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Malaysian Urban Residents' Readiness to Reduce Car Usage and their Perception on Non-Motorised Facilities.

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Abstract. The research in this paper tries to establish the readiness of urban residents' in Malaysia to minimize the car usage and their inclination to use non-motorised transport, such as cycling and walking, as alternatives to using a car for commuting. This study also tries to measure the perception of the residents regarding the existing scenario of walking and cycling infrastructure facilities provided in their cities. The data used in the study was collected through a survey in three cities, namely-Shah Alam, Batu Pahat, and Putrajaya, as a representation of the main cities in Malaysia. The results produced suggested- the majority of the population was not ready to give up travelling via car and take up cycling and walking in lieu of it. The causes listed for "refusal" of reducing the car usage included hot weather, surrounding safety concerns and undesirable pedestrian and cycling infrastructure conditions. The research explored that attitude, lifestyle and high level of dependency on cars are crucial factors dictating the travel behaviour, which is the reason why residents refuse to shift to sustainable and environment friendly options of travel. The research also suggests that these three cities need to improve and uplift their walking and cycling infrastructure facilities, especially in terms of provision of cover and shade, connectivity, design and maintenance and cleanliness to motivate the urban residents to minimize usage of the cars and take up walking and cycling instead.

1. Introduction

Being completely dependent on the car, as a mode of travel, has become the current nature of commutation because of the lifestyle and stature of the society, which inculcates the need for more comfortable travelling choices. The flexibility offered by cars in accessing multiple destinations, that too right at the doorstep, makes them more reliable, convenient, and safe in comparison to public transport. These factors influence the desire of residents to own purchase and a car [1]. In 2012, Malaysia, a country of 5 million households, had a registration of more than 20 million vehicles, which posed a serious challenge and a threat for the country to tackle. [2]. According to a 2014 press release by Nielsen (market research agency), Malaysia is a country which has the third highest car ownership in the world where 93 percent of the households possess a car. Increased dependency on cars, and other vehicles on the road, contributes to rising traffic congestion and constant degradation of the environment because of high pollution levels emitted by them.



2. Car Dependency

Car dependency occurs when the city and its inhabitants decide to take up commuting through a car, as a priority over public transportation, infrastructure, and land use. The factors influencing people's dependency upon car are the high levels of per capita automobile travel, automobile-oriented land use. on cars instigates the traffic congestion and degradation of environmental quality caused by continuous emission of pollutants from the rapid increase of vehicles on the road. Numerous studies have proven that some people like to drive out of their own will and choice but not need. [3] Cars affixed with various features provide humans with psychosocial value, which affects the human psychology to choose a car over other modes of transportation. To encourage the commutation via more sustainable transport modes, reduction in the pattern of car dependency is needed. To outstrip the -unrestrained reliance on motorised vehicles, the Malaysian government traversed the five-pronged transportation policy with contemporary laws. This policy allows the Malaysian government to spend road tariff, as a means to fund other issues and abolition of fuel subsidies will lessen the government's expenses. Fuel, cars, congestion, and road taxes were proposed, in anticipation of decreasing motorised vehicles, resolving congestion and pollution issues [4].

The previous studies on sustainable transportation have identified numerous elements that influence the degree of non-motorised travel in the city as demographic and socio-economic characteristics, trip characteristics, environmental factors, and their viewpoint and perceptions.[5] From an emotional viewpoint, which alternate should one choose to travel can be perceived as either an intentional activity, or begin from behavioural habits.[6] Habit has an automated link between an individual's goal and their behaviour. It is believed that a strong habit can supposedly block intentional processing; even before behaviour. Before a habit evolves, the travel behaviour is most likely to be aligned with an individual's intentions and personal preferences. However, once a strong habit to commute via car has developed, then the motivation to reduce it (e.g. following awareness campaigns to understand the problems linked with motorised travel) will not influence travel pattern and behaviour much, because the individuals are accustomed to behave in alliance with their habits and not their motivation. Thus, an existing strong habit of using cars to travel can be a hurdle to motivate people for reducing car usage [7].

3. Methodology

The three cities, namely Shah Alam (the first planned city in Malaysia), Putrajaya (the new planned administrative city) and Batu Pahat (old city) were selected for this research and survey, to represent urban residents in Malaysia, by using stratified random sampling technique. The questionnaires were prepared and taken to numerous selected houses along with approaching the respondents at various picked recreation and shopping centres in each of the three cities mentioned above. The respondents were provided with a survey form, which had various tests to respond to, to help us understand the extent of car usage by the selected respondents. Numerous factors determining the degree of car dependency of the respondents were identified in the form of the number of cars owned; the emotion and perception of owning and driving a car; the level of readiness to reduce car usage and shift to non-motorised modes and the evaluation of walking and cycling infrastructure facilities.

4. Results

4.1 *Number of cars owned in a family*

Table 1 indicates that the average number of cars owned by each family was two in Shah Alam and Batu Pahat, and three in Putrajaya. These figures depict that virtually every family, in these cities, has a car to commute and every family has more than one member with a legal driver's license.

Table 1. Total Number of cars owned by families in each city

Number of cars owned in the family	Shah Alam	Putrajaya	Batu Pahat
1	40.4%	1.7%	48.1%
2	41.4%	21.4%	40.4%
3	9.4%	42.8%	10.9%
4	5.7%	9.8%	0.6%
5	1.8%	5.6%	-
More than 5	1.3%	1.1%	-

4.2 Car Dependency Ratio

As per the calculations derived from the Littman's formula, Shah Alam and Batu Pahat cities indicate a mediocre dependency on cars, whereas on the other hand, Putrajaya City has a high car dependency. Table 2 depicts the comparison of car dependency in these three cities (Shah Alam, Putrajaya, Batu Pahat), compared to Malaysia's average ratio. The growth in the number of vehicles in the country has been 3.3 times faster than the growth in the population. [8]The traffic on the road has increased tremendously over the past few years because most of the households today have access to two or more cars.

Table 2. Car Dependency Ratio for Shah Alam, Putrajaya and Batu Pahat Cities

Car Dependency Level	Shah Alam	Putrajaya	Batu Pahat
Car : Population	1:2.2	1:1.5	1:2.6

Note: low dependency- 1:4 or higher, medium dependency- 1:4-1:2.2, high dependency-1:2.2 or lower

4.3 Emotions and perceptions towards cars

In the questionnaires, when respondents from these cities were asked about their experience while driving cars, the majority of them responded with a positive feedback. Most of them considered driving a car as "relaxing" and "safe". The Majority of them also stated that driving a car was practical and gave them liberty. Hiscock et al., established a positive car perception from his research, quoting that a car is seen as something that offers convenience, reliability and capability in providing easy access to multiple destinations as compared to public transport and can provide security from unwanted people, events and happenings [9].

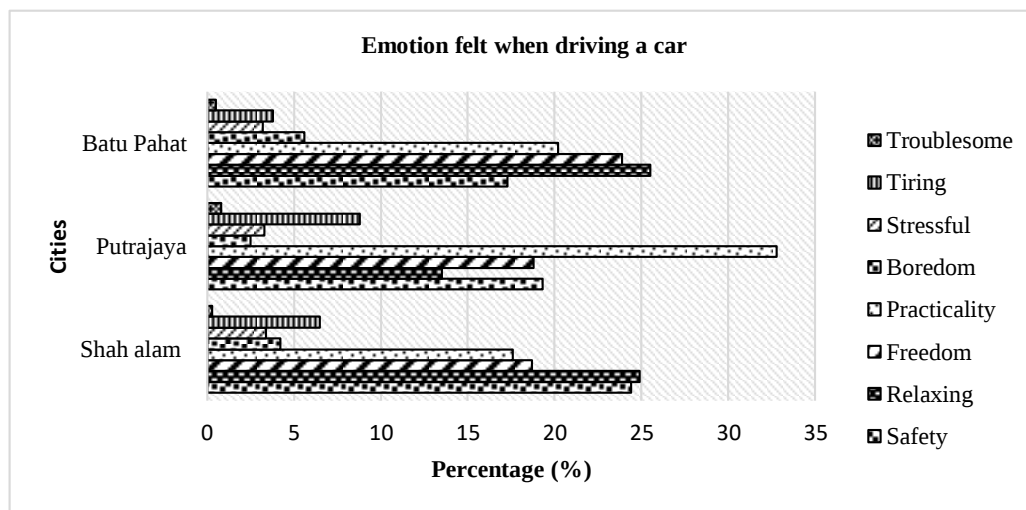


Figure 1. Emotion felt while driving a car

4.4 Willingness to reduce car usage

Upon being asked regarding the willingness of these respondents to reduce the car usage, the majority of them from these three cities gave a negative feedback with the highest percentage of people being 'unready'. However, some people who responded with a positive feedback for being 'ready' to reduce car usage, gives a ray of hope for these cities (Shah Alam and Putrajaya) to switch to more sustainable modes of transport.

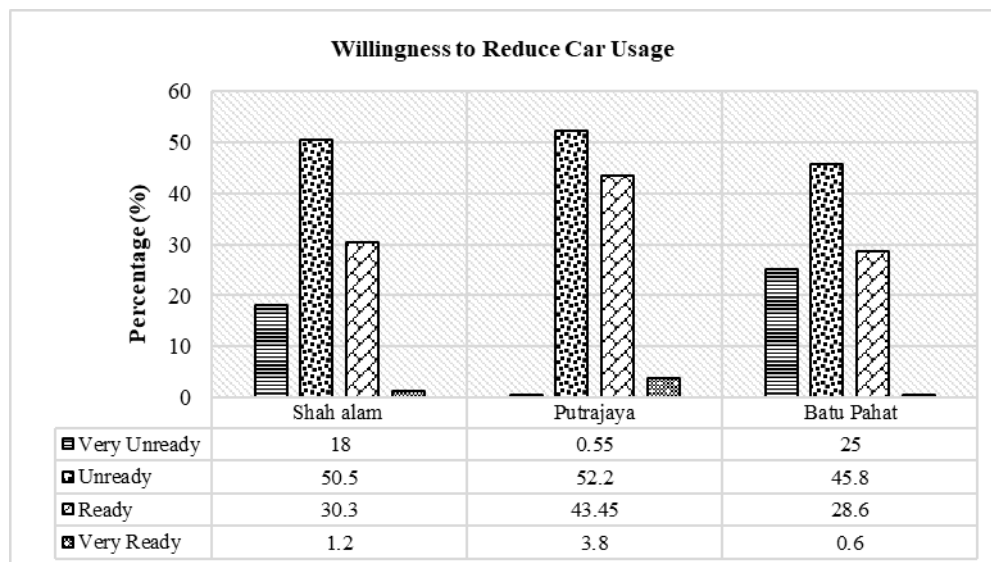


Figure 2. Willingness to reduce car usage

4.5 Reason for being unwilling to reduce car usage

The majority of the respondents from the above-mentioned three cities stated that they are not ready to reduce car usage because they did not prefer to walk or cycle in the hot weather. They also considered walking as “exhausting, tiring” and “not safe.” According to them, driving a car was more convenient than walking. “No proper pedestrian walkways” contributed to being one of the reasons why people refused to walk. These findings are similar to Rose and Marfurt (2007), who revealed that distances and other aspects such as weather conditions, physical abilities and safety issues often influence an individual’s perception [10]. McDonald’s, in his research, believed that humans normally follow their norms in terms of travelling pattern [11].

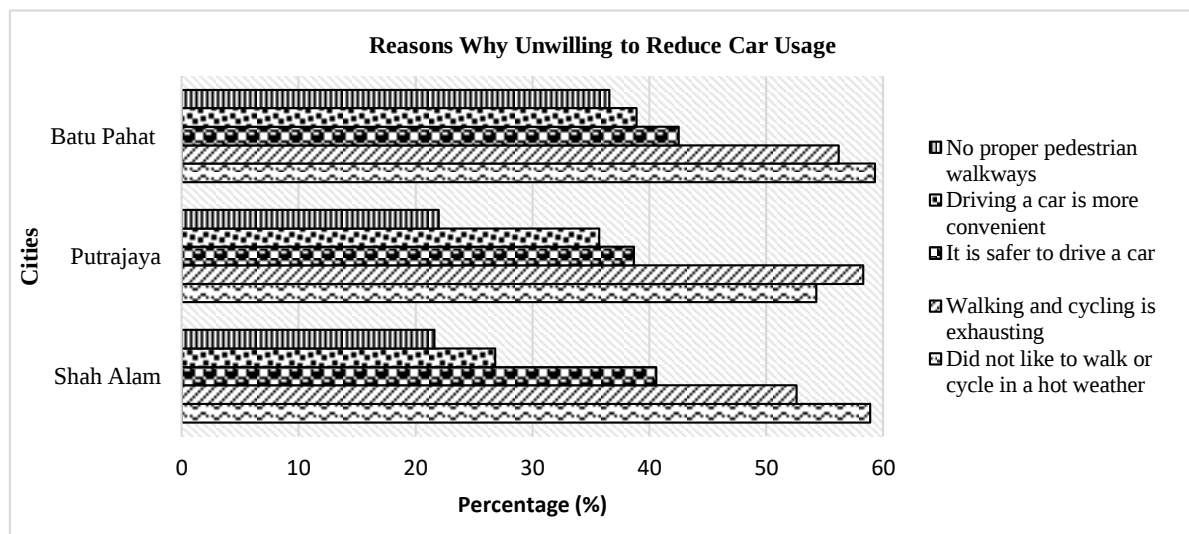


Figure 3. Reason why not willing to reduce car usage

4.6 Readiness to walk and cycle

This research also investigates and evaluates if Malaysian urban residents are ready to use non-motorised transport. Through this study it is found, that the majority of the people are not ready to cycle or walk in lieu of using motor vehicles. However, in case of Putrajaya and Shah Alam cities, the majority gave a positive feedback with a higher percentage of respondents willing to walk and cycle in comparison to Batu Pahat city respondents. This finding could be related to Cao et al. (2006), who suggested that residents of a “New Urbanist” area are more willing and able to commute via public transport, walk, or cycle to their destinations, owing to their personal principles and philosophies on transport and environment [12]. Lensink also concluded that achieving a more sustainable transportation system needs to pay more focus on the inter-relations between the infrastructure planning, traveller’s decision behaviour and the transportation energy used in government transportation policies [13].

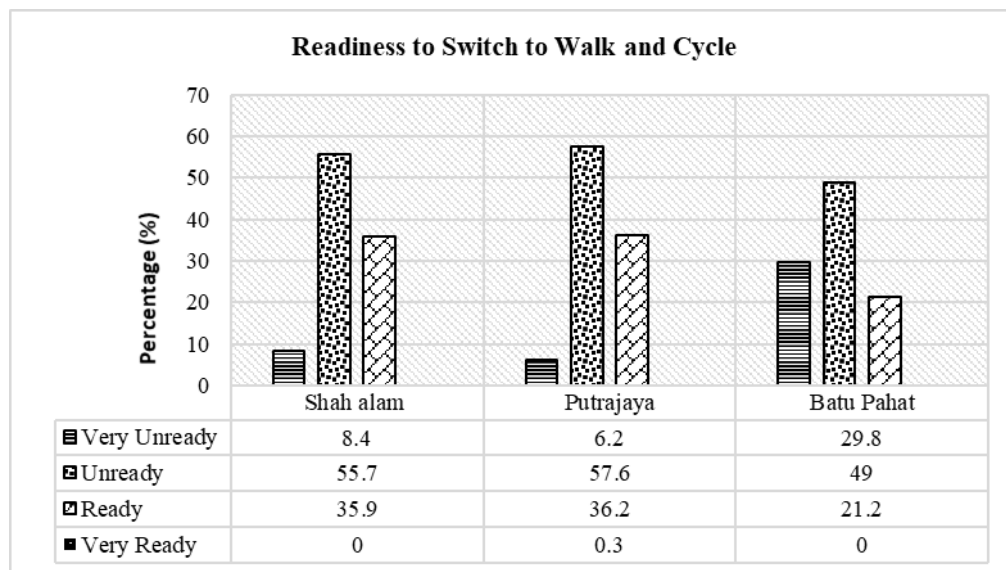


Figure 4. Readiness to switch to walking and cycling

4.7 Existing Condition of Walking and Cycling Facilities

Table 3 below shows residents' satisfaction level about the existing condition of walking and cycling infrastructure facilities available in their cities. The responses received from urban residents ranged from poor to moderate level. This indicates that these three cities have to improve their walking and cycling infrastructure, especially in terms of covers and shades, connectivity, design, and maintenance and cleanliness to motivate urban residents to walk and cycle in order to reduce car usage.

Table 3. Existing Condition of Walking and Cycling Facilities

Existing Condition of Waking Facilities		Mean Score for Each Cities		
		Shah Alam	Putrajaya	Batu Pahat
WALKING	Design	2.41	2.75	2.94
	Width	2.85	3.12	2.96
	Design Material	2.33	3.13	2.91
	Separation of lane	2.89	3.24	2.75
	Landscape	2.45	3.35	2.83
	Covered and shades	1.91	2.33	2.78
	Trash bin	2.64	3.28	3.12
	Street light	2.53	3.51	3.04
	Benches	2.55	2.84	2.97
	Connectivity	2.37	2.32	2.61
	Maintenance & cleanliness	2.82	3.01	2.77
Existing Condition of Cycling Facilities		Mean Score for Each Cities		
		Shah Alam	Putrajaya	Batu Pahat
CYCLING	Design	2.34	2.91	2.55
	Width	2.58	2.54	2.52
	Design Material	2.12	2.72	2.50
	Separation of lane	2.27	2.46	2.44
	Landscape	2.33	2.91	2.79

Covered and shades	2.18	2.38	2.41
Trash bin	2.52	2.72	2.64
Street light	2.75	2.62	2.55
Benches	3.31	3.69	2.63
Bicycle parking	2.31	2.54	2.45
Connectivity	2.72	2.31	2.41
Maintenance & cleanliness	3.11	3.56	2.54

Note : 1.00-1.49 =Very poor, 1.50-2.49 = Poor, 2.50-3.49 =Moderate, 3.50-4.00= Good 4.50-5.00= Excellent

5. Summary

This research indicates that the majority of people in these three cities are not ready to reduce their car usage and to consider cycling or walking as alternatives to using a car. The reasons provided with for “refusal” to reduce car usage were more associated with their attitudes and perceptions like- they did not like to walk or cycle in a hot weather, they had safety concerns and unsatisfactory conditions of pedestrian and cycling infrastructure facilities. According to them, driving a car was more convenient than walking and cycling, which was a reflection of their habits. This study eventually reveals that attitudes and lifestyle of people in these cities are important determinants of travel behaviour and high level of car dependency is the key factor why they refused to shift to more sustainable modes of travel. According to Stern, attitudinal factors (such as values, personal norms and attitudes), habits, personal resources, and contextual factors are important for environmentally significant behaviours [14]. Thus, it is not unanticipated that car habits, attitudinal factors such as moral motivation analysed in this study, explicated only a small amount of willingness in reducing car use. In order to reduce car dependency, personal resources, the time and knowledge to transform travel behaviour as well as contextual factors, such as the availability of alternate travel modes, supporting social norms and policy strategies to influence the sustainable transformation may be critical.

This study also suggested that these three cities have to improve their walking and cycling infrastructure facilities, especially in term of covers and shades, connectivity, design, and maintenance and cleanliness to encourage urban residents to walk and cycle to discourage the existing habit of car usage. Advertising campaigns, with the aim of increasing more sustainable transport usage, needs to focus on the environmental and health benefits attained by using the sustainable modes such as tagging walking, cycling and public transport as environmental symbols; Hence, opposing the status symbol of cars.

6. Recommendations

Malaysian citizens should have mental and physical readiness aligned with the goal of implementing an environment friendly sustainable transportation system. The importance of protecting the environment by using sustainable vehicles should be strengthened through various programs, campaigns, advertisements and promotions. A well-coordinated, joint campaign by local authorities and non-government institutions such as public transport corporations, health organizations, and environmental lobby groups could help in influencing the attitude of citizens towards car ownership and its usage amongst the next generation of potential drivers and may contribute towards restraining the demand for car travel.

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References

- [1] Anable J 2005 Complacent car addicts' or 'aspiring environmentalists'? Identifying travel behaviour segments using attitude theory *Transport Policy* **12** 65–78
- [2] Ministry of Transport Malaysia 2012 Transport Statistics Malaysia 2012 Kuala Lumpur
- [3] Handy S, Weston L and Mokhtarian P L 2005 Driving By Choice Or Necessity? *Transportation Research Part A* **39** 183–203
- [4] Kasipillai J and Chan P Travel demand management: Lessons for Malaysia *Journal of Public Transportation* **11** 41-55
- [5] Chandra R B, Jessica Y G and Rupali S 2005 Non-motorised travel in San Fransisco Bay Area, Texas *The University Texas, Austin*
- [6] Garling T and Axhausen, K W 2003 Introduction: Habitual travel choice *Transportation* **30** 1–11
- [7] Erisson L, Garvill J and Nordlund A M 2008 Interrupting habitual car use: The importance of car habit strength and moral motivation for personal car use reduction *Transportation Research Part F* **11** 10-23
- [8] Ministry of Federal Territories and Urban Wellbeing, 2011.
- [9] Hiscock R, Macintyre S, Kearns A and Ellaway A 2002 Means of transport and ontological security: do cars provide psycho-social benefits to their users? *Transportation Research Part D: Transport and Environment* **7** 119–135
- [10] Rose G and Marfurt H 2007 Travel behaviour change of major ride to work day event *Transportation Research Part A* **41** 351-364
- [11] McDonald N C Critical factors for active transportation to school among low-income and minority students' evidence from the 2001 National Household Travel Survey *American Journal of Preventive Medicine* **34** 341-344
- [12] Cao X, Handy S L and Mokhtarian P L 2006 The influences of the built environment and residential self-selection on pedestrian behavior: evidence from austin *Transportation* **33** 1 - 20
- [13] Lensink S M 2005 Capacity building for sustainable transport, optimising the energy use of traffic and infrastructure *University of Groningen*
- [14] Stern P C 2000 Toward a coherent theory of environmentally significant behavior *Journal of Social Issues* **56** 407–42