URBAN TRANSPORT GROWTH: THE EMPIRICAL CHALLENGES TOWARDS LOW CARBON SOCIETY

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Alhamdulillah wa syukran Lillah. This dissertation is dedicated to my lovely mom, Bonda Aminah Abd Rahman and my late father, Ayahanda Wan Daud Wan Yusoff, who has given fully supports and courage with love and patience and to all my family members who gives inspiration for me to further my studies and completing this dissertation. And last but not least, my highest gratitude and special thanks to all my beloved lecturers & teachers (Murabbi) and friends, thank you for all your supports and encouragements.

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ABSTRACT

This research is mainly concerned on urban transport growth in Iskandar region as the challenges which should be resolve towards achieving Low Carbon society in 2025. The biggest challenge in bringing the Low Carbon city concept into real practice is due to the impact of urbanization in the boundary study, as the number of vehicles increased rapidly on roads. The growth of urbanization in Iskandar Malaysia has increased the demand for the energy consumption, which cannot be simply reduced due to economic influences without providing alternative for the society to be diverting from the polluted and economic energy to clean and renewal energy especially from transportation system for the society and nature. The objective of this research is to study on how to reduce the amount of emission gas produced by vehicles in Iskandar Malaysia without affecting the economic activities, mobility of goods and services, and social interaction between peoples from the different geographical location in boundary study. The formulation and establishment of ideas on transportation are produced to understand the real issues on ground and later to create a better solution for the authorities and transport planners for planning a better environment in future.

ABSTRAK

Kajian ini adalah kajian yang memfokuskan tentang pertumbuhan pengangkutan bandar di dalam Wilayah Iskandar sebagai cabaran yang perlu diberi perhatian ke arah mencapai matlamat untuk menjadi Masyarakat Kurang Asap 2025. Antara halangan besar untuk merealisasikan Masyarakat Kurang Asap ke dalam pembangunan adalah disebabkan oleh kesan pembangunan bandar di dalam sempedan kawasan kajian, sebagaimana bertambahnya bilangan kenderaan yang sangat banyak di jalanraya. Pertumbuhan bandar di dalam Iskandar Malaysia menyebabkan berlakunya pertambahan permintaan terhadap sumber tenaga yang tidak boleh dikurangkan dengan mudah, disebabkan oleh kesannya terhadap ekonomi jika dilakukan tanpa menyediakan sumber alternatif kepada masyarakat untuk berubah dari penggunaan tenaga yang menyebabkan pencemaran dan murah kepada pengunaan tenaga yang lebih bersih dan boleh diperbaharui terutama untuk kegunaan kenderaan untuk kebaikan masyarakat dan alam sekitar. Matlamat utama kajian ini adalah untuk mengkaji bagaimana kaedah yang boleh mengurangkan penghasilan asap kenderaan di dalam Wilayah Iskandar tanpa memberi kesan kepada aktiviti ekonomi, pergerakan barangan dan juga perkhidmatan, dan juga interaksi masyarakat dari pelbagai tempat yang berbeza di dalam sempadan kajian. Penciptaan dan penghasilan idea terhadap pengangkutan dilakukan untuk lebih memahami isu sebenar yang berlaku di dalam kawasan kajian dan untuk memudahkan penghasilan jalan penyelesaian yang lebih baik kepada kerajaan tempatan dan perancang pengangkutan untuk menyediakan persekitaran yang lebih baik di masa hadapan.

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GLOSSARY OF TERMS

IRDA   -   Iskandar Region Development Authority

JPBD   -   Jabatan Perancangan Bandar Dan Desa

MIROS   -   Malaysian Institute of Road Safety

NPP   -   National Physical Plan

BAU   -   Business As Usual

BOS   -   Based On Scenario

JPJ   -   Jabatan Pengangkutan Jalan

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CHAPTER ONE

INTRODUCTION

1.1 Background of Problem

The Kyoto Protocol formed as a blueprint for environmental policy to address the issues of greenhouse gases (GHG) which affecting climate changes and increase the heat of the earth. According to Gray, V (2002) the large scale of mass production in the energy and industrial sector around the globe have led to a dramatic changes in these systems.

The radiation forcing activities from the human activities resulted from burning of fossil fuels, oil, coal and gas activities are hazardous. Most of these gases produced by industrial activities and emitted from vehicles on the road. The mass amount of gases produced to the atmosphere has reached the limits and raised the alarm to the nature which resulted in the event of glacial melts, sea level rise and unpredictable weather pattern when it should be cooling.

Malaysia, as a developing country, faces major problems in reducing the emission of gases especially from transportation activities where the urban transport growth rapidly in major cities such as Johor Bahru, Kuala Lumpur, Penang and other cities. The transportation sector plays a vital role in reducing emission of carbon produced by vehicles, and also need to reduce congestion and other transportation issues which happen in long period of history.

This study mainly focuses on how to reduce the amount of emission gas produced by vehicles in Iskandar Malaysia without affecting the economic activities, mobility of goods and services, and social interaction between peoples from the different geographical location in boundary study.

The formulation and establishment of ideas on transportation are produce to understand the real issues on ground and later to create a better solution for the authorities and transport planners for planning a better environment in future.

In addition, this dissertation also attempts to highlight the efficiencies of Low Carbon society model as a holistic planning strive to tackle real problems in transportation planning sector while respecting the environment and sustain the well-balanced of ecosystem. The concept of Low Carbon society is also in line towards Islamic principles and teachings from the Holy Quran and Sunnah from our beloved Prophet Muhammad p.b.u.h. The researcher aims at explaining the beauty of Islamic teachings in transportation planning and transforming the ideas and principles into real world practices.

1.2 Problem Statement

In transport, the social interaction of people and movement of goods and services is defined as the mobility which highly important to create the accessibility for movement of the activities for the growth of the area and its economic life. It was highlighted by Mosseley (1977) which define accessibility as 'mobility for opportunities' that is mobility which allows the person to get to the desired destinations. However there are certain problems leads to result in air pollution and eventually affecting the nature while people are striving to have a good lifestyle and healthy living environment.

1.2.1 The Gases Emission Production Factor (High automobile dependency)

As stated by Thomson (1977) as well as Newman and Kenworthy (1989), the term 'automobile dependence' refers to a condition of urban areas in which there is a very high use of private cars has become entrenched in both the transport and land use system. In many cities today, private car has become an important and dominant mode of transport. Based on Prabuwono and Idris, (2008), an increasing in car ownership, changes in traffic arrangements and densification of land contribute to the major transportation problems, which can be seen in result of total amount of gases emission produced in the Iskandar Malaysia which affected from increasing number of vehicles on road.

As one of the most important region in Malaysia, Iskandar Malaysia continues to be flooded with newly-registered motor vehicles each year either from local or Singapore. Based on the data from the Road Transport Department, the vehicles registered in Johor has increased from the first quarter year 2010 which about 2,658 953 vehicles and increased in second quarter year 2010 about 2,696 054 vehicles on the road (refer to Figure 1.2.1-2).

Table 1-1   First Quarter Year 2010 (Vehicle Registered)
Source: Road Transport Department (JPJ)

State	Motorcycle	Car	Bus	Taxi	Hire & Drive Car	Goods vehicle	Others	Total
Perlis	57 979	16 722	206	196	3	1800	1354	78,260
Kedah	656,316	245,045	3212	3,529	420	34,449	18,798	961,769
Penang	1,090,593	845,255	5,605	3,586	496	60,473	18,405	2,024,415
Perak	1,056,023	586,605	4,605	4,256	67	62,614	35,596	1,749,366
Selangor	998,886	957,345	6,933	8,532	322	144,768	66,028	2,182,814
Kuala Lumpur	1,293,206	2,702,872	17,348	31,358	13,791	198,473	142,132	4,399,180
Negeri Sembilan	430,782	269,753	2,747	2,010	16	39,033	7,657	751,998
Melaka	357,362	257,377	1,983	1,759	44	23,797	5,589	647,911
Johor	1,366,361	1,104,477	9,731	11,855	103	118,382	47,744	2,658,953
Pahang	428,487	290,020	1,994	2,670	12	38,061	13,196	774,440
Terengganu	265,118	149,567	1,084	1,130	18	19,490	6,943	443,350
Kelantan	373,949	219,216	1,970	2,043	9	25,548	7,676	630,741
Sabah	184,370	457,988	6,761	5,101	1,228	104,294	51,392	811,134
Sarawak	521,402	555,587	3,090	2,197	488	72,092	53,080	1,207,936

Table 1-2   Second Quarter Year 2010 (Vehicle Registered)
Source: Road Transport Department (JPJ)

State	Motorcycle	Car	Bus	Taxi	Hire & Drive Car	Goods vehicle	Others	Total
Perlis	58,822	17,233	205	194	2	1,811	1,357	79,624
Kedah	665,749	249,186	3,220	3,540	516	34,662	18,894	975,857
Penang	1,102,967	860,356	5,643	3,635	511	61,579	18,622	2,053,313
Perak	1,067,126	595,716	4,646	4,289	68	62,638	35,927	1,770,420
Selangor	1,011,764	967,224	6,999	8,898	333	146,535	67,533	2,205,304
Kuala Lumpur	1,313,347	2,760,129	17,582	32,204	14,056	200,453	142,762	4,480,623
Negeri Sembilan	343,871	273,314	2,758	2,038	16	39,411	7,691	760,099
Melaka	361,255	261,951	2,000	1,777	44	23,950	5,674	656,651
Johor	1,383,063	1,123,042	9,828	11,915	102	119,649	48,445	2,696,054
Pahang	434,035	294,491	2,014	2,666	16	38,279	13,355	785,306
Terengganu	207,300	152,596	1,099	1,127	16	19,614	6,997	452,109
Kelantan	381,438	224,127	1,976	2,038	9	25,747	7,763	643,098
Sabah	190,926	467,901	6,764	5,082	1,233	104,334	52,004	828,244
Sarawak	529,906	565,471	3,114	2,216	504	72,772	53,747	1,227,730

However, the increase number of vehicles ownership is resulted due to certain lifestyle changes, high income, the poor public services such as trains and buses. In addition, Iskandar Malaysia that serves as new business centre district of Malaysia has also increased the number of its population which leads to increase in vehicle ownerships.

Therefore, the increasing number of vehicle ownerships in Johor has created the problems of air pollution and traffic congestion. Furthermore, the increasing number of private vehicles contributed to the inefficient of public transport modes that cannot be operated to serve only on small group of users which will results in failure of operation cost and maintenance cost.

1.2.2 Mode of Transport (Motorized and Non-motorized transportation)

Most of the area in the major cities in Malaysia is not planned to improve the public transport to provide more efficient and effective services instead of providing and building more roads and highways to cater the demands of vehicles on roads as show in figure 1-1. The ad-hoc planning in transportation system did not serve the entire community as it is now or later will creates another problems and issues when the capacity reaches its limitation and constraint.

The current situation and nature of life creates certain mindset in the community as they would agree that the car is the best available reliable transport mode which available to provide a better door-to-door services than other transport modes as it was highlighted by Diestra and Kroon (1997) in their books; Psychological Barriers to Car Restraint and Sustainable Urban Transport in Tolley. The numbers of vehicles ownerships keep growing in the city and force the authority to plans another road to be build.

Peoples are still not really exposed and well-educate to use the non-motorize transportation since the provision of transportation infrastructure did not support the promotion of being green in community lifestyle. The pedestrian pathway, cyclist track and other infrastructure did not really planned to promote a healthy and dynamic living of life.

Certain areas still face traffic congestion during day and night.	Bad traffic conditions happen during peak hours in most of the area in Johor Bahru.
Gases emission produces by vehicles on the major road in the business district.	Lack of maintenance and improvised for public bus services also contributes to the gases emission production.

Figure 1-1 Traffic Condition in Iskandar region

Hence, the trends of the lifestyle changes will leads to the growth in urban transport especially in Iskandar Malaysia territory while people always strive for the easiest way to achieve and accomplish their daily jobs and works. In addition, the public transport mode provided such as buses are also did not achieve a standard quality to reduce the emission produced if the entire passengers in private vehicle mode will be shifting into the public buses.

1.2.3 Share factor

The factor of increasing amount of the total gas emissions in atmosphere which will leads to failure of achieving Low Carbon society level is not only caused by transportation systems only. There are several factors which indirectly contributed to the main issue are defined as listed below:

1.2.3.1 Landuse distribution and Urban Sprawl

The zoning of landuse activities which not really planned to serve the need of peoples movement and mobility without increasing the need to travel in distance also increased the results in traffic volume and vehicles uses while the public transportation are not the best answer to respond for their needs. The needs to travel for works, leisure, social and others have no option and alternative except to use their own vehicles. Lack of landuse integration and poor planning provision in transportation are major problems in planning process towards development in most cities in Malaysia, especially in Iskandar Malaysia business district.

Moreover, the ad hoc planning and infill development in the areas also leads to the development sprawl outside the boundary limits and later results in more complicated issues which required more agencies and governmental bodies to involve in future. The involvement of more agencies from different teams means more difficulties need to be face by the current authorities and reduce the time to respond faster to people`s complaints. The need of zoning and landuse integration for promoting green transportation and healthy lifestyle is vital for the Iskandar Malaysia territory to achieve the target to provide a less carbon environment for the society.

1.2.3.2 Culture and riders profile

The understanding of the issues in transportation is not just limited in transportation system and its components in society. The need of understanding about the people, who use the system and later should indicates the system is succeed or not is really important. The current situation in Malaysia, peoples are tend to own their cars after graduate or even in college seem like a new trend in Malaysian culture.

While the upper class of the society tends to have more than a car and it`s contribute for reduction of passenger per car to one car/person. This trend was stressed by Vasconcellos (2001) in his discussion ,the lifestyle of elites and middle group of the society might influenced the interest of society to enjoying having more cars than they should have just to show the power of possessing prosperity towards society.

Moreover, the policy of government in financing to increase the ability to purchase vehicles by reduces the certain rate of loan for banks also contribute to the increase number of vehicles on road. Entire policies in government related to transportation directly or indirectly affecting the system should be comprehensively reviewed in deep discussion. Hence, the government bodies, institutions, NGOs and individuals are the key players should boost the healing process towards the nature in providing a better and quality living environment.

1.3 Research Question

The research question focuses on how urban transport growth will affect achievement of Low Carbon society which targeted in Iskandar region. This research attempts to review several factors which might leads to the growth of the traffic and vehicles on the road. The increase number in vehicles ownership in Table 1-1 shows that people are tend to use their own vehicles than using the public services.

These circumstances will reduce the possibilities of achieving the Low Carbon 2025 in Iskandar Malaysia if the public still did not aware about the carbon that emitted from their vehicles. The study attempt to clarify on several issues:

1. What are the factors contribute to use of private vehicles on road?

2. What is the pattern of fuel consuming by people in the region?

3. Does the current transportation system in Iskandar Malaysia give the choice for the people to shift from private to public?

4. How the impact of current carbon emission (BAU) from transportation system will cause the delay of the achievement of Low Carbon society in Iskandar Malaysia?

These questions will lead the researcher to solve the issues on urban transport growth in order to understand and offer better alternatives for the public to reduce the use of private vehicles towards reducing the emission production from transportation sector. These questions are used to formulate the aims and objectives for this research to help researcher to have clear direction and guidance towards the end of the study.

1.4 AIM

The research aims to study about the **urban transport growth** as empirical challenges in achieving low carbon society target in Iskandar Malaysia by year 2025.

1.5 Research Objective

1.4.1 To determine the current emission level for Iskandar Development Region.

1.4.2 To analyze the emission produced by vehicle/month based on fuel consumption in study area.

1.4.3 To evaluate the future emission level based on Business as Usual (BAU) and Based on Scenario (BOS).

1.4.4 To mitigate the alternative available in urban transportation system to reduce urban traffic growth in Iskandar region.

1.4.5 To formulate recommendations based on scenario for the future urban transportation system.

1.6 Significance of Research

The study about urban transportation growth is needed in order to overcome the challenges which resulting from the impact of urban transportation growth in order to achieve a low carbon society in Iskandar Malaysia as targeted by 2025. There are several importance for this research as outlined by the researcher as listed below:

a) Provide a clear understanding background about the low carbon society theory and translating it into a real world practice in transportation planning system to meets the highest quality of living environment without compromising the need of mobility in community.

b) Provide a better framework in solving transportation problems from an ad-hoc solution to more comprehensive and complex approach of mobility restrictions without affecting the economic and social interaction in Iskandar Malaysia.

c) Provide recommendation towards transportation facilities which limits the dependence of any single mode of travel and increase the use of transit, bicycling and walking.

d) Promoting a sustainable and green transportation system to protect and enhance the living quality of community with safe and healthy environment.

1.6 Research Design

Urban Transport	Low Carbon Society

1. Mode of transport
2. Impact of urbanization
  -Landuse and zoning
  -Development of high densities
3. Private transport growth
4. Public transport availability
5. Transportation Infrastructure
	1. Vision and opportunity
	  -Kyoto protocol
	  -Carbon footprint
	  -Low Society Blueprint
	2. Development trend
	  -Green Transportation
	  -Transport Oriented Development

Urban Transport Growth:

The Empirical Challenges towards Low Carbon Society

Realism- Key issues on Low Carbon Society

1. The emission production factor (High Automobile Dependency)
   - Total emission gases produced by vehicles in a timeframe
   -The standard measure of gases emission
   -Emission produced by a vehicle/month
   -Dependant factor between population and vehicle used
2. Mode of transport (Motorized and non-motorized vehicles)
   -Distribution of emission produced by mode of transport
   -Private mode vs Public mode
   -Impact of growth in private transportation
3. Share factor-Indirectly affecting growth in urban transport
   - Landuse distribution/Urban Sprawl
   - Culture/Lifestyle

Challenges

1. Meeting environmental targets while achieving mobility
2. Public acceptability of new transport proposals
3. Promoting cities in terms of safe living through transport

Opportunities

1. Urban Transportation Management System (UTMS)
   -Traffic management
   -Modal split management
   -Non motorized Network management
   -Public Transport Network Management
2. Decision Making
   -Evaluating existing Transportation Policies
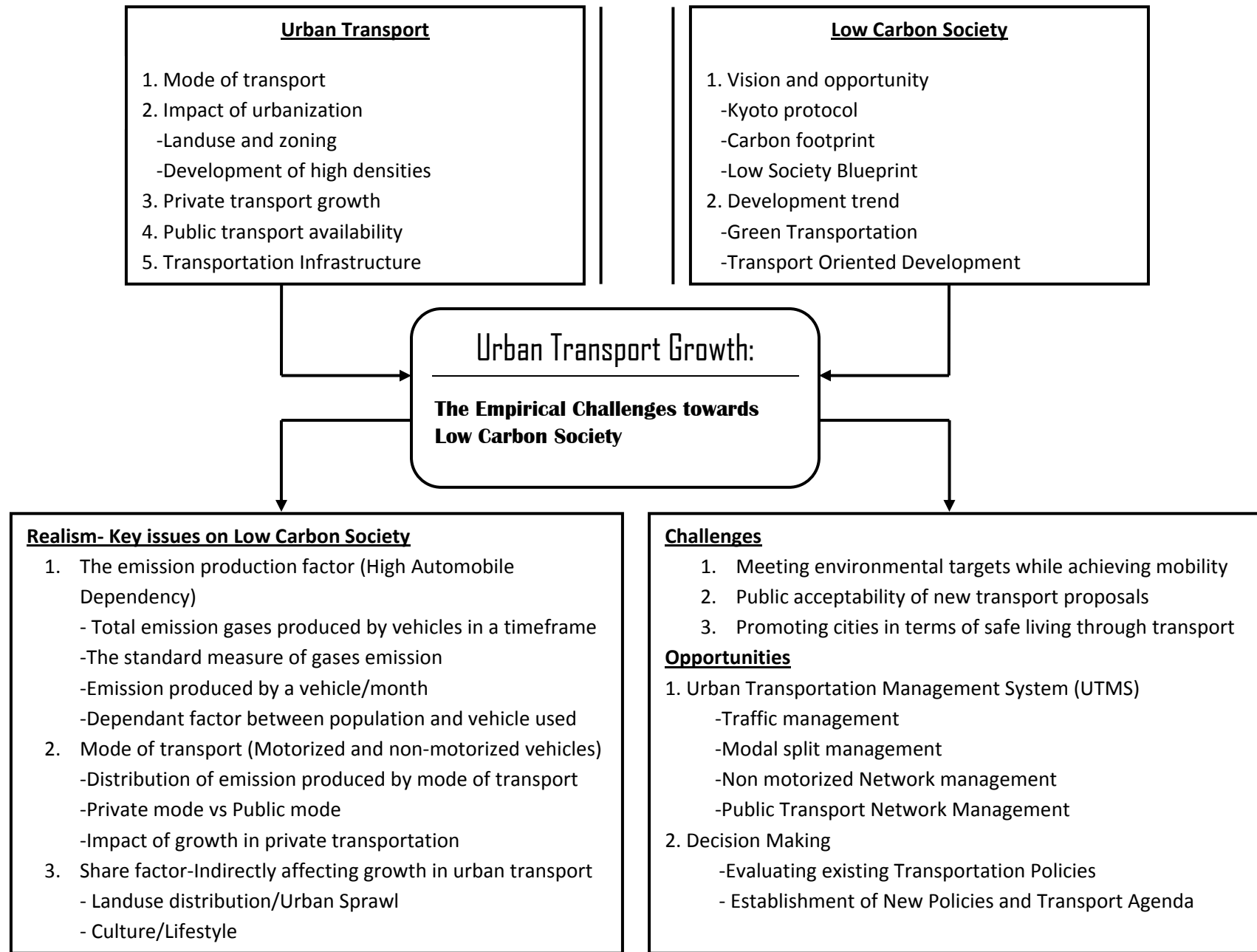   - Establishment of New Policies and Transport Agenda

Figure 1-2   Research Design

1.8 Expected Contribution

This topic has selected by researcher to be part as an academic study towards the national as well as international issues about greenhouse gas effect which related to transportation sector. The researcher aims to make a contribution for the Technology University Malaysia through academic research and also for the Iskandar Malaysia authorities as well.

The outcome and recommendation proposed through this research can be used to tackle current issues in transportation for Iskandar Malaysia to achieve the target to become a Low Carbon society by 2025. The investigation and analysis are basically based on real information and latest data in order to prepare a real and professional academic research which should give return credits to UTM as an innovative and progressive higher learning institution in the country.

1.9 Study Limitations

The limitation of the study is in determining the sample size for a huge number of vehicle ownership in Iskandar Malaysia and the exact amount of the carbon emission produced according to the mode of transportation. The findings from the analysis may not be generalized to a larger population in the area due to the small number of sample size compared to bigger number of vehicles on the road.

Moreover, the exact amount of the carbon emission produced also cannot be measured directly to indicate the current level of gases produce to be reduced at a standard quality of emission level for Iskandar Malaysia. However, the findings can still be used for the study as it shows the average ownership of the vehicles/person in the area that may determine average amount of the carbon emitted in the area.

1.10 Summary

This chapter provides an introduction to the study and explained the background of the study by outlying the aim, objectives, scopes of study, research design, limitation of study, significance of study as well as the direction of the research for these issues in Iskandar Malaysia. In addition, this chapter also provides the structure of the research report which explained generally about the issues and research area. On the whole, this chapter is essential in giving the clear picture about the study that will conduct and challenged involved.

Thus, the next chapter will address the matter pertaining to these problems by a comprehensive literature review on the subject matter. Numerous literature reviews are studied to gained information for the researcher's knowledge that important for further analyses.

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