited time offer.

Moreover, in order to promote the purchase, if the short-term subsidy leads to good condition petrol-powered motorcycles being replaced with the subsidies, will this kind of change not also add waste to the environment? It is to be expected that the uptake of electric motorcycles will increase because of the short-term subsidies. Yet if purchases later decrease when subsides are decreased, it will be critical to consider whether any decline in uptake is simply due to the loss of subsidies, or rather reflects broader issues with the entire electric motorcycle network?

5.3.3 Conclusion

The above findings indicate that main factor that could influence people to change to an electric motorcycle is the need for a replacement. When people have demand, looking for a

replacement is the most reasonable factor. The attractiveness of the product also motivates some groups of people to consider replacing their motorcycle, such as those who pursue novel vehicles, who choose a vehicle based on the material orientation – the newest, the most fashionable, and trendy vehicles. Secondly, people who hesitate to change might do so because they think the electric motorcycle system is still immature. Comprehensive assessments of effective engagement, communication with the public, and maturity of the system are required. From the findings, most people would be more willing to wait for this new transport system to become stable. This viewpoint may come from the fact that they have not yet established trust in the system. However, it is also important to pay attention to why some people will wait until the last possible moment, until the time when electric power becomes mandatory, before transitioning. For such people – who may not be able to afford electric transport – it may be necessary to provide policy support that enables a just transition to low-carbon mobility, and to ensure that they are not still left behind in the post-petrol transport system.

The most widely discussed promotion issue for electric motorcycles is the influence of subsidies. The policy aims to replace old vehicles with new ones, and if old vehicles are replaced with the Phase Seven exhaust standard petrol-powered motorcycles, they could also obtain subsidies from the Environmental Protection Administration. This led to the number of subsidised petrol-powered motorcycles being actually five times more than that of electric motorcycles (Chang, 2020). Contradictorily, even though the 2035 policy was cancelled in 2019, the government still claimed that they would still promote electric motorcycles. The results show that the role of the government disregarded people's real needs, cut-off policies, and reduced subsidies. It thus seems the assisting role of the government in the transition process is vague and indecisive.

The aim of my research is not to review the advantages and disadvantages of policy subsidies, but rather to focus on a stable and just transition for low-carbon transport systems, and to consider the role of practices within the transition of a transport system. My research has focused on what practitioners will face during the transition process, and what kind of situation could hinder or speed up the change of the practice, as the focus of facilitating the transition will never only depend on the financial and market angles. Even when the practitioners have the will, which is the opportunity for making a change, it is vital that policy-makers retain practitioners' trust and motivation to change. The question is thus how to

preserve people's positive attitudes (as Theme Two discovered) towards policies. In addition, perhaps it is necessary to bring the focus back to examine the original intention – to benefit the environment – of the policy. In the next theme, discussion of the public's views on the environmental debate generated by the motorcycle issue will therefore explore the root question of the motorcycle 'problem'. Interviewees' views on air pollution and their experiences of those negative sensations and feelings while travelling in the city may be the key to making a change happen.

5.4 Theme Four: Environmental debate

The 2035 policy is to reduce emissions from mobile pollution sources, especially motorcycles, by promoting the conversion of petrol-powered motorcycles into electric motorcycles. This action has also caused environmental debates. The controversial part is nothing more than whether it is really environmentally friendly to change to an electric motorcycle, if we also consider how the electricity is produced. Continuing the argument mentioned in Theme Two, if the national energy system is still mainly coal powered (Hofmann et al., 2016), will this really help reduce air pollution? Arguably, although the air pollution in cities will be reduced due to the electrification of vehicles, if factories or power plants located in the suburbs continue to produce pollution, is this a way to actually reduce carbon emissions for the entire country? As there is also a target of 2040 for a ban on selling petrol-powered cars, why was the focus mostly on the motorcycles in the past few years? There are many motorcyclists who think that the government should be more focused on the larger emission sources (such as factories) instead of targeting the small emissions of their motorcycles. As the findings suggest, this leads some to question whether the purpose of the government's policy towards motorcycles really reduces the overall air pollution in the country. Section 5.2.1 showed that respondents had positive views on the policy to reduce air pollution, but what about their views on environmental quality? The aim of this section is thus to explore motorcyclists' views towards the environment more generally.

5.4.1 Views on air pollution

Bad air quality

Three of the interviewees (Interviewee S, J, and M) ride petrol-powered motorcycles. In the beginning, through the narratives of Interviewee S and J, they remembered that the common focus of motorcycle exhaust is the so-called cuttlefish vehicles[10]. Although Interviewee S, who has 17 years of riding experience, said that there are actually fewer cuttlefish vehicles on the road than in the past, Interviewee J, whose riding experience is much shorter than that of Interviewee S, still said he was deeply impressed by his encounter with a cuttlefish vehicle. He began to feel that the exhaust of other motorcycles from when he started riding three years ago. He even thinks these people are irresponsible to fail to deal with the problem of dirty

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[10] Cuttlefish vehicles refer to vehicles that emit black and stinking smoke

smoke emitted by their own vehicles. While riding by law, helmet wearing is required, and wearing a facial mask is also a necessity due to the air pollution they might face while riding.

Interviewee M shared that she will cover herself as much as possible when riding a motorcycle. In addition to not inhaling poor air, the dirt in the air will also cause discomfort on her skin. She also shared that the dirty air outside could easily cause her to get a lot of dust on her face after riding home, because these experiences made her feel that a good environment is very important.

> *"After riding a motorcycle, I started to feel that many motorcycle riders are not socially responsible. I don't like inhaling the exhaust … like my own motorcycle, although it would also emit, but the smell is not very strong. It is a better one, and more environmental friendly. For example, some motorcycles are the so-called cuttlefish motorcycle. They squirt out that kind of white or black smoke. I didn't ride a motorcycle at the beginning, I wouldn't know that so many motorcycles on the road actually have such a big impact on the air [quality]. I have bad impression when I'm riding on my own, and I feel that it's bad."* (Interviewee J)

> *"In fact, I think that the exhaust of some motorcycles is really terrible ... some smells you will be uncomfortable. It used to be easy to see the so-called cuttlefish motorcycles on the road, now there are really few, I think there is more or less improvement now."* (Interviewee S)

> *"You don't see how I cover myself [laughs]. Because my skin is sensitive, I don't like any wind. I use a scarf to cover my head and a wear a full-face helmet. You can't even recognise that's me [laughs]. [Because] The air is very dirty! Of course the environment is important, as you said about pollution, otherwise you dress up beautifully to go out and will become black man [because covered with dust] when you're home [laughs]! This is true! You can wipe your face with a piece of toilet paper to see if it all [dirt]."* (Interviewee M)

The above three interviewees all ride petrol-powered motorcycles, and their narratives can also convey their uncomfortable feelings about the exhaust from petrol-powered vehicles. There is one, Interviewee S, who has been riding for a long time and has accepted the facts of

poor air quality; there are also others such as Interviewee J, who is still adjusting, and Interviewee M, who tries to protect herself as much as possible. Although the exhaust makes them feel uncomfortable, they still choose to ride a petrol-powered motorcycle. It can be seen that the impact of poor air quality is not strong enough to cause them to change. This links back to Theme One, and the poor air quality of this theme discussed plus the uncomfortable riding environment raised. Still, many petrol-powered motorcycle riders are willing to endure these conditions.

After moving to Taipei, Interviewee W, who has stopped riding her motorcycle and uses public transport to commute, even said that in the past, she would still use the motorcycle based on its convenience and flexibility no matter whether she was feeling uncomfortable about the poor air. She said that the situation could only be accepted because she was also a user at that moment.

"The first reaction I thought of was that's very annoying [laughs] … there is no other way, I need this vehicle to ride a motorcycle because I want its flexibility and convenience. If I produce the exhaust gases, I might think that I also emit the exhaust gases, thus I won't take any action [to change]." (Interviewee W)

For electric motorcycle riders, Interviewees E, N, C, L and F had all changed to electric motorcycles. It is actually interesting to see here the interviewees who had changed their means of travel method. There was a separation in their perception of air pollution, a sense of being made to feel uncomfortable by "those vehicles that emit exhaust gases". Interviewee C directly pointed out the difference that when he was riding a petrol-powered motorcycle, he didn't care much about emissions, but after switching to an electric motorcycle, when he is not emitting exhaust gases, his feelings have changed noticeably. Interviewee E said the stinking emissions of petrol-powered motorcycles are very heavy, meanwhile, she added compliments to the electric motorcycle she had just changed to, and so did Interviewee N. Regardless of whether it is environmentally friendly or not, no smell and no noise are the advantages of electric vehicles on which many people agree.

"When it's sunny now, I think it's very annoying and smelly of those [petrol-powered motorcycles] next to me. I used to emit the black smoke, so everyone emits it together, now [after I changed to an electric motorcycle] I think they're stinky [laughs]."

(Interviewee C)

"Yes! Yes! The petrol-powered motorcycle smells very heavy, this [electric motorcycle] is eco-friendly, and it really has no smells." (Interviewee E)

"The smell of that motorcycle that just passed by is very strong, and there is also no noise of the electric motorcycles." (Interviewee N)

Stoppage in a traffic jam

Meanwhile, Interviewees L and F shared the same uncomfortable feeling when they smell a lot of stinking emissions in the traffic. Like Interviewee C mentioned above, Interviewee L said the smell would be more obvious when the temperature is high in summer. From Interviewee F's perspective, he added that because the riders are closest to their own vehicles after he changed to an electric motorcycle, he felt obvious that there was a lot less stinking smell when there are fewer vehicles next to him.

"How do you feel during summer time, when you stop at the traffic lights, and in the traffic jam? … Don't you think that the internal combustion engine system of petrol-powered vehicles is a very scary carbon emission which produce the … what is that called in the city? One of the most serious source for urban heat island effect? … I'm not blaming them, this is a great factor causing the urban heat island effect." (Interviewee L)

"The advantage is that at least you will breathe in less exhaust gases when you ride [it]. I think this is very different. Although while you stop at a traffic light, you may still breathe in other vehicles' exhaust fumes when you park next to them. [However, if you ride one by your own], you are sitting on this motorcycle, and the exhaust from this motorcycle is the closest to you. Thus, I think the exhaust gases we breathe in are quite different [while riding electric motorcycle] … like, when there are only one or two vehicles at the traffic light, there is actually no smell at all, I think it is quite different ... I think this [riding an electric motorcycle] makes us breathe in much fewer exhaust fumes." (Interviewee F)

Interviewee Group 13 also discussed that the main road next to their building would be full of vehicles during rush hours, and Interviewee I also used a 'waterfall' to describe the scenery.

This road is also one of the main lines connecting New Taipei City and Taipei City, it is the same concept as the Taipei Bridge Motorcycle Waterfall in Figure 2.1. What they feel most is that the whole road is full of exhaust fumes from motorcycles, and the stink smell is not only a source of pollution, but also noise. They also shared that they had encountered experiences where some motorcyclists will lift the exhaust pipe in order to make their motorcycle stand out, which is very unfriendly to other passers-by because the exhaust air will be very close to people's faces.

> *Group 13*
>
> *Interviewee I: "In the morning, Keelung Road is stinking! There is a 'waterfall' [of motorcycles] in front of Taiwan Tech. There is a large amount of motorcycles they are like [imitating the sound of motorcycles roaring by]. Yes, the whole road is terribly stinking. So if all motorcycles are replaced by electric vehicles, this will be good."*
>
> *Interviewee G: "It will be full of vehicles on main roads. People who come from ZhongYonghe [Zhonghe and Yonghe District] during the rush hours."*
>
> *Interviewee I: "Well, some people will modify their [exhaust] pipe, do you know the face-squirted pipe?"*
>
> *Interviewee Q: "Exactly! I encountered some in Taichung, they modify it [the exhaust pipe] elevated. It will squirt on your face when you are riding a motorcycle [stop behind them]. When you see that kind of motorcycles, you have to stop aside, you have to stop diagonally behind."*

Although Group 13 feels that the road next to their building is full of motorcycle emissions when discussing air pollution in Taiwan, they also raised that they believe that the main source of air pollution should come from factories, and the responsibility of mobile pollution sources are not only motorcycles, as there are also many cars. Moreover, they think a large part of the recent air pollution in Taiwan is because of the influence of the weather from China's air pollution. In fact, Taiwan's air pollution is mainly divided into domestic production (such as factories and power plants) and overseas impacts by wind (such as China's air pollution) (Greenpeace, 2017).

> *Interviewee Q: "No, I think isn't the main source of pollution in Taiwan are these motorcycles?"*

Interviewee G: "Factories, [I think] factories [should be the] first [as the main

pollution source]"

Interviewee Q: "The main source of pollution should be automobiles and

motorcycles, because for example, if you talk about Taipei, there is no

factory in Taipei [City], but air pollution is still so serious."

Interviewee I: "Isn't it the goodwill from Mainland China [laughs]?"

Interviewee Q: "That's true."

Interviewee I: "It's the goodwill from Mainland China, the automobiles only have

a small percentage, but it's[motorcycles] actually closer to

people."

Interviewee G: "You still need more electricity generation, yet it feels cleaner in

our living area."

Area differences

However, in terms of uncomfortable air pollution, Interviewee H indicated that as long as the vehicle passes the exhaust inspection, it can only be accepted because he himself is also a user. For those who failed the test, of course, they are unacceptable. He also said that other means of transport would affect the air quality, but one may not be in contact with the dirty air longer than riding a motorcycle. According to his statement, it can be seen that he thinks that the air pollution can only be accepted if it is legal. Yet he did not point the finger at other modes of travel, on the contrary, he believes that as long as it is a vehicle, it will produce exhaust fumes, which is a very common phenomenon encountered in urban life.

"If you have passed the so-called exhaust test, there is nothing to say. Then we can only

accept it, we are also users. However, if it is the kind that violates the current

environmental protection regulations, it is of course unacceptable. Of course we all would

like to have a very comfortable air quality, but this is inevitable if you are in a city ... you

ask me if I like it, of course I don't, but what can I do? This is not a choice, this is a problem

of acceptance. In fact, taking public transport will also have the problem of [inhaling]

exhaust, but you may have less contact time. Yet, you still have to walk when you take a

bus, the air you breathe while walking is actually the same as you riding a motorcycle."

(Interviewee H)

Continuing what Interviewee H mentioned, he thinks that because more people are using their own vehicles in the city, the air quality in the city is expected to be poor. Nevertheless, he thinks when discussing the air quality difference between Taipei and other areas in Taiwan, the air in Taipei contradictorily seems to be better than other places. It can be seen from the findings that people's conception of air quality often comes from comparing with their own life experience. To support this point of view, I also take Interviewee W and E for example here, as their experience of air quality in Taipei is quite different. Interviewee W lives in Taipei, she thinks about places with industrial areas and power plants are in central or southern Taiwan. Thus, she mentioned that from her impression, the information she received was that the air in Kaohsiung was poor, but Taipei city where she is located is relatively bright and beautiful, she likes this environment a lot. Apart from Interviewee W's idea, Interviewee E said she moved from Chiayi County [a more rural county in southern Taiwan] to Taipei, and she feels it is obvious that the air in Taipei is much worse.

"There is some kind of air pollution in southern Taiwan, like in Kaohsiung, etc., because we haven't lived in that environment for a long time, so we might just say that the pollution is serious there, but in fact we won't have any action to deal with it … When you are in the capital, you are in Taipei, it is relatively bright and beautiful, then I think this kind of environment is very good." (Interviewee W)

"The environment is important, we didn't feel this way in southern Taiwan at that time, because the air quality was better. Don't you think the air in Taipei is much worse?" (Interviewee E)

Interviewee D's perception of the area difference in air quality from his university classmates is also shown clearly. Nevertheless, he thinks the habit of choosing to ride a motorcycle or take public transport is also different depending on where people are from. Interviewee D said if his classmates are those who are not growing up in Taipei, they are not very sensitive to air pollution. His narrative here shows that different regions have different perceptions of traffic modes and air quality. By the comparison with the area difference, he also associates that although he does not know the exact number of motorcycle carbon emissions, if it was saying that motorcycles are a major source of urban pollution, Taipei's air quality should be as bad as the central and southern parts of Taiwan, since motorcycles are everywhere across the whole island. Yet, according to his friend's example, the air quality in Taipei is relatively better.

"I think Taipei seems to be okay, and other classmates from central and southern Taiwan seems to not care about this a lot. Their public transport is more inconvenient, thus they still ride motorcycles. Even though the air is not good in some places like Taichung and Kaohsiung, but for convenience, they still have to ride … It feels as if they said that because motorcycles are easier to buy, so there are more motorcycles, but I don't feel it's correct. Because if explaining in this way, [the large amount of motorcycles in] Taipei City should probably be on the same level as central and southern part of Taiwan. However, my classmates said that the air in Taipei is relatively good, so I think in the central and southern part of Taiwan [the emission sources] should be the kind of industrial power generation ... I feel like this, although I don't have any scientific basis." (Interviewee D)

The air pollution issues caused by motorcycles discussed above shows practitioners' feelings on the move. After converting to electric motorcycles themselves, they dislike and feel uncomfortable towards motorcycles with poor exhaust quality. Yet, most of these negative perceptions from the interviewees seem to be limited to the poor air quality when they are moving. When discussing urban air pollution issues, the interviewees expand their views to consider whether there are seasonal changes that may cause air pollution (such as China's air pollution) or large-scale stationary pollution sources. This perspective seems to be: my motorcycle is small, how can it contribute a lot to the air pollution of the entire city, or how much impact can it produce? When weighing the balance between their own contributions and the environment, how do the interviewees view environmental issues? How much can the value of the environment be recognised in the interviewees' perceptions? The next section will discuss the interviewees' environmental values to understand their thoughts when helping to make a better environment and how they weigh the priorities and pros and cons when they consider environmental issues.

5.4.2 Personal environmental values

Air pollution issues and urban heat island effects have been discussed widely in recent years, and many environmental issues of this type are often linked with motorcycles (Lin, 2010). However, it may be the case that these require too much specialised or technical knowledge for motorcycle riders to engage with. The aim of this section is thus to understand what the view of the practitioners (i.e. motorcycle rider) is in the implementation of relevant (environmental protection) policies or related communication in the name of environmentally

friendly actions; and to understand riders' attitudes towards environmental disputes when reflecting on how their daily practice connects to the environmental disputes. It is also important to understand if the environmental values of practitioners will differ if the practice is excluded from the practitioners.

Polarisation of the environmental dispute

The direction of the policy shows that a major source of urban environmental pollution is petrol-powered motorcycles. In the interviewees' replies, it can be seen that most of them disagree with this claim, even if they think motorcycle pollution is inappropriate. For example, Interviewee T thinks that this puts the responsibility for the big problem of air pollution on to the people. Perhaps changing to ride electric motorcycles can reflect the reduction of the city's carbon emissions to a certain extent, but this kind of large-scale problem should not make the public feel that the pressure is only laid on practitioners. As Shove (2010) argued, reducing the problem to the individual level is not an effective way to resolve environmental disputes. The trend even leads to people's opposition for opposition's sake (as Interviewee L said below), and people's use of different types of transport will be divided into different parties (as Interviewee F mentioned below). However, this is not just a divide of different choices of travel modes but instead develops into a polarisation, and the labelling of different vehicles.

> *"I personally feel that there're so many motorcycles in the city, it's not right to accuse them as the main culprit of air pollution. It's just that the government wants to throw probably the most general citizens to the wolves ... I don't think that riding an electric motorcycle is more low-carbon environmental protection. But for my mind of riding it, it seems that it really echoes the low-carbon issue, or I won't produce exhaust gases for other people to smell. The low-carbon issue can't be compared, but I think it's still a little attractive in other environmental aspects, or influence me in purchasing motorcycles."*
> *(Interviewee T)*

> *"But it might be because when electric motorcycles are released, people think that electric motorcycles may be relatively environmental friendly. And then they [petrol-powered motorcycles] will be labelled as the other party, they become not environmentally friendly. This will raise the opposition, many electric motorcycle riders may also directly attack, AH, you are not environmentally friendly motorcycles. Therefore,*

they [petrol-powered motorcycle side] will find some articles to say that electric motorcycles are not environmentally friendly, they will still produce air pollution." (Interviewee L)

"At first, I actually thought of this, that if I change this [electric motorcycle] will it be better for the environment? But there are too many things that have not been finalised yet. Thus, like I said, you can buy a petrol-powered motorcycle, you can buy an electric one. Everyone thinks differently, you don't need to think [criticise] the other side. I don't think my doing this [buying an electric motorcycle] is more environmentally friendly." (Interviewee F)

The three interviewees mentioned above are practitioners who have switched to electric motorcycles. Through their responses, it can be shown that the policy approach of promoting petrol-powered motorcycles needs to be adjusted. This also shows that it is not only petrol-powered motorcyclists riding a vehicle that needs to be changed who think they were being targeted, but also those who *have* already made a change. The emergence of antagonism has also contributed to the doubts from the petrol-powered motorcycle group about whether the electric motorcycle itself is really more environmentally friendly. Unfortunately, looking at this situation, it may be the case that polarisation between electric and petrol-powered motorcycle riders has been unintentionally created by policy implementation. Furthermore, subsidises for both petrol-powered motorcycles and electric motorcycles will only increase and confuse people, which could potentially lower the speed of the low-carbon transport transition (as discussed in Theme Two). When the purpose and the so-called environmental benefit of the 2035 policy is no longer clear, the value of the environment seems to disappear in this issue. The environmental aspects of the debate are reduced to opposition and a war of words between different groups of people.

Surviving first

Regardless of opposition created by the policy, most of the interviewees, whether they are public transport users, electric motorcycle riders, or petrol-powered motorcycle riders, show that they believe that the environment is important. Only if they need to perform specific behaviours to meet an environmentally friendly lifestyle, like changing the means of travel, will a difficult barrier emerge. The findings show that the importance of survival/living is often

more crucial than a relatively high-cost environmentally friendly living mode. Interviewee C mentioned that for those who have just started to work, it is difficult to afford an electric motorcycle on many of their salaries, hence they prefer to prioritise the maintenance of their daily living.

> *"Not everybody can afford it, if it cost around NT$ 80,000 and most people who ride motorcycles they only with [NT$] 22K salary, how can they take out NT$ 80,000? They just go and get a NT$ 60,000 or maybe a smaller CC motorcycle that may cost around NT$ 50,000 or 45,000. They could get one with this price, [for them], they are all the same as just a vehicle for transport. They may not care if it's environmental friendly enough, you have to survive first!" (Interviewee C)*

Interviewee C gave a practical example that when he thinks of those young people who have just started to work, they may be under economic pressure to choose a cheap mode of transport – motorcycle riding. These people are definitely not a minority, and for these people, even if they really care about the environment, it will become more burdensome for them if they change to use a higher cost transport mode. This links back to Interviewee L mentioning in Theme One that he thought spending more money to be more environmentally friendly is like a punishment for those who have changed to a lower carbon transport method.

To follow up this idea, Interviewee A mentioned that when she was a student, she would always choose the more cost-effective option. At this moment, even if she knows the environment is very important, it is more important to maintain her daily life. The environmental issues felt a remote and inaccessible topic to her. Her top priority was to maintain her daily living under limited economic considerations.

> *"I think environmental protection is very important … But I want to share a very realistic experience while riding motorcycle every day in Kaohsiung. I went to change the machine oil. There were two products, one is environmentally friendly but more expensive and the other regular one is cheaper. I was a student without much money at that time. For me, as long as I can ride the motorcycle, I won't care about the environment. The topic of environmental protection for me is too big, it's too big that I don't have any idea about it. Just like if you tell me 1 billion money, I couldn't imagine how much it is. That is, I didn't have so much money in my hands. If I lost NT$ 1000, I will be upset, but if there's 200*

million money lost, I feel nothing. It's a bit like this feeling, the idea of environmental protection is too big, and you say that you can spend NT$ 200 to protect it, yet I can spend NT$ 100 to ride my motorcycle. Why do I have to spend more? So I want to express that although I am a person who loves the earth, I am willing to do my best for environmental protection, but when it comes to my economic ability, for example, I think I still take care of myself first. I will still choose the cheaper option." (Interviewee A)

Feeling distant to the environmental issues

Interviewee A's response shows that she thinks the environment is important, but when she needs to spend more to change her daily life, the environmental issues that are too distant will become less relevant to her. When it comes to air pollution issues in Taiwan, what people (in Taipei) often think of is the poor air quality in central and southern Taiwan. As Interviewee W said, she actually thinks Taipei's environment is very acceptable to her, but she "knows" southern Taiwan, especially Kaohsiung, is not good. The issue of air pollution to her reminds her not of Taipei, which is her living environment, but the industrial zone in Kaohsiung, which is several hundred kilometres away. When discussing environmental pollution with Interviewee D, he had the same thought that the environmental quality in cities was much better than that in the remote areas, where the destruction of the environment or factories are mostly in the countryside. This also caused Interviewee D to feel that "those issues" do not exist in his living environment, and it is difficult to become issues that he has to worry about.

"I think this environment is acceptable to me at this stage. There is some kind of air pollution in southern Taiwan, like in Kaohsiung, etc., because we haven't lived in that environment for a long time, so we might just say that the pollution is serious there, but in fact we won't have any action to deal with it … When you are in the capital, you are in Taipei, it is relatively bright and beautiful, then I think this kind of environment is very good." (Interviewee W)

"Regarding the environmental protection, because we all live in cities, not in other places, those environment may be obvious damaged, or the rainforest has been cut down. So we all will not have that obvious feeling about that when we do these things … it will harm the environment. People still feel there is a distance between them, and then they feel more care about what they are using at the moment." (Interviewee D)

Value-action gap

The standpoint of Interviewee A and C is to maintain daily living with affordable economic conditions first, even if they think the environment is important. Interviewee D and W then showed that they felt distant from the pollution or environmental dispute since they are in cities, and most of the pollution they thought of is in the remote suburbs. The environmental damage is relatively far from their consideration. Interviewee W may have important values regarding the environment, but she also expressed that she is more passive and will not take the initiative to be environmentally friendly unless the policy requires it. Even though she changed her travel mode from motorcycle riding to public transport after moving to Taipei, she admitted that it was only because there is an additional option for her to travel here, instead of deciding to change to a more low-carbon transport method. She pointed out there is a gap between the agreed importance of the environment and the actual action to protect it.

> *"… Agreeing versus actually doing it [is different]. If I am personally in a very passive state, I will only do something if there is a policy or what must be done … It should be said that I was subconscious. It's not because there is much public transport here, hence I don't ride a motorcycle. I changed because there is a choice here, it's not because of if it is environmentally friendly or not to change my transport mode. (Interviewee W)*

The example of Interviewee W also shows that when there is a choice, it can offer practitioners something to consider, but it is difficult for her to take the initiative to act to be more environmentally friendly. Whether Interviewee A, D, or W, we can see the concept of the value-action gap (Shove, 2010) emerging here. This gap has been shaped by their so-called sense of distance, so they continue to use the more accessible lifestyle at hand in their daily life. In Taiwan's environmental education process, several concepts of caring for the environment are instilled, however as Interviewee T says, this tends to be more of a one-way process. Through Interviewee T's daily life, he feels that although he has been receiving the concept that the environment is important during his studies (perhaps this is also influencing Interviewees A, D, and W's perception), in real life, he feels that his behaviour is difficult to be in accordance with the environmentally-friendly lifestyle, especially after he started to work, to enter the 'reality' he faced.

"I think the idea that the environment is very important seems to be a little brainwashed in our education process, but in fact, it seems that everything in my life and behaviour are not able to balance this. Just like if I really want to reach the extreme level, which will be only [rely on] walking or cycling. But in your actual daily life, or when you don't want to make your mode of moving so hard, the mode you choose will always be a burden to your environment … This seems to be a confession [laughs], although I think it [the environment] is important … I will not tell you clearly or boldly that the environment is the most important thing, or the value of the environment is higher than anything else … I could talk about it in school before, but I think sometimes you may want to choose other kind of lifestyle or live a little bit luxury life after you start working … But while talking to the next generation, you still have to tell them that the environment is important, because I think you have to have this thing in your mind. You will know you should reflect on what you do, or even if you want to choose a different lifestyle. Instead living the kind of life that has been going to extremes." (Interviewee T)

Interviewee T's response raises the question of why, if education and policy place heavy emphasis on environmental protection, people have failed to act in accordance. To explore this, I look not at how the behaviour of practitioners can be changed or influenced, but at the top-down process of influencing practitioners. The interview findings above raise questions about whether there is a need to rethink education modes that advocate behaviour change for the good of the environment. This is especially important given the responses above which suggest practitioners may feel powerlessness or a lack of financial capability to act to adopt environmentally-friendly practices. Moreover, given respondents' emphasis on convenience, one may also question whether there is a need to address changes in transportation networks as well as motorcyclists' practices.

In the abovementioned responses of Interviewee A and Interviewee D's responses, they feel the distance from and overwhelming size of the environmental issues. Under this comparative concept when they realise that their changes may be too small to be effective for the entire environment, they tend not to change first and maintain their own benefits instead. So in response to what Interviewee W mentioned, agreeing on a concept is different from actually taking the initiative. Respondents state that the environment is important, yet when they need to choose, they will prioritise to their own preferences. Take Interviewee J for example,

who admitted he was perhaps selfish to care about the air quality only when it affected him. However, his own consideration of transport mode has nothing to do with carbon emissions. It is based on what he is fond of and the convenience of the vehicle itself. He also said directly that if convenience is reduced in the name of environmental protection, then this would be too difficult for him. He also examined his own behaviour, and was even a little embarrassed to say that he thinks that if he does not destroy the environment, others will do it.

> *"Although it is very selfish to say this, I honestly tell you that I don't really care about this matter that much ... But as a person who can breathe in other people's exhaust, I dislike them. However, when I'm choosing my own vehicle, I don't care about if other people will breathe in my vehicle's exhaust. I might just consider the appearance of the vehicle ... In fact, my own respiratory tract is not good, and my family's respiratory tract is also not good, so if I can, I will also hope to achieve a balance between convenience and environmental protection, but if there is no way to balance it, of course convenience first ... I just told you honestly that I a hundred percent agree with the [idea that] environment is very important, but when it faces my own convenience even if it just two minutes faster, I will choose my own convenience eventually. I don't know what other people think, but at least I am facing this problem honestly. Whether I'm selfish or long for convenience, I'm not the one who will say the environment is super important, so I will ask myself wake up say half an hour earlier to work. I think this is too difficult." (Interviewee J)*

> *"I think the environment is very important, but you will have a mentality like since other people are doing it [like utilising plastic bags], it makes no difference if I use one more plastic bag." (Interviewee D)*

Negative and positive perspectives

However, responses relating to environmental damage may also come from people who have trust in current technology. According to Interviewee W, she believed that technology could handle any environmental issues we were currently facing. As opposed to changes in behaviour or policy design, she has more confidence in advancing science and technology. Perhaps besides many people who worry about environmental damage, she is a relatively optimistic case.

"I think science and technology are very advanced nowadays, so the air pollution or any other pollutions or environmentally unfriendly problems, the technology will be more or less helpful. Thus, I don't think it will be a terrible problem." (Interviewee W)

Compared with Interviewee W's optimism, environmental issues are issues that Interviewee Y would not consider at all. Interviewee Y's response was one of the few interviewees who said frankly that she did not care, and she would not be concerned about whether her thoughts are consistent with actual life implementation or not. For her, living is the priority. The risk perception shown in Interviewee Y's response was relatively low compared to other interviewees, which could echo to Hung and Bayrak (2020) argue that people with fatalistic values would not care about situations that happened outside of their world, and carry lower risk perceptions than others.

"I think the earth is going to be annihilated one day, other countries are still so wasteful. Even if you are frugal and environmentally friendly, other places are continuing [destroy the environment]. Anyway, we won't be able to see that day in our lifetime, this is none of my business?" (Interviewee Y)

As a geological researcher, although Interviewee F hopes that the oil industry will last for a long time, he provided a flexible idea. He thought that, in order to achieve progress, it is not a black and white method, but rather to discover what is effective and helpful in the process of the progress of pollution reduction, and to make corrections and adjustments in the meantime. Linking back to what Interviewee O mentioned in Theme Two, when something is immediately banned or stopped, the result may be a public backlash.

"As a person who wants to enter the oil industry [laughs], I certainly think that oil will not be replaced easily. From the perspective of environmental protection, from the perspective of a citizen of the earth, of course, we hope that we head to the right direction. If the policy can slow down the damage to the environment or even be helpful for the environment, then we head to this direction. But many things need to be considered again, like the problems of different pollution sources ... I'm not an expert, so for this kind of thing we still need to see how effective it is after people have done it for a period of time. If we find that we have caused more pollution than before, then we change the direction. If we find that there may be some statistics telling you that the air quality is really getting

better, and then we can really reduce carbon emissions, then we will continue to go on in

this direction." (Interviewee F)

People who have positive environmental values can assist in implementing environment-related policies, whether they are active (environmental activists) or passive practitioners (value-action gap). Interviewee F's response, along with other data in this section, show that individuals' lifestyles are a response to their relationship with the surrounding environment. Thus it could be argued that over time, even for people who do not have strong environmental values, as long as there is a consistent and stable implementation of policy, as the surrounding environment is changed through systemic changes and planning, people's practices will slowly change too. This incremental philosophy illustrates how a transition may happen through a combination of systemic changes and practitioners' own practices and experiences, and not simply by putting pressure and responsibility on individuals.

5.4.3 Conclusion

This theme tried to understand the interviewees' perspectives on air pollution, their views on the connection between air pollution and motorcycles, and how they view the importance of the environment. Returning to (what should be) the basic central idea of environmental protection in the 2035 policy, the environmental issues which the policy aims to respond to are also related to the daily needs of the people. This does affect not only people's daily movement but also people's health due to poor air quality. Whilst the electric motorcycle issue affects people's daily mobility and also their health due to air quality, many respondents expressed a lack of ability to act to enact more environmentally friendly practices. Paying attention to the barriers that prevent citizens from implementing the practices that lead to sustainable mobility transitions is important, especially in situations such as motorcycling in Taiwan where practitioners are in general agreement with the aims of the action but may be dissatisfied with policy implementation. Attention to these gaps can give indications as to where additional improvements or support mechanisms may be required.

When the policy generated from the top-down planner's perspective is matched with the bottom-up practitioners' actual viewpoints, it could lead to a balanced method to move the low-carbon transition forward. Combining the findings from Theme Two and Theme Three, by linking discussions of the top-down (policy planners' perspective) method with the bottom-up

(practitioners' perspective) thinking, and furthermore with the understanding of interviewees' values about Taiwan's air pollution issues, we can see where policy gaps and requirements are by considering the practical and ideological perspectives. The policies may require people to be willing to make changes and stimulate people's thinking to require practitioners to be greener and turn this idea into behaviours. Yet from the practitioners' angle in the findings, we can see that there are still many practical problems that need to be overcome, and that these critical and large-scale problems cannot be resolved by individual strength alone. The findings may give policy planners more practical experiences from the practitioners that should also be considered in order to add granularity to the challenges of policy implementation and turn rhetoric into reality. This suggestion may not only apply to the transition of low-carbon transport but also other transitions. This matters because the purpose of a transition is not to produce high-level rhetoric, imagery or statistics on emissions reduction; but rather to understand what kind of a world that the society wants to live in, and also how a government ought to fairly treat the practitioners during a transition.

The idea of simply applying air pollution issues and environmental issues to make practitioners who use gasoline motorcycles pay the bill for the transition may be too simple. Even if the starting point of the policy is admirable, the controversy aroused by it has blurred the focus of the issue. The nation's aim is to look for pollution sources to reduce carbon emissions, not to create opposition and build opposition in society. Unfortunately, through the findings, many interviewees reflected that they clearly feel these tensions, or they will be influenced by these broader debates when making a decision. Responses indicate that a result of this polarisation is that rather than considering the environmental merits of their practice, practitioners are more likely to consider whether they are somehow 'better' or 'cleaner' than others – in other words, competing with other citizens - as a result of their mobility choices.

5.5 Theme Five: Low-carbon transport mode

The last theme of the data analysis focuses on understanding respondents' perceptions of low-carbon transport modes. Section 5.5.1 looks at interviewees' views on alternative low-carbon transport modes such as public transport, and Section 5.5.2 specifically focuses on the electric motorcycles promoted by the 2035 policy to see the interviewees' perspective on electric motorcycles.

5.5.1 Perceptions on alternatives low-carbon transport methods

Differences between areas – developments, spaces, and weather

According to the findings, there are obvious regional differences in the public transport system in Taiwan. Most interviewees think that Taipei's transport is much more convenient than other regions, especially as there is a good public transport system network. After moving to Taipei, Interviewee W said she was hardly riding a motorcycle, and neither was Interviewee A. Even when Interviewee A first moved to Taipei to work, she also shipped her motorcycle she rode in southern Taiwan to Taipei, but because she thought the riding environment in Taipei was dangerous it made her reluctant to ride. Taking public transport is more convenient for her in Taipei, and she has stopped riding a motorcycle. Recalling Interviewee S, who pointed out in Section 1.1 that she believes that the development of cities is very different, in the central and southern regions, you almost have to be able to ride a motorcycle, otherwise, the convenience of movement is extremely low.

> *"I almost don't ride a motorcycle anymore, because the transport in Taipei is so convenient. I can take the MRT, the buses." (Interviewee W)*

> *"In Taipei, it's quite convenient, the most common way for me is by buses ... Riding a motorcycle is never an option, because I know that the traffic conditions in Taipei are terrible, so it's never my option. If the MRT or buses can reach my destinations, why should I ride a motorcycle?" (Interviewee A)*

Interviewees also said that people who grew up in Taipei are more accustomed to taking public transport than central and southern Taiwan, and they do not think riding a motorcycle is

necessary for Taipei. What's more, they thought as public transport is less developed in central and southern Taiwan, it is hard to move around without a motorcycle. For instance Interviewee F mentioned in Theme One that he thinks transport development in areas other than Taipei is relatively slow, so residents living and growing up in different areas have different transport habits. In addition, southern Taiwan is relatively less crowded and with wider spaces, and it is more convenient for motorcycle parking. Moreover, the weather is more comfortable to ride in southern Taiwan. Interviewee Y also shared that her experiences of studying in both Kaohsiung and Taipei showed that the riding conditions in the two places are very different. When in Kaohsiung, she needed to "practice" parking her motorcycle, yet when studying in Taipei, the motorcycle parking lot provided by the university was very spacious, she did not need to move other motorcycles at all.

> *"There are differences between northern and southern Taiwan. People ride bicycles, take buses and the MRT in northern Taiwan [Taipei]. Because the transport is very convenient here. People in Taipei don't have to ride motorcycles when they grew up … The transport in southern Taiwan is not convenient, everyone started riding a motorcycle since we were young ... I have practiced a lot in Zhongshan [University], if you study in Zhongshan, you must need to learn how to move motorcycles [laughs]. Because our university has a lot of motorcycles, and there are not enough parking spaces … You have to practice to park three motorcycles in one parking grid [laughs] and squeeze your motorcycle in it … I think the motorcycle parking of NTU is spacious, I don't have to move vehicles, and there is no charge in the University. It is possible that there are not many students ride motorcycles to the University in Taipei." (Interviewee Y)*

However, although the above Interviewee Y said she did not need to move motorcycles when parking, which seems to conflict with Theme One's mention of 'pull six and park one' in Taipei, the premise here is that this is the parking lot provided by the university. She also noted that it is very likely that her department building is far away from the main centre of the university, and she did not need to share the parking lot with too many motorcyclists from other departments.

Gender acceptance

Linking back to Interviewee F's statement in Theme One, who is from Kaohsiung and has been in Taipei for many years, he found that the biggest difference is the riding habits between

Taipei and Kaohsiung. In addition to the weather or space mentioned above, he observed that because of the well-organised transport network, Taipei's younger generation is more inclined to take public transport, especially young females. He even believes that some young females may never consider motorcycles in Taipei. Continuing Interviewee F's discovery, he found that young females in Taipei prefer to take public transport. In addition to the aforementioned regional differences (southern Taiwan and Taipei), this also shows that there are seemingly differences in the use of low-carbon transport by gender. Echoing back to Interviewee W's experiences in Theme One, she said that she had adapted very well to taking public transport after she arrived in Taipei. Interviewee A even pointed out that she felt that men do not want their mode of transport to be restricted, and she thought men prefer to control their movement. She mentioned that the fixed or sometimes irregular timetable for public transport and the increased friction with others on a crowded public transport could make men uncomfortable. She also added that although what she provided was her own experience, she observed her female friends also have this tendency.

"I think there is a point about the difference in personality and gender, the feeling that public transport will restrict you. They [males] don't like being restricted, they want to have to be proactive. Like my dad or my boyfriend, they are very keen on controlling their own schedule - I don't have to wait for the bus or the MRT, I don't have to squeeze in the carriage with other people. Although I will be stuck in the traffic jam, but I can turn around on my own … And I also discover that my female friends seem to be more able to accept public transport, and will not feel restricted." (Interviewee A)

In the research of Hung and Bayrak (2020), it was found that while urging people to response issues of climate change, it is shown that men are less effective to participate on the topic of the climate crisis, but women are more capable under the climate crisis related label. Linking to the findings here, the interviewees who changed to riding electric motorcycles happened to be males, and those who had switched to public transport tended to be more female. Whether it is riding an electric vehicle or taking public transport, both are a lower carbon transport mode. However, looking back to Theme Three, which argued that the reasons that influence practitioners to change the travel mode are often derived from needs, and that new choices appeared, none of these changes in practice are due to a desire to improve environmental issues. It seems that the link between the environmental crisis and transport mode is quite low here. From a policy perspective, this could suggest that promoting

environmental protection concepts to practitioners may be less effective than focusing on more practical rationales that emphasise eliminating old vehicles, and designing a schedule to phase out petrol-powered motorcycles based on this.

Flexible arrangements

In fact, many interviewees' choice of their transport mode depends on many factors at the moment they need to travel, such as time, weather, or price. They have flexible arrangements to complete their travels. Although Interviewee H has many years of motorcycle riding experience, he still changes his choice depending on his moods. This could reflect their choices of travelling being irrational (Cresswell, 2006). Interviewee D's consideration of whether he wants to ride a motorcycle that day entirely depends on whether there is a place for him to park at the destination. If there is no parking space, he would definitely choose public transport.

> *"I'll take turns, sometimes by bus, sometimes by motorcycle, depending on mood."*
> *(Interviewee H)*

> *"There are still some places that are difficult to find [parking spaces], it may be more convenient to take the MRT or a bus." (Interviewee D)*

Interviewee C has a petrol-powered motorcycle as well as an electric motorcycle, he plans routes that match his schedule the most. He may take an Uber or a Taxi when he is in a hurry, or leave his old motorcycle overnight at his destination (maybe the places he often visits) because it may be bad weather or he feels tired after working all day and does not want to ride a motorcycle home. In that case, taking public transport would be a better choice for him at that moment. For him, only having one mode of travelling is not beneficial.

> *"I use all of them...I just changed a Gogoro. I didn't throw away my Haomai [a brand of old petrol-powered motorcycle], sometimes when I go to point A, I'll leave it there. Because I might not coming back to point A at the same day, I may just go straight home [by other means of transport, such as MRT]. Thus, I will have one more option to utilise there. Anyway, I am super flexible ... If I am not in a hurry, I may change A to B and B to C [like motorcycle to MRT and MRT to YouBike] However, it will be terrible if you come*

out [the MRT] and there's no YouBike or there's no vacancy at the parking station during work hours when you arrive at your office. Hence, there is still a need for a motorcycle ... We may need to get to a place in a hurry, so I will choose the fastest to arrive, all transport methods would be considered ..." (Interviewee C)

Noisy travel environment

Just as Interviewee C sometimes wanted to relax and did not plan to ride a motorcycle, Interviewee S also mentioned that she always rides a motorcycle when she commutes. Yet, when she sometimes felt it was annoying to ride, she felt that she could let others take her to the destination with more relaxed travel. One thing she least likes about public transport is that it is always full of passengers, which would affect her mood of squeezing in the same space with others. Theme One mentioned her stressful riding experience in Taipei where she has to fight for space every day, yet the feeling of squeezing on public transport makes her uncomfortable as well.

"There are a few times when I think I've been riding a motorcycle for too long and then I will think – Ah! Why not let other people take me to my destination [laughs]? And then I will take public transport, but you know, sometimes the MRT is very crowded or the bus is crowded, too. At that moment, I'll regret and think I should ride my motorcycle today ... I will feel annoyed about this." (Interviewee S)

Time-consuming

Continuing what Interviewee S said, when she changes to public transport, the crowded environment reduces her willingness to take it. The unpleasant feeling of noisy travel environment and rush hour commuting experiences on public transport, especially when the public's demand increases such as on rainy days, made her stay away from public transport in the end. In the past, Interviewee S had tried to take the MRT to work, but the detour of the MRT design route was too long for her to commute, with a long commuting time. If the whole movement to work is mainly by public transport, she would have to change four modes of travel – motorcycle, MRT, shuttle bus, and walking. The time-consuming and cumbersome way of moving made her give up commuting based on public transport.

"Like [when I worked] in Nangang [Software Park], I took the MRT at the beginning. I rode a motorcycle to the MRT station and then took the MRT to Nangang [only] by the blue line. After a while, I couldn't stand it anymore because the commuting time is too long and very crowded … I had to take the shuttle bus from Nangang [station] to the software park, and walk to my office … This took an hour. I tried before that there was a station of the Software Park, but it was not integrated with Nangang station at that time, so I had to change for the Wenhu [brown] line at Zhongxiao Fuxing. I watched everyone get off the train and I was the only one left, I could only ask myself why it hasn't arrived yet? This made me feel tired of the world … Wenhu [brown] Line is very similar to Japan's commuting time, always full of people. I forget after how long that I couldn't stand it and then I changed to ride my motorcycle." (Interviewee S)

Interviewee S once chose to take public transport to commute because of the long riding distance to work, and finally changed back to the original commuting mode because the process was too tiring. Another similar example could be taken from Interviewee J. Interviewee J lives in Taipei, and his first several jobs were all close to MRT stations, thus he was accustomed to taking public transport since childhood. Yet, he shared his experience that if he only relies on public transport, and only searches for convenient working places near the public transport system, it would limit the new job opportunities he could try. Therefore, it is precisely because of this that he started to ride a motorcycle. After he had a motorcycle, he thought that motorcycles could do most of the commute, so he would no longer consider public transport.

"Like the start-up company mentioned at that time, I could arrive by YouBike. After it was closed, I started looking for the so-called general full-time job, but it was difficult to choose if you only use the MRT, there were very few choices. Thus, started from then, there is a need for commuting [by motorcycle] since then." (Interviewee J)

From Interviewee D and Y's experiences, it can also be seen that public transport is more time-consuming than riding by themselves, mainly due to the need to transfer and take detours. What's more, there are also operating time restrictions on the public transport system.

"The MRT is also good, but sometimes you have to change trains. Although that is actually not a big trouble when you are willing to spend a little more time. Except this

point and there's no trains when it's too late, or everything else is OK." (Interviewee D)

"It depends on departing from Neihu [where the interviewee lives]. If come into the city centre, I think it's quite far, it will detour. There are many buses, but they will detour. I don't like it, moreover sometimes with traffic congestion. To the city centre, like to the university, the faster time could be about 35 minutes by motorcycle, but it takes an hour by bus. The MRT may be faster, maybe 3, 40 minutes. But I have to change lines … which will take a little longer. There is a parking lot next to my department building if I ride a motorcycle." (Interviewee Y)

Safety concern

Echoing back to the safety concerns the interviewees raised in Theme One on the travelling environment in Taipei, the relatively unsafe consideration of motorcycle riding would also prompt practitioners to take public transport. This is the reason why Interviewee A has changed. She even, based on this concern, tried to persuade her boyfriend to change to public transport. This concern would have nothing to do with whether to ride a petrol-powered motorcycle or electric motorcycle, it was because the road users' behaviour and traffic conditions in Taipei reduced Interviewee A's trust in riding vehicles in Taipei. This was also why Interviewee K's family stopped her from shipping and riding her motorcycle when she went to study in Taipei.

"Take my boyfriend for example, I told him why you don't just take public transport? Why do you want to ride a motorcycle because I think it's dangerous … Riding a motorcycle is never my option, because I know that the traffic conditions in Taipei is terrible … I think it's related to safety, that is, human (flesh) covered the iron [motorcycle], thus I think it's dangerous to ride a motorcycle." (Interviewee A)

"I have a motorcycle in Chiayi … Later when I moved to Taipei, my parents stopped me from shipping my motorcycle here. Because it belonged to my parents, they thought it's okay to ride in Chiayi but not okay in Taipei, it's too dangerous …" (Interviewee K)

Good coverage

However, Interviewee Q used to ride a motorcycle in the past, but after studying in Taipei, she felt that the coverage of public transport could meet her needs, so she did not want to ride a motorcycle. But according to Interviewee L, although he agrees that this coverage can achieve a certain degree of convenience, in fact, people who use motorcycles or cars still account for a large proportion. This reason may echo back to what he said in Theme One, that public transport is much more expensive if you utilise it for the daily commute.

> *"The main reason is that I don't want to ride here in Taipei. I think Taipei seems to be very convenient [by public transport]." (Interviewee Q)*

> *"I think this is quite important. At that time, I read some information about the coverage rate of public transport. I remember that Taipei is 98% or 95 [%]. That is, if you go out about 500 metres, there is an option of public transport available. This sounds impressive, but you will still ride your own motorcycle and drive your own car. In such a situation, it should be possible to reduce the utilisation rate of your own vehicle, but instead, only 40% or 45 [%] people will take the public transport. 50% of people still drive." (Interviewee L)*

Peer influence

Interviewee Y, who cannot travel without riding a motorcycle, also observed that when she started studying at National Taiwan University, her peers often set an MRT station as the meeting point. This also showed the trend of taking MRT among her friends. From this case, meeting at an MRT station is the most convenient option, and it is suitable for those friends who do not ride a motorcycle. They can take the MRT to the meeting point, and those who ride motorcycles can park their vehicles near the MRT station, or maybe this could affect motorcyclists to simply take public transport as the others did. The case shows the power of peer influence.

> *"Everyone at National Taiwan University arranges meeting ups with a bicycle [laughs]. Public transport is convenient here in Taipei, people are just meeting up at an MRT station, just take the MRT." (Interviewee Y)*

Never under consideration

However, even although as discussed above, there are many factors that may influence people to take public transport (good coverage, fare, or peer influence), still, there were interviewees who did not consider this option at all. Interviewee B, for example, is a very determined person who hardly uses public transport. In the following conversation between him and me, the only reason that he can take public transport is that he needs to travel to other cities, but the parking place at the station is too crowded, and he already illustrated in Theme One that he loves his motorcycle quite a lot. He worried that if he parks the vehicle in the parking lot of a busy railway station, his motorcycle will be at risk of being scratched. For him, the alternative function of public transport in mobility seems to be minimal, the only reason that he will take public transport is to protect his vehicle.

> *Interviewer: "You usually ride a motorcycle, do you occasionally take a bus or*
> *MRT?"*
> *Interviewee B: "No I won't."*
> *Interviewer: "What if the destination is far?"*
> *Interviewee B: "I will still ride my motorcycle."*
> *Interviewer: "So if you want to take the high-speed rail or train, where will you*
> *park your motorcycle?"*
> *Interviewee B: "No, I will take the MRT [laughs]."*
> *Interviewer: Why? (After multiple questions the interviewee always answered he*
> *only rides his motorcycle)*
> *Interviewee B: "Because I am afraid that my motorcycle will be scratched at the*
> *parking lot hahaha."*

When the public transport is not considered an alternative travel mode, an obvious main reason can be found in the result of Interviewee J. As he said, he already has his own motorcycle, and he can go to wherever he needs by his motorcycle. For him, alternative public transport seems to be of little functionality, no matter how convenient it is, this convenience does not mean much to him.

> *"Yes, I'm from Taipei. I always took public transport before riding a motorcycle, no matter*
> *the MRT or buses. I think in fact the public transport in Taipei is getting more and more*

convenient … nowadays, the MRT plus buses could reach most of the places you want to go. However, for me, as a motorcyclist, I don't care about this kind of thing, because I already have a vehicle. Therefore, I can go wherever I want. Thus, it may actually be more convenient, but for me, I don't care about it much." (Interviewee J)

Higher cost

Other possible reasons why the interviewees were unwilling to use public transport as an alternative could continue Interviewee L's mentioning in Theme One that public transport is actually more expensive. Taking public transport every day is also more expensive than riding a petrol-powered motorcycle. As Interviewee T mentioned, he thought that owning a vehicle is more economical. Even with a low fare YouBike, for Interviewee Y, she still prefers to save NT$ 5 and walk directly. She does not think that riding a bicycle would be low-status, in fact, except for her daily commute by motorcycle, she has her own bicycle at the university. She was actually riding the bicycle to our interview to meet me. She mainly thinks that even NT$ 5 are an extra cost, plus her mentality of being able to own her own vehicle means that no matter how low the price/fare is, the tools are still publicly-owned, and hence there is a degree of restriction for her.

"I think the cost is a bit high. It's really a lot less if I ride a motorcycle. There is a big difference in the time between this two, for a single trip, it [public transport] takes more than 1 hour, or 1 hour and 10 minutes or 15 minutes, and a return trip will be nearly two and a half hours [for commuting to the university]." (Interviewee T)

"I have ridden the YouBike before, but I don't like it very much. I think instead of riding a YouBike, I can just walk. I think riding a YouBike is the same thing as walking. I don't want to spend extra money on other transport, even if it's only cost NT$ 5 [laughs]. [Furthermore,] I might want this thing to be mine, I want to have my own one. This is a public bicycle, I don't want it." (Interviewee Y)

5.5.2 Perception of electric motorcycles

For the transition of low-carbon transport to improve the air quality and mobile pollution issues, compared to changing to public transport, electric motorcycles may be a relatively

acceptable option for petrol-powered motorcycle riders, because they can keep the original riding mode on the move with only a change in the type of power. This section understands the interviewees' views on electric vehicles depending on whether they still maintain gasoline vehicles, have converted to electric motorcycles, or are people who take public transport. By understanding the interviewees' perceptions of electric motorcycles' advantages and disadvantages, these statements can be used to observe how electric motorcycles can attract people, and to understand the shortcomings of it, so as to suggest improvements for the policy in the promotion of electric motorcycles. Through findings, the advantages of electric motorcycles are (a) a trend; (b) environmentally friendly; (c) with improved performance; (d) convenient for refuelling; and (e) fashionable.

A trend

Interviewees believe that electric motorcycles are the future trend. For example, both Interviewee L and T mentioned in the previous themes that this is a certain future trend in their perceptions. This thinking shows a certain degree to prompt them to switch to electric motorcycles. The future trend idea can also be a factor to attract petrol-powered motorcycles users to a certain extent in that when they find that their vehicle will be banned in the future, it is a chance for them to change. As an owner of a motorcycle repair shop, Interviewee O also believes that moving towards electric vehicles is the future trend. As a member of the motorcycle industry, he also started to learn about electric motorcycles through company training, otherwise, his job would be eliminated in the future.

> *"Because if you don't follow the trend, you will be eliminated. Electric vehicles are the trend in the future, so you have to work on this field first. If you don't keep up, you will not be able to keep up with stuff in the future. " (Interviewee O)*

Environmentally friendly

Perhaps due to the publicity of the policy, the interviewees still have the impression of electric motorcycles as environmentally friendly, which makes them feel that as there is no bad smell or noise compared to petrol-powered motorcycles, they seem to be more environmentally friendly (such as Interviewee N). It is worth exploring whether or not this perception of electric motorcycles as environmentally friendly has been exaggerated, which will be explored further in the 'cons' section. However, remembering the actual riding experience mentioned by

Interviewee F in Section 5.4.1 whereby he actually feels the air is less dirty than before, the local pollution angle could indeed demonstrate why electric motorcycles are promoted in this way.

> *"The one just passed us by, the smell of it was very strong, and there is no noise from the electric motorcycles." (Interviewee N)*

Performance

The sales of electric motorcycles has increased in recent years, and a major reason is that the performance of electric motorcycles has been greatly improved. This links back to Theme Three that performance improvement also enhances people's desire to change. During the interviews in 2019, compared with the past electric scooters, especially for the brand Gogoro the speed and the charging mode have been greatly improved. First of all, new electric motorcycles are better than before. As Interviewee L said in Theme One, no one wants to ride an old electric motorcycle because of its slow speed and trouble charging. Secondly, new electric motorcycles are better than expected. Interviewee T said that the performance of new electric motorcycles even makes him need to spend some time to adapt its power, because the explosive power of electric motorcycles is much greater than he thought.

> *"I think it may take two or three weeks to adjust when changing from a petrol-powered motorcycle to an electric motorcycle. Because I was used to the way of riding a petrol-powered motorcycle, I would be more cautious. The electric motorcycle's explosive power is quite strong, so when seeing how other people [also Gogoro riders] can start quickly and weave between the lanes, I think it's impressive." (Interviewee T)*

Convenience of 'refuelling'

Bringing back what Interviewee T mentioned in Theme Three, after receiving subsidies, an electric motorcycle is cheaper than petrol-powered motorcycles of the same grade. The improved performance and seemingly cost-effective option can become a point that attracts people to switch their travel mode. Not only the improvement of performance but also the Gogoro battery swapping method is much faster than going to the gas station to refuel. According to Interviewee B and P's conversation, it can be seen that in addition to the

convenience of movement, they think it is convenient when supplementing power to the vehicle, similar to what Interviewee T said.

> Interviewee B: "There are many [Gogoro battery swapping station], it's very convenient to change the battery, now it's about 30 seconds to swap the battery."
>
> Interviewee P: "It's faster than going to gas station."
>
> Interviewee B: "Faster, much faster!"

Fashionable

Regarding the view on the benefits of electric motorcycles, except for the more practical benefits mentioned above, the electric motorcycle has actually attracted a lot of people interested in this novel product. Interviewee L described it as an 'alien technology' in Theme One, and Gogoro even designed a 'silent' riding experience for the riders (Weng, 2020). Interviewee F also said that even if these new functions were not the main reason for him to change initially, he was surprised by some fancy functions it has. For example, he said his electric motorcycle would play birthday songs when he started the vehicle on his birthday. He can feel some of the intentions of the new electric motorcycles. He can also imagine that these novel and new functions will have a chance to be improved compared to past petrol-powered motorcycles. Moreover, Gogoro also put effort into the appearance and design, for instance Interviewee D was thinking that its appearance would definitely attract his sister.

> "It has some functions that are quite fancy, that is, if you start it on your birthday, it will sing a happy birthday song for you. I have a video later, I'll show you later [laughs]. I was quite surprised when I first encountered it … I was feeling touched a little haha, and when you turn it off, it would finish the song. It's so funny, there are two parts of the song [laughs]. There are also mote fancy functions, you can use the APP on your phone to operate. Such as changing it's start sounds etc … I actually not care about these, but many people think it's very fancy." (Interviewee F)

> "I think my younger sister also thinks it's [Gogoro] pretty or something, she might want to buy one." (Interviewee D)

After discussing the interviewees' perceptions of the good aspects of electric motorcycles, the next section will examine the negative aspects and interviewees' concerns. These concerns also reduce the likelihood of purchase and reduce the possibility of travel mode transition at the same time. The concerns from the interviewees are (a) few choices; (b) the system is immature; (c) dangerous silence; (d) whether electric motorcycles are actually environmentally friendly; and (e) price concern.

System immature

In fact, continuing the advantages discussed in the previous paragraph, interviewees raised many disadvantages that are just opposites of the same topic. That is, some advantages have the opportunity to attract practitioners to buy successfully, but these points may also be considered negatively by practitioners who are still hesitating. For example, Gogoro's thriving has become a hot topic in recent years, and with subsidies, it has attracted many buyers. But Interviewee S said that although it has thrived and was popular, she felt that there are not many choices of electric motorcycles. Interviewee D is also concerned that if there are not many electric motorcycles to choose from in the market, he thinks it may be monopolised, resulting in the unattractive price of electric motorcycles.

> *"There are too few choices, only Gogoro dominates … suppose you don't want to choose Gogoro, choose a Kymco, Kymco is super bad, my impression of it is super bad. It is not as good as Gogoro." (Interviewee S)*

> *"If the market becomes larger, there will be no such monopoly, and the price may be more reasonable." (Interviewee D)*

Recently, other electric motorcycle brands have joined the market, such as Aeon Motor, PGO, or Yamaha, which all cooperated with the Gogoro network (SanjiNoir, 2020). Perhaps this can gradually become a turning point for the expansion of the electric motorcycles supply side, and it can also make the interviewees decrease their concerns on only a single company dominating. In addition to consumers' worries that prices will be too high because only a few companies are producing them, it can also be seen from the interviewees' responses to the current electric motorcycles network that they are not confident enough in this emerging system, which is one of the main reasons that people are still hesitant to switch to electric

motorcycles, linking back to Section 5.3.1. Because the rise of electric motorcycles (especially meaning Gogoro here) is new, the coverage of repair points will be a big concern for the riders. Interviewee F mentioned that because of this, he is more likely to extend the time before putting his motorcycle in to be serviced.

> *"Oh! This is a big problem. This is a big shortcoming! Because they still have very few stores now, those with a repair centre. If you need to have a maintenance check, I was going to have a maintenance check when I rode 4000 kilometres at that time, but I might ride 2,000 kilometres more before going for maintenance … In Taipei, suppose that the 10 repair centres. How many people in Taipei are riding Gogoro in total? And then there are people need to do maintenance check every day." (Interviewee F)*

As for Interviewee T's reaction, he said that there is actually no repair centre in his hometown. He thought that electric motorcycles are more suitable for urban residents to ride. Linking to Henderson's (2020) argument that the electric vehicle system will potentially benefit the urban area and higher income areas, which may fail to be just during the transition process.

> *"I haven't ridden too far yet, but I probably don't want to ride too far when buying this motorcycle. Although they say it can be rode to circle the island now, you will still be limited by the battery power and take a fixed route. I am from Miaoli, and there also have battery swapping stations. But if I go back to Miaoli and you ask me to buy an electric motorcycle, I may not be able to do it. Because they don't have a repair centre there, and no stores. I can only simply swapping batteries there, so this kind of vehicles should still be more convenient for the urban area at present." (Interviewee T)*

The biggest worry for the practitioners is that the coverage of charging stations is not enough. Interviewees H and W mentioned that this would be their point of concern. Interviewee J believed that in big cities such as Taipei, there would be no need to worry about if there is a battery swapping station or not, yet if he has to travel outside the big cities today, it will become a big concern. In this way, the convenience and his willingness to buy an electric motorcycle decreases. Through Interviewee F's personal experience, it can be found that even in the centre of Taipei City, he has experienced difficulties in finding battery swapping stations.

> *"If we ride the mountain road, we probably ride from Taipei to Yilan. Here may have a lot*

of batteries [swapping stations] in Taipei, but are there any in Yilan? So this will be a big concern … a person who wants to buy a new vehicle, he/she would assess that what I am after today is convenience. Is it really convenient for me? If I choose Gogoro today and I can change the battery conveniently near home, but I will start to worry about going to other cities, isn't the inducement would be a lot less? The average small vehicle may be 3 litres [petrol], and the distance you can ride on 3 litres, there may be a gas station in the middle, but what about Gogoro? Is there a point where the battery can be swapped for the distance before it dying?" (Interviewee J)

"Some areas are very empty, there are not having even one. There are very few in the eastern district in Xinyi District. I have encountered the situation that I parked my Gogoro near the Sun Yat-sen Memorial Hall [MRT] station and then I took the MRT to [go to the airport to] travel abroad. When I came back, my motorcycle was running out of battery, and there was no battery swapping station nearby. Of course, this vehicle has a protection mechanism, even if it has no electricity, it will still keep [a few] electricity. To allow you ride very slowly, and see where you can slide to, to a battery swapping station … so I slowly slid to the battery swapping station near my house to change at a speed of about 20 kilometres per hour." (Interviewee F)

The abovementioned worries of hard-to-find battery swapping stations and the real experiences of low coverage, coupled with the fact that there are not many comparable options in the overall market, constitute the concern that the entire electric motorcycle network is not yet mature enough. Interviewee D's thoughts that one might be like a lab rat when buying an electric motorcycle at this point, or that insufficient battery swapping stations might cause charging troubles, both show the uncertainty and low trust of interviewees. On the other hand, for the abovementioned concerns, Interviewee T, who is already using and electric motorcycle, thought that there were already many battery swapping stations in the city and that the network is still expanding, and also did not think there are too many problems with maintenance. Interviewee T also noticed that there are other manufacturers joining the market. Although this may influence the demand for batteries, overall, he showed a certain degree of trust when he actually got involved and used it.

"In terms of Gogoro, I think the battery swapping stations are quite sufficient in the urban area. And I also don't think I couldn't make an appointment at the repair centre. I haven't

repaired it yet, but I occasionally check it out [online], to see if for current repairs and appointments need how many days or how long to make an appointment ahead … the battery swapping stations are actually constantly expanding … it won't let you feel you won't be able to reach [a battery swapping station] if you go to somewhere. However, Yamaha or PGO will join the market in June or July this year … If these traditional motorcycle manufacturers release electric motorcycles, when the number of these vehicles increases, I am not sure whether it [the battery swapping stations] will be enough. But if Gogoro is the only company occupies this market, I think it's quite enough. For the urban area, PeiPeiTao [Taipei City, New Taipei City and Taoyuan], I think it's quite OK" (Interviewee T)

No matter how the physical network develops, it can be seen from the findings that when people are still uncertain about choosing this model, there is still room for development and improvement. A new low-carbon transport network cannot be created in a short period of time. Because mobility is fluid (Cresswell, 2006), observing the riders through their mobility in the construction of physical networks may be what the Gogoro network has noticed and is working on. It can also be seen from Interviewee T's narratives that there is a growth of this network, and it is noticed and can be felt by the users, which is positive. However, the transition to a low-carbon transport society should not put the responsibility entirely on practitioners (as Section 5.4.2 discussed) or the manufacturers. Moreover, policy planners need to work to ensure that this growing network is not too singular.

Environmentally friendly?

Apart from the physical parts of electric motorcycles discussed above, it should be considered how much emphasis is placed on the promotion of environmental protection. The 2035 policy promoting electric motorcycles with environmental protection issues has led to electric motorcycle manufacturers marketing their vehicles on the basis of environmental protection. However, as was discussed in Section 5.2.3., it is difficult to separate debates over electric-versus petrol-powered motorcycles from bigger questions of the national energy system. Interviewee S mentioned that there would be buyers who buy the electric motorcycle thinking that this could respond to environmentally friendly imperatives, but fail to understand the reasons and goals behind it truly. Interviewee T also said that although he has considered environmental issues before buying the electric motorcycle, he believed that this is still a

marketing means of using the hot topic of being environmentally friendly to seek potential psychological influence over the customers. He thought that as long as the country's main source of energy is still coal power, saying any travel products are good for the environment would only be a marketing method.

> "There are some people who switch to electric motorcycles, I think they are really doing it for environmental protection. But they may not consider the following questions, such as whether changing to electric vehicles really achieves its effeteness? Yet, they may just ignore it, and doing in response to environmental protection first anyway. And there are some people they purely for collecting a good-looking vehicle, and this group of people are less likely to consider related issues." (Interviewee S)

> "I knew it, but I really don't agree that it should really be relatively low-carbon. I have considered this before I buy, this may be a fake marketing method, because you can do a lot of business activities in the name of protecting the environment … When you are using electricity, you are still burning coal. Actually, I don't know compare to petrol burning which could cause larger pollution or energy consumption. I think it seems that electric vehicle companies should discuss this." (Interviewee T)

While emphasising environmentally friendly topics and linking air pollution issues, Interviewee F also put forward another point of view. He said that perhaps changing to electric motorcycles will help to decrease the city's carbon emissions because at least the reduced mobile pollution sources can be converted into stationary pollution sources, which enables better management and control of these carbon emissions. However, another potential environmental issue that may cause that is the waste of batteries. He wondered if the large number of batteries produced by electric motorcycles will also become environmental pollution in the future.

> "In fact, in terms of environmental protection, there still many controversies [about electric motorcycles]. Because, if these batteries are manufactured in large quantities, the batteries that will be eliminated in the future may be the source of some chemical pollution. At least in terms of air pollution, I believe the effectiveness will be different that the waste is concentrated in one power plant of the energy processing than those produced individually everywhere. Electric motorcycles may be better in this respect, at least for air pollution, but it just produces another kind of chemistry or something [waste]. I'm not a professional, so it's difficult to discuss. In fact, this topic has been debated for a

long time on the Internet that everyone have various standpoints." (Interviewee F)

Perhaps many opposing viewpoints, as mentioned in Section 5.4.2 by Interviewee L, were people giving opposition for opposition's sake, but when there are voices of doubt and confusion among the people, should policies or manufacturers consider adjusting the means of promotion? The findings above suggest that consumers may become sceptical of companies' claims to the environmental benefits of electric motorcycles, especially when the promotion of electric vehicles is not consistent with broader environmental issues such as waste and electricity production. Over-emphasis on environmental benefits may hence possibly increase negative effects and rebounds in the transition process of practitioners.

Dangerous silence

In addition to the general systemic adjustment suggestions discussed above, the interviewees also have many different concerns about electric motorcycles in their lives. For example, one advantage is the lack of noise, but because there is no noise, some of the interviewees thought this is dangerous. Interviewee A revealed that the silence and speed of the electric motorcycle make her worried because she is already familiar with the sound of a petrol-powered motorcycle, which allows her to make sure that there is a vehicle nearby and that she needs to pay more attention. Interviewee Y told me that even if she hadn't encountered the situation she mentioned before, she applied her experience with petrol-motorcycles to the electric ones, which amplified her sense of worries about it.

> *"We found that a very serious thing is that we didn't know that there was a motorcycle coming, because electric motorcycles have no sound, so I think they are very dangerous. Because you will hear the sound of PUFF PUFF PUFF when a petrol-powered vehicle coming, even if it has lowered down the sound, you can still hear it. But the electric motorcycle is completely silent and the speed is faster. I think this is a hidden worry." (Interviewee A)*

> *"I think they are very quiet, and feel they are very dangerous, because they are very quiet. If they suddenly rush out from a small alley, you won't even notice them. I haven't encountered one before, but I still think they're dangerous." (Interviewee Y)*

For Interviewee L, who has been using an electric motorcycle for a while, he thought that the topic of dangerous silence is just a problem and process of adaptation. As time passes, people will get used to it. Interviewee I thought this argument is strange because passers-by should pay attention to traffic more generally, not just focus on listening if there are vehicles coming. Group13 believes that traffic accidents mainly came from the problem of passers-by. Interviewee K pointed out that the transition of traffic mode should be for the entire population. In this case, as motorcycles are such a significant part of daily life in Taiwan, the people who need to adapt should not only be the motorcycle riders themselves but the people living in the entire social network.

"People used to say that motorcycles made noise, and then waited until it was really quiet, it became its too quiet to scare me. For me, I was like, hello [with an unbelievable gesture]? This is a very interesting process, but it is a process of adaptation, when you know there is such a thing, you will get used to it. I think nowadays, fewer people are talking about electric vehicles are scaring." (Interviewee L)

Group 13

Interviewee I: "But I always think this argument is weird, don't you have rear mirrors [to notice there's a vehicle coming]? Even for the [safety of] pedestrians, they won't walking in the middle of the road, isn't it?"

Interviewee I, Q and G: "That's the problem of human!"

Interviewee G: "So the people's literacy is not enough."

Interviewee K: "Then it has to be promoted to the whole, right?"

Interviewee Q: "Yes, if you are in the south, people make turns by their mood and pedestrians will be hit. And what's more, there's no sound [of an electric vehicle], but you can't blame the sound because they would hit [pedestrians even with sounds]."

Price concern

Compared with old petrol-powered motorcycles and old kind of electric motorcycles, the new electric motorcycles (made by Gogoro) have a different way of supplementing energy. The cost of refuelling petrol-powered vehicles will be affected by the fluctuations in fuel prices. However, if the compartment is full of fuel, it can be used for a while. Gogoro has launched

the swapping battery system based on different tariffs[11], where people can select a tariff that suits them the best. However, according to the experience of Interviewee F, this kind of monthly payment is much higher than when they used to ride a petrol-powered motorcycle, plus the new electric motorcycle itself is not cheap, so the overall cost is not cost-effective. As mentioned by Interviewee H, if they want to make electric motorcycles more competitive, they have to use the same benchmarks as petrol-powered motorcycles. The comparison of prices often become a major factor in people's choices.

"What I have encountered, the point what I care about the most is, it may cost more than a petrol-powered motorcycle. Not the price of buying it, it's the price of the tariff, it's twice the original costs ... Compared with petrol-powered motorcycles, I think they are quite expensive." (Interviewee F)

"Because there is a threshold, firstly, it is more expensive, and second, you have to eliminate your own things [original motorcycle] ... If you want to be competitive, you can't be much more expensive than the current petrol-powered motorcycles ... and must meet the basic needs." (Interviewee H)

Too heavy to carry

The advantages of electric motorcycles mentioned in the previous section are that it is convenient to swap the battery and even faster than to refuel. However, in terms of the battery's weight, Interviewee P felt that the process of swapping the battery is more difficult for females, and the weight of the motorcycle is more difficult for her to stand it to park. Interviewee E also mentioned the same problem that it is too heavy for her to lift the middle stand of the vehicle. Actually, regarding the weight issue of Gogoro's design, they have recently designed a lighter motorcycle body for females (Gogoro Official Website, 2019), but for the improvements of the weight of batteries, it would be a large amount to deal with, which will need more adjustment to be unified, and be more difficult. Nonetheless, this is an important point to consider.

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[11] Gogoro provides multiple monthly riding plans (like a rental for the batteries) for people with various riding distance.

"The battery is heavy. That's really heavy, I don't think girls can move it easily … I don't know the general but I think it's quite heavy, heavier than a 100cc motorcycle. And the centre-kickstand is difficult to stand, I can't stand it easily, it's heavy." (Interviewee P)

"Its style is also very good ... Many colours option, which is a bit heavy for girls. I always use side-kickstand." (Interviewee E)

Many of the topics discussed above are based on people's perception of Gogoro, because of the rise of Gogoro in recent years. When discussing electric motorcycles, most of the interviewees would directly associate the term 'electric motorcycles' with Gogogro. It can be seen here that Gogoro also made efforts on the appearance design, performance and software innovations to be different from the old electric motorcycles. The most readily felt change could be the swapping system, which greatly improves convenience and makes many riders feel the improvements (such as Interviewee B, P and T).

Perception changes

In recent years, the public's perception of electric motorcycles has greatly changed. In the past, most people believed that electric motorcycles are used by elderly people. Interviewee C mentioned that his mother-in-law was riding 'that kind of electric motorcycle', and the biggest trouble was the inconvenience of charging. Interviewee H also mentioned that when the first generation of Gogoro was launched, no one was optimistic about it. He said that Gogoro changed the previous charging mechanism, this big change has indeed helped accelerate the goal that the policy originally intended to promote.

"My mother-in-law also buys an electric motorcycle, the kind that probably no need to register a licence. But there's a big problem of charging. If you are not live in an own house like in the south that you have your own ground floor, how to charge it? Unless you have to carry it [upstairs], if the battery is small, you have to charge it often, if it's big, then carrying it upstairs is also a problem. But I can change it [swap the battery at Gogoro's network], which is equivalent to buying electricity from them. Buying electricity from them for a fixed fare." (Interviewee C)

"Before the Gogoro first generation had released was … because there weren't no electric

motorcycles released before, but everyone thinks the electric motorcycles were like rubbish [laughs]. People think this would fail even the first generation [of Gogoro] has begun to be stable. The traditional big manufacturers still look down on it." (Interviewee H)

Interviewee L's own experience is that he encountered people who were interested in his new Gogoro while riding. The person he met was surprised that its appearance was different (without an exhaust pipe) and was frightened by the price. The image of the old kind of electric motorcycles has occupied people's awareness for a long time, which also caused many people to directly apply their old ideas to newly launched electric motorcycles at the beginning.

"At that time everyone thinks the electric motorcycles were slow, the efficiency was poor, it's light, and the price was relatively cheap. [Therefore], when Gogoro appeared with an expensive price, people would think why a motorcycle can be this expensive? Because they put the given impression of the electric motorcycles on Gogoro, but Gogoro subverts the impression … the question I have encountered the most was, when riding on the road, there was an Ah-bei [old man] came and told me that - you don't have an exhaust pipe, you've lost your exhaust pipe [Interviewee L laughs]. Or ask me, what is this? … How much is it? I said NT$ 90,000, and they would be so surprise that an electric motorcycle costs NT$ 90,000. People will use the same impression of electric motorcycles in the past, because only grandmothers would ride electric motorcycles with a food basket at front at a very slow speed." (Interviewee L)

Secondly, in addition to changes in the view of electric motorcycles, no matter whether people are new to electric motorcycles or are already owners, the overall perception of it has become more positive, and the riding experience and maintenance of it are also different from the past. For the riding experience, Interviewee F mentioned it has stronger kinetic energy than expected, and the riders can also adjust the riding mode through the electronic panel during riding and then customise their most suitable mode. For a different way of maintenance, Interviewee C said the new repair centres of Gogoro were not like traditional repair shops of petrol-powered motorcycles, where motorcyclists could directly bring the vehicle to the repair shop if they have a problem or for maintenance. By contrast, electric motorcycle repair shops would need an appointment. As the amount of traditional maintenance shops is quite a lot, and mostly the process of repair is fast, no appointment procedures are required.

"I went for a test ride at first, and then I was really surprised when I rode for the first time. The power was much greater than I thought, but it has some different modes to adjust. Everybody has their own riding habits ... This motorcycle could be considered a new technology, and there was no such a powerful electric motorcycle in the past ..." *(Interviewee F)*

"[We have to] make an appointment first, they doesn't have many spots, so you still have to make an appointment first. Unless it is an easy problem to deal with, they may spend less than 10 minutes to help you ... Like the maintenance check appointments we have to reserve, unlike the traditional motorcycle maintenance shops, they will directly help you when you arrive with your motorcycle. But that is also because there are many shops, but there are only a few Gogoro service bases." *(Interviewee C)*

Thirdly, the innovations of Gogoro in recent years have brought a new trend to Taiwan's electric motorcycle market. Many new perceptions have emerged, but at the same time, a large number of people still lack relevant knowledge, and this lack of knowledge further affects their perception of electric motorcycles. When people do not understand, they are likely to deny the possibility directly and generalise all perspectives. For example, Interviewee A did not understand any new functions developed by electric motorcycles. From the interview process with her, it can be observed that although she said she did not know enough about the new electric motorcycles, her responses were full of doubts. Even if her knowledge of it is only what she heard from others, it seems to be internalised into not accepting this new mode of transport (also recalling her aforementioned fear of the quiet vehicle on the road), which can be seen from the responses in the previous discussions.

"I don't know much about electric motorcycles, so it's quite different from the riding mode I originally knew. For example, it doesn't need fuel and it needs to be recharged. Where do I go to recharge it, is there any [charging station] near my house? Is there any near the company? Does it cost me money when charging? Maybe it's free but it's still troublesome. Where can I get it? If it's obvious that everyone knows that there is the charging point, or it has a sign shown obviously at the gas stations. Therefore, I think this will affect everyone's willingness to ride an electric motorcycle. And I heard that Gogoro's motorcycle does not have a key! I'm very curious about how it works, I just don't understand all of it." *(Interviewee A)*

However, compare this to Interviewee T's thinking here – he thought people would do their homework if they want to buy an electric motorcycle. Hence, all the questions of Interviewee A were actually not that disturbing. Just like Interviewee T said, he thought there were still many people who do not know very much about electric motorcycles and were still unwilling to discover more about it.

> "It is available on the Internet or APP, because before I buy, I checked how many stations near where I live, how many stations I can change the batteries, or how many places I can change on my commuting route. Only with this, I will think there is no problem now, I can buy it. So, I think it's a problem that whether you have been to understand it or not [laughs] … I was not afraid of running out of battery now, so I felt that after all evaluations, I could buy this motorcycle with confidence." (Interviewee T)

There were also emerging plans to let electric motorcycles become a shared system, such as Taipei City Government's '3U' – YouBike, U-motor, and U-car – project (Taipei City Government, 2017). For those who have not owned to a motorcycle but would like to travel by it in the city, it would be very helpful. For example, Interviewee K was not allowed by her parent to ship her own motorcycle to Taipei to ride, but was accustomed to riding a motorcycle. The chance for her to maintain this riding habit was the new option of shared electric motorcycles – WeMo Scooter, as a collaborator with the Taipei City Government for the 3U project.

> Interviewee K: "My parents stopped me from shipping my motorcycle here … they thought it's okay to ride in Chiayi but not okay in Taipei, it's too dangerous ..."
>
> Interviewee Q: "But you can ride a WEMO."
>
> Interviewee K: "I think charging is very convenient, that WEMO is a charging motorcycle."
>
> Interviewee Q: "[the APP of WEMO looks] just like this. It will show you where the motorcycles are parked, and also the percentage of the battery … which is quite accurate."

In addition to replacing the electric motorcycles with the practitioners themselves, the shared electric motorcycles system can also be one of the methods to assist the transition process. At present, although the existing options (WeMo Scooters) are not as good as most of the electric

motorcycles discussed above, they can also provide people with mobility in urban areas. This could be an option that is faster than shared bicycles and can provide people with short-distance needs to reduce the emissions to a certain extent. For those who can only take public transport if they want to move through a motorcycle temporarily, they can complete their mobile needs without owning a motorcycle.

5.5.3 Conclusion

In order to reduce mobile pollution sources, except for improving the public transport system, the Taipei City Government has also promoted electric motorcycles heavily. No matter whether this is followed up with the Central Government's 2035 policy or developed with the 3U project, on the road to a sound low-carbon transport society, these initiatives will require more adjustments and time. Through the above findings, my research has illustrated that compared to other regions in Taiwan, Taipei has already led a lot in the development of public transport, which could show that an existing low-carbon network could be influential for people's travel habits.

Firstly, for the perception of public transport, the interviewees' acceptance and perception were good, but the daily commuting expenses and time spent are higher and longer than their own way of using petrol-powered motorcycles, which could be a resistance to the process of change. Nevertheless, my results also found that females have a relatively higher acceptance of the use of public transport than males. Moreover, it is also found that the use of travel mode is not a single choice. Most people may have a major travel mode, but in many cases, they make decisions based on different current conditions, price considerations, or even mood. This shows a transport network also needs to consider the uncertainty of people in making choices, which could be irrational and flexible for them to make decisions. Therefore, echoing back to Theme One on the importance of the functionality of public transport, the more sound the transport network the better, because it can provide people with any situation and at any location to make choices that are more convenient. However, it is also predictable that people's needs cannot be fully satisfied, thus a weighed development is required.

It may not be easy to reduce public transport fares to rival petrol-powered motorcycles' petrol cost, but the public transport system may have more opportunities to address factors such as longer commutes or the need to work through traffic during rush hours. These angles may be

advantages for public transport to improve more effectively than vehicles on the roads. If the convenience is much higher than self-driving/riding at peak times, it will improve people's confidence in utilising public transport that they will not face congestion like in their own driving/riding when needed. Perhaps, improving the efficiency of public transport ought to be a priority over simply expanding networks further.

Secondly, in terms of the perception of electric motorcycles, this section has already sorted the advantages and disadvantages the interviewees thought of. Through findings, it can be seen that electric motorcycles do have many advantages in the current process of promoting low-carbon transport transition. It can help the practitioners to continue the riding action of general petrol-powered motorcyclists and good performance, while also taking into account convenience and reducing mobile pollution sources in the city. However, the current development of the electric motorcycle industry is not yet very mature, which is also a major concern of people before making a change to electric power. Many interviewees were also not sure whether an electric motorcycle is really an environmentally friendly vehicle. In the transition period of low-carbon transport, compared with petrol-powered motorcycles or other modes such as cycling, the electric motorcycles do maintain a similar riding action and achieve the reduction of mobile pollution sources in cities.

However, before the policy promotes the vigorous conversion of electric motorcycles, perhaps it is important to think about the future plans for entire Taiwan's low-carbon transport network. For instance, electric motorcycles are actually linked to the national energy distribution, if all of the petrol-powered motorcycles are converted into electric ones, the combustion problem of coal power plants in the suburbs will affect the lives of people in remote and country areas. As part of a truly just transition, it is therefore important to consider what the consequences of a rapid increase in demand for electricity for low-carbon transport may be. As from the findings that a transition should happen based on the entire society, not just the practitioners alone, if the Taiwanese government's goal is to convert most of the petrol-powered vehicles to public transport in the future and only regard the electric vehicles as a transition period travel mode, will the large amount of electric vehicles promoted in recent years become a new pollution problem in future when they need to be disposed of?

Chapter 6. Discussion

6.1 Introduction

Most of the interviewees provide the contextual knowledge that Taiwan's narrow land, densely populated and weather is suitable for motorcycle riding. The interviewees also mentioned that Taipei's public transport is better developed and has higher coverage than other cities in Taiwan. Because of this, people who grew up in Taipei are more familiar with the use of public transport than other places in Taiwan. Therefore, it could be said that the public transport system in Taipei can be a good alternative for motorcycle riders. However, even so, Taipei users could still be constrained by the longer travelling time of public transport, relative inconvenience, or uncomfortable riding experience such as crowded carriages in comparison to riding motorcycles.

This links back to what Bissell (2018) indicates about commuting, and that commuting can easily bring out commuters' negative emotions. The importance of 'feeling' on the move from the findings shows that a deeper influence on practitioners can be illustrated. For instance, the uncomfortable feeling of taking public transport to work during rush hour, inhaling polluted air in the traffic, or worrying about the high danger rate of motorcycle commuting. These negative feelings may be reasons to make practitioners change their travel practices. For example, people who hate crowded transport carriage are more likely to use private vehicles, people who are worried about the safety of riding motorcycles tend to take public transport.

In addition to the aforementioned basic background of the riding environment and the understanding of travel emotions, this chapter develops the discussion from three major aspects of the low-carbon transport transition of Taipei motorcycles raised by the author of what the policymakers should be aware of. First, *meanings*, starting from discovering what different meanings can be brought to practitioners of riding a motorcycle from different experiences. Second, *change* is to understand the transition to a low-carbon transport mode through embodied experiences and perspectives of practitioners. The perspective of change of practices examines the areas that require further attention and support in the process of change. Third, *inclusion*, through the experience of practitioners, explores the injustice or neglect that may exist in this practice during the transition process, which has been discussed

less extensively in previous research. Fourth and final, I will discuss how my research can make a contribution to social practice theory for low-carbon transition.

6.2 Meanings of motorcycle riding

Taiwan's significant motorcycle culture brings out many interesting meanings that this practice possesses. According to the findings, it can be found that the meanings of riding motorcycles to the interviewees can be sorted into (a) practical dimension; (b) satisfaction dimension; (c) maintaining relationships; (d) emotional connection and (e) culture shaping. First of all, the *practical aspects* for motorcycle riders include, for example, completing daily demands, various practices that need to be completed by riding a motorcycle, such as shopping, going to school, hospital or work; there are also occupation needs. In addition to commuting to work, in Taiwan, we can see that some jobs ask employees to meet the requirement of having a motorcycle driver licence; finally, it could be seen simply as an essential tool value for travel or earn a living.

Secondly, the *dimension of satisfaction* is the satisfaction produced from riding motorcycles by carrying the practice of motorcycle riding. For instance, practitioners' enthusiasm for motorcycles or the pursuit of trendy things that make them eager to replace new vehicles when they are released. As per Section 5.1.2, some interviewees mention their enthusiasm towards vehicles and the new kind of feeling of riding electric motorcycles, which is a very new embodied experience for petrol-powered motorcycle users. Moreover, this dimension also relates to the control right of one's own movement. Motorcycle riding allows changes, plans, or decisions to be made quickly, and practitioners can have the autonomy of self-travelling. This also brings out what the interviewees said about how riding a motorcycle can symbolise being an adult. After reaching the legal age, people are allowed to get their driver's licence and have their own transport method. They can control their own movement and travel longer distances by riding a motorcycle. Compared with cars, whether driving or owning, the threshold is relatively low, which could be more popular among young people. Recalling how Interviewee Group 13 conveys that they desire to own a motorcycle; in addition to being a symbol of growth and controlling their own travel, they can also *establish and maintain networks* with families and friends through motorcycles. They may need to use the motorcycles to complete the social activities in group activities or the movements required for the day-to-day relationships between families and friends to meet each other.

As for *emotional links,* through my findings, the relationship between the interviewee and the vehicle may be deeper than the nature of the tool. One is the aforementioned enthusiasm for vehicles. This paragraph mainly discusses the emotions projected on the motorcycle by practitioners, and less the value of the motorcycle as an economic tool. Taking the existence of partners for example, 'growing up together as friends' can be seen in Section 5.2.2 through Interviewee A's friendship with her motorcycle; in Interviewee Y's case by how her motorcycle is like the legacy left to her by her father; and in Interviewee J's case where he carries his childhood dream of owning a specific kind of motorcycle from his grandfather's influence brought to him as he was growing up. Finally, *shaping the culture* is illustrated by Interviewee A and Interviewee T, who said that it is like an unspoken rule that when Taiwanese reach the age of 18, they will take the test for a motorcycle driver's licence. A more special phenomenon also shows that most motorcycle riders know how to move others' motorcycles to create a parking space for themselves (see Interviewee Group 13 in Section 5.1.3) and tacitly have local motorcycle riding etiquette norms that are all embedded in life. The colour of the locality is strong and shows the weight of the motorcycle culture in Taiwanese society.

The important meanings of motorcycle riding are mentioned and discussed relatively rarely in the relevant literature in Taiwan, but they are the most accurate life experience of every practitioner. Furthermore, because of the existence of these meanings, whether the feeling is positive or negative, the thoughts from the angle of the interviewees show that none of them regards the motorcycles as a challenging problem or a hindrance that needs to be solved. This is because the existence of motorcycles is everyday to them, and the motorcycles carry the daily freedom of movement for more than ten million people in Taiwan, helping these people access daily demands. Even if there are annoying and uncomfortable situations, as Hage (2009) raises, people are inclined to bear the discomfort, and motorcycles are still a useful aid to complete their daily needs and connect their various daily practices.

This section is intended to illustrate to decision-makers the importance of increasing attention to meanings; which echoes my first research aim, which is to understand the importance of Taiwanese motorcycle culture derived from the motorcycle practice. The importance of the practice of motorcycle riding that carries these meanings needs to be taken seriously. The approach adopted by treating the motorcycles simply as a means of transport may easily lead the discussion to be focused on the user's dependence on the travel mode. The meaning of motorcycle culture is connected with the interaction between each individual and the social

networks of families and friends, and is a closely-connected relationship. The issue of motorcycle culture we are facing will be the broad network, in a sense, behind it. As such, it is not only individual long-term habits that practitioners are being asked to move away from in the low-carbon transition, but the deeper interconnected and connotative motorcycle culture that has been built by each practitioner. Therefore, the primary issue that the decision-makers should ask, instead of how to improve a transport system, is how to make sure a new system can also cover these meanings for the practitioners after their change, as Dennis and Urry (2009) propose.

6.3 Change of motorcycle practice

Although practice theory may be criticised for a lack of consideration for the bigger picture, understanding the social framework of a large structure from various small doings can extend more practical and appropriate assessments (Watson, 2012). The stacking of small doings can also project the big background. It is not possible to design a perfect new low-carbon transport society, but it is possible to design a new system that is suitable and feasible, and to make adjustments to the motorcycles. In policy implementation, it is necessary to make sure these changes are what practitioners need. This supports my second research aim, which is to explore the disconnection between the aspirations of policy-makers for low-carbon transport and the practitioners' lived experience. Hence, the perspective of practice change may provide a substantial help. Otherwise, the public's perception fails to keep up with the changes that the policy wants to make, possibly bringing distrust to the public. For instance, Interviewee W and Interviewee D expressed concern that the new system is not mature enough and might lead them to become lab rats.

From the suggestions provided by Watson (2012) and Spurling et al. (2013) compared in Section 3.1.3 (see Table 3.1), I propose four aspects that make up a practice-changing mechanism: (a) changing the composing elements of practices; (b) recruiting practitioners; (c) substituting new or existing practices; and (d) changing bundled practices. First, *elements can be changed*, following Shove et al.'s (2012) elements of a practice which includes material, competence and meaning (see Figure 3.2). In my findings, what interviewees worry about during the process of changing to low-carbon transport can be applied to the dimension of the elements that can be changed to the electric motorcycle system and discussed further. We can discuss what policymakers can pay attention to for each of the materials parts in turn. For

infrastructures, there should be more battery stations, more brands of electric motorcycles to choose from, expanding the electric motorcycle market and more electric motorcycle repair centres. For spaces, one of the important points mentioned by the interviewees is that their riding space is compressed, and the space for parking is not enough. Although electric motorcycles can get free parking in Taipei, they require the same riding and parking spaces used by petrol-powered motorcycles. This means that even if petrol-powered motorcycle riders are converted to new electric motorcycles, they still have to face the daily life of being over-squeezed by the space in the city.

However, if the decision-makers compress motorcycles in the urban spaces (e.g. roads) to reduce people's desire to ride motorcycles in the city and persuade them to change to public transport, whilst also extending electric motorcycle infrastructure, such as charging stations or promoting of purchasing the electric motorcycles at the same time, there may be a contradiction point in this process. As electric motorcycles could be a relative 'painless change', as Bergman et al. (2017) state, they can maintain similar practices at present and can achieve the goal of reducing carbon emissions in the city which is what the policymakers target. Therefore, it may be easier for people to change to electric motorcycles at present than jump to using public transport. However, if the ultimate goal is still for everyone to change to the public transport system, the current construction, promotion, or persuasion of electric motorcycles seems an inevitable contradiction. This may be the so-called transition period, yet before rationalising the transition period of the change by electric motorcycles to a low-carbon transport society, Henderson (2020) reminds us that we need be aware of and avoid falling into EV lock-in status during planning. Regarding public transport, most of the interviewees took the Taipei MRT as an example. The interviewees said that the trains are too crowded, or the MRT routes that could be taken to work take too many detours. These are two points for the infrastructure design of the public transport to give more consideration to.

For the competencies of the practice elements, the transition into an electric motorcycle requires many new adaptations. The manner in which a new electric motorcycle is ridden is slightly different from older ones and petrol-powered ones. For example, Interviewee T mentioned that he spent some time adapting to the way his electric motorcycle starts. Also, compared to old electric motorcycles, there is a new technique for how these new electric motorcycles are charged – battery swapping. The competencies that would be required for battery swapping were mentioned by the interviewees, where they may not understand how

the battery exchange works at the charging station or be able to lift a heavy battery for replacement at the swapping station. Some interviewees also mentioned that they do not understand the new technology, such as how the electric motorcycle's electric system is linking to their mobile phone. The lack of understanding for new electric motorcycles discourages them from changing. These points also need to be considered by the promoters – how to help people build their skills of using new electric motorcycles. Moreover, the repair, maintenance and design of electric motorcycles are different from the traditional petrol-powered motorcycle industry. Where people can reach the electric motorcycle repair stations, and the technical training for the traditional motorcycle industry to switch to electric ones is also something that the policy-designer must consider. In addition, not only do the riders need to be familiar with the riding skills of electric motorcycles, but passers-by also need time to adapt to the existence of electric motorcycles. They need to be familiar with what they think of as the 'silent' electric motorcycle shuttles on the road in the usual living environment (see Interviewee A and Interviewee Y). Besides, the competencies for taking public transport also require skills to recognise the route maps, instructions in stations or bus stops, and ensure clear instructions to reduce the confusion of users during their journey.

In the process of recruiting or adding new or alternative practice populations, the planners have to take into account the ultimate goal that people can use the new system with confidence, so that the public could have the will to change and have less worry about changing. In addition to learning the above-mentioned competencies, the interviewees mentioned in Theme Three that material satisfaction and preference for trendy things could be a big pull for adding new low-carbon transport mode users. As Interviewee L said, Gogoro is a powerful example. Compared with the old electric motorcycles in the past, Gogoro's improved performance and eye-catching appearance have absorbed many petrol-powered motorcycle riders who have replaced their vehicles with electric motorcycles. With policy subsidies, this change shows a significant increase in recruitment, noting also the interviewees' hope for a more stable market and more brands to choose from. Policymakers should not only think about how to allocate subsidies, as raised by the interviewees in Theme Five that encouraging more brands' establishments can also establish stability in market demand and increase the public's trust in the new electric motorcycle system. For example, when people go out, they can only see one brand of electric motorcycle running on the street, and the feeling is very different from the electric motorcycles of three or more brands on the streets.

Ho (2017) praises the example from the Netherlands and Denmark of promoting bicycles or walking for Taiwan to follow. Yet as I argue in the literature review Section 3.2.5, it is necessary to understand the locality and the background of Taiwan while implementing policies instead of directly borrowing from the successful cases of other countries. Considering how to promote the same low-carbon transition strategies in a country where motorcycles are popular seems still have a lot of work to do. According to the findings, the interviewees state that they may still use motorcycles even within a short distance (e.g. Interviewee C). Time flexibility is also a major point to consider for alternative transport. Interviewee D has stated in Theme One that because there are no public transport services available during certain times, outside of this time, private vehicles are still required, hence the relative mobility of motorcycles is convenient. Nevertheless, as mentioned in the previous section, motorcycle users may have established a deep connection with their own vehicles, and motorcycles are also their possessions, whether it is material enthusiastic direction, looking for trendy things or pure use value as a tool for transportation. The alternative solutions must also consider if petrol-powered motorcycle riders want to replace their old vehicles, they will have to make a decision for discarding their vehicles. As a matter of fact, according to findings, most users will use their vehicles until they need to be discarded. Therefore, on the road for people to change to the alternative transport, the designers need to understand that it may take time. The effect of promoting substitution may be seen in the early stages of transition, but achieving the final change may require a longer-term consideration of the significance of motorcycle culture.

It can be seen from the findings in Theme One that respondents are more inclined to take public transport for long-distance or in poor weather conditions. According to this, when the interconnected practices are time-consuming, costly or exhausting to complete by riding a motorcycle, then there is a chance for other modes of transport to intervene such as public transport, bike-sharing schemes or even shared electric motorcycles. However, if alternative methods are still too time-consuming, expensive or take too long, practitioners will have a higher intention to go back and choose their own transport method. Therefore, the design of alternative transport networks is an important consideration. Interviewee C is an example of using various transport methods to complete his daily demands. Every decision made is depending on his current situation, distance and even mood to make choices as to which is the most comfortable or economical way to move. The flexibility of his travel methods shows the practice is possible to be completed through different modes of transport. For example, he can take either public transport to work or ride a motorcycle to commute. Therefore,

increasing and improving the alternative low-carbon transport options to appear on the route of practitioners' travel might be helpful to intercept and then influence the possible choices of the travel mode, when practitioners execute and move to the next practices.

6.4 Inclusion, equality and power for motorcycle riders

Linking back to the previous section, many interviewees revealed that their space is compressed while riding motorcycles in Taipei. In addition to the reduction in the number of motorcycle parking spaces, interviewees shared many related experiences such as that they have to squeeze through traffic when moving (see Figure 5.1 and Figure 5.2). The use of negative descriptive phrases such as *"I will die"* by Interviewee Y emphasises the oppression of motorcycle riding in Taipei. There are also many examples of cases where because the riding environment is too dangerous in Taipei, practitioners change to driving or taking public transport. Apart from the aforementioned unfriendly motorcycle riding environment in Taipei, policy promotion or academic research seems to regard motorcycles as a problem to be solved. The interviewees did not deny that the petrol-powered motorcycles would produce carbon emissions or air pollution, but they did not accept that motorcycles are considered the culprit when discussing Taiwan's air pollution. This may appear inconsistent with how the use of motorcycles is interpreted in research or policy, and it also highlights that the concerns and interests of motorcycle groups are likely to be removed first in terms of transport/air quality policy planning and existing academic research recommendations. Many interviewees also mentioned that they are confused about promoting electric motorcycles as a zero-carbon emissions solution, since they think this might shift focus away from the nation's energy use. They ask for clear energy allocation strategies by the policymakers, because they are not sure whether the low-carbon mode that policymakers promote is really low-carbon enough, or if the zero-emission electric motorcycles' electricity is actually generated from high-emitting power stations that are distant from the urban areas.

According to Theme Two, most of the interviewees know that relevant policies are being promoted, and they also hold a positive attitude towards them. This echoes the research by Chou and Liou (2020) that mentioned the rising public awareness of related issues. However, the in-depth interviews indicate that what the interviewees know best about the policy is there are many subsidies for buying electric motorcycles, but most of them are not very confident about the details. They know that the promotion is related to air pollution, but they have no

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idea that the policy is about stopping the sale of petrol-powered motorcycles, let alone that the policy's target schedule is by 2035. People who know more about this are those who need to change their motorcycles, whether it is electric ones or new petrol-powered ones because they can all receive subsidies for substituting. This is an alert that the effectiveness of policy promotion needs to be improved. Besides, the 2035 policy was cancelled after less than three years of promotion. Although the government did not explain the reason, the environmental groups believe that the government has been lobbied for 'equal rights for both petrol and electric motorcycles' by some petrol-powered motorcycle industries (e.g. we can now also get a subsidy for changing to a Phase Seven exhaust standard petrol-powered motorcycle) as the direction of development (SMAT, 2020).

Interviewee S said that when promoting electric motorcycles, the market is also constantly introducing new petrol-powered motorcycles. She even thought that new petrol-powered motorcycles have more choices, plus they can also receive subsidies. This situation makes her feel very confused. Even some people did not even know that this policy was started. This shows that the communication at the beginning of the policy implementation is unclear, the transparency in the implementing process is vague, and the flow of information provided to the public is low. The final result of cancellation shows the policy lacks consistency in execution. Findings also showed that respondents pointed out that the reason for the cancellation of the 2035 policy could possibly be related to the political motives behind it (e.g. to draw voters in the next year's election), and some respondents were not even surprised that the policy was cancelled. These all illustrate the lack of credibility of the policy implementation.

There are several online platforms that provide policy-makers and the public to have conversations in Taiwan, such as Join (a government online platform that gathers public's proposals about matters of concern), g0v (an online platform that aims to gather the power of everyone to bring changes to society; everyone can contribute on this online platform to initiate projects on public issues) or vTaiwan (a digital regulatory adjustment platform that allows people from different disciplines to contribute policies and law-making) (Tang, 2019). Although as yet no topics have been raised on these platforms regarding low-carbon transport transition justice for the practice of motorcycles, these deliberative platforms would be a good opportunity to bring the viewpoints of practitioners from my research findings into the policy process to support future policymaking or adjustments.

From the perspective of environmental pragmatism and recommendation for policies, continuous adjustment of a policy is inevitable because of society's complexity and rapid changes. As interviewee F said in the findings, it is crucial for policy-makers to keep the idea in mind that policies can always be made with adjustments. There is no perfect policy that can be achieved within a short time. In the process of policy implementation, making adjustments and improvements whenever needed will have more progress than directly cancelling a policy. Through interviewees' responses, we can understand here that publics feel the instability in the implementation of these policies. The worries raised above will make practitioners more willing to wait until the last minute to make changes. Moreover, as soon as people start to feel that there is a lack of genuine commitment, it is hard to criticise the public for not taking the policies seriously.

The burden of socio-economic factors is the pressure that needs to be addressed regardless of transport mode. Through my interviews, I have discovered more in-depth discussions about socio-economic pressure than setting a specific factor such as high or low incomes which was utilised in Chen and Lai's (2011) research model. In addition to the fact that the cost of petrol-powered motorcycles is lower than cars, the long-term comparisons of taking public transport or riding electric motorcycles are also relatively expensive to practitioners. These are the experiences given by the respondents (e.g. Interviewee T, Interviewee W and Interviewee F). In Chen and Lai's (2011) research, they conclude that low-income households are more likely to choose low-cost motorcycle riding. According to this, if the post-transition travel mode is relatively burdensome for lower-income families, which can be categorised as 'mobility poor' as per Sheller (2018), it could be a more stressful choice for them.

Moreover, it is not only the price of the transport mode that will be crucial for these mobility poor. The new competencies required for new technology transport methods could also be a threshold. Changing to electric motorcycles may not involve merely changing a vehicle, there are investments that the practitioners need to invest in making a change. For example, electric motorcycle users need to have a mobile phone device and data package to connect their electric motorcycles or battery swapping stations; if more investments are required to change to an electric system, this could become prohibitive to poorer people. Most of the ' mobility poor' could be referred to as those relatively disadvantaged groups in terms of socio-economic inequality - they may have lower incomes or young adults just starting to work, or elderly people. This characteristic also shows that they may have less power to voice for themselves

and choose under the current societal framework. Not to mention knowing what platform they could utilise or what approach they could know to adopt to deal with the low-carbon transport transition obstacles and difficulties. Furthermore, in addition to poorer groups, traditional motorcycle industry workers also need to retrain and acquire new competencies for maintaining electric motorcycles, so that their jobs will not be eliminated in the entire industrial transformation.

The cheap oil price and energy under the nation's larger structure was also mentioned by the interviewees, but Chen and Lai's (2011) research did not discuss much of this. Mobility poor people are more likely to be affected and excluded in the low-carbon transport transition (Henderson, 2020; Sheller, 2018). According to my findings, whether it is before the low-carbon transport transition that the petrol-powered motorcycle riders are more likely to be exposed to air pollution, urban heat, or moving through compressed spaces, or if they are forced to change after the transition in the end, they will have difficulties affording and adapting the new low-carbon transport mode. As a result, they can easily fall into social exclusion, and then this might affect their daily routine and everyday demands.

Furthermore, it is unfair to direct urban air pollution solely to the problem of petrol-burning motorcycles. After all, riders are the closest to the exhaust pipes, and they are exposed for a longer time to dirty air and pollutants than other vehicle users. Therefore, they have a deeper feeling about air pollution. Theme Four discussed the impact of air pollution on many interviewees while travelling and their experiences of it, especially when they were in the middle of rush-hour traffic. Most of the interviewees felt deeply about the famous image of Taipei Bridge's 'motorcycle waterfall'. These unpleasant experiences and their positive perspectives towards related policies all stated that they might travel more comfortably if they had other better choices. Other transport users might have relatively little experience of air quality compared to these motorcycle riders. For example, for car users, these pollution sources are blocked outside their car windows. This is like the interviewees talking about many environmental problems in Theme Four where factory pollution is distanced from the city, which means people have less direct experience of the pollution, so it can cause them to pay less attention.

However, linking back to what Henderson (2020) argues – it is the least empowered people in society who may continue to rely on older forms of transport. It may be difficult for these

mobility poor to worry about environmental issues because it is not the most immediate issue they face in their daily lives, even if they think the environment is very important. From a bottom-up practitioner's angle for instance, Interviewee A mentioned that she feels that environmental issues are too far away for her; Interviewee C said that it will be difficult for ordinary office workers to act while the policy encourages an environmentally friendly lifestyle since their salary is limited. These points all show again that whether it is in Taiwan's current transport policy, environmental policy, or environmental issues, motorcycle riders seem likely to be already regarded as an excluded group. Therefore, answering my final research aim, which is to examine inclusion for motorcycle riders during the low-carbon transport transition progress, it is crucial to give them voices. Their value-action gap may often be due to the few choices they can afford. Even if the government wants to invest heavily in electric motorcycles, bearing in mind Henderson (2020) and Sheller (2018) and the findings from this study, it is critical not to ignore the rights and interests of the mobility poor, in this case motorcycle riders, in the process of transition.

6.5 Contribution to social practice theory

While discussing practice change, the mechanism of how practices change seems to be presented in existing literature with a linear way of thinking. This mechanism of change is undoubtedly helpful for understanding how to shift practices, however as in Section 6.3, based on my findings I propose a different way of understanding the mechanism for practice change which combines Watson (2012) and Spurling et al. (2013). I also use this to construct a blueprint for a shifting electric motorcycle practice. I argue that there is a need to understand the intrinsic value and the dynamics between the three elements of practice (material, meaning and competence see Figure 3.2) that are shifting. Firstly, while utilising social practice change mechanism to help a practice change, apart from seeking the implementation of new materials, meanings, and competencies for the new practice, we should also ask whether the three core elements of the new practices are worthwhile for practitioners to change. Take changing to a low-carbon transport system for instance, of the kind focused on in my thesis. Taiwan is focusing on persuading petrol-powered motorcycle riders to shift to either (a) an electric motorcycle system or (b) the public transport system. It is important to consider whether the elements (e.g., materials – electric motorcycles; meanings – environmentally friendly riding ways; competences – skills in using technology products) in these two post-change systems worthwhile for the petrol-powered motorcycle practitioners to give up their

connections to the old practices. It is also important to consider whether riders would have to sacrifice a lot to make it happen, or if they would actually suffer more if they do not change.

This finding shows that having a clear and commonly-agreed core understanding of what change involves is important for both the practitioners who continue with old practices, and the practitioners who have changed to a newer practice. Belittling the existing/old practice (such as stating petrol-powered motorcycles are the prime culprit of urban air pollution) to promote or praise new practices (such as stating that electric motorcycles are more environmentally friendly) runs the danger of bringing negative perceptions to practitioners and might lead to an opposite effect whereby those continuing with the old practice actually become more resistant to change. It is imperative for policymakers to slow down and ask what is the purpose of the new practices for society, and how can the new practice be designed and communicated in a way that makes it valuable for the public to shift.

Secondly, a social practice theory researcher should hold the thinking that the world is continually changing, and hence that the developments of elements of practice possess this continuity and their changing processes are non-linear. Materials, meanings and competences are all essential elements but may sometimes not be in balance with one another while recruiting new or shifting practitioners. From the findings, an invisible tension could be found between these three elements. As the findings point out, some interviewees think a fabulous 'material', such as the new version of Gogoro, is the main reason pushing them to change. The other two elements - meanings and competencies – take on greater significance later on in the change process. Some interviewees think 'meanings' could accelerate them to change, whereby the promotion of electric motorcycles as an environmentally-friendly technology fascinates practitioners to change, which then leads them to start to learn new 'skills' afterwards without so much attention to the element of materials. Some interviewees think competencies could block them from changing, that they are keener to stay with a more familiar and affordable old practice and that the new skills are too hard for them to learn.

Such examples are not intended to problematise the practice-changing process, because it is too difficult to know ahead which element should be emphasised first and what circumstances could be applied to various practitioners. It is still important to implement the three elements altogether, and we can use this holistic idea to map out an initial design for the new practice from the beginning. The process of change possesses various uncertainties. Accordingly,

starting out by identifying the potential requirements for 'fit' with each element between the old practice and the new, similar to what I did in the previous section, might be a helpful start.

However, in the meantime, the elements of the new practice should be continually modified to suit the new practitioners who are being recruited. It should be noted that as well as recruiting new practitioners, there is also a need for caution as to whether it is possible for practitioners, who have changed, to return to their old practice. Therefore, a continually adjusting approach to a social practice theory should be borne in mind. The thinking of environmental pragmatism provides flexibility for the social practice theory utiliser to design the new practice for the practitioners. There is no perfect solution, but an initial approach can be created at the start and then further alterations and corrections made in response to new or changing situations that are faced along the way. Geels et al. (2016) point out that the practice-action approach could solve problems for those 'on the present', but I argue from an environmental pragmatism standpoint that the approach of continually adjusting social practice could help not only in solving the problems that exist 'now', but also the 'ongoing' issues that could lead to problems in future.

Thirdly, in existing theory on adopting social practice to low-carbon transition research, there is relatively little understanding about what practice means through the life experience of practitioners. Most of the existing literature focuses theoretically on social practice theory and how can it be utilised for low-carbon transitions (e.g. Spurling, 2020; Watson, 2012). Research which does interact with practitioners from the perspective of bottom-up understanding is often undertaken to discuss the feasibility of a low-carbon practice transition by observing individuals' behaviour (Hargreaves, 2011). My findings can supplement and link these areas of research with practitioners' perspectives of new and old practices, where understanding of practitioners' lived experiences can be used to construct a more suitable new practice. My findings can supplement and link these areas of research with practitioners' perspectives of new and old practices, where understanding of practitioners' lived experiences can be used to construct a more suitable new practice. Because practitioners are users of the practice, their experiences and viewpoints are crucial to shaping the reality of new practice in a way that could respond to my research aims on understanding the social and cultural context of motorcycle culture in Taiwan, exploring the disconnect between motorcycle practitioners and the Taiwanese government's goals for low-carbon transport transition and seeking a just low-carbon transport transition for the motorcycle practitioners. A crucial point to note is the idea

that change is from practice A to practice B, and that the transition is the process. Giving more consideration and emphasis to the process of practice change may thus help to enhance the prospect of a fair and just transition. One role of practitioners is thus to be able to provide an important source of knowledge required for the transition process.

Lastly, an interesting point is that the interviewees were not surprised about the cancellation of Taiwan's 2035 policy for petrol-powered motorcycle phase-out, even though the cancellation surprised me. For a practice to be carried out, as well as enough numbers of practitioners, it also needs a supporting context. My findings indicate that most of the interviewees were not surprised by the cancellation of the 2035 policy, and that they were 'used to' unstable policy implementation due to political factors. In addition to showing that the 2035 policy lacks continuity across the formulation of new practices, my results also therefore suggest that the support and stability of policies are essential elements that any practice needs in addition to Shove et al.'s (2012) three practice elements. If the objective of policy at government level is to phase-out or transition environmentally-harmful practices, there is thus a need for decision-makers tasked with environmental policy to recognise that social practice design can yield valuable and practical insights into what a transition means in reality, but also that these changes in practice need to be supported by a stable or consistent policy environment. Practitioners can respond to changing or shifting policies, as long as these are logical, consistent and incremental in nature.

6.6 Conclusion

In this chapter, my discussion started from the in-depth understanding of the meanings of the practice of Taiwan's motorcycle culture, the changes of practices under a theoretical framework based on the theory of practice, and the final focus on the social inclusion for the motorcycle riders in the entire low-carbon transport transition progress. I also pointed out any injustice that might be overlooked for the Taiwanese motorcycle riders, whether it is in policy, research or debates on environmental issues. I continue making connections and flows of understanding from a bottom-up angle between individuals and large systems. I emphasise that the low-carbon transport transition is integrated as a whole. It is impossible to design a 'pretty' or 'one size fits all' policy without considering the meanings between the users and the practice. Moreover, it is crucial that the condition of practitioners should be considered. If their condition is still far from being 'ready' to transition to low-carbon mobility, the top-down

policy implementation will fail to help the entire system to move forward together. On the other hand, it is possible that a clear policy decision may drag practitioners to move forward, and a rebound may occur in any progress after or even during the transition. I raise several points to social practice theory to low-carbon transition that changing is nonlinear and it has complexity in it that requires constant adjustments to achieve what social reality requires. I also supplement this conceptual engagement with practice with a bottom-up understanding through qualitative in-depth interviews of practitioners' lived experiences. I show from my findings that attention to practitioners' lived experiences is useful for policymakers and transport designers to understand and construct a practice that people need in reality, instead of planning a transition in a way that is based on false or wrong assumptions about what matters to practitioners.

Through interviewees' perspectives on the cancellation of the 2035 policy in a short period of time after implementation, the interviewees' responses can reflect the importance of the policy's trustworthiness, transparency and consistency. The lack of communication of policy implementation at the beginning will lead to a high risk of unsustainable policy results. A fair process also needs the opinions and participation of practitioners. After all, they will be the executors of every new system, and their viewpoints are critical for policy design. Decision-makers also have to give prior consideration of social inclusion and equality to provide a firm and stable source of confidence for the practitioners in the transition process, and reduce practitioners' hesitation in the process of transition. There is a need to ensure the practitioners of the motorcycle practice, especially those who are mobility poor, possess the power to make a voice and choose during the process of the low-carbon transport transition.

Chapter 7. Conclusions

With the increasing demand for mobility, Taiwanese society began to rely on the use of motorcycles in the 1960s, and the industrial development of motorcycles has gradually flourished with Taiwan's economic growth. After the use of motorcycles began to spread, it has slowly evolved into the most normal travel mode for Taiwanese people. However, even if motorcycles are very popular, the discourse and 'labels' on motorcycles in Taiwanese society are more inclined to negative issues such as traffic safety, mobile source air pollution, noise, or poor city appearance. As seen in the interviewees' views presented in the Findings chapter, motorcycle riders admit that these 'situations' of motorcycles do exist, but their existence is not a 'problem' for them. As listed in the Discussion chapter, there are many significant aspects of Taiwanese motorcycle culture. Its meanings do not only deepen the connection between the rider themselves and the vehicles, but also inherently complete the meaning of mobility for practitioners, moving for commuting, travelling with friends, or simply moving freely. These meanings consolidate the motorcycle culture and the existence of motorcycles.

In addition to the significance of motorcycle culture mentioned above, regardless of the distance of travel, the demand for mobility means motorcycle riders need to keep practising this practice to maintain their daily requirements. Therefore, the policy implementation of switching from petrol-powered motorcycles to electric motorcycles is relatively less stressful for practitioners in their behavioural change, compared to changing to other public transport services. They can also continue to maintain most of the meanings they possess in the motorcycle culture. The utilisation of 'most of the meanings' here is because there are some meanings associated with petrol-powered vehicles which the electric vehicles cannot easily replace. For example, some people enjoy the sound of petrol-powered vehicles or the smell of petrol. Therefore, there will be a higher possibility of an instant result for the policy-makers to reduce the mobile source pollution in urban areas by promoting petrol-powered motorcycle users to become electric motorcycle riders. Most policy or research perspectives are based on presenting the long-standing habits of petrol-powered motorcycle riders as 'barriers' that should be changed during a low-carbon transport transition. However, when thinking about this issue from the practitioners' perspective, we can see there are many challenges during the change process for motorcycle riders. How to help motorcycle riders reduce the difficulty while facing these challenges can be the starting point for policy-makers when setting out a plan. It will also make practitioners feel they have been understood.

Therefore, for the low-carbon transport transition for petrol-powered motorcycles, policy promotion, persuasion, incentives, subsidies, carbon emission restrictions, or green transport infrastructure construction, are all inclined to top-down implementation aspects. In the existing literature, most of the focus is similar to this top-down policy direction, except Chang's (2019) systemic transition for petrol-powered motorcycle regime which aims not to place too much responsibility on motorcycle riders' individual-level change. Although my utilisation of practice theory on this issue may discuss transitions from the perspective of small doings, the social and cultural context constructed from these small daily practical experiences of motorcycle practitioners is also the most in line with real life and which can echo back to my first research aim. Perhaps a focus on practice can provide a different perspective to observe the motorcycle issue. The participants' lived experiences help shape Taiwan's motorcycle culture deeply rooted in Taiwan; this significance cannot be taken for granted. Suppose the existence of motorcycle culture is taken for granted in the policy planning process. In that case, it may be overlooked or viewed as an obstacle to building a low-carbon transport society from the perspective of policy-makers. Based on this assumption, it could be believed that the difficulty for low-carbon transport transition is purely relying on the willingness of individual-level restriction. It could even be thought that it is difficult for a low-carbon transition to happen if people are not willing to change. In this way, while the significant meanings in practices for practitioners were erased during the promotion process, and they still are asked to make changes, it could easily lead to a backlash.

I emphasise that the purpose of my study on the significance of Taiwan's motorcycle culture is not to find ways to shake the foundation of this culture in order to achieve the goal of low-carbon transport transition, but rather to make policy-makers understand the importance of this culture through a bottom-up perspective. The aim is to provide decision-makers with understanding, so that when designing low-carbon transport transition for motorcycles, they can also take into account what essential factors other than economic development or personal behaviour change considerations that might keep people maintaining this practice to constitute their daily needs or concerns, and then go on to think how low-carbon transport systems can be designed. However, as I mentioned above, the discourse about motorcycle culture in the eyes of current decision-makers seems easily connected to the aforementioned negative images, whereby the policy-makers design or set goals under this preconceived idea. Here, I would like to return to my second research question: does Taiwan's aspiration for motorcycles' low-carbon transport transition align with motorcycle riders' perceptions?

From the interviewees' perspectives, although many of them are confused or not clear about the details of the 2035 policy, most of them have a positive attitude towards implementing a low-carbon transport policy to reduce air pollution in urban areas. Because they are usually the easiest group of people to get exposed to air pollutants when they are riding motorcycles, it is good for them if the air quality in their travel environment is improved. Besides, the respondents who have not changed have reservations about the transformation, and are hoping to wait for the entire electric motorcycle system and the market to stabilise before considering replacement. However, even if they have no intention to change at present, interviewees all reveal that they would still make that change if it became mandatory. Examining these aspects implies the interviewees' uncertainty and lack of confidence in current policies and lower-carbon transport systems. This can also be seen in the practitioners' actual behaviour, revealing one of the important factors why most people choose to wait and see before committing to changing to an electric motorcycle. Nevertheless, even though the respondents show their awareness of environmental issues, no further actions are taken, which can be linked to the 'value and action gap'. However, according to the findings, the important factors affecting the change of motorcycle riders may not only be the internal habitual behaviour that previous research points out, but also the influence of unstable external policy implementation. In addition to the habitual factor, many studies or government reports may conclude that low public willingness to change to electric motorcycles is due to poor performance, high cost, and insufficient networks. Yet, based on my findings, the unstable policies have profoundly affected people's willingness to make a change. The abrupt cancellation of the 2035 policy is a testament to the respondents' concerns. Nonetheless, this influential factor seems to be easily hidden behind the value-action gap of practitioners' low-carbon transition.

To sum up the contributions of my research, theoretically and conceptually, I provide a case study from a non-Western context, different from the primary focus on cars in the field of mobility and sustainability, which discusses the low-carbon transport transition of the more popular motorcycle daily travel mode in Asian countries. Furthermore, most existing research focuses on industrial development or motorcycle riders' travel behaviour changes in Taiwan. I provide a bottom-up social practice research understanding from a practice perspective. In terms of contribution in research methods, I provide a qualitative approach with open-ended in-depth discussions with motorcycle practitioners, which is relatively less quantitative compared to the existing questionnaires or government surveys related to motorcycle issues,

but with findings shaped through participants' narratives about the significance meanings with a deeper and broader understanding of the role of motorcycle riders in the process of low-carbon transport transition in Taiwan. This approach illuminates the motorcycle culture that may be taken for granted and neglected in previous governmental or research discourses. Moreover, the difficulties in the low-carbon transport transition of motorcycles could be similarly applied to the low-carbon transport transition for cars. I argue that social practice theory users should hold the thought, grounded in environmental pragmatism, that a low-carbon transition is nonlinear and that it is central and normal for the practice designers to adjust when they face emerging problems. As long as practice designers have a firm and focused attitude toward making a practice change, with a clear and consistent goal, then practitioners may be able and willing to accept incremental changes or adjustments in policies in the short- to medium term.

Practically, from my research Taipei's example can be an example to other places in Taiwan to learn from. A well-developed public transport system can indeed help people reduce the use of private vehicles. However, because of Taiwan's long-developed motorcycle culture, it would be not enough to only focus on increasing green transportation infrastructure. The design of green transportation infrastructure also needs to consider thoroughly about the access of people and should pay attention to reducing the chance of letting any groups of people fall into social exclusion at the beginning of the design. This is important for our current technology-oriented low-carbon transport modes, no matter whether it is electric vehicles or public transport systems. Questions may be asked as to whether all of the public can have access to learn and use electric vehicles, or if the shared mobility of electric motorcycles implemented in Taipei may require people to have internet allowance on their mobile phone devices to connect the shared vehicles. How could the groups of people without internet access or even mobile phones respond to this well-intentioned measure? Furthermore, the mixed traffic mode has compressed the riding space of the motorcycles. The uncomfortable movement, risky riding environment and exposure to air pollution have repeatedly shown that the group of motorcycle riders is relatively disadvantaged as a traveller in Taiwan, and that this gives a huge group of disadvantaged people given how many motorcycle riders there are in Taiwan. With such a large number of vulnerable practitioners, we can link back to my final research aim, which is to ask if the transition can be carried in a just way. We can foresee that it is challenging for both the policy-makers and the practitioners to make a low-carbon transport transition happen, which is a complicated issue with various voices that need to be

heard. Therefore, it is vital to incorporate considerations at all aspects to increase the flexibility of policy designs.

According to my findings, the example of Taiwan's 2035 policy can provide a lesson to other Asian countries, which also have a large number of motorcycles, that promoting any low-carbon transport transition policy should be aware to avoid insufficient communication and lack of transparency. Moreover, if the decision-making and execution process lacks continuity, this often increases confusion about the transition that practitioners face. There are many complex factors that could intervene in the possibility of a low-carbon transition from social, cultural, economic or political influences at all levels. Therefore, the decision-making process requires careful and comprehensive consideration, but the primary concern should be a just transition for practitioners. While many countries are settling targets and are eager to stop selling petrol-powered vehicles, how many practitioners can speak out about the importance of their lived experiences and different transition challenges in this low-carbon transition wave? How many challenges that the practitioners face during transitions can be taken into consideration by policy-makers? Making a low-carbon transition happen is difficult and is impossible to be painless, but to consider how to design to minimise the challenges for the practitioners during the low-carbon transition process, the role of decision-makers is crucial. The implementation of policies must remain as neutral as possible and be careful not to be swayed by political, social, and economic factors. Although holding a neutral attitude from policy-makers in practice may be too ideal, only a broad-based perspective can make a durable and long-lasting policy implementation.

As Geels et al. (2016) emphasise, a low-carbon transition has to happen across multiple scales, and thus is very difficult to make a transition happen successfully only through one dimension/discipline/ group of people. Liu and Chao (2022) also point out that the coordination between related ministries in Taiwan regarding the low-carbon transition is weak. My research proposes a nuanced bottom-up angle, which lowers the emphasis on responsibility for motorcycle riders in Taiwan's case and strongly suggests that researchers and policy-makers communicate and work together to understand a much broader range of aspects of low-carbon transitions. Decision-makers and transport designers also have their considerations and difficulties; thus, this illustrates the importance of cooperation, communication and mutual understanding. It is not either a top-down or a bottom-up approach that needs to be adopted to keep practitioners' mobility (in every dimension such as

travel, accessibility, and access to information) in daily life while experiencing a low-carbon transport transitions, but a combination of both. A combined approach of this nature is also crucial for increasing the mobile interactions, connections and communications between government, scholars and urban designers.

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Appendix I Full details of interviewees

Interview number	Interviewee code	Gender	Age	Riding age	Petrol-powered motorcycle	Electric motorycycle	Public transport	Interview date		Interview venue
1	H	Male	37	18	V			21/03/2019		Interviewees' office
	W	Female	29	8			V			
2	N	Male	55+	30+		V		27/03/2019		Interviewees' shop
	E	Female	55+	30		V				
3	C	Male	43	25		V		14/03/2019		Coffee Shop
4	L	Male	39	21		V		20/03/2019		Interviewee's office
5	B	Male	29	10		V		25/03/2019		Interviewees' home
	P	Female	31	12	V					
6	M	Female	57	34	V			25/03/2019		Interviewee's home
7	F	Male	31	15+		V		21/03/2019		Interviewee's office
8	J	Male	30	3	V			27/03/2019		Coffee Shop
9	S	Female	35	17	V			14/03/2019	20/03/2019	Interviewee's office
10	D	Male	21	3	V			14/03/2019		Inrerviewee's office
11	A	Female	29	7			V	14/03/2019		Coffee Shop
12	Y	Female	25	8	V			22/03/2019		Coffee Shop
13	G	Male	22	4	V			21/03/2019		Interviewees' office
	I	Male	22	4			V			
	K	Female	22	4			V			
	Q	Female	28	10			V			
14	T	Male	31	12		V		25/03/2019		Coffee Shop
15	O	Male	40+	20+	V			29/03/2019		Interviewee's shop

25/03/2019(一)
Interviewer: Z
Interviewee: T (31，博士生)
Interviewee T's friend: P
PART I

Z：你騎[電動車]的目的是甚麼？

T：要換的契機當然是那個，舊的油車剛好壞掉，就是準備快壞了，就是老闆...就是機車行的老闆也跟你講說 可能再騎不久你這台車就準備應該要淘汰了，然後就是剛好，就主要是這個原因啦，然後在挑選的時候就想說如果自己一台機車如果 10 年內你還在騎油車的話，好像...會有種這東西在 16 年後就要準備被淘汰了，那在在接下來 10 年左右都在使用這台車，還騎油車的話好像會有點 low low 的這樣子哈哈

Z：所以你那時候就已經知道 2035 政策的目標是想要換成電動車嗎？還是？

T：對，我大概知道政府的這個政策所以我才會想說...因為我原本還是想要考慮油車啦，因為我通勤距離很長，然後我想說電動車可能會有些...

Z：你都從哪裡騎到哪裡？

T：新莊騎到三峽，每天將近 40 公里來回

Z：這樣大概多久？

T：一趟大概 30 分鐘吧，恩，然後就原本想挑油車可是因為在政府補助之下其實電動車的價格跟油車其實差不多，甚至有些更低

Z：你是哪裡人？

T：喔我是苗栗人，可是我是找桃園朋友買的哈哈哈，對，所以那個價格真的是會比油車更低

Z：你是買幾代的？

T：我是買 S2 的，然後就是同樣都六萬多塊可能買到油車反而是一般就是比較基本的，就是也不是那種馬力比較好或是性能比較好的車，所以去試騎之後還是覺得好像電動車在那個價格上的表現好像真的還是好很多，所以就是除了車子本身價格之外還有政府政策吧，就這幾個面向

Z：你之前油車騎多久了？

T：你說那台車的壽命還是我自己騎那一台？

Z：你自己騎車

T：12 年吧

Z：我到現在還沒有機車駕照，滿常發現大家其實年紀到了就考一考然後開始騎車，你也是這樣嗎?

T：對啊，就 18 歲過了就馬上去考

Z：我那天問到一個他就是 18 歲生日當天早上請假去考的哈哈

T：沒有，我是隔了一個月之後才去考的呵呵呵

Z：因為有些人說他需要才會去考起來

T：可是我覺得一旦離開都會地區應該都是 18 歲就會去考吧，因為移動距離或是⋯就是沒有像台北這麼方便的時候，就一定都要騎車啊，家裡一定都是這樣

Z：但台北的方便也沒有讓你就是[改成只搭大眾運輸工具]？

T：痾...我覺得那個成本更高，

Z：成本更高是不是，所以相比起來所以講起來是其實油價比較便宜嗎？

T：油價比較便宜？

Z：如果你比起來的話你要每天搭大眾運輸交通工具跟...

T：痾…你是說如果加買車還有加油價或電費之類的跟搭車成本比嗎？

Z：你單純騎車的油錢，如果價錢是你衡量的點的話

T：當然是自己有交通工具是比較省錢的啊，因為大眾運輸大概我通勤距離大概就是 1 天要 100 塊左右，就是不是不是用學生悠遊卡的話就是一天大概 100 塊，我覺得那成本有點高，那自己騎車就是真的是少很多再來就是兩者時間真的差異蠻大的，就一個你單趟就要 1 小時以上，1 小時 10 分 15 分，然後來回就將近兩個多小時了，兩個半小時了

Z：你騎車整個少了一半的時間耶

T：就是大概一個小時左右啊，其實這真的是我的考量，可是這是從比較都市中心到郊區的這個通勤吧，

Z：那你知道這個 2035 年的政策其實最近又在？

T：喔，我有注意到，但這應該是跟選舉有關吧[笑]

Z：對呀，但長期來說之後走向、趨勢還是會往電動的或者是…就是怎麼講"低碳"的交通這個方式，那你對這樣子的趨勢，你的想法是？

T：痾…因為自己多少都應該是學過這個或念過這個，所以當然會想說如果自己生活習慣也是跟低碳有關的話可能會比較好，可是可是你仔細去想的時候發現你在用電動車的時候你還是在用電吶，你在用電的時候你還是在燒煤啊，其實我也不知道說跟你燒汽油的哪個製造的污染或消耗的能量是比較大的，我覺得這個好像就是電動車公司好像應該去討論這個東西，可是我會覺得說痾怎麼講，就是我覺得這個東西應該比較，我也不覺得說使用電動車真的是會比較低碳環保，可是就自己騎乘個人的心理來講會覺得說好像真的有呼應到低碳這件事情，或是說欸我也不用製造什麼廢氣給人家聞這樣，我覺得這可能是…痾…低碳無法比較可是我覺得在其他環保上還是有一點吸引人的地方，或是讓我想要買車的這個決定這樣

Z：所以你一開始決定你是有想到這一點的是不是？喔他可能低碳或是比較環保還是你在騎起來的時後才覺得它沒有在排放一些...

T：應該是說本來就知道，可是我真的不太認同它真的一定會比較低碳 7:58

Z：那我想要問一下，因為其實滿多時候是一開始會覺得電動車很像比較環保，但後來會漸漸發現說喔其實它也是在用電，就是這個想法是你買之前就有考慮到的還是？

T：痾…買之前就有考慮到耶，就不知道這可能是一個假的行銷方式吧，因為不就是打著環保就可以做很多商業行為嗎，其實就是這樣[笑]

Z：你大概騎多久電動車了？

T：應該是第三個禮拜吧哈哈哈

Z：所以到目前為止適應得還…騎起來？

T：哪方面的適應?你說對車子的適應嗎？

Z：聽說剛開始起步需要適應一下？

T：痾…我覺得適應是…欸怎麼講…我覺得從油車換到電動車適應可能是真的需要兩三個禮拜時間吧，就是因為過去都是用油車的騎乘方式，就好像會比較謹慎一點，然後可是換到電動車的時候，它其實爆發力蠻強的，所以其實看著別人都可以吃直接馬上衝出去鑽來鑽去，我覺得好像蠻厲害了，可是目前好像不至於這樣子

P：你知道它可以換模式嗎？

T：我知道可以換模式啊，可是換了模式之後自己好像也

P：不敢衝出去是不是

T：就是還沒有這麼大膽的衝出去，可是漸漸在上手當中

Z：我有個疑問，他們的維修方式是？是需要先預約嗎？

T：對，是需要預約，對，如果是有狀況的話應該是要打拖吊吧哈哈哈，就像他們現在有推那個兆豐銀行信用卡，他其實就會送你免費每年兩次的就是如果你在路上遇到狀況的話，就道路救援之類的

Z：小狀況呢？

T：目前我還沒遇到哈哈

Z：你要遇到了才去看怎麼處理這件事嗎

T：好險你提醒我這一點哈哈哈，可是因為像我上禮拜用電上面顯示大概 10 公里可以騎乘的距離，那個電量大概可以再騎 10 公里，可是我傍晚在牽車的時候發現我發不動了，所以就必須...我當下因為它有鎖龍頭，所以我也沒辦法牽車去維修還幹嘛，然後就是我覺得他們的客服務或業務算是這方面還不錯，就是會一直跟業務保持關係，然後會馬上幫你解決問題，目前遇到的小狀況可能就這樣，我覺得可能業務真的是訓練得蠻好的

Z：他們的電池…那叫電池站嗎還是充電站？

T：換電站

Z：他是加油站都有了嗎？因為我其實看到滿多加油站有的，我在台中鄉下也有看到換電站

T：他現在就是在很多便利商店或全聯或是中油其實都結合了

Z：所以你這樣子換起來你還覺得算方便的？

T：我覺得比自己去加油還方便內[笑]

Z：那出了台北市或者是出了新北？目前有騎著它出去？

T：沒有，目前還沒有，但買這台車應該也不會想要騎太遠吧，可是雖然說目前已經可以環島了，可是你還是會受限於那個電池電量然後走一定的路線，就像我本身是苗栗人，然後我那邊也有換電站，可是如果說我回苗栗然後叫我買電動車我可能沒辦法，因為他沒有維修中心，也沒有展示的就是銷售的地方，所以就遇到問題我沒有辦法解決，就只能單純充電而已換電而已，恩，所以這種車目前來講應該還是對都市是比較方便的吧

Z：這項政策或這個議題來說，例如移動性汙染源，空污這件事，有些騎油車的會覺得他們被針對了，那你之前也騎過油車你會覺得…

T：你會覺得這個政策是針對他們嗎？

Z：恩恩

T：恩，我個人是覺得在都市裡面這麼多的機車把它當成是空氣污染的兇手好像也不對[笑]，這是我覺得它不是真正構成空氣汙染的兇手辣，恩，只是政府想要找最…應該說可能是最一般民眾的事情小事去開刀啊，可是我覺得那個效益感覺好像不大耶

Z：這樣說起來，你會覺得台灣的機車文化是一個特色還是是個問題?

T：因為我平常都在騎所以我不會覺得他是問題耶[笑]

Z：我滿常問到像這樣，因為如果像越南的話，他們覺得說很像太多機車看起來整個城市市容不夠[整齊]…[而且]越南 2030 要禁機車

T：可是這同時之間都市的交通工具應該要跟得上接的上，那如果沒有機車的話就要汽車嗎或是腳踏車嗎?可是如果說這城市如果沒有你的機能就是生活機能、工作跟居住都要分得這麼散的話，可是我覺得這可能是台灣本身已經很習慣這個生活模式了，就是我可以住遠一點我騎機車也比較好找車位，然後速度也比較快，所以這個大家都越來越習慣，應該說這是一個習慣吧

Z：像你說是習慣了這個模式，那…我單純問交通工具好了，機車對你來說算是單純的代步工具，還是你會覺得你跟它很有感情？

T：痾…小時候可能會覺得有感情，長大之後[笑]就會覺得反而就是我每天通勤的工具，可是就像我現在住在新莊那裡就是六月底之後，可能會有一個捷運站開通，坦白講我到三峽如果要上班的話上課的話，其實我覺得是相對會變得更方便，而且時間可能會減少一點，欸！可是我為什麼要講這個呢哈哈哈，你剛剛問題是甚麼[笑]

Z：[笑]我剛問你機車對你來說是單純代步工具還是？

T：喔喔喔，我想到了，可是雖然交通建設有改善，可是整體而言就是所有的捷運都還在蓋，然後你的公車或捷運也不是你想到哪裡就可以把你搭到哪裡載到哪裡，那可能除了平常想要就是平常通勤之外你偶爾也會想要去遠一點的地方或是你沒有去過的地方或是交通很難到達的地方，所以這個誘因還是會讓我想要有自己的私人運具這樣

Z：我會這麼問是因為一位受訪者她幫她的機車起了一個

T：小名嗎？

Z：對，然後她要報廢之前還幫它錄了最後一段影片

T：可是我覺得很多人都會這樣耶

Z：我訪談到目前為止還好耶，她是女生，我問到男生多半會回我就是交通工具呀，但我本來以為對車子的熱情在男生身上會發現比較多

T：可是你問到的是在都是台北人嗎？

Z：都有

T：因為我就會覺得說…就是我的機車陪我走過很多上山下海的地方，我會覺得要把它淘汰掉還是會有點難過

Z：不過可能問到不是台北人的，就有些車是家裡車的或者是…

T：就是共用這樣

Z：那我們剛剛其實有聊到環保的這個議題，那我想要知道你個人的…這一題比較…比如說你個人的環境價值觀

T：恩…我覺得在教育的過程中好像有點被洗腦環境是很重要的，可是其實自己在自己生活行為上好像也不是事事能兼顧到這件事情，就就就像如果真的要走到很極端值的話，那我真的就是步行或腳踏車，可是，可是你有時候真的就是生活的時候，或是你你不想要讓自己的移動方式這麼辛苦的時候，你所選擇的行為總是會對你的環境有負荷負擔，所以說自己多重視那個環境價值，痾…這樣好像有點在告解的感覺[笑]就是我會覺得…就是雖然我會覺得很重要可是當我選擇就是其他的生活方式的時候，我不會這麼明白的跟你講說或很大膽跟人家講說，環境是最重要的，環境價值高過於什麼，我覺得我會…以前可能在學校可以講啦，但是我覺得現在出社會或是你選擇一些生活方式你可能有時候會想要過一點奢華的生活，然後你對用水用電或是消耗能源這一塊其實你真的不見得真的是對環境是好的，所以就是低調一點就好了哈哈哈，我現在是這樣想啦，可是…痾…可是要跟人家就是如果下一代的話還是要跟他講說環境是重要的，因為我覺得就是你要讓人家在心裡有這一個東西，在做什麼事情的時候會反思，然後或者說就算你想要選擇一些不一樣的生活方式，可是你會還是會稍微顧慮一下，而不是一直走向極端的那種生活，應該是這樣吧，目前想到是這樣。

PART II

T：我目前覺得以 Gogoro 來講的話，我覺得換電站在都市地區真的是，我覺得蠻足夠的耶，就是或是維修中心其實我覺得也不會預約不到，因為通常都要預約，就是我目前就是…因為我還沒進維修，可是我偶爾會看一下說，痾…目前的維修跟預約大概要提早幾天或是提早多久預約，目前看起來是如果近一點的地方沒有的話，稍微遠一點的地方都會有，或是說換電站我也覺得它其實不斷地在擴充，我也覺得…會發現有幾個點就是它的滿電的電池其實一直都很多，不會讓你覺得就是到哪裡都沒了，我反而覺得目前這應該是 OK 我覺得是 OK 啦，可是如果像今年六月還是七月的時候會再加入 YAMAHA 或 PTO 宏嘉騰之類的，如果這些這些傳統機車廠推出電動車，他可能這些數量變多的時候，我不確定真的會不會夠啦，可是目前只有 Gogoro 寡占這個市場的話，我覺得還蠻足夠的，就都市地區啦，北北桃，我覺得蠻 OK 的

Z：我覺得滿特別的一點是，像你已經換這個模式了，像你覺得已經很方便，可是蠻多油車的人他們第一個考量就是:我不知道要去哪裡換、或者是他們覺得貴，但聽起來其實滿充足的

T：恩…網路上或 APP 都有，因為我在購買之前會去看說我住的附近有幾個站點，幾個站可以換電池，或是我通勤的路途當中有幾個地方可以換，我確定都有了我才會想說 OK 沒問題了，我可以買，恩，所以，我覺得那是有沒有自己去了解的問題哈哈哈，因為在購買之前我也曾經覺得說，如果我每天騎這麼長，那速度又滿快的，所以我也很怕就是騎到一半沒電怎麼辦還是甚麼的，可是當你去網頁上接觸或看論壇人家分享，或是實際去接觸業務的時候，他們都他們其實都蠻給你一個肯定的答案說沒有問題，然後自己換了之後騎起來覺得誒真的是沒有問題，就是我不會怕沒電啊，我真的不怕

沒電，所以我就覺得在一切評估之下可以放心的去買這一台車之後我就買了[笑]

Z：我不確定年長一點的，對他們來說會不會困難使用？

T：我覺得不會啊，我覺得就是我買的是一個性能比較好馬力比較好的車子，然後看到那種八加九或阿北也在騎那種車的時候，我覺得，就是有些老人也會騎 Gogoro，或是有些八加九有些小屁孩們他們也會想要騎哪種檔車什麼之類的，可是他們也會騎這種車，然後你就會覺得說…覺得說甚麼…就我覺得沒有什麼差異啊，我覺得重點是自己有沒有花時間去了解，而不是說你不去了解然後就覺得那個很多限制的感覺，

Z：不過可能也要大家要等到油車有狀況的時候，等到真的需要換的時候才會去了解…

T：可是像我最近也一直叫我弟趕快換，

Z：趁著有補助嗎還是？

T：恩，因為不是一直在說 2019 年應該是最後一年有補助嗎，然後我弟的車也 17 年 18 年了，然後我覺得要的話就趕快換這樣，所以他最近也要換這樣

P：那他車就要報廢嗎？他車是二行程的？

T：不是

Z：可是應該地方政府跟經濟部的應該還會一直有補助？

T：工業局好像說要停掉了，今年預算好像評估大概到 6 月左右，

Z：我以為是工業局要繼續是環保署要停掉

T：因為好像說原本給的預算就是那些，那因為去年到目前為止數量成長的比較快，所以那些預算會提早結束、用光，可是我現在想想應該可能不一定會結束啦，因為今年是選舉年，所以他為了要綁樁他一定還是會釋出一些優惠，恩，就像計程車也是，不是說要給他 35 萬元的補助換車嗎?所以這就是可能在選舉前會發生的事情

Z：嗯嗯嗯，所以你是念都市？

P：他念都市計畫，我們在北大認識的，我去修他們都計的課

T：沒有你是修環境規劃，對吧

P：啊我們是因為某某某[他們朋友名，此處以某某某代稱他]認識的

T：某某某也是另一個 Gogoro 車主哈哈，他之前也有做 Gogoro 的調查因為他做綠能產業的東西

P：誰

T：某某某啊，所以他之前有去訪談 Gogoro 的樣子

P：應該問他他會比較懂

Appendix III Samples of initial coding and sorting into themes in written Mandarin

Socio-cultural aspects of the environmental debate in Taiwan

Fresh findings on interviews structured by bullet points under five themes:

1. Socio-cultural context: shaped by motorcyclists' experiences
   1.1. Being mobile in Taipei and New Taipei City
      1.1.1. City transport environment
      - **A small island with high density**

         W:台灣的本身地緣遍有天氣，還有人口密集度等等的問題，所以才會有機車這麼的好用這樣子，可能在國外很冷的地方就不會想騎機車啊。

         J:我在騎車之前，就是我沒有太深刻的感觸，我只有覺得台灣是一個地狹人稠的地方，然後去過過以台北來說的話，其實你不見得需要到騎車，因為通勤的時候其實像上下班可能都自己…開車的話成本很高，一開始我的理解是這樣，但我在騎車之後我就覺得很多機車騎士沒有那麼有公德心。

      - **Convenient public transport system vs. public transport coverage is not yet enough**

         H:我遇遇再次強調在台灣現有的大眾交通工具的支撐力之下，完全沒有機車的話，對台灣來講會是個麼慘的災難。

         F:台北的大眾運輸可能年紀比我們小的人大概他們從小就這些東西，所以他們就是就去啦，然後就我覺得就我所知，台北的年輕的女生好像要坐車的比例都沒有。他們完全沒有考慮要有機車需嗎，不是說覺得用不到不需要，是連考慮都沒有考慮，就可能交通光便吧，反正就是我覺得我聽到這件事也以後發現這跟高雄比起來他們的交通的習慣可能不太一樣，我不太確定台北以外怎麼樣，不過台北交通省然算是比較早資源比較多比較早開始發展，所以台北的交通蠻的得健康啊。

         J:那如果以台北的交通，台北的捷運來說，從住的地方就是象山到內湖需要繞一大圈…尤其你在軟體周邊植圈的花不是真的離捷運站很近，所以你可能走路要走個 15 到 20 分鐘就很麻煩，所以大家就會覺得騎車更好。

         S:就台灣環境或捷運騎摩托真的是一個方便的工具，畢竟不是說所有的縣市他都有辦法像台北，因為台北的交通他就的是很發達，各式各樣的就是都可以到達你想去的地方，但我覺得這可能是城市發展的問題吧，中南部那邊你很多地方可能公車沒銜接到對，還或說你要騎摩托車或是你連至要開車，所以我覺得有摩托車啊所以是會騎車在台灣內部都就就是你要出去就跃就你要去哪就是比較方便，I:就是交通運輸又沒有很發達，然後其他地方又難你家很遠所以以跡

所以你是台南(I)對

T:對呀，就 18 歲過了就馬上去考…沒有，我是隔了一個月之後才去考的呃呃呃…可是我覺得一旦離開都會地區應該都是 18 歲就會我覺得，因為移動距離或是…就是有像台北這麼方便的時候，就一定都要騎車啊，家裡…定都是這樣…嗯嗯嗯，我想到了，可是難然交通建設有改善，可是整體而言就是所有的捷運都還在蓋，然後你的公車或捷運也不是你想到哪裡就可以把你帶到哪裡蠢到哪裡，那可能除了平常想要就是平常通勤之外你偶爾也會想要去逛一點的地方或是你沒有去過的地方或是交通很難到達的地方，所以這個聽因還是會讓我想要有自己的私人運具這樣。

      1.1.2. Natural, societal, and cultural factors
      - **Commuting demand**

         W:我是因為我有的大學在台南，所以交通沒有那麼方便，然後大家有騎機車所以就騎機車了這樣，交通不方便的原因。

         H:交通不方便啊如果沒有摩托車我沒有辦法在下課的時候移動到下一個教室[笑]

         H:我到台北就繼續騎頭，只是沒有像中山是就一個旦是生活必需品在那邊，那這邊是一個促進生活便利的工具可是他就不是必需品。

         E:不過我們住在南部都有在騎因但是有可能你上來北都還大學，高雄也需要用到摩托車比較方便，其實我們哪都是機車比較方便，因為如果像你從這裡要騎到中正紀念堂，可能我們那裡也沒有公車，台中可能要看有沒有啊，高雄就沒有，那麼近的經程沒有就是要騎摩托車不然就騎車。

         M:一開始是騎即踏車，結絕以後來走達上班的需要，上班要每天騎，以前讀書的時候搭公車，因為上班地點交通不方便。

         J:我自己本身都騎車的話都是做週末使用。

         S:因為學校在文化，在陽明山上，那時候就天天騎車。

         D:升大學通勤才開始。

      - **Weather factor**

         W:我們兩個一起騎，就怕天氣不好的時候或是個如就騎太晚公車已經過了，所以那我們就必須要騎摩托車這樣。

         H:天氣環境是影響機車很重要的東西，太冷其太熱大概也受不了，那當然我們在二三十度的這個國家機車多的地方選擇也不多嘛，所以是不是特色我覺得很關係，可是我覺得以台灣這麼高密度的比如說人口跟機車比這麼高，的確是蠻特殊的，

         L:你平常會搭大眾交通運輸工具嗎、目的？會搭捷運跟公車，原因：氣候、懶得騎的時候、下雨、或很冷的時候，或突然想走路的*

      - **Distance consideration**

2. **Awareness of government policies**

Focus shifting

2.1. **Know(13) vs. Do not know(7)知道/不知道/加不熟**

H:知道，有聽聞啊可是還沒有答案。

W:我不知道，就很像 gogoro 那種比較?。

H:就是 0 的氣啦，不過油不會製造污染，你不知道?

W:就知道就這件事情還是沒有那麼詳細 因為你比較少購啦，對啦。

(E)我們當時因為車子壞了，車也久了，我們女兒就叫我們考慮換這個，因為比較環保，那時政府也有在補助，台北很像補助 16000，桃園最多，有人會桃園有親戚帶他們考慮，人 我是想補助一萬六，跟一般的機車價錢差不多。

這部分主要是 E 在回答，不過兩人共同騎這台 Gogoro。

(J)對政策就知道要換而已，可以網路就就像有一點人，可能要找頭路這樣啊，傳統的機車行全部都要找路頭，就這樣啊，可是最換或那個還是說不能賣?

(L)不是沒有了嗎?昨天看到新聞，他們已經賣掉了，交通部長林佳龍說，這個事情已經...我昨天看到...我不知道是今天早上看到還是昨天，就是頭我覺得整個是實策嘛啊。

(B)其實找剛剛才知道你喔嗎說一般的油車也有補助那就是淘汰二行程,其實我也不知道[笑]我知道電動車補助比較多...買之後才拖的吧 我那時候有補助24000，現在好像換越少。

(M)不知道，那是最好啦，因為對空氣嗎?對啊，而且比較不會那麼少。

(F)因為那個時候我騎一台是二行程的車子，我騎一台小 50，YAMAHA 那台叫比較JOG，很經典的某啦，大概 20 年前的車，然後則好因為政府補助電動車汰舊換新，然後二行程的車補助更多，汰換二行程的車補助更多，所以就有這車子有點狀況我想說不然就來換個車子...之前其實沙滿混的，反正也很多人在抗議就算換跟沒購某啦，為什麼政府要強制啊可之類的，不過我覺得本意都是好的啦，那你要在底面對這當人的需求在麼合就調整可能就是還是需要時間吧。

(D)對，他們只買電動機車可是原本的機車沒有說不能騎。

(S)但是因為他現在政策有在改，比如說機車有分二行程四行程，然後現在可能連機油也要或化油器噴射對的，現在是噴對的，然後化油器的可能比較少，然後後下來可能就變電動的。

(D)知道

(A)還很久不會去想對，而且這件政策我也不知道。

(Y)我不知道，但我知道電動車有在推廣，沒有甚麼影響耶，就一樣可以騎車，對我來說沒有甚麼影響。

(G)知道。

(Q)真的喔?我不知道在 2035 年我只知道台中市有機條路不可以騎汽油的車。

(I)我不知道，我只知道有各種補助。

(K)不知道，我知道有在推電動。

(T)對，我大概知道政府的這個政策所以我才會想說...因為我原本還是想要考慮油車啦，因為我通勤距離很長，然後我想說電動車可能會有些...嗯，我有注意到[政策取消]，但這應該是還舉吧[笑]。

(O)所以現在政策要淘汰掉，有證時間點?二行程，對，時間點不一定吻可能到明年，應該是到明年是最後的期限...他不是不能幫他應該是說補助會結束，汰舊換新的金額會結束，阿超實他就是逐年遞減喔，你越早汰舊換新他的經實就越高，你越晚汰舊換新的經實就會給減，到什麼期限還不太確定，就是就政府那邊的金額多少...還不大確定耶，2035 年以後可能會全面都是電動化，賈電動化，可是他不等於說你 2035 年之前的車不能騎，應該是可以騎啦，你如果一次汰補民眾會反彈吶，啊大家那個時候的車價可能又比現在更高，民眾也買不起，所以他應該是遍會再延續啦只是不能取售燃油車，政策應該是這樣。我有有看到那能應第六期的(現在都第 6 期的比較環保嗎?

他不是比較環保，他是因為第六期他是要符合政府的法規要全時點燃，不是排氣，他是大燈，你白天晚上都要點燃，所以變成跟外國一樣 24 小時你只要發動大燈就馬上亮，這是六期油法規喔，五期的他不是不用點燈了嘛，就算到到第 6 期他不是說環保會比較鬆最後人他是指彼府的大燈，白天要點燈會比較安全，那五期是環保法規比較鬆人六期後是要全日點燈，

那排氣量的差別? 排氣量現在標準已經變高了，可能他遍是在維持五期排氣豐的法規，台灣其實比國際都嚴格?我們台灣是最嚴格的啊，跟國外比油規是很嚴格。

2.2. **Viewpoints of the policies**

- **Lack of relevant education, popularisation, and communication**

政府須了解機車騎士(practitioner)對此的疑惑有哪些

H:我覺得這方面的教育其實並沒有很多。

(L)當然你也可以說政府的溝通不夠，就是在道我會合上或是什麼的就不夠，不遍像者就是嗯...就是道樣，大家又縮回去了，就不用做了，就是很多我覺得類似但不多都是道樣。

(L)我覺得這個就是我覺得與問團體重要就是我跟民眾溝通完之後，政策在實施的時候才比較無痛，大家不會說就怎麼突然然這一招，就像空污法突然就出現，然後大家會覺得現在是要我換車了嘛?我記得那個時候用一個照片是老車戴著孫子，然後以後這種車子就不可以存在，靠我根本就沒有講...嬌嘛，就最長貼隨係有趣的方式，不遍總之就是有很多的攻擊點。

(S)因為人很容易只看到一遍 今天你沒有全部搬出來 A 有 A 的疑惑 B 有 B 的疑惑 C 有 C 的 你今天不全部搬開來你怎麼知道大家的疑惑 你只說

這一面要去遢 大家就會想有甚麼意義 有甚麼代價 我想你讓清楚遢明白大家看到其有有被說服就會過去了。

(O)對，但現在又改了現在 _...遷不大確定耶，2035 年以後可能會全面都是電動化，賈電動化，可是他不等於說你 2035 年之前的車不能騎，應該是可以騎啦，你如果一次砍掉民眾會反彈吶，阿大家那個時候的車價可能又比現在更高，民眾也買不起，所以他應該是遍會再延續啦只是不能取售燃油車，政策應該是這樣。

- **Passive execution** 政府心態過於消極

H:...可是如果以現況來說的話，強制性當然有是以政策推動或是經濟推動最理想。

(F)當然這個像一個政府用強制的方式或是用政策來致驅人民還拍捏種決定的東西這樣棒，當然是不一樣的做法，然後效率上有善，但是看人民在麼去接受他，就如果大家都有共識，好，政府能幫助我去淘汰掉這個東西或許能接受程度可能會好一點，那大家可能也願意接受說政府原本的用意就是解決空污瞄題啦，而且我覺得很多爭情就是，你不可能一次決定可以解決所有瞄題，那他一開始有一些方案然後當然你遍到不同的狀況再去慢慢的修正，不可能說你想好一個想法就可以解決所有事情，所以我覺得大家都需要接受這種想法，就是沒有完美的事情，再這麼樣都有瞄題。

(J)我覺得我從政府的道迪政策上面來看的話你可以覺得出來政府的心態其實是消極的想要改善這個東西，就是說我知道我現在沒換油影響的，但是你給你這樣的觀念然後我去道樣子教育你，然期的爭情過在三年五年十年之後你想要換車的時候你會選擇電動車，用一種比較和緩的方式，緩和的方式來做推行辣，可是你說你很階段其實要在這個時間這個 Moment 就要做一些改變的話其實政府推行的力道是不夠的，

(S)他也就今年新款機車也是有些玫瑰 而我就覺得你們態是要推新款機車吧遍是電動機車~. 反而比較常在推新的東西都是燃油的機車，的 好 是也沒關係啦 就瞄家專一樣 不是有分級以可能是因為遢樣子吶就是遢要符合租大多數人的需求 因為大多數人遢是覺得燃油的比較便宜 比他們可能每個月的可能幾百塊租金

(T) 恩，我個人是覺得在都市裡道道麼多的機車把它當成是空集污染的兇手象世也不對[笑]，這是我覺得它不是真正構成空集污染的兇手辣，恩，只是政府想要找最...應該說可能是最一般民眾的事情小事去開刀啊，可是我覺得那個效益那麼好像沒有大耶。

- **Insufficient matching plans** 配套措施不夠完善

H:政府開始要推廣，像我們剛剛講到的那個政策你要付多少背景啊，比如，

3. Intention to change transportation mode

Effectiveness

3.1. Factors could influence "change"

- **Become mandatory** 強制規定 到不得不的時候、政策有這個導向的時候

  (H)現在不會啦，可是我覺得以後如果變成一個趨勢，比如說現在大陸很多都是禁止騎那個一般燃油機車，那你就是只能接受，要強制性的話就，不過整體來說我是買或這個，這個政策這個策略電動化。

  (H)我覺得這個東西是要一個整體，因為這個政策的目的是為了降低空氣污染，那如果你只靠自主性的人去負責，我不知道可能銷得，電動車的成本偏高比於一般燃油車的，目前現階段，但是我以經濟學的考量省於他飽個匣宜大家就會選，或者設置在誘就是規定你要進台北市你只能走電動車，那那下列不管有所轄，那你就只能強迫，那道補償於就是支持，因為道有一個門檻在，第一他比較貴，第二你要把這東西套給然後，補助跟那個損失，除非我給給我一台我可以賺一萬，那那不會有道種政策發生。

  (W)我同意他的觀點，但是同對這件事和實際做這件事情，假如我個人就會屬於那種非常被動的狀態，除非有什麼政策或一定要怎麼做的時候，你才會去做。

  (S)我們家現在抱持著等到最後真的不行的那一刻。

  (S)我得那台機車他是以故騎很久，她那個就是剛好在需要換淘汰的名單內，好像是今年還去年的時候政府就有公布好像二行程，好像與國騎年的車子，其實是要淘汰的因為真的就是修一休她覺得可以騎她就繼續騎。

- **Need a replacement** 車子需要換了

  (H)其實也不一定要到最後，假較舊一我家摩托車突然壞掉了，那可能就是一個契機，可是如果以現況來說的話，強制性當然是以歐美推動或是經濟推動最理想。

  (W)我們等待因為重子遭了，車也久了，我們女兒就叫我們考慮換道個，因為比較環保，那時政府也有在補助，台北很像補助16000，桃園最多，有人去他面有親戚請他們嫁耶，我是想補助一萬六，跟一般的機車價錢差不多。

  (J)我去年12月換的，因為就我哥的摩托車太舊了，壞掉不想再修了，就把他淘汰掉，換一台新的，因為本來有兩台摩托車，一台我哥的，都沒國回路難，我哥的壞掉，當然修很多次那個應該有27、25年了，大

  一大二的時候呀，對呀，我就換一台 Gogoro，但我本來那一台滾運也沒有換，有時候去 A 點你就會把他丟在，因為你有時候也不會再回 A 點，你就直接回家都，可是你假如去塞裏的話，你就有多一台車可以騎去那邊人，反正我很極級靈運用的。

  (L)後來到了大三以後我就買了一台二手的四行程，我就在台北騎，然後那一台二十年了，所以很舊了，然後剛好我在 Gogoro 快出來有在打資會。我就規說天褪世界上面於有電動機車道種東西。

  (P)沒有，我一直想換但是我的車遇沒有壞掉，我的車遇能騷。

- **你會覺得改電動機車對你會有影響?** 我覺得影響是一定會有的，畢竟就是雖然是耗材可是他沒有壞掉你不會換，所以如果有一天我必須要換成電動車，可是我遇沒有壞的時候，我當然會覺得不方便，但是我可時也會覺得自為我現在就有車到那個時候或許可以換一台新的，所以我覺得遇好...道台如果遇可以騎的話比較不會去換電動車...我自己本身是覺得對我來說他會是 Second priority，就是說第一我當然是想要騎電動車，可是如果我今天非得要換回題哪車或者是自動車的話，我就會遇 Gogoro，因為對我來說我覺得環保出很好啊，就至少不要被些聚聚給到別人。

  (G)如果現在的車已經騎到不銷換用了，必須要換車，會想換現，如果有必要的話才會考慮。

  (T)要換的契機當然是那個，舊的油車剛好壞掉，就是遇舊法壞了，就是老舊...就是機車行的老闆也跟你講說 可能再騎不久你道台車就準備應該要淘汰了，然後就是剛好，就主要是道個原因吼，然後在就遇的時候就想說如果自己一台機車如果10年內你遇在騎油車的話，好像...會有種遇東西在16年後就要準備被淘汰了，那在在遇下來10年左右都在使用用道台車，遇騎油車的話好像有點 low low 的遇樣子哈哈。

- **Material orientation(newest/ the most fashion)** 有一部分族群為了追求潮流

  (C)因為是一窩蜂，他有補貼的話當不多要一窩蜂，電動的比較貴，**是因為補助?** 也不是，補助來遇是比較貴吼，因為就想說沒有轉過電動車，因為買不起好斯拉阿嘛不對哈哈只好電動的就買一台 Gogoro 來騎看看。

  (L)遇種天哪 Gogoro 就是看起來很酷道樣。

  (B)因為我覺得我車太吵[笑]那時候 Gogoro 很少人騎，比較新，潮，剛好我朋友也有買，他比較早買他買一代的，然後我買的是 S 飯剛出的，所以我是有騎過他的。

- **Comprehensive assessment, wait for new transport systems become stable** 等電動車 穩定性夠了 (觀望)全面性評估

  (M)我覺得那個很危險，在外面好像省跟跑車在騎，很危險，常常那個的就不銷阿，可是剛出來我們老觀念就會認為跟汰剝出來的東西就像實驗品一樣，一定又貴，修零件也貴，嘿了買又不划算，等到穩定一點的話，再來騎，像現在已經遇了差不多，幾年了? 覺得大家比較認知，覺得他零件應該也比較便宜一點，比較普遍一點，比較平穩，以我們的觀念是遇樣啦，可是年輕人不一樣，年輕人就是新買的車子就是要嘛，年輕人的觀念就是找最新的啊，阿我們比較保守，到一個穩定性的時候才會買。**那如果你之後要換車你會考慮電動車嗎?** 會阿，我會換他們那個新的，我當初買的時候就是補助的，之前買那一台就是二行程汰換的時候換的，**所以以二行程淘汰不一定要你換電動機車你只要換機車就有補助?** 對阿，就是因為他要淘汰，那就是有一些獎勵，那時候我就那台機車壞掉就順便換遇台，因為那時候他們叫我買那個[Gogoro]因為那時候很少人騎那個，就會比較省怕伯。

- **It's trend**

  (L)我本來就是做環境議題的，我知道電動的趨勢他本來就是接下來的趨勢，我不是說他可能永遠都是道個，那他本來就是一個速度、轉型的過程當中一定必須要用電動的方式來取代現在用的交通工具。

  (T)舊的油車剛好壞掉，就是遇舊法壞了，就是老舊...就是機車行的老闆也跟你講說 可能再騎不久你道台車就準備應該要淘汰了，然後就是剛好，就主要是道個原因吼，然後在就遇的時候就想說如果自己一台機車如果10年內你遇在騎油車的話，好像...會有種遇東西在16年後就要準備被淘汰了，那在在遇下來10年左右都在使用道台車，遇騎油車的話好像有點 low low 的遇樣子哈哈。

  (T)其實我也不知道她有故換汽油的那個製造的污染或消耗的能量是比較大的，我覺得道個件事就是電動車公司好像應該去封換道個東西，可是我會覺得說騎遇個東西，就是我覺得道個東西遇騎比較，我也不覺得說使用電動車真的是會比較低碳環保，可是就自己騎病個人的心裡求感會覺得好像真的有呼應到低碳道件事情，或是說就我也不用製造什麼廢氣給人家遇道樣，我覺得道可能是一窗...低碳無法比較可是我覺得在某他環保上遇是有一點吸引人的地方，或是讓我想要買車的遇個決定道樣。

- **New options**

  (L)我那時候，真實你不管買道意車只要換電動機車本來就有補助跟 Gogoro 沒有關係，可是之前的電動機車根本沒有人要買[笑] 都是那種遇基系不然他那種本來就是 hard core 的人他就覺得電動機車可以改變世界...嘿，我以前租房子就有一個宜友騎中華的電動機車，可是那電池是要拔起來故拉到假上去充電的那種，然後充一個晚上你可能騎個 30

4. Environmental debate

Air pollution
Environmental value
Value-action gap

4.1. Views on air pollution

- **Bad air quality**

(E) 對對對沒汽車味道很重，這個環保的真的都沒有味道。

(N) 剛剛那台他那個味道就很臭，電車也沒有噪音。

(C) 有啊，現在晴天的時候我就覺得旁邊那個很臭啊 以前自己也在放黑煙就大家一起放，現在就覺得旁邊很臭哈哈。

(L) 你在夏天的時候，你在停紅綠燈的時候、你停在車陣當中那個什麼感受，你的排放你不覺得燃油的內燃機系統就是一個蠻嚴重可怕製造都市那個區叫什麼都市熱島效應最嚴重的來源之一嘛，對你就是好啦也不要指責他，這種方式就是一個都市熱島效應很大的一個因素啊。

(M) 有啊，你都沒看到我包覆什麼哈哈 因為我皮膚是過敏性皮膚，我不喜歡吹那個風，頭其風或風起來，安全帽全罩式，你根本看不到是我

[笑][會] 不都戴哈哈 空氣很髒啊…而且比較不會那麼吹 (看要不要標題 變 pollutions)。

(F) 那遠點的話，就是至少你騎車的時候吸的廢氣少一點，我覺得這蠻很多，雖然你停在個段紅燈好了，你停在很多車旁邊你可能還是在吸他們廢氣，但是自己騎的時候，至少你就坐在這裏吊上嘛，這車子排的廢氣就跟你最近，所以他低的話我覺得是蠻蠻多的，好、停紅燈就只有一兩台車子的話，就根本就沒有味道，我覺得蠻很多…就覺得必然很多廢氣。

(J) 我在騎車之後我就覺得很多機車騎士沒有那麼有公德心，因為我不太喜歡吸到那個廢氣，然後我覺得那個空氣很體，像我自己的車子，他騎然也會排廢氣，可是他那個味道不會很臭，就是比較好的一種，又比較環保一樣，像有些車就是新�的烏賊車，他會噴那個很臭啊就不是很好聞，那我就會因為一開始也沒有騎車的時候，你就不知道那個路上的機車源來這麼多人其實對空氣影響那麼大，那我自己騎的時候就滿滿的印象，然後我覺得不是那麼好。

(S) 其實我覺得就是有些騎機車的排氣其實有點可怕...但有些就是聞到你會不舒服啦，因為以前很密是在路上看到其他的烏賊車，現在真的很少了，我覺得現在多多少少有改善吧。

(D) 我覺得台北好像還好，其他同事中南部的他們好像也沒變，因為他們那邊的大眾運輸更厭煩一點，所以他們還是騎車啦，就是雖然他們那邊有些地方像台中高雄空氣不好，可是為了方便還是要騎嘛，就應該不會

有道理，感覺好像還是就是我不知道機車就是有道德懸崖，因為我也不知道，我也沒有看過甚麼歡據...**你有覺得機車族比對了嗎**我有覺得有啊，就是當然會有這種行為，就是，愛，就那覺好像他們說因為機車比較好質所以機車數量比較多，可是我覺得就是感覺起來好像不是，因為照道理講的話台北市應該是可能也會不相上下，跟中南部比，可是我同學他們說台北空氣第是好的，所以我覺得比較中南部的應該是那種工業發電或是…感覺起來是這樣，雖然我也沒有查甚麼科學根據...就是我自己在講，我應該不會覺得怎麼樣。

(A) 空氣汙染那個在高雄就是那名昭彰，高雄空氣很差，我自己本身有氣喘跟過敏，所以我現在習慣出門都會帶口罩，所以不管有沒有空汙反正都會帶口罩，可能在高雄又更嚴重一點因為剛好我在工作的地方又剛好在加工出口區，會有很多很大的那種聯結車排放那種很很臭的黑煙所以我都會帶口罩，我同事們我知道的人他們也都會戴口罩要騎車，或是騎車啦，台北的話，我就進捷大眾運輸都會戴口罩更別，所以機車根本就不用騎，就好坐機車，我通是都會戴不管是不是騎車。

(Y) 就是空氣其實的很髒啦，就算戴口罩也很不舒服，高雄舒比較寬敞比台北，因為我後來都會戴丈夫去上班，在那個前鎮加工區，那邊很多大車，通常是過加大車啦，就他們那個聲氣阿，一直就很可怕因為車子就太密集了，因為車子非常非常多，砂石車比較少一點，不過還是會過到。

(I) 就是上某隆路都很臭嘛，就台科前面有湧布，有一群摩托車會道橫模仿機車轟轟轟緊加把熱機車快速通過手動對阿，就蠻條路都很臭這樣，所以如果全部都換電動車的話，這樣也是不錯啦。

(Q) 真的。

(K) 對，我覺得機車都好臭。

(G) 就跟大條食有很多車，上班時間從中永和來的人。

空污、很臭，騎車或沒駕都有很深刻體會？

(I) 居，有些人還會改裝，改那個讓駛管你知道嘛？

(Q) 對!!! 我以前在台中真的有，就改的很大聲很低級，就你在騎車就會噴到你的臉。

(I) 對阿對。

(G) 你在學紅綠燈就會道樣。

(I) 嘟嘟嘟嘟駛管吵吼是強在那邊改管。

(Q) 看到那種車要停在旁邊，要躲在後幾方。

你們剛剛都覺得往電動車方向是好的，會不會覺得太針對機車？

(Q) 不會，我就覺得台灣主要汙染源不就是這些汽機車。

(G) 工廠吧，工廠先吧。

(Q) 主要汙染源應該是汽機車，因為比如你講台北，台北沒有工廠可是空汙還是這麼嚴重。

(I) 不是祖國的善意嗎。

(Q) 對啦。

(I) 祖國的善意，其實汽車佔的比例很小。

(I) 可是他就是職人比較近。

(G) 你還是一樣花更多的電去發電，在我們生活層裡面感覺比較乾淨。

- **Controlled emission standard**

通過排氣檢驗的只能接受，若沒通過，當然不行。
其他交通工具也會造成空氣品質降低，只是可能接觸時間較少。
以前大家一起排就一起排，換電動車後就覺得旁邊的很臭。

H: 那我先回答好了我覺得有一個程度底性，有些東西是必要的，如果具醫來說如果你過了所謂排氣檢驗的那個那就是沒什麼好說的，那就只能接受，我們也是使用者，可是如果是那種違反就是沒有通過現行環保法規檢驗的那種，當然就是不能接受。

H: 當然我們每個人都會希望有一個很舒服的空氣品質，可是這是必要的，你在都市裡面就...當然你問我喜不喜歡當然不喜歡，但不然怎麼辦，這不是一個選擇這是一個接受與否的問題。

H: 其實機大眾運輸交通工具一樣會有排廢氣的問題，只是可能接觸的時間少一點，可是你搭公車你一樣還是要走路，你走路吸的其氣跟我模車其實一樣，你在意的是暴露在空氣中的時間嘛，所以以就回到你不要交通就不會有這個狀況，所以以反過來說這個問題關鍵就可以簡化的就很，在現行環保法規之下，那個接受的合格那我們就只能接受，可是超過這個合格的話是不應該存在的，那就會很困擾，我覺得像回顧法規跟三階法規那個一期有每一期的法規嘛，我個人覺得應該要加限制就是愈嚴格化就是排氣的標準，然後過大家...比如電動車就是最終的，他就是不排氣，就是這種狀況，然後要嚴格執行去淘汰那些沒有通過現在現有法規。

- **Stoppage in a traffic jam**

夏天停紅綠燈時，停在車陣中的感受是甚麼?製造都市熱島來源之一，你沒有想改變嗎?

W: 我剛才第一個反應就覺得那個很封閉啊哈哈哈 但是你就說我自己也在排那個廢氣，當然就是就沒辦法省我需要這個交通工具騎摩托車時候，就因為我想要他的機動性方便性嘛，那我自己製造那些廢氣只能這樣，對我可能就想我也是製造廢氣的，就不會有任何的作為，但如果別人就我我就那種非常高汙染的車子出現的時候，你其實是蠻討厭的，對，會檢視那我的摩托車是不是也是這種狀態，如果是好一點的話我就

5. **Low-carbon transportation mode**

Electric motorcycles
Low-carbon transport system
Perceptions

5.1. **Perception on alternatives low-carbon transportation way(e.g. public transit or**

- **Differences between areas**

台北交通太方便 在台北長大的小孩比中南部習慣搭大眾運輸 他們不會覺得騎車是必要 但你在中南部你不騎車哪裡都去不了

W:我就沒有騎了，幾乎沒有騎，因為台北交通太方便啦，坐捷運、坐公車，然後剛好住的地方，我就得以騎到比較沒有騎，所以就變下來一來台北的那兩年是幾乎沒有騎車的，對，都是坐公車。

(F)我覺得台北跟高雄人從小到大的交通習慣不太一樣，這個其實我之前有文章寫過這個東西，忘記寫在哪裡了我如果找到的話可以…就是天氣就有差別，人口數量有差別，就是在高雄就是你就是都晃得天就不太會下雨你比較有意願騎車出門，而且你出門的話你找車位很好找，到處都可以停，就是不會像台北車位都塞的很滿，然後就生活圈圈吧，市區會去的地方就大概是那樣，然後因為我就住市區啦，就是騎機車到哪裡都很方便，這樣，這三點就是跟台北就不一樣，台北有時候下雨你根本就不想騎車淋雨什麼，然後找車位，然後還有就是台北的大眾運輸可能年紀比我們小的人大概他們從小就這些東西，所以他們就是就去搭，然後就就覺得就沒所知，台北的年輕的女生好像慢不的比例都沒有考量，就可能交通方便吧，反正就是我覺得我聽到這件事也以後發現這跟高雄比起來他的交通的習慣可能不太一樣，我不太確定台北以外怎麼樣，不過台北交通省然算是比較早資源比較多比較早開始發展，所以台北的交通其的很厲害啦。

(F)騎車這個其實就很有趣，像我就覺得送的取捨點是天氣啊，停車位這些東西，交通上嘛，就大眾交通工具方便的話，因為我覺得在台北你只要兩趟，不管你是公車或者是捷運，你大一趟公車或一趟捷運或是互相轉配這樣，你可以到所有地方，就是整個交通是設計的發展的很好，而且台北市區如果不只是騎車騎車也會受影響，就是很多人都住於鬧人那你要進市區上班，騎車可能回頭又遠，騎車的話你停車實實又貴什麼的，所以搭大眾交通的人也會比較多，如果方便的話，我自己勵覺是這樣，然後像高雄我很多朋友就是住市區，市區大家都住得起，這是很重要的一點，大家都住得起然後就不會覺得騎機車很快就到了。

(S)就台灣喔喔交通騎騎托其實的是一個方便的工具，尋覺不是說所有的縣市他都有辦法像台北，因為台北的交通他就真的是很發達，各式各樣的就是都可以到你想去的地方，但我覺得這可能是城市發展的問題吧，中南部那邊你很多地方可能公車沒辦法到對，變成說你要騎摩托車或是你甚至要開車，所以我覺得有摩托車牌照或是會騎車在台灣中部啦就是你要出去或取你要去哪就是比較方便。

(D)新北台北市的大眾運輸工具還是有差。

(A)在台北的話還蠻方便的，最常坐的是公車…騎車從來不是在我的選項之內，因為我知道台北車況很恐怖，所以從來不是在我選項之內，所以如果搭公車都到的了我為什麼要騎車。

(Y)南北有差，就北部大家都騎騎腳踏車，搭公車搭捷運，南部就是騎摩托車嘛，因為北部他們可能就是交通很方便，如果是台北人就你就不會騎到摩托車這種東西呀，頂多是騎腳踏車，南部交通不方便，大家就小就是騎摩托車。這個我在中山就讀了呀呀啦去中山讀書的人要嘛會騎機車，因為我們學校機車很多，然後就是子不夠多，然後就剩停車位被他佔，一個停車搶要騎機車三台跟硬擠這樣，常常會有一些機車糾紛，FB 就會有人說搶搶到我的車就找我，不然你要調整視腦，就常會有這種，反倒覺得台北那個搶車位還很是，我都不用搶車，就學校的不用收費，可是有可能台北的停車上學不夠，專門給學生的，我沒有辦，那個好像大家都可以進去，停明進搭，然後我騎腳車活動就很方便，我也有一台腳腳車，像我剛就騎騎腳車過來，就比較方便呀。

- **Gender acceptance**

女生在台北生活比起男生更會傾向選擇搭大眾運輸工具

W:遠點 你週週得很 OK 對

(F)我覺得台北跟高雄人從小到大的交通習慣不太一樣，這個其實我之前有文章寫過這個東西，忘記寫在哪裡了我如果找到的話可以…就是天氣就有差別，人口數量有差別，就是在高雄就是你就是都晃得天就不太會下雨你比較有意願騎車出門，而且你出門的話你找車位很好找，到處都可以停，就是不會像台北車位都塞的很滿，然後就生活圈圈吧，市區會去的地方就大概是那樣，然後因為我就住市區啦，就是騎機車到哪裡都很方便，這樣，這三點就是跟台北就不一樣，台北有時候下雨你根本就不想騎車淋雨什麼，然後找車位，然後還有就是台北的大眾運輸可能年紀比我們小的人大概他們從小就這些東西，所以他們就是就去搭，然後就就覺得就沒所知，台北的年輕的女生好像慢不的比例都沒有，他們完全沒有考慮要有機車駕照，不是說覺得用不到不需要，是連考慮都沒有考量，就可能交通方便吧，反正就是我覺得我聽到這件事以後發現這跟高雄比起來他的交通的習慣可能不太一樣，我不太確定台北以外怎麼樣

樣，不過台北交通省然算是比較早資源比較多比較早開始發展，所以台北的交通其的很厲害。

(A)我覺得還有一個是那個個性別上的差異，會覺得大眾運輸會限制你，他們不喜歡受到限制，他要有主動性，像我爸或我男友他們就很熱衷於自己我可以想怎我自己的行程，我不用等公車等捷運我不用跟別人人擠人，離然說我在男男我我也會待在那邊可是我會解啊，所以我覺得還是有點那個差異，然後後發現搭大眾運輸的女生朋友，好像更喜歡大眾運輸工具，不會有被限制的感覺，阿等就等間滑風手機聊個天。

選大眾運輸基於環保的考量是 1%懲罰對環境友善的人

- **Flexible arrangement to complete travels**

為了趕時間 各種交通工具搭配，遠的地方一定搭捷運 下雨也是自己習慣有變。

H:就交替啊，有時候坐公車，有時候騎摩托車看心情。

(C)我全部都有用…我就換一台 Gogoro，但我本來那一台養還也沒有換，有時候去 A 點你就會把他丟在，因為你有時候也不會再回 A 點，你就直接回到家，可是你如果去真真的話，你就有多一台車可以騎去亂騎人，反正我超級蘇蘭活這用…便如沒波視蘭，可以有換，可是有時候上班時間出來沒有或是騎到你公司都後遲了更慘，所以說，對阿，全都都卡著，所以說還是有機車還是有它的需要…所以說台北便如要跑路可能也是要 A 搭到 B 然後 Ubike 也是好處，就中間換捷運之類的可能會比較 OK，可是現在都趕時間應該就是以最快到遇的，所以全部交通工具都要用…像我們剛剛去永康街就是搭 Uber 去，因為 Uber 也是有作活動打折，因為養或是浮數的喔，那你除非不太遠整的點，因為他們今天要去教會啦，就以說說我們這邊到興隆墾可能一百多，可是像早上他有折扣就約 90 幾(塊)省約我就叫，那也有可能兩百多，所以我就會叫計程車，不然最省最聰聰最便宜，省錢也是可以搭 284 可是就會比較慢，因為都時間到了才要出門錢你找就比較少。

(D)還是會有一些地方比較難找停車位的話，那可能搭捷運或者搭公車可能會比較方便。

- **Relaxing travel**

每天騎累了 週末給別人載

(S)有幾次會就是覺得騎車騎太久的時候就是覺得今天~呀~嗯人家載怎了人[夠]就會搭大眾交通運輸工具，可是有時候你知道搭搭公車搭很多人的時候就會覺得今天我應該騎車的，因為人太多有時候你會遇到一些很奇怪的事情，對，你就會覺得很煩嗯。

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