IHS
Making cities work

IHS is the international institute of urban management of Erasmus University Rotterdam

MSc Programme in Urban Management and Development

Rotterdam, The Netherlands

September 2011

Thesis

Implementing Congestion Charge in Jakarta

Rindy Farrah Indah Dewi

Supervisor: Mansee BAL

Specialisation: Urban Infrastructure Management and Energy

UMD 7

Executive Summary

Transportation Demand Management (TDM) is one of the popular approaches in sustainable transport policy. TDM consist of strategies to change travel behaviour through demand-based approach in order to achieve efficient transport resources, improved environmental condition, as well as to generate revenue. One of the incentives in TDM strategies to use alternative modes and reduce driving is road pricing. Congestion charge is one of the categories in the road pricing mechanism. Congestion charge is introduced in several cities around the world such as Singapore, London and Stockholm, most of which are located in developed countries.

As the centre of politics, economy, trade and social activities of Indonesia, Jakarta becomes denser every year. The vast number of population in Jakarta is not only influenced by natural population growth, but also because of the commuters from Jakarta's surrounding municipality. As a consequence, congestion is seen especially in the central area of Jakarta on the radial highways during rush hours in the morning and in the afternoon.

TDM strategies were introduced in Jakarta as one of the approaches to reduce traffic congestion. They are road pricing (toll roads), the Bus Rapid Transit system, and the traffic restraint (three-in-one system). Although Jakarta has been implementing those strategies, the traffic condition in Jakarta has not shown significant improvement. Congestion charge, as one of TDM strategies, has been considered to be one of the problem-solvers for Jakarta's traffic crisis. This system is planned to replace the 'three-in-one' system. Therefore, there is a need to assess the possibilities of implementing congestion charge in Jakarta.

The research aims to assess the possibilities of implementing congestion charge, as a road pricing mechanism of TDM, in Jakarta. The approach of this research is developed through the review of relevant literature by looking the ways of congestion charge application in theory and practice as a road pricing mechanism of TDM. It assesses the current policy on transportation framework that fits in with congestion charge in Jakarta; the opportunities and challenges of implementing it; and the necessary measures needed to implement congestion charge in Jakarta.

The research is a qualitative and quantitative type. This research combines descriptive and exploratory methods, using in-depth interviews, questionnaires and field observation as research instruments.

The research finds that there are opportunities and challenges of implementing congestion charge in Jakarta. The opportunities and challenges are classified into five aspects which is derived from the literature review. They are: (i) institutional capacity (including legal framework, technology and enforcement), (ii) political support, (iii) public transportation system, (iv) road network system, and (v) public acceptability. The research looks into these opportunities and challenges in details. Then it gives necessary measures to implement congestion charge in Jakarta based on those aspects.

From the research, it is found that congestion charge is possible to be implemented in Jakarta as a road pricing mechanism of TDM as long as measures on implementation as mentioned in research question four is fulfilled. However, looking at the target of implementation that has been defined by the government which is at the end of 2012, many are pessimistic about this target.

***Keywords**: Jakarta, transportation demand management, (electronic) road pricing, congestion charge, implementation measures for congestion charge*

Acknowledgement

First I would like to express gratitude to Allah SWT that made all this happens.

My sincere gratitude goes to many people from Indonesia to the Netherlands. It goes for those who gave me the opportunity, guidance and knowledge to complete this thesis and for those whose support, encouragement and love kept me struggle and win this fight.

Some special people to whom I would like to give special gratitude are;

Mansee Bal, my supervisor who has helped me from the beginning to the completion of the thesis. Thank you for the frequent meeting and discussion that helped shaping my understanding on the topic and figuring out the way to develop this thesis.

Marijk Huysman, my mentor; Ogenis Brilhante and Jacko van Ast, our specialization coordinators. Thank you for the valuable times inside and outside the class.

Siska Aprilianty and NESO Indonesia. Thank you for the opportunity to experience studying in the Netherlands and to learn a lot more.

Max Antameng, my superiors, my colleagues in my office, and all officers of Ministry of Public Works. Thank you for the precious experience, support and broad access to data, documents, reports, and studies.

Officials from the Ministries, Jakarta Province, NGOs, and universities for the interviews and for sharing the information.

Faculty of IHS for giving a clear understanding of how cities work. Thanks to the interdisciplinary and international lecturers who have tried to show us the full framework and for sharing their knowledge and experiences.

My gratitude extends to all my class mates of UMD-7 for their encouragement, support and friendship. My UIEM fellows, especially Eka, Heri, Adhi and Ferdinand for their help during the courses. All Weenapad tenants for their kindness and support during my stay in Rotterdam, especially the cooking club: Deary, Kittima and Safitri, the studying club: Deva, Bram, Sigit, Rizky and Paramitha; and the travelling club: Dewi and Dian.

My friends back home, Annisa, Halida, Dwi Ratih, Amalia Nur, Vikka, Rini and Andhika Fajar Sulaiman for their never-ending encouragement. Sri Kartini and Fisqa Tasyara for helping me with my English.

Last but not least, my deepest gratitude to my beloved family, Hamdi Rachman, Rachma Laurina, Rindi Nuraini, Ashari Rahmandani, and Aldi Rachmansyah for their love and support, without whom all of this would be impossible.

Rindy Farrah Indah Dewi

Rotterdam – The Netherlands

Abbreviations and Acronyms

ANPR : Automatic Number Plate Recognition
DCA : Development Coordination Agency alias *Badan Kerjasama Pembangunan*
BRT : Bus Rapid Transit
CAI : Clean Air Initiative
CBD : Central Business District
CMEA : Coordinating Ministry of Economic Affairs alias *Kementeriaan Koordinator Bidang Perekenomian*
DSCR : Dedicated Short-Range Communications
DKI : *Daerah Khusus Istimewa* (Special Region)
EPOMM : European Platform on Mobility Management
ERP : Electronic Road Pricing
E-TLE : Electronic-Traffic Law Enforcement
GPS : Global Positioning Satellite
HOT : High-Occupancy Toll
HOV : High Occupant Vehicle
ITDP : Institute of Transportation and Development Policy
ITS : Indonesia Transportation Society alias *Masyarakat Transportasi Indonesia*
IU : In-Vehicle Unit
Jabodetabek : Jakarta-Bogor-Depok-Tangerang-Bekasi (Greater Jakarta)
JCCT : Jakarta City Council for Transportation alias *Dewan Transportasi Kota Jakarta*
JETRO : Jakarta External Trade Organization
JICA : Japan International Cooperation Agency
JTO : Jakarta Transportation Office alias *Dinas Perhubungan*
JUTPI : Jabodetabek Transportation Policy Integration Project
MOF : Ministry of Finance alias *Kementerian Keuangan*
MPW : Ministry of Public Works alias *Kementerian Pekerjaan Umum*
MOT : Ministry of Transportation alias *Kementerian Perhubungan*
MTM : Macro Transportation Model alias *Pola Transportasi Makro*
NGO : Non-Government Organization
NPDA : National Planning and Development Agency alias *Badan Perencanaan dan Pembangunan National*
SITRAMP : Study on Integrated Transportation Master Plan for Greater Jakarta
TOD : Transit Oriented Development
TDM : Transportation Demand Management
VTPI : Victoria Transport Policy Institute

Conversions

1 USD = 8,538.00 Indonesian Rupiah (IDR) as 20th August 2011

1 Euro = 12,000.00 Indonesian Rupiah (IDR) as 20th August 2011

Table of Contents

List of Tables

List of Charts

List of Figures

Chapter 1: Introduction

1.1 Background

Jakarta is the centre of politics, economy, trade and social activities of Indonesia. With a total population approximately 9.5 million people, Jakarta is one of the most populated and dense cities in the world (Indonesia Central Statistic Bureau 2010). The vast number of population in Jakarta is not only influenced by natural population growth, but also commuters from Jakarta's surrounding municipality. Jakarta as a city cannot be separated with its surrounding urban areas consisting Bogor, Depok, Tangerang and Bekasi city, known as "Bodetabek". This situation affects the commuting trips to Jakarta from surrounding areas. The commuting trips from the surrounding areas to Jakarta had increased roughly 1.5 times between 2002 and 2010. This data was found in an on-going research conducted by the Coordinating Ministry of Economic Affairs (CMEA) and Japan International Cooperation Agency (JICA) which was started in 2010. The increasing number of commuting trips was due to government policies which were more in favour to private vehicles such as construction of highways and fuel subsidies (Kusumastuti 2006). As a consequence, congestion is seen especially in the central area of Jakarta on the radial highways during rush hours in the morning toward the centre, and to the opposite direction in the afternoon.

Traffic congestion as a chronic problem faced by Jakarta had become worsen. The total lost from traffic congestion is estimated US $ 1.5 billion per year (Jakarta Transportation Office 2010). The lost consist of time value loss, health cost and fuel consumption. Approximately 98% of the vehicles in Jakarta are private-owned and the numbers of vehicles are increasing everyday without the growth of the road itself. The number of private vehicles increased 9% per year, while the road length growth is only 0.01% per year. It is predicted that in 2014 the road network in Jakarta will reach its saturation point (Soehodho 2010). Therefore, the key challenge is to define an approach to overcome these transportation problems.

With the immense concern on sustainability, Transportation Demand Management (TDM) is one of the popular approaches in sustainable transport policy (Litman, Burwell 2006). Compared to the traditional transport policy which focuses more on the supply of either the quantitative and qualitative improvement of public transport system or the expansion of network, TDM focuses more on the demand. TDM is defined as general strategies for efficient transport resources that can change travel behaviour as a response to transport problem (Litman 2002).

Road pricing is one of the examples of TDM strategy. It is an economic concept that regards the various direct charges applied for the use of roads which may vary by time of day, by the specific road, or by the specific vehicle type being used (Link, Stewart-Ladewig 2005). An example of road pricing approach is congestion charge which most urban economists and policy analysts agreed as the best policy to deal with traffic congestion (Small, Gomez-Ibanez 1998). Congestion charge is a fee that can vary depending on the traffic condition (higher prices under congested conditions and lower prices at less congested times and locations) or based on a fixed schedule (VTPI 2010a). This approach has been used in several big cities around the world such as Singapore, London and Stockholm, and results have shown a reduced percentage of congestion in those cities (Pike 2010).

The TDM strategy has been introduced as one of the approaches to reduce traffic congestion in Jakarta. The first TDM strategy was introduced in 1978 in a form of road pricing, specifically toll roads. The first toll road that was built connected Jakarta with its neighbouring province. Throughout those years, more toll roads were built for inter urban

and inner urban connection. Another TDM strategy was introduce in Jakarta which is the Bus Rapid Transit (BRT) system, known as *busway*. The first BRT line has been operated since 2004. The number of lines keeps increasing, and in 2011 there are ten lines in operation around the city.

A different form of TDM strategy in Jakarta is the 'three-in-one' rule which was introduced in 1992. The ‘three-in-one’ rule is basically a traffic restraint strategy applied on several arterial roads in the centre of Jakarta from 6.30 a.m. to 10.00 a.m. and 4.30 p.m. to 7.00 p.m, from Mondays through Fridays. During the restricted time, only vehicles with three or more passengers are allowed to enter the restricted road sections. In a research conducted by JICA (2004) stated that this system had shown drawbacks such as: (i) lack of monitoring and controlling, (ii) the increase of traffic demand on the parallel streets during the restricted hours and the decrease of travel speed. (iii) the existence of temporary passengers called jockeys, (iv) inflexibility, and (v) no revenue is collected for the local government while cost is incurred by the traffic police for enforcement. Although Jakarta has been implementing those TDM strategies mentioned previously, yet the traffic condition in Jakarta has not shown any significant improvement.

1.2 Problem Statement

The congestion charge in the form of Electronic Road Pricing has been considered to be one of the problem-solvers for Jakarta’s traffic crisis. This system is planned to replace the ‘three-in-one’ system which is one of the policies stated by the Vice President to alleviate the Jakarta worsening congestion (Berita Jakarta 2011). The application of congestion charge has been stated in the Act No. 22 of 2009 on Road Traffic and Transport, and also in the Government Regulation No. 32 Year 2011 on Traffic Management, Impact Analysis and Traffic Demand Management. However, this Act and Government Regulation has not been defined in terms of operational standards and regulatory mechanisms. In the Study on Integrated Transportation Master Plan for Greater Jakarta, known as SITRAMP conducted by JICA (2004), it was stated about congestion charge as part of TDM strategies with the area alternatives to implement it.

Congestion charge is introduced in several cities around the world such as Singapore, London and Durham, England; Stockholm, Sweden; Valleta, Malta and New York, United States, most of which are located in developed countries. This concept has been frequently discussed and debated in other cities, but seldom been implemented since the institutional barriers in implementing congestion charge and public acceptability are considered to be crucial (Gaunt, Rye & Allen 2007). Moreover, experiences from other cities that have already implemented congestion charge, for example Singapore, London and Stockholm, show that geographical condition in relation with the road network system, also comprehensive and well-functioning public transport system is also vital to implement congestion charge. Therefore, in order to implement congestion charge in Jakarta, there is a need to assess its possibilities for implementation.

1.3 Significance of the Study

Congestion has been a chronical problem in Jakarta throughout the last decade. The congestion charge mechanism was introduced as one of the way to solve congestion in Jakarta which has been stipulated in the Act No. 22 of 2009 on Road Traffic and Transport, as well as Government Regulation No. 32 Year 2011 on Traffic Management, Impact Analysis and TDM. However, the congestion charge has not been implemented yet due to legal barriers. This study aims to assess the possibilities of implementing congestion charge in, as a road pricing mechanism in of TDM, in Jakarta. The findings of this study are

expected to contribute to the preparation of implementing congestion charge in Jakarta, focusing on opportunities, challenges and measures needed to implement congestion charge. Since there are other metropolitan cities in Indonesia besides Jakarta that are also facing congestion as their main problem, this research could contribute to solution of congestion though implementation of congestion charge. Finally, it is also hoped that the study will contribute to the knowledge on congestion charge, specifically on implementation in developing countries.

1.4 Research Question

The objective of this research is *to assess the possibility of implementing congestion charge, as a road pricing mechanism of TDM, in Jakarta.*

To achieve the objective, the research questions are put together as follows:
(1) What are the ways to apply congestion charge as a road pricing mechanism of TDM?
(2) What is the current policy on the transportation framework that fits with congestion charge in Jakarta?
(3) What are the opportunities and challenges of implementing congestion charge in Jakarta?
(4) What are the necessary measures needed to implement congestion charge in Jakarta?

1.5 Research Methodology

The research is a qualitative and quantitative type of research. It combines descriptive and exploratory methods of research, using in-depth interviews, questionnaires and field observation as research instruments. The units of analysis of this research are transportation experts from various institution and common people of Jakarta.

1.6 Scope and Limitations

The scope of the research is to assess the possibilities of implementing congestion charge, as road pricing mechanism of TDM, in Jakarta. It includes reviewing the current application of congestion charge in several countries, analyzing the current policy national/provincial transportation framework that will fit in congestion charge in Jakarta, opportunities and challenges, also necessary measures needed to implement congestion charge in Jakarta.

Regarding the limited time and resource, this research does not cover the whole population of Jakarta in order to find out opportunities and challenges of implementing congestion charge from people perception. This research uses a purposive sampling technique to identify respondents for the questionnaires. Another limitation is the researcher cannot make a complete transcription from all of the interviews.

1.7 Thesis Structure

The thesis is divided into six sections that are outlined as five chapters followed by the '**Introduction**' chapter (refer Annex 1). Chapter 2, entitled '**Literature Review'** sets the theoretical foundation of the thesis. It reviews literature on the main topic of this thesis which is congestion charge as road pricing mechanism, categorized as one of the TDM strategies. Regarding research question, this chapter relates to the first research question about the ways that TDM is applied. Chapter 3, entitled '**Research Methodology**' gives an overview on how the research will be conducted. It also describes the method adopted to answer the research questions and the analysis of data. Chapter 4, entitled '**Context of Jakarta**' gives an overview on condition of Jakarta and its transportation policy in general. Regarding research question, this chapter relates to the second research question about the current policy on the transportation framework that fits in with congestion charge in Jakarta. Chapter 5, entitled '**Research Findings and Analysis**' is the empirical part of the study that

presents the findings and analysis to answer research questions from literature review and primary data collection conducted during fieldwork. Chapter 6, entitled '**Conclusions**' presents conclusion of this thesis by answering the research questions. This chapter also summarizes the findings of the thesis. Bibliography and annexes are attached at the end of the thesis.

Chapter 2: Literature Review

2.1 Introduction

This chapter reviews the existing literature on transportation policies, especially related with the demand-based approach (TDM) which includes definitions, benefits and challenges of implementing it in order to set up the base of the study. The chapter gives further explanation regarding TDM strategies as incentive to reduce driving specifically related with road pricing and congestion charge. Description of cities that have already implemented congestion charge is shown in this part of this research by taking example from Singapore's, London's and Stockholm's experiences. At the end of this chapter, the conceptual framework is presented.

2.2 Transportation Policies

Since the Brundtland Report introduced the concept of sustainable development, there has been a significant concern in the world regarding the principle of sustainability, sustainable development and sustainable transport which is basically related with economic efficiency, social equity and environmental quality (Litman, Burwell 2006). According to the Brundtland Report, Sustainable Development is: *"one that meets the needs of the present without compromising the ability of future generations to meet their own needs"*. In close relation to Sustainable Development, Sustainable Transport as defined by the (Transportation Research Board 2008) is a system which:

(1) "allows the basic access needs of individuals and societies to be met safely and in a manner consistent with human and ecosystem health, and with equity within and between generations;
(2) is affordable, operates efficiently, offers choice of transport mode, and supports a vibrant economy; and,
(3) limits emissions and waste within the planet's ability to absorb them, minimizes consumption of non-renewable resources, limits consumption of renewable resources to the sustainable yield level, reuses and recycles its components, and minimizes the use of land and the production of noise."

The World Bank (1996) defines sustainable transportation should consider all the angles:

(1) "to ensure continuous capability to support an improved standard of living corresponding to economic and financial sustainability,
(2) to generate optimum possible improvement in the general quality of life that relates to the concept of environmental and ecological sustainability, and
(3) to produce equitably benefits shared by all sections of the community which term social sustainability".

In order to translate the concept of sustainable transport into practices, Geerlings and Lohuis (2008) introduced different approaches to the making of transport sector policy. They are: (i) spatial planning, (ii) transportation prevention, (iii) pricing, (iv) stimulating public transport, (v) mobility management, (vi) modal shift, (vii) infrastructure capacity management, (viii) infrastructure upgrading, and (ix) infrastructure constructing. As illustrated in Figure 2.1, the pyramid shows the options and types of transport policies with the aim to improve transportation problem. The order of the pyramid is based on its preference of each option from the sustainability perspective. Moreover, each options of different approaches needs to be combined in order to achieve a sustainable transport through transportation policies. This research will focus on pricing and mobility management as shown in the grey area in Figure 2.1.

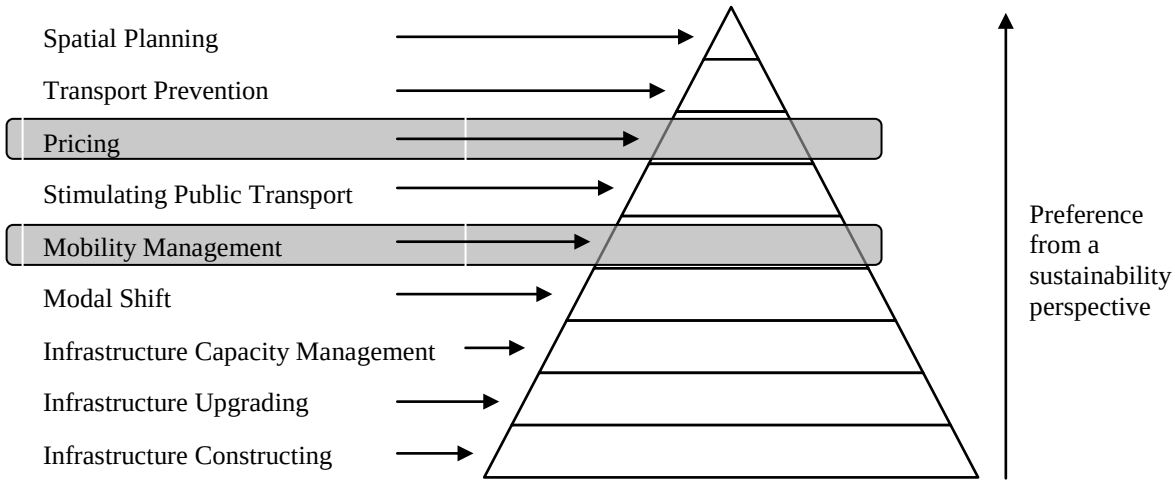


Figure 2. 1. Priority Pyramid of Transport Sector Polices Towards Sustainability
Source: Adapted from Geerlings and Lohuis 2008

As stated by Mingardo (2008), traditional (urban) transport policies are usually supply-based which focus either on the quantitative and qualitative improvement of public transport system or on the expansion of network and parking capacity. Most of those approaches are considered no longer effective or sustainable. However, as a demand oriented transport policies, TDM (also known as 'mobility management') delivers sustainable transport mechanism if it is used in combination with other policies.

To sum up, with the concern of sustainable development in the world, sustainable transport policies are the ways to achieve economic efficiency, social equity and environmental quality. The demand-based approach or known as TDM and road pricing are examples of transport policies which will promote sustainable transport. In order to implement those sustainable transport policies, the policy making process is related with the policy environment, inputs (demands, support and resources) and the government itself. The next part of this chapter will review the literature regarding TDM as one of the sustainable transport policies.

2.3 Transportation Demand Management

TDM (also called Mobility Management) is a general term for "*strategies that can change travel behaviour for efficient transport resources, as opposed to increasing transportation system supply by expanding roads, parking facilities and other motor vehicle related facilities*" (Litman 2002, VTPI 2010b). As stated by VTPI (2010), "*TDM treats mobility as means to an end, rather than an end in itself; it emphasize the movement of people and goods, rather than motor vehicle, and so gives priority to more efficient modes particularly under congested conditions"*. Another definition of TDM by EPOMM (2009) is "*a concept to promote sustainable transport and manage the demand for car use by changing traveller's attitudes and behaviour"*.

According to (Saleh, Sammer 2009), the objective of TDM "*is to encourage individuals to either make their trip outside peak times, but by a different mode or to find another way of carrying out the trip purpose"*. TDM aims to improve travel options and persuade travellers to choose the most efficient mode for each trip focused on soft measures such as information and communication (Litman 2002, EPOMM 2009).

TDM strategies have been implemented in many developed countries around the world. Several researchers advocate that TDM is also suitable in developing countries. Litman (2002) justified several factors that link with the appropriateness of TDM in developing countries. They are:

(1) Infrastructure supply. In most developing countries, the infrastructure condition is poor. Roads are not well-designed for heavy motor vehicle traffic which then causes congestion. Roads and sidewalks serve many functions and users such as for walking, retail businesses, sleeping, begging, etc.
(2) Vehicle supply. The trends in developing countries are low vehicle ownership among general population, medium to high vehicle ownership among middle-income households, and high vehicle ownership growth rate among wealthy people.
(3) Personal mobility. Generally, in developing countries there are large variations in mobility between different income groups: low mobility among the general population and high mobility among wealthier groups.
(4) Transportation diversity. From walking, cycling, animal carts, public transportation to private vehicle.
(5) Institutional capacity. Some developing countries have poor civil institutions to plan, implement and enforce traffic improvements, with poor coordination between levels of government. Most decision makers tend to personally favour private vehicle-oriented improvements.
(6) Government costs. In most developing countries, government has limited funds for transportation infrastructure and services.
(7) Consumer costs. Many household in developing countries spend a large portion of income on transport.
(8) Traffic safety. In most developing countries, there are high traffic casualties per motor vehicle and high risk to vulnerable road users (pedestrians, cyclists, animals, etc.).
(9) Comfort. The comfort level of transportation modes vary: low comfort levels for non-motorised travel and most of public transportation, and medium to high comfort for private vehicle and taxi.
(10) Environment. In most developing countries, urban areas have high pollution concentration.
(11) Land use. Generally, in developing countries, urban areas have medium to high accessibility, while suburbs have poor accessibility.
(12) Economic development. There is a high dependency on imported transportation goods in developing countries.

As stated by Litman (2002), developing countries in particular have limited resources to allocate to infrastructure transportation. They also often have narrow and crowded streets, limited space for parking and a diverse mix of road users, leading to conflicts over space and risk of accidents. Therefore, TDM is considered as an appropriate response to transport problems particularly in developing countries because of its low cost and multiple benefits. This statement is supported by Saleh (2007) who stated that the application of TDM *"results to a more efficient transport system, improved environmental conditions and improvements in a safety as well as revenue generation"*. The EPOMM (2009) also mentioned that TDM does not necessarily require large financial investments compared with supply-based transportation policies. Nonetheless, the implementation of TDM and its challenges has not been discussed further in this subchapter.

In summary, TDM are strategies to change travel behaviour through demand-based approach in order to achieve efficient transport resources, improved environmental condition and revenue generation which leads to the principle of sustainable transport. In practice, TDM has been used in many countries around the world. However, it has been considered that TDM is appropriate to be applied in developing countries because of its low cost and

multiple benefits. Since TDM is considered appropriate to be applied in developing countries, the next part of the literature review will discuss TDM categories, specifically as incentive to use alternative modes and reduce driving.

2.4 TDM as Incentive to Use Alternative Modes and Reduce Driving

TDM strategies are believed more effective at reducing traffic congestion than roadway capacity expansion projects (Litman 2002). According to Litman (2002) and VTPI (2011), TDM strategies can be classified into major categories based on how they affect travel (refer Annex 2). They are:

(1) Improvement of transport options, including bicycle and public transportation integration, shuttle services, taxi service improvement, park and ride, etc.

(2) Incentives to use alternative modes and reduce driving, such as congestion pricing, distance-based pricing, walking and cycling encouragement, vehicle use restriction, fuel taxes, etc.

(3) Parking and land use management, including parking management, car-free districts and pedestrianised streets, clustered development, etc.

(4) Policy and institutional reforms, such as freight transport management, car-free planning, regulatory reform, institutional reform, TDM marketing, etc.

Each TDM categories has their own specific strategies to fit in based on their way to affect travel. Other classifications of TDM strategies are 'push and pull' strategies, and fiscal and non-fiscal strategies (Saleh 2007). Examples for the 'push and pull' strategies are including regulatory, planning or persuasive, and pricing policies. Examples for non-fiscal strategies are traffic calming and access controls and restriction, public transport improvement, road space reductions, and travel awareness campaigns; while for fiscal strategies includes parking charges, fuel taxes, car ownership permits, public transport subsidies and also road-user charging.

The VTPI (2010) also mentioned that most of the TDM strategies use positive incentives with the purpose of giving consumers more travel options or opportunities to save money. Examples of positive incentives in direct consumer impacts on TDM are alternative work schedules, bike/transit integration, car sharing, commuter financial incentives, guaranteed ride home, improved security, location efficient mortgages, new urbanism, park & ride, pay-as-you-drive insurance, pedestrian and cycling improvements, ridesharing, school trip management, shuttle services, TDM marketing, telework, transit improvements and transit oriented development.

There are mixed and negative incentives, direct and indirect impacts on consumer as a result of TDM strategies (VTPI 2010). Examples of TDM strategies that have mixed incentives in direct consumer impacts are access management, car free planning, comprehensive market reforms, HOV (high occupant vehicle), performance, parking management, smart growth, street reclaiming and traffic calming. In addition, examples of negative incentives on direct consumer impacts are fuel tax increases, parking pricing, road pricing, and vehicle use restriction.

There are various TDM strategies mentioned above. Litman (2002) stated that to select which TDM strategy to implement will vary. It depends on community demographic, geographic and political condition. An effective way to implement TDM is usually a combination of positive incentives to use alternative modes and negative incentives to discourage driving. Road pricing is identified as one the TDM strategy which is a negative incentive to discourage driving. The next part of the literature review will focus on road

pricing as one of the TDM strategies – its definition, objectives, categories, implementation and principles.

2.5 Road Pricing

Road pricing is one of TDM strategies that requires motorist to pay directly for using a particular roadway or driving in a particular area which may vary by time of day, by the specific road, or by the specific vehicle type being used (Link, Stewart-Ladewig 2005). The economic theory of road pricing was introduced by Pigou in 1920 and Knight in 1924 because of the phenomenon of external effect (Rouwendal, Verhoef 2006). The authors stated that if there is congestion, each trip on the road forces other users to slowdown, and consequently users have longer trip times; when this cost is ignored, the market fails. This situation can be improved by pricing the road. Following elaborates on the objectives, categories and principles of road pricing in theory.

2.5.1 Objectives of Road Pricing

As mentioned by Link, Stewart-Ladewig (2005), the road pricing idea was suggested by Pigou in 1920 with various objectives which are partly overlapping or even conflicting. Link, Stewart-Ladewig (2005) grouped the objectives of road pricing which were achieving: (i) infrastructure use efficiency; (ii) infrastructure provision efficiency and improvement; and (iii) financial viability. Litman (2002) and VTPI (2010) stated that road pricing has two general objectives: (i) revenue generation, and (ii) congestion management. As revenue generation, the rates are set to maximize revenue or recover specific cost and the revenue is often dedicated to roadway projects. As congestion management, road pricing reduces peak-period vehicle traffic and the revenue is not dedicated to roadway projects.

2.5.2 Categories of Road Pricing

The VTPI (2010) defines seven major categories of road pricing with its specific objectives. They are: (i) road toll (fixed rates), (ii) congestion charge (time-variable), (iii) cordon fees, (iv) high-occupancy toll (HOT) lanes, (v) distance-based fees, (vi) pay-as-you-drive insurance, and (vii) road space rationing. Each category of road pricing has different description and objective as mentioned below:

(1) Tolls is a common way to fund highway and bridge improvements, related with the fee-for-services principles with revenues dedicated to roadway project cost which is considered more equitable and economically efficient than other roadway improvement funding options.

(2) Congestion charge (also called ‘value pricing’) is intended to reduce traffic volumes in peak-period to an optimum level where the price varies or dynamic. The rates change depending on the level of congestion that exists at a particular time or higher prices under congested conditions and lower prices at less congested times and locations.

(3) Cordon tolls are fees paid by motorists to drive in a particular area, usually in the city centre, and apply only during peak periods, such as weekdays.

(4) HOT lanes are HOV lanes which allow usage by a limited number of low occupancy vehicles if they pay a toll. This allows more vehicles to use HOV lanes while maintaining an incentive for mode shifting, and raises revenue. HOT lanes are often proposed as a compromise between HOV lanes and Road Pricing.

(5) Distance-Based Charges can be used to fund roadways or reduce traffic impacts, including congestion, pollution and accident risk. It is also considered as a way to

reduce traffic congestion and more equitably reflect the roadway costs imposed by each vehicle.

(6) Pay-As-You-Drive Vehicle Insurance, prorates premiums by mileage so vehicle insurance becomes a variable cost. This gives motorists an incentive to reduce traffic impacts, but provides no additional revenue.

(7) Road Space Rationing is a variation of road pricing to ration peak period vehicle-trips or vehicle-miles using a revenue-neutral credit-based system. Residents can use the credits themselves, or trade or sell them to somebody else. The result is a form of congestion pricing in which the benefits are received by the residents rather than road owners or governments.

2.5.3 Implementation of Road Pricing

Road pricing is usually implemented by public or private highway agencies or local authorities as part of transportation project packages. It is also implemented through privatization of highway construction and operation which may require other levels of government approval (VTPI 2010a). Moreover, the implementation of road pricing will give impacts that vary depend on various factors, including the type of pricing, how it is structured, and the transportation and geographic conditions in which it is implemented.

The VTPI (2010) classified various scales for implementing road pricing as follow:

(1) Point – pricing a particular point in the road network, such as a bridge or a tunnel;
(2) Facility – pricing a roadway section;
(3) Corridor – pricing all roadways in a corridor;
(4) Cordon – pricing all roads in an area, such as a central business district; and
(5) Regional – pricing roadways at regional centres or throughout a region.

The various scale of pricing strategy is suitable for certain type of road pricing as illustrated in Table 2.1.

Table 2. 1. Appropriate Scale of Pricing Strategies

Category	Spot	Facility	Corridor	Cordon	Regional
Road toll (fixed rates)	X	X	X		
Congestion charge (time variable)	X	X	X	X	
Cordon fees	X	X			
HOT lanes			X	X	
Distance-based fees					X

Source: VTPI, 2010

As shown in Table 2.1, each category of road pricing has its own appropriate scale of pricing strategy which can be used as a basis to decide what type of road pricing mechanism to use. From Table 2.1, congestion charge is the most flexible category that can be used in spot, facility, corridor or cordon scale. The next part of literature will review the principles of effective and fair road pricing system.

2.5.4 Principles of Road Pricing

Road pricing has been a controversial and debateable concept since it involves the issue of equity. Ison (1998) in Goh (2002) stated that the willingness to adopt road pricing depends on political will, public acceptance, budgetary constraints and the availability of alternatives. According to Cracknell (2000), Litman (2002) and VTPI (2010), there are several principles that need to be fulfilled in order to achieve an effective and fair road pricing system. These principles are classified into three perspectives: (i) user, (ii) traffic authority, and (iii) society's perspective.

- From the user perspective, road pricing principles should be convenient and easy for users to understand. Consumers should have viable travel options available and easy to use with multiple payment options, transparent and anonymous where the privacy of users is assured.
- From the traffic authority perspective, road pricing principles should be efficient and equitable, effective, flexible, reliable, secure and enforceable, cost effective, does not require each vehicle to stop at toll booths or in other ways which would delay traffic, and minimum disruption during development phase.
- The principles of road pricing from society's perspective should be positive net benefits, politically acceptable – though public perception of fairness and value, has positive environment impacts and integrated. The principles regarding the society's perspective, particularly the political acceptability is also stated by Link, Stewart-Ladewig (2005) and Small, Gomez-Ibanez (1998).

To sum up, road pricing has been considered as a way to solve congestion problems since it limits the number of vehicle in a particular road or area through a certain tariff/charge that has been set up. Besides reducing congestion, the objective of applying road pricing is to generate revenue. Major categories of road pricing are road toll (fixed rates), congestion charge (time-variable), cordon fees, HOT lanes, distance-based fees, pay-as-you-drive insurance, and road space rationing. In order to implement an effective and fair road pricing system, there are principles that need to be fulfilled. They are classified into the user, traffic authority and society's perspective. The next part of literature review will focus on congestion charge as a road pricing mechanism.

2.6 Congestion Charge as a Pricing Mechanism

Congestion charges is a fee that can vary depends on the condition of the traffic (higher prices under congested conditions and lower prices at less congested times and locations) or based on a fixed schedule (Litman 2002; VTPI 2010). This approach can be implemented on existing roadways as a TDM strategy to avoid the need to expand capacity, or when road tolls are applied to raise revenue.

According to Small, Gomez-Ibanez (1998), urban economists and policy analysts agreed that congestion charge is the optimum policy to deal with traffic congestion in an efficient and equitable way to pay roadway costs and encourage more efficient transportation. This statement is also agreed by (Hensher, Pucket 2007) who stated that congestion charge has become popular as an effective instrument in responding to high levels of traffic congestion. On the other hand, disagreement appears from the consumers' level such as motorist which usually represents a small portion the city population (Litman 2002). This is based on several cases around the world that had been implemented or tried to implement congestion charge. The next part of literature review will give explanation about examples of technologies for congestion charge, implementation in Singapore, London and Stockholm, benefits and challenges of congestion charge.

2.6.1 Technologies for Congestion Charge

The implementation of congestion charge or road pricing applications has used a variety of technology. This is done in order to achieve flexibility of implementation. Several important technologies that have been used in cities that are applying congestion charge include: (i) camera based recognition, (ii) dedicated short-range communications, and (iii) global positioning satellite systems combined with cellular radio communications (Blythe 2005; Pike 2010).

The camera based recognition or video-based licence-plate recognition relies on the accurate 'reading of vehicles' licence plates to identify, charge and enforce vehicles in a congestion charge scheme (Blythe 2005). A system named Automatic Number Plate Recognition (ANPR) process the video images taken by a camera at the roadside or on a gantry, locates the number plate in the image and converts this into the appropriate alphabetic/numeric characters. The ANPR system does not involve human intervention (refer Figure 2.3). Example of cities that are currently using this type technology in their congestion charge system are London and Stockholm.

The dedicated short-range communications (DSRC) is another technology for congestion charge. It is a microwave-based system that needs a road-side equipment, typically mounted on a gantry, with electronic tags in the vehicles which may be read-only, read-write or smartcard-based (Blythe 2005). The DSRC system requires a reliable, high-speed two-way data-communications link with the road side and more complex on-board equipment (refer Figure 2.4). Examples of users for this type of technology are the Singapore system, Melbourne City link and Highway 407 in Canada.

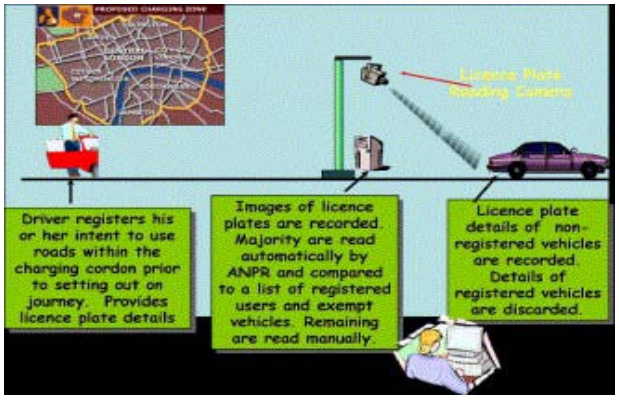


Figure 2. 2. ANPR Charging System
Source: Blythe 2005

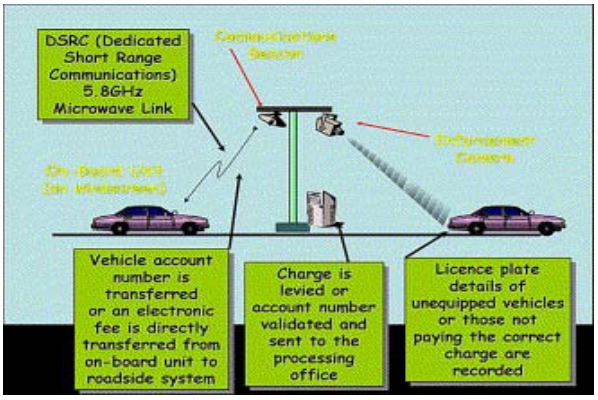


Figure 2. 3. DSRC Charging System
Source: Blythe 2005

The combination of global positioning satellite (GPS) systems with cellular radio communications is also known as wide-area communications-based system or mobile positioning system (Blythe 2005). The system mutually adapted two technologies: (i) GPS whose satellites enable suitably equipped vehicles to calculate their location accurately, and (ii) a two-way communication link based upon either global system for mobile communication or DSCR. The vehicle unit needs to have a GPS receiver and some computing and memory which must contain a record of the locations of all charging points either pre-stored or downloaded directly via the units' communication link (refer Figure 2.5). This type of technology for congestion charge system is use on the German autobahn network.

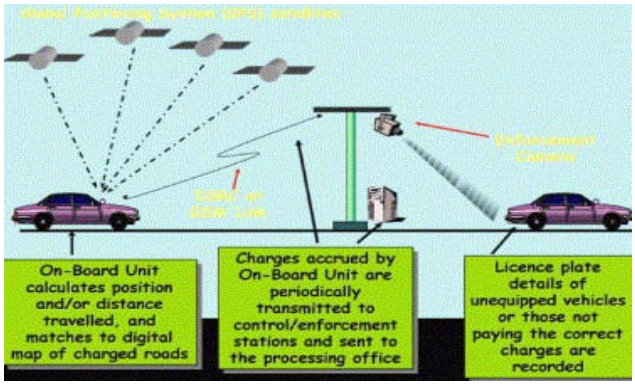


Figure 2. 4. Mobile Positioning-Based Road Charging System
Source: Blythe 2005

In summary, there are several types of technology that have been used by cities around the world in order to implement congestion charge. Each type of technology needs to be supported by financial and human capacity in order to ensure the system to work properly. The next part of the literature review will give explanation regarding the implementation of congestion charge in several cities around the world.

2.6.2 Implementation of Congestion Charge

Congestion charge has been applied in several countries around the world such as Singapore, London and Durham, England; Stockholm, Sweden; Valleta, Malta and New York, United States most of which are categorized as developed countries. From several cities that have been implementing congestion charge, Pike (2010) stated that there are three cities that have successfully implemented it: Singapore, London and Stockholm.

Singapore, a small island-state, decided to find a way to solve congestion without building more and wider roads since land is scarce. It has only 3122 km of road, of which 3038 km are asphalt paved and there are eight expressways with a total length of 150 km in the network (Goh 2002). Since the 1970s, Singapore has implemented various measures to manage the increasing number and usage of vehicles on the road. In 1972, Singapore tried to limit the traffic growth by making car more expensive to own through implementing Additional Registration Fee; nonetheless, it did not abate the demand for motor vehicle as the economic growth was 8% and consumer aspirations were high (Goh 2002).

In 1975, Singapore was the first country to adopted congestion charge called Area Licensing Scheme through a paper system of daily licences for vehicles entering the central zone during peak traffic periods (Goh 2002, Pike 2010). Due to development of technology, the paper system was felt needed to be developed further. The Singapore Government watched and observed the Electronic Road Pricing (ERP) system when it was first tried out in Hongkong from July 1983 to March 1985 (Hau 1990 in Goh 2002).

In 1998, the system was significantly renovated and changed into ERP by installing in-vehicle units (IUs) or on-board units (OBU) in 680,000 vehicles at no charge to the user. According to Pike (2010), *"the units communicate with overhead gantries at charging points and deduct the appropriate charge from a smart card (which can also be used for other transaction such as parking and public transportation) inserted into the IU; the transaction occurs onboard as a debit on the smart card rather than through a central processing system"*. The enforcement cameras on overhead gantries photographed vehicles which do not have an IU installed or if the smart card do not have an adequate balance. The violators are fined and then they are asked to pay online or through other automatic methods. Figure 2.6 shows the location of the gantries which is more distributed on the southern part of the country where the city centre is located.

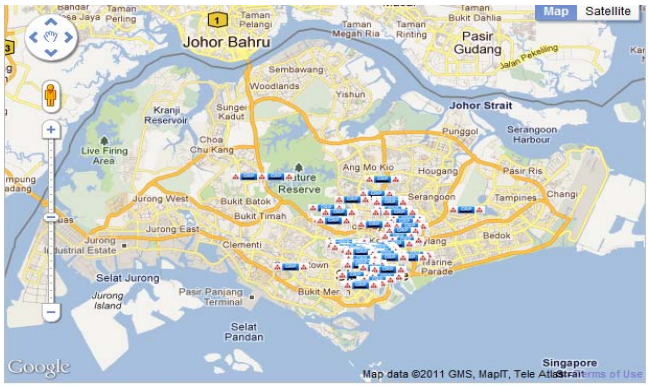


Figure 2. 5. Singapore ERP Gantry Locations
Source: Singapore Land Transport Authority 2011

As the ERP system becomes more familiar and acceptable by Singaporeans, the government will set up more ERP gantries. The price differs from each category of vehicles based on their size, time of entry and location of entry (Goh 2002). In order to determine appropriate toll levels, the traffic levels are reviewed in every three months. As stated by Pike (2010), "*Since 2008, it is an official policy to adjust fee rates at each of the 70 charging points as needed to ensure traffic moves at uncongested target speeds 85% of the time or more. For example, when average travel speed on highways is observed below 45 km per hour (kph) or above 65 kph, the rates are increased or decreased respectively*".

London has implemented the congestion charge system since 2003 with the strong support from the incumbent Mayor at that time, Ken Livingston (Leape 2006). The aim was to reduce the traffic and air pollution. The idea of congestion charge in London was from a report titled Review of Charging Options for London issued in 2000 which recommended two alternatives in order to reduce the traffic congestion: (i) an area license scheme for central London based on video camera enforcement, and (ii) a work-place parking charge. The final decision chosen by the Livingston was the area license scheme which had gone through 18-month period of public consultation (Leape 2006). The decision was supported by evidence that area license scheme would be more effective in reducing congestion compare to parking levies. This was consistent with Livingstone's campaign to introduce congestion charging.

As mentioned by Pike (2010), the London congestion charge system was initially implemented in a high congested area of 21 km^2, which is surrounded by 200,000 residents. Since there was public support for the system, the zone doubled in size in 2007 with the additional western extension. The London system uses ANPR with overhead cameras to recognize license plates. Different payment methods are available including online, text messaging, phone and retail stations.

There are several key factors that contribute to the successful implementation of congestion charge in London. As stated by Leape (2006), London has a comprehensive and well-functioning public transport system which offers good alternatives to road user including railway, subway and bus system. The readiness to set-up the system for enforcement is also a key factor to implement congestion charge because it is mostly where the practical problems occur. Other factors are the geography and roads of London which use the ring road around inner London as a suitable boundary for the congestion charge as shown in Figure 2.7. Only a small part of Greater London (London Boroughs) applied the congestion charge system.

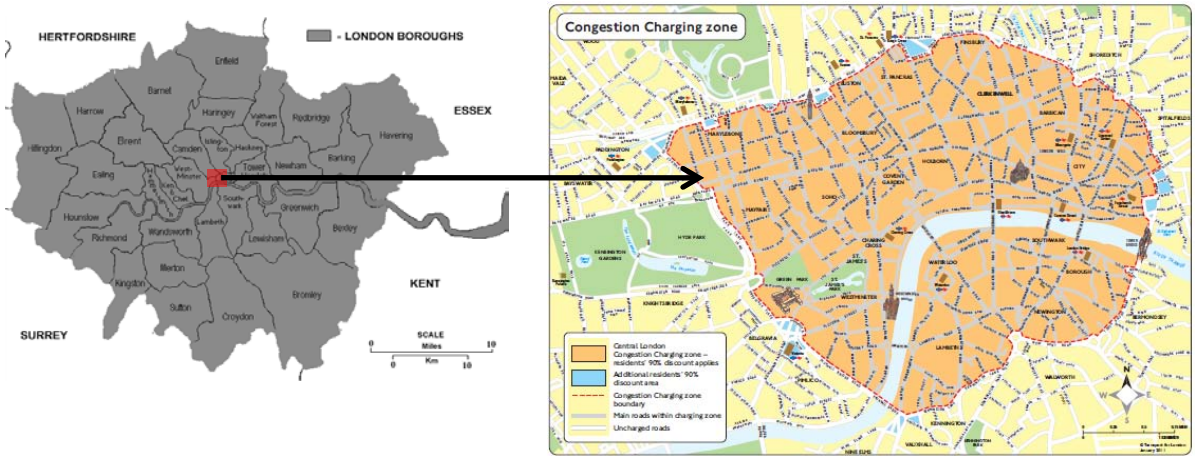


Figure 2. 6. Greater London (London Boroughs) and the Congestion Charge Zone
Source: Transport for London 2011

Stockholm is a unique city since congestion charge was turned off temporarily after an initial seven-month trial in 2006. The starting point of Stockholm trial started in 1970 with a long and intense debate. Due to lack of public support and unstable political agreement, the issue of congestion charge has been up and down throughout the years (Schuitema, Steg & Forward 2010). After the election in 2002, the Social Democratic Government and their supporting parties (the Left Part and the Green Party) agreed on congestion charge trial. The trial itself started on January 3 until July 31, 2006, and finally Stockholm permanently implemented a national congestion tax in 2007. According to Pike (2010), *"During the trial, the system reduced traffic volumes by about 20%, with vehicle speed increases of the same amount or more, and transit ridership growth between 6 and 9%. When the trial ended, traffic rebounded by a similar amount"*.

The Stockholm government conducted a survey before and after the trial in order to identify Stockholm's residents' view of congestion charge. *Before the trial took place, about 55% of all Stockholm residents viewed the congestion charging scheme negatively. After the trial 53% of Stockholm city residents viewed the idea favourably, while 41% viewed it unfavourably, providing enough public support for the system to be implemented permanently* (Pike, 2010).

Stockholm has been using the ANPR for its congestion charge system since 2006. According to Pike (2010), the system that covers 34 km^2 with approximately 345,000 daily passes, was initially based on detecting vehicles with a combination of automatic license plate recognition and transponders. Then the system shifted primarily to cameras which automatically detect license plates. The method of payment includes online payment, automatic account debiting, and direct payment at shops and banks. Figure 2.3 shows the congestion charge zone in Stockholm which is at the centre of Greater Stockholm (Stor-Stockholm) using bridges as its boundaries and gantries.

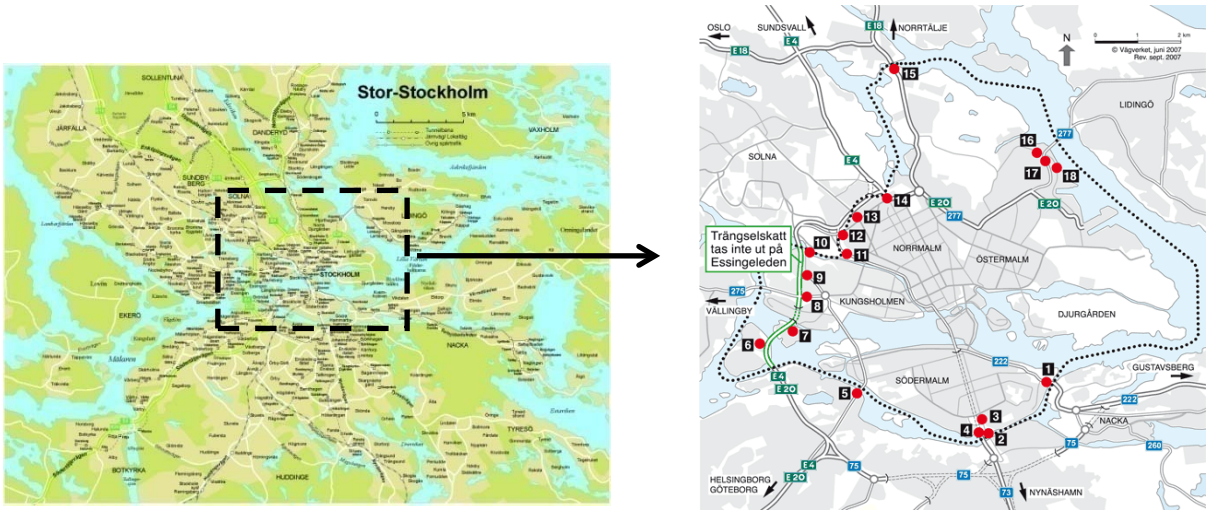


Figure 2. 7. Greater Stockholm (Stor-Stockholm) and the Congestion Charge Zone
Source: Swedish Transport Agency 2011

2.6.3 Benefits of Congestion Charge

Congestion charge has been used in several cities around the world. From cities which have already implemented it such as Singapore, London and Stockholm. This approach has reduced the number of traffic congestion and emission, also given shorter and more reliable travel times (Pike 2010, Dennis et al. 2009). Singapore was the first country that started this system in 1975. The congestion charge in Singapore had reduced 13% congestion. Another example is London in where the system was introduced in 2003, had reduced 30%

congestion for original zone and 10% for western extension. Stockholm also introduced congestion charge system in 2007 and resulted in 25% reduction of congestion.

Environmentalist views congestion charge as a means of stimulating car pooling and the use of public transport which will then reduce the congestion (Emmerink, Nijkamp & Rietveld 1995). The reduction of congestion will result to decreased fuel use and less pollution. Pike (2010) stated that the implementation of congestion charge in the London and Singapore has reduced the production of green house gases by 15% to 20% including the significant reductions of ozone and fine particulate pollution.

As mentioned by Cracknell (2000), until now the success of congestion charge implementation in developed cities could be achieved because: (i) traffic congestion is increasing and congestion charge can target congestion times and congested areas of a city; (ii) the majority of travellers use road based public transport which should benefit significantly from congestion charge and thus should be natural supporters; and (iii) the revenues should enable essential parallel public transport improvements to be made.

2.6.4 Challenges of Congestion Charge

For world-wide implementation, the congestion charge concept is still limited to developing countries. There have been several researches that showed challenges in implementing congestion charge in developing countries. For example, there had been initiation about the congestion charge concept in Kuala Lumpur and Bangkok, but the Government rejected the proposal for political reasons. Those cities had already implemented road tolls as another form of road pricing (Mahendra 2004). Jansson (2010) also stated that road pricing would be the solution to the traffic congestion problem in most large cities; but on the other hand, political resistance to the idea should be overcome first.

Cracknell (2000) mentioned that the reasons for lack of implementation of congestion charge in developing countries are complex. It includes: (i) political, some public opposition; (ii) failure of transport planners to present convincing arguments; (iii) legal and institutional constraints associated with direct charging for road use; (iv) lack of legal framework dealing with offenders; (v) institutional weakness to plan, design, implement and manage a scheme on a continuous basis; (vi) a tendency to regard congestion charge as a stand-alone scheme, and (vii) failure to recognize and develop integrated policies for improved, quality public transport as an alternative to car use.

A research conducted by Mahendra (2004) mentioned seven challenges of implementing congestion pricing in Mexico City based on their importance which are: (i) public resistance, (ii) political conflicts, (iii) fragmented institutions, (iv) lack of alternatives to driving, (v) lack of funds, (vi) vandalism of traffic cameras, and (vii) poor enforcement. The research also stated that Mexico City government officials are reluctant to implement congestion pricing since there are other options that need to be considered as the best way to deal with congestion such as improving public transport.

Though institutional barriers were considered as one of the challenges of implementing congestion charge, public acceptability is the significant barrier to implement congestion charge in many countries (Gaunt, Rye & Allen 2007). A research by Gaunt, et al. (2007) regarding public acceptability of road user charging in Edinburgh, shows that car owners opposed the scheme, while non-car owners supported it. Public acceptability as defined by Schuitema et al. (2010) is "*the tendency to evaluate a road pricing scheme with some degree of favour or disfavour before its implementation*"; while public acceptance is "*the tendency to evaluate a road pricing scheme with some degree of favour and disfavour after its implementation*".

There have been various studies that show public support based on acceptability and acceptance of road pricing including congestion charge as a pricing mechanism (refer Table 2.2). There are cities that had an increased public support after the implementation of road pricing schemes. For example, in the 1980s and 1990s, several Norwegian cities implemented toll ring roads. The three largest cities in Norway: (i) Oslo, (ii) Bergen and (iii) Trondheim also implemented this scheme. Based on a research conducted by Odeck and Brathen (1997, 2002) and Trevik (2003) in Schuitema et al. (2010), the acceptability of those toll ring roads increased during their implementation. Nevertheless, there are also cities that did not show an increase of public support after implementing the road pricing scheme. In Copenhagen, Denmark, there were no differences found in acceptability before implementation and acceptance after implementation of a toll charge (Gehert and Nielsen 2007 in Schuitema et al. 2010). Another example is Lyon, France which due to public resistance, the toll levels were forced to decrease and area of toll was limited (Raux and Souche 2004 in Schuitema et al. 2010).

Table 2. 2. Public Acceptability and Acceptance of Road Pricing Scheme

Location	Public Support		Research Conducted By
	Acceptability (Before Implementation)	Acceptance (After Implementation)	
Norway: Oslo, Bergen and Trondheim	Low	High	Odeck and Brathen 1997, 2002; Tretvik 2003
UK: London	Low	High	Transport of London 2004
Sweden: Stockholm	Low	High	Stockholmförsöket 2006; Winslott-Hiselius et al. 2009
Denmark: Copenhagen	Low	Low	Gehert and Nielsen 2007
France: Lyon	Low	Low	Raux and Souche 2004

Source: Schuitema et al. 2010

Jakobsson, et al. (2000) conducted a research to identify factors that determine car user's reluctance to accept road pricing at Greater Goteborg, Sweden. From this research, the implication of congestion charge is that the lower the income of car users, the more they intend to reduce car use when the travel costs increase, presumably because they perceive that they cannot afford to drive to the same extent. Therefore, the lower income car users are less willing to accept road pricing because they perceive that it invade on their freedom and is unfair (Jakobsson, Fujii & Garling 2000). This statement is also mentioned by Emmerink, et al. (1995) that the low-income groups will be hit hardest by the implementation of congestion charge which will then cause inequity.

In summary, the implementation of congestion charge is still limited at developing countries due to several challenges. The main challenges showed from studies and researches are: (i) political conflicts, (ii) public resistance including acceptability and acceptance, and (iii) legal and institutional barriers. Adding to this, experiences from cities that have already implemented congestion charge, the key factors that support the implementation are geographical condition in relation with the road network system, also the availability of a comprehensive and well-functioning public transport system.

2.7 Conceptual Framework for Analysis

From the literature review, the transportation policy framework can be classified based on its approach; supply-based and demand-based. This research focuses on the demand-based policy, known as TDM, as a way to achieve sustainable transport. Several TDM strategies can act as incentives to use alternative modes and reduce driving, for example the road pricing mechanism. The congestion charge is one of the categories of the road pricing mechanism that will be the main vocal point of this research in relation with its possibilities of implementation in Jakarta. The grey area in Figure 2.9 is the focus of this research.

In order to apply the congestion charge policy in Jakarta, there are implementation measures needed by looking at the challenges and opportunities as developed and presented as the conceptual framework (refer Figure 2.10). They are: (i) institutional capacity, including legal framework, human resource and technology, (ii) political support, (iii) public acceptability, (iv) road network system, and (v) public transportation system.

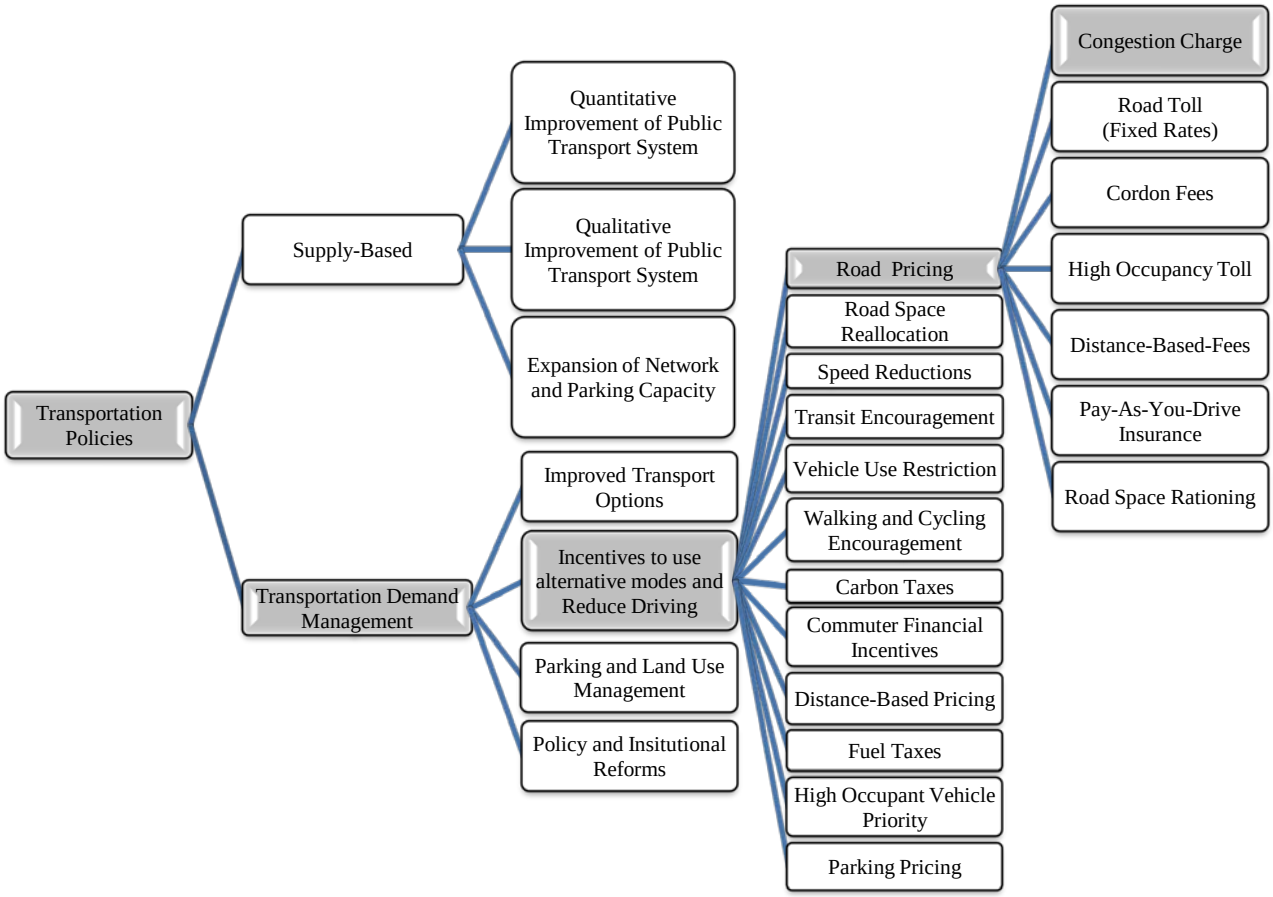


Figure 2. 8. Transportation Policy Framework

Source: Theoretical framework developed based on the adaptation from Mingardo (2008) and VTPI (2010, 2011)

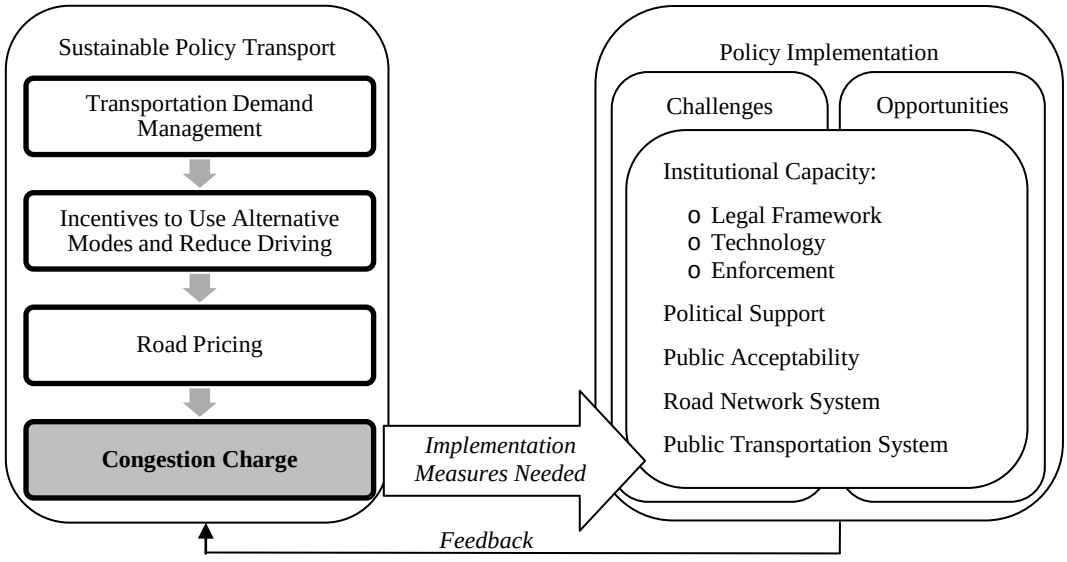


Figure 2. 9. Conceptual Framework

Chapter 3: Research Methodology

3.1 Introduction

The research is a qualitative and quantitative research with descriptive exploratory methods. The qualitative and quantitative research aims to find out the current policy on the transportation frame work that can fit in with congestion charge and the current process of formulating and implementing congestion charge, the challenges and opportunities for applying congestion charge in Jakarta from policy makers' and road users' perspective, how congestion charge has been applied in other cities, and what needs to be done to implement congestion charge.

3.2 Research Objective and Question

The objective of this research is formulated as follows: *To assess the possibility of implementing congestion charge, as a road pricing mechanism of Transportation Demand Management, in Jakarta.*

To achieve such objective, the research questions are put together as follows:

(1) *What are the ways to apply congestion charge as a road pricing mechanism of TDM?*
In order to reach the objective of this research, there is a need to identify the ways of congestion charge application in theory and practice as a road pricing mechanism of TDM.

(2) *What is the current policy on the transportation framework that fits with congestion charge in Jakarta?*
After identifying the ways of congestion charge application, it is essential to understand the current policy on national/provincial transportation framework in Indonesia/Jakarta that is suitable with congestion charge.

(3) *What are the opportunities and challenges of implementing congestion charge in Jakarta?*
While understanding the policy environment and the ways that congestion charge apply, it is crucial to look at the opportunities and challenges of implementing congestion charge in Jakarta.

(4) *What are the necessary measures needed to implement congestion charge in Jakarta?*
Necessary measures will be identified from the opportunities and challenges of implementing congestion charge in Jakarta.

3.3 Identifying Variables

Table 3.1 below gives the definitions of dependent and independent variable that are used in the research in terms of the operations or techniques used to measure it.

Table 3. 1. Variables and Operational Definitions

Variables	Operational Definitions
Transportation Demand Management	Also called Mobility Management, is a general term for "*strategies that can change travel behaviour for efficient transport resources, as opposed to increasing transportation system supply by expanding roads, parking facilities and other motor vehicle related facilities*" (Litman 2002, VTPI 2010b).
Road Pricing	One of the TDM strategies that requires motorist to pay directly for using a particular roadway or driving in a particular area which may vary by time of day, by the specific road, or by the specific vehicle type, being used (Link, Stewart-Ladewig 2005).
Congestion Charge	A fee that can vary depends on the condition of the traffic (higher prices on congested conditions and lower prices at less congested times and locations) or based on a fixed schedule (Litman 2002, VTPI 2010).

3.4 Operationalization of Variables and Indicators

After defining the variables, the researcher selected specific indicators to measure it. The individual variable in each research question and the indicators used are further explained in Table 3.2 below.

Table 3. 2. Variables and Indicators

Research Question	Variables	Indicators	Questions	Data Source
What are the ways to apply congestion charge as road pricing mechanism of TDM?	Form of Road Pricing	Definition	1. What is road pricing? 2. What are the categories of road pricing?	Literature Review
		Application	3. How is road pricing applied?	
	Form of Congestion Charge	Definition	4. What is congestion charge?	
		Application	5. How is congestion charge applied? 6. What are the technologies for congestion charge? 7. What are the benefits and challenges of applying congestion charge?	
What is the current policy on national/ provincial transportation frame work that fits with congestion charge in Jakarta?	Form of Transportation Policy	Current Status	8. What is the current policy on transportation framework?	• Primary (interview, questionnaire and field observation) • Secondary (policy documents and reports) data
		Approaches to Overcome Congestion	9. What are the approaches that the government has done to overcome congestion?	
	Form of TDM	Application of BRT and three-in-one system	10. How is TDM being applied in Jakarta and it influences Jakarta's traffic condition?	
	Form of Road Pricing	Application of Toll Road	11. How is road pricing or toll road being applied in Jakarta and it influences Jakarta's traffic condition?	
	Congestion Charge Application	Policy	12. How does congestion charge fit in the current transportation policy?	
What are the opportunities and challenges of implementing congestion charge in Jakarta?	Potential Opportunities and Challenges	Institutional	13. What are the institutions involve in implementing congestion charge?	Primary (interview and questionnaires)
		Legal Framework	14. How is the legal framework for implementing congestion charge in Jakarta?	
		Technology	15. How is the current technology available to support applying congestion charge in Jakarta?	
		Enforcement	16. How is the current ways to enforce traffic regulation in Jakarta?	
		Road Network	17. How does the current road network contribute to applying congestion charge in Jakarta?	
		Political Support	18. How is the political support for applying congestion charge in Jakarta?	
		Public Transportation System	19. How is the public transportation system condition to support the implementation of congestion charge in Jakarta?	
		Public Acceptability	20. Are Jakarta people familiar with the plan of implementing congestion charge?	
What are the necessary measures needed to implement congestion charge in Jakarta?	Measures for implementing congestion charge	Institutional Capacity	21. What is the essential legal framework needed for implementing congestion charge in Jakarta? 22. What is the most suitable technology for implementing congestion charge in Jakarta? 23. What are the ways to enforce congestion charge if applied in Jakarta?	Primary (interview and questionnaires) data
		Political Support	24. What kind of political support needed for applying congestion charge in Jakarta?	

Research Question	Variables	Indicators	Questions	Data Source
		Public Transportation System	25. What kind of public transportation system needed to contribute to applying congestion charge in Jakarta?	
		Road Network System	26. What is the most suitable area/road for applying congestion charge?	
		Public Acceptability	27. What is needed to gain public acceptability? 28. What kind of charging system do Jakarta people prefer?	

3.5 Data Analysis

Data analysis is conducted qualitatively and quantitatively using the literature review, in-depth interview, questionnaires, field observation (primary data), and desk studies (secondary data) to answer the research questions. A set of questions were prepared and clubbed based on the research questions (refer Table 3.2.). Those questions were used as guiding factors for the analysis.

The first step is literature review which is mainly used to analyze the ways of congestion charge application in theory and practice as a road pricing mechanism of TDM. This step is to answer the first research question. The next step is to analyze the current policy on Indonesia/Jakarta transportation framework that is suitable with congestion charge which is from the primary and secondary data. This step it to answer the second research question. While understanding the policy environment and the ways that congestion charge applied, a qualitative and quantitative analysis from the primary and secondary data are conducted. This is to identify the opportunities and challenges in implementing congestion charge in Jakarta and answering the third research question. A transcription was made from the interviews as the primary data. The data then filtered and only used if it is relevant with the variables that have been identified previously using word-based analysis. This method is used because interviewees were answering the questions not in a sequential order. Necessary measures were identified from the opportunities and challenges in implementing congestion charge in Jakarta, referring to the literature review. This step is to answer the fourth research question. Figure 3.1 below shows the analytical framework of this research.

3.6 Units of Analysis

The units of analysis in this research are experts on Jakarta's transportation sector from various institutions such as the national and local government, national and local policy agency, private sectors, as well as NGO and donor agency, and also university/academia. Common people of Jakarta are also part of the unit of analysis of this research.

3.7 Data Quality

The validity of this research is controlled with triangulation technique by using the secondary data analysis, literature review and primary data collection with interviews, questionnaires and field observation. Validity was insured by employing purposive sampling techniques focused on competent and qualified respondents. Additionally, common question were asked to different authorities and actors.

The reliability of this research is established by unambiguous, clear and non leading question. Data collections are derived from cross sectoral respondents with purposively sampling methods to ensure the right key respondents to provide reliable data and answers in the interview. Records/interview notes was made for analysis and further results. Reliability is enhanced by piloting the interview questions to fellow students and a staff in one of the institutions involved in the congestion charge implementation process.

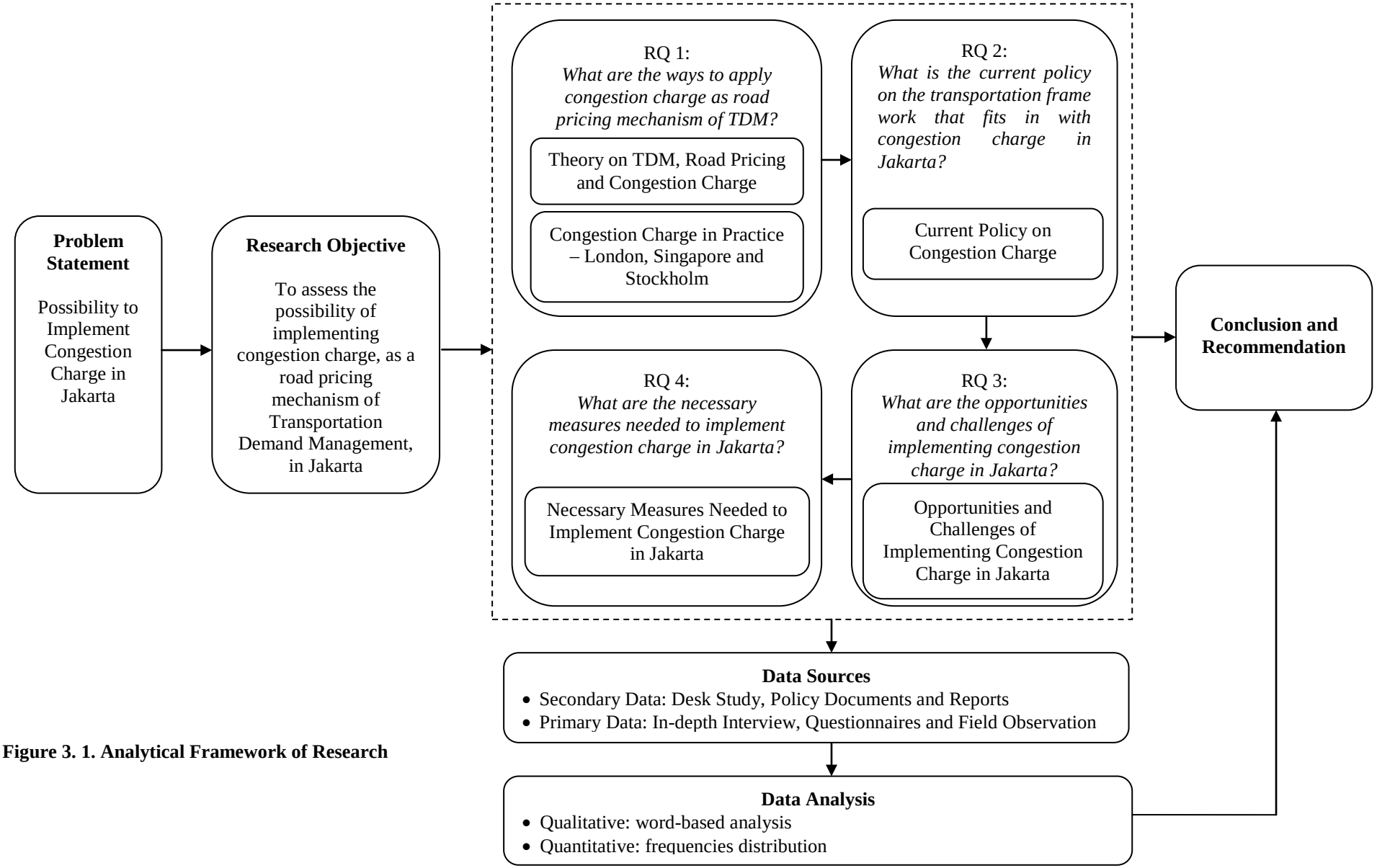


Figure 3. 1. Analytical Framework of Research

3.8 Research Population and Sample

The research area is Jakarta city with a population of 9.5 million people and is divided to five municipalities and one regency. This research used purposive selective sampling technique that will identify the people involved in transportation sector in Jakarta. As stated in Black (1993), purposive sampling is used to pick the sample on the basic of traits to give what is believed to be a representative sample. This is a non-probability sampling and the interviewee are selected from national and local government, police agency from the national and local level, NGOs, private sector, donor agency, university/academia who are related to transportation sector in Jakarta. After reaching the purposed respondents, a snowball sampling technique will be used to enable the researcher collect more information from Jakarta's transportation expert.

The purposive selective sampling technique is also used for choosing the respondents for questionnaires. The respondents chosen to fill in the questionnaires were common people of Jakarta who drive their private vehicle (car) and works in a building located on the proposed congestion charge corridor as per Figure 3.2 (Sudirman Rd. – Thamrin Rd. and a part of Gatot Soebroto Rd.). Online questionnaires were spread to the respondents. The snow-ball technique was used in this research. Respondents were requested to forward the online questionnaires to other people who have the criteria mentioned above. Out of 63 invitation sent, 31 questionnaires were filled.

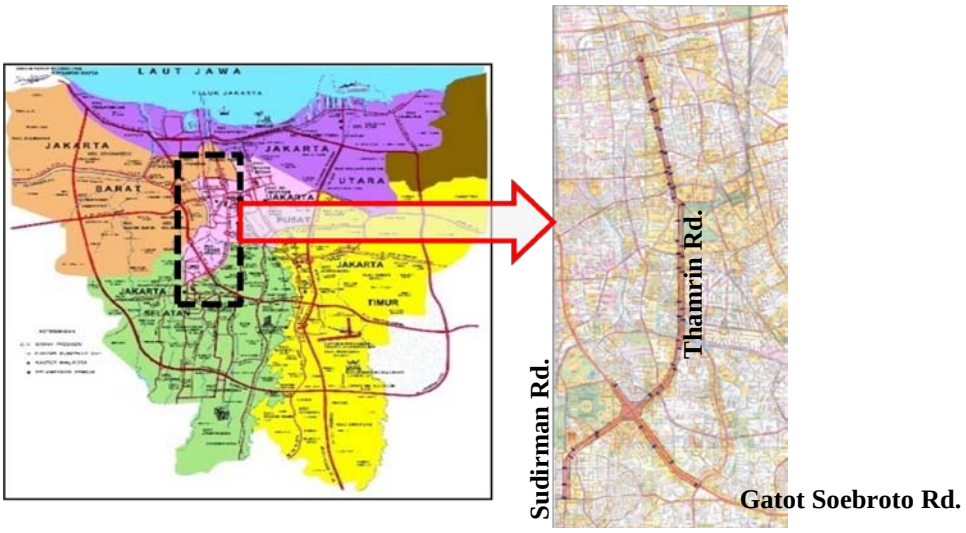


Figure 3. 2. Proposed Congestion Charge Corridor/Existing Three-in-One Corridor

3.9 Data Collection

The qualitative and quantitative research is based on primary and secondary data, also on literature review to assess the possibilities of implementing congestion charge in Jakarta. The primary and secondary data collection will be elaborated below.

3.9.1 Primary Data

The primary data collection is an empirical part of the study which answer the second, third and fourth research question. They are: (i) to analyze the current policy on transportation frame work that can fit in with congestion charge and the process of formulating and implementing congestion charge, (ii) the opportunities and challenges of implementing congestion charge in Jakarta, and (iii) measures needed to implement congestion charge in Jakarta. The primary data were collected through field work between 4th of July and 1st of August 2011 in Jakarta, Indonesia. The field observation was conducted during field work.

An in-depth interview with open-ended question and semi-structured was conducted. The key respondents were selected through purposive sampling continued with the snow ball technique. Bahasa Indonesia is the most widely used language and also known by researcher, so it was used for communication. The key respondents were transportation experts from planners and policy makers involved and related in the development of transportation especially the road sector in Jakarta, private sector which is involved in the toll road sector as one of the road pricing mechanism, practitioners from consultants, NGO, donor agency and academia/universities (refer Annex 4). Additional interview was conducted with the representative from Ministry of Finance as suggested by other interviewees. The total numbers of respondent interviewed in this research were 26 people.

An online questionnaire was spread to common people of Jakarta to get a view on perception regarding congestion charge. This was to answer the variable of public acceptability in research question number three on opportunities and challenges. The sample of this research is selected with purposive sampling and snow-ball technique. The respondents chosen were common people in Jakarta who use car and their main activity location (work place) is located along the proposed congestion charge corridor/existing three-in-one corridor. Respondents were requested to forward the online questionnaires to other people who have the criteria mentioned above. Out of 63 invitation sent, 31 questionnaires were filled.

3.9.2 Secondary Data

Relevant secondary data was collected, including policy documents, reports, journal articles, newspaper articles, internet source and archival data related with transportation specifically with congestion charge as a road pricing mechanism of TDM (refer Table 3.3). From the secondary data, the literature review will be conducted in order to prepare theoretical framework of key concepts for congestion charge and the application of congestion charge in other cities. This is to add up the foundation to the framework and also the context of Jakarta and its transportation profile.

Table 3. 3. Types and Sources of Secondary Data

No.	Data Type	Data Source
1.	Law No. 22/2009 on Road Traffic and Transport	Ministry of Transportation
2.	Government Regulation No. 32/2011 on Traffic Management, Impact Analysis and Traffic Demand Management	Ministry of Transportation
3.	Jakarta Road Network Map	Jakarta Public Works/Transportation Office
4.	Jakarta Spatial Plan	Jakarta Planning and Development Board
5.	Jakarta Transportation Master Plan	Jakarta Planning and Development Board
6.	Study on Integrated Transportation Master Plan for Jabodetabek (Phase II)	National Planning and Development Agency
7.	Master Plan and Detailed Engineering Design of Electronic Road Pricing in Jakarta	Jakarta Transportation Office

3.10 Limitations of the Study

To conduct a comprehensive study, time and resource are the biggest limitation of the study. Most of the data collected in this research is based on government authorities' opinion. This research does not cover the whole population of Jakarta in order to find out opportunities and challenges of implementing congestion charge from people perception. This research uses a purposive sampling technique to identify respondents for the questionnaires. Detailed aspects on technology and tariff setting for the congestion charge implementation are kept out of the scope of research. Another limitation is the researcher cannot make a complete transcription from all of the interviews.

Chapter 4: Context of Jakarta

4.1 Introduction

This chapter provides the basic information about the general description of Indonesia, especially Jakarta, and also the transportation issues and policies in Jakarta in order to make a clear understanding about the context. It begins with the physical condition, demographic condition, transportation profile and transportation policy.

4.1.1 Indonesia

Located in South East Asia across the equator line, Indonesia is the largest archipelago in the world with 17,504 islands of which only approximately 6,000 are inhabited (CAI-Asia Centre 2009). Its five major islands are Kalimantan, Sumatra, Papua, Sulawesi and Java. The archipelago is situated between the Pacific and the Indian oceans, and bridges two continents, Asia and Australia which are parts of the international trade route. The cultural, social, political, and economic life of the country has been influenced by this strategic geographical position.

With a total population of 237 million in 2010 as stated by the Indonesia Central Statistic Bureau, Indonesia is currently the world's fourth most populous country with population of about 3.5 % of total world population. The closest neighboring countries of Indonesia geographically are Malaysia, East Timor and Papua New Guinea, all of which share land borders with the country (refer Figure 4.1.). Other neighboring countries bordered by the sea include Singapore, Brunei Darussalam, the Philippines and Australia.

Figure 4. 1. Map of Jakarta, Indonesia

4.1.2. City of Jakarta

Jakarta is located on the north-western coast of Java Island at 6° 16′ 0″ S, 106° 48′ 0″ E . Located at the mouth of the Ciliwung River on Jakarta Bay, Jakarta has a relatively low topography condition on a flat basin with topographical slopes ranging from 0º to 2º in the northern and central part, and up to 5º in the southern part (Djaja et al. 2004). Jakarta serves as the capital while also being the largest city of Indonesia with an area of 661.52 km^2. It is divided administratively into five municipalities and one regency: (i) North Jakarta, (ii) East Jakarta, (iii) South Jakarta, (iv) West Jakarta, (v) Central Jakarta and (vi) Thousand Islands or *Kepulauan Seribu*.

The city of Jakarta is the centre of political, economic, trade and social activities of Indonesia. Jakarta is not only the seat of government, but for more than three decades has also been a dominant investment destination. During the 1970s to 1980s, Jakarta became one of the centres for manufacturing, and then later on established itself more as city of service. With a total population of approximately 9.5 million people, Jakarta is one of the most

populated and densed cities in the world (Indonesia Central Statistic Bureau 2010). Jakarta is recorded as the 12th largest city in the world and its metropolitan area, commonly called "Jabodetabek" or Greater Jakarta, housed about 23 million people.

4.2 Jakarta Transportation Profile

Jakarta as a city cannot be separated with its surrounding urban areas which consist of Bogor, Depok, Tangerang and Bekasi city, known as "Bodetabek" which affects the commuting trips to Jakarta from surrounding areas. Due to the high land price in the centre of Jakarta, people tend to live in the Bodetabek area and commute every day (Kusumastuti 2006). In 2010, an on-going research named Jabodetabek Transportation Policy Integration Project Urban (JUTPI) started. This research was conducted by the CMEA and JICA. From this research, it is stated that the commuting trips from the Bodetabek area to Jakarta increased approximately 1.5 times between 2002 and 2010 (refer Figure 4.2.).

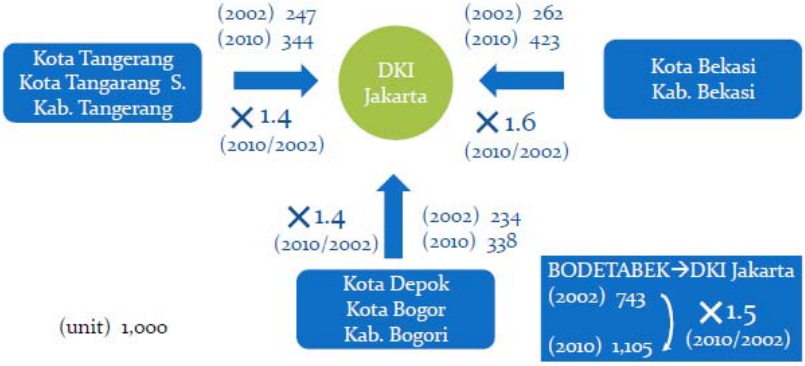


Figure 4. 2. Increase of Commuting Trips to Jakarta From Surrounding Areas: 2002-2010
Source: Preliminary Figures of JUTPI Commuter Survey 2011

With the population growth of Jabodetabek and commuting activities from Bodetabek to Jakarta, the trend shows that people are more highly dependent on private vehicles (motorcycle and car) compared to public transport. The preliminary figure of JUTPI commuter survey (2011) shows an increased number of motorcycle from 2002 to 2010, while the number of buses decrease (refer Chart 4.1.).

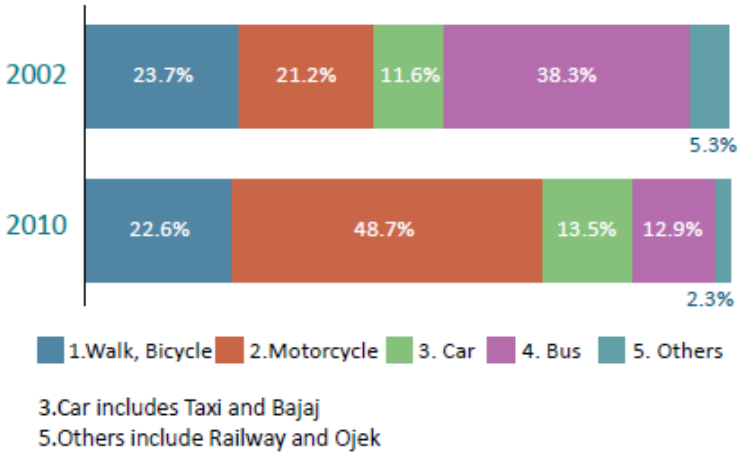


Chart 4. 1. Mode Share for Jabodetabek 2002 and 2010
Source: Preliminary Figures of JUTPI Commuter Survey 2011

The vehicles in Jakarta are mostly private-owned, approximately 98% from the total vehicle and the number of vehicles increased everyday without being followed by the growth of the road itself (Sebhatu, Enquisit & Johnson 2010). The number of private vehicles increased 9% per year, while the road length growth is only 0.01% per year. Based on the data from

JTO, the total road length in Jakarta is 7,616 km with the road area 47.7 km^2 or 6.3% of the total city area. Moreover, it is predicted that in 2014 the road network in Jakarta will reach its saturation point as illustrated in Chart 4.2 (Soehodho 2010).

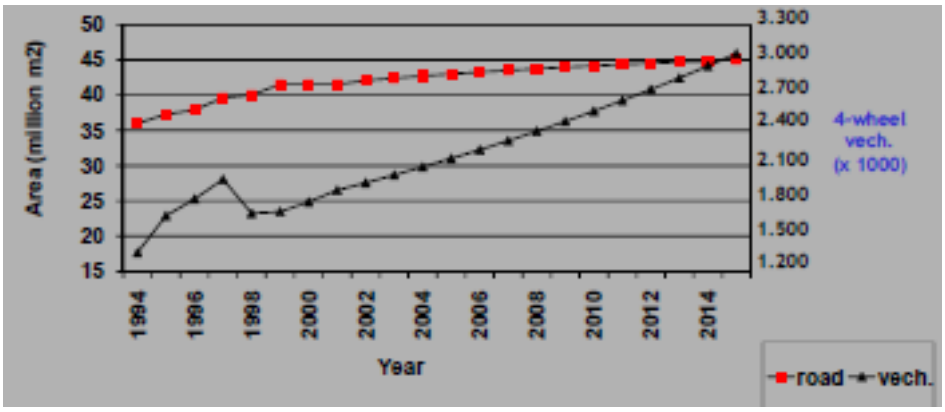


Chart 4. 2. Comparison between Utilization of Vehicles with Total Road Area in Jakarta
Source: Soehodho 2010

As many big cities in the world, traffic congestion is a chronical problem in Jakarta especially in peak hours. Congestion is seen in every morning and afternoon during rush hours, in the central area of Jakarta and the radial highways. A research conducted by JETRO in 2008, mentions that the average travel speed in the Jakarta's Central Business District (CBD) area in evening peak hour is mostly less than 20 km/hour (refer Figure 4.3.). Congestion does not only causes lost of productivity, time value and health cost, but also increases the fuel consumption. The total lost from traffic congestion is estimated Rp 12.8 trillion per year or US $ 1.5 billion per year (JTO 2011).

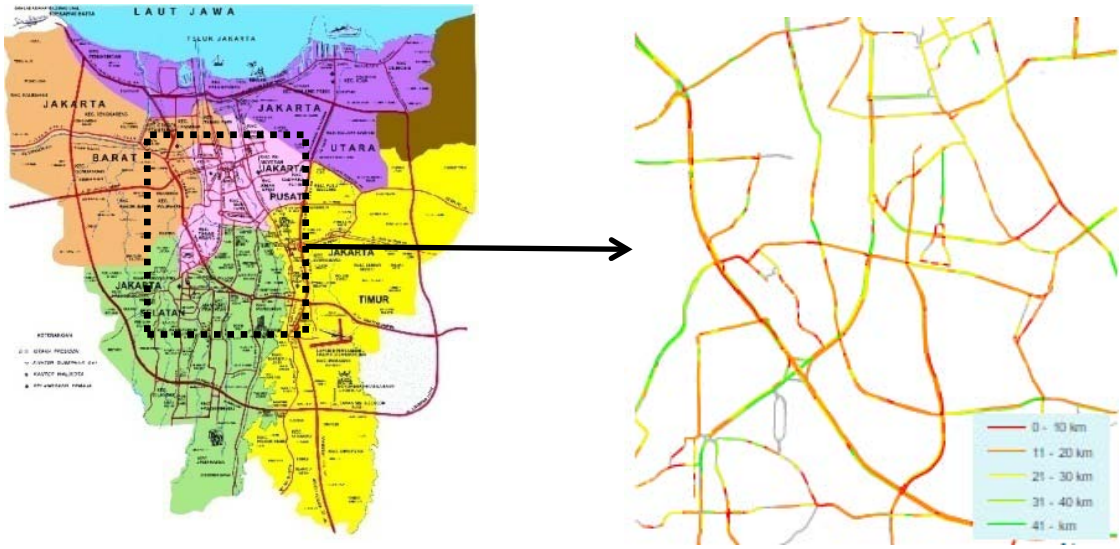


Figure 4. 3. Travel Speed of Weekday Evening Peak Hour in CBD Jakarta
Source: JETRO 2008

4.3 Jakarta Transportation Policy

Several studies have been conducted to improve Jakarta transportation condition. One of the studies that are also used as the basis for the Jakarta transportation master plan is the Study on Integrated Transport Master Plan (SITRAMP) 2020 for Jakarta Greater Area. This study was conducted by JICA in cooperation with the National Planning and Development Agency (NPDA) in 2004. The master plan coverage is not only for Jakarta province, but also its surrounding cities which includes Bogor, Depok, Bekasi, and Tangerang (Bodetabek). Referring to this master plan, the government of Jakarta developed a legal framework for the

Jakarta transportation master plan. The legal framework is the DKI Jakarta Governor Regulation No. 103 Year 2007 on *Pola Transportasi Makro* (Macro Transportation Model or MTM). In this master plan, there are three main strategies to improve Jakarta's traffic condition: (i) public transportation development, (ii) network capacity development, and (iii) traffic restraint (refer Figure 4.4.).

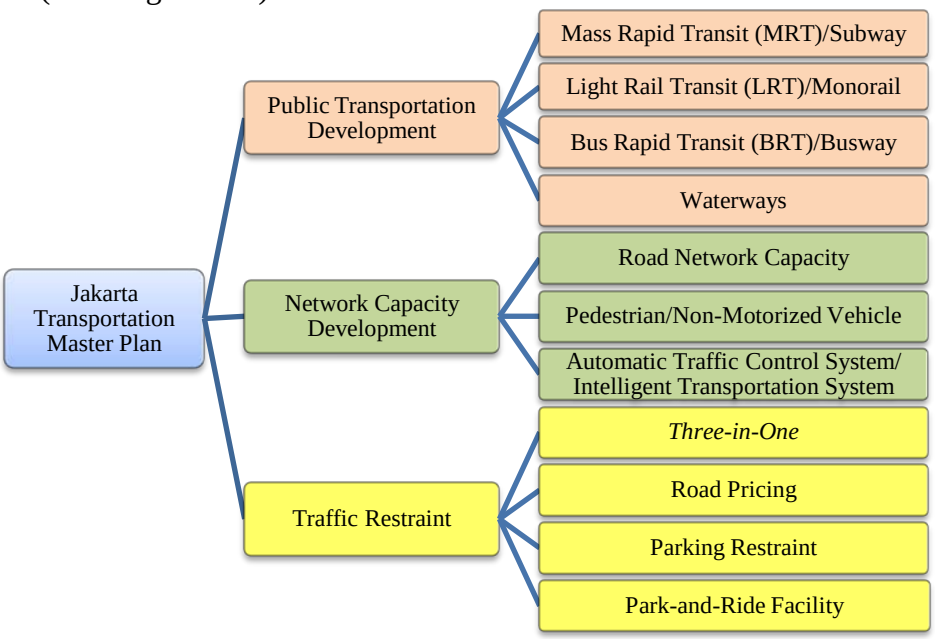


Figure 4. 4. Jakarta Transportation Master Plan
Source: Jakarta Transportation Model 2007

Jakarta gets special attention from the Central Government. In September 2010 the Vice President of the Republic of Indonesia gave an instruction in a form of 17 action plans to overcome Jakarta's transportation problem. The '17 action plans' act to overcome the problem is classified into four main areas: (i) transportation infrastructure, (ii) spatial development, (iii) public transportation improvement, and (iv) regulation and governance. The 17 action plans within the four main areas is shown in Figure 4.5.

Transportation Infrastructure	(1) Electronic Road Pricing scheme to be fast-tracked (2) Review parking bylaw especially on-street parking (3) Road maintenance fund based on multiyear contract (4) Six new inner-city toll roads to be built (5) Government to issue policies aimed at halting growth of vehicle use
Spatial Development	(6) Park-and-ride sites near train stations to support the trains
Public Transportation Improvement	(7) Crackdown on vehicles using TransJakarta busway lanes. (8) Additional 2 busway corridors to open in 2010 and 2 in 2011 (9) More gas stations to offer subsidized fuel for TransJakarta buses (10) Reduce number of road-clogging *mikrolet* vans and urge the use of bigger buses with more capacity (11) Police to crack down on illegal buses (12) Renewed pledge to start building MRT stage one in 2011, restarting monorail, and Manggarai-Cengkareng railway development to be fast-tracked (13) Rail line to Cikarang to be made a double track (14) Faster development of inner-city rail project to be integrated with Jakarta's transportation system. (15) Trains rerouted and more services to move 3 million commuters daily
Regulation and Governance	(16) Establishment of Greater Jakarta transportation authority (17) Revising master plan for Greater Jakarta integrated public transportation system

Figure 4. 5. 17 Action Plans to Overcome Jakarta Transportation Problem
Source: MOT 2011

4.3.1 Public Transportation Development

The public transportation development in Jakarta includes: (i) MRT/subway, (ii) LRT/monorail, (iii) 15 corridors of BRT/busway, and (iv) waterways on *Kanal Banjir Timur* and *Kanal Banjir Barat*. The MRT is still under tender preparation and targeted to start the construction phase in 2012. The LRT construction was started in 2004 but the investor failed to meet their agreement. The waterways pilot project was started in 2007 using the Ciliwung River; however, the waterways only operated for 3 months. From four approaches mentioned, only the BRT system is still in operation.

BRT or bus priority technique, known as 'busway' system, started to operate in 2004. The Governor of DKI Jakarta Province issued a Governor of DKI Jakarta Decree No. 84 of 2004 concerning MTM confirms the implementation of BRT using an exclusive line. The objective of BRT in form of 'busway' is to reduce the use of private vehicle. With this objective, BRT is considered as one of the TDM strategies applied in Jakarta.

The BRT system has been considered the most comfortable and affordable public transportation to users. The government expected that private vehicle users are willing to change their mode of transportation to BRT system. Based on the master plan, the complete 15 corridors of bus were planned to be completed in 2010. However, until this research was conducted, there are only10 corridors in operation. The total length of 10 corridors in operation is 172.35 KM which made the BRT system in Jakarta the longest BRT lane in the world (Transjakarta Busway 2011). Based on the data given by the Jakarta Transportation Office (JTO), since its first operation in 2004, the number of passenger carried by 'busway' had increased from 15.9 million to 86.9 million passengers per year in 2010. The total passenger carried daily is approximately 250,000 passengers per day.

4.3.2 Network Capacity Development

The network capacity development include: (i) road network development, (ii) pedestrian/non-motorized vehicle, and (iii) automatic traffic control system/intelligent transportation system. The road network developments comprise road capacity expansion, fly-over and under-pass construction. The non-motorized vehicle development has been done by creating integrated bicycle lanes. The first phase of bicycle lane development has created 1.4 KM bicycle lanes in Jakarta. The automatic traffic control system/intelligent transportation system is under development by the JTO.

4.3.3 Traffic Restraint

The traffic restraint strategies include: (i) three-in-one system, (ii) road pricing, (iii) parking restraint, and (iv) park-and-ride facility. The three-in-one system which was introduced in 1992 is basically a traffic restraint strategy applied on several arterial roads which are Sudirman-Thamrin Rd., and part of Gatot Soebroto Rd. in the centre of Jakarta (refer Figure 3.2.). The restricted time starts from 6.30 a.m. to 10.00 a.m. and 4.30 p.m. to 7.00 p.m, from Mondays through Fridays. During the restricted time, only vehicles with three or more passengers are allowed to enter the restricted road sections.

Road pricing in form of road tolls was introduced in Jakarta in 1978. The first toll road corridor connects Jakarta to West Java, specifically Ciawi and Sukabumi, known as Jagorawi toll road (PT Jasa Marga (Persero) Tbk 2011). Other toll road section that connects Jakarta with its neighbouring provinces, West Java and Banten, are: (i) Jakarta-Padalarang-Cileunyi, (ii) Jakarta-Cikampek, (iii) Jakarta-Tangerang, and (iv) Jakarta-Merak. In Jakarta itself, the toll road network consists of three ring roads:

(1) Jakarta Intra Urban Toll Road or the inner ring road. This ring road is already in operation.
(2) Jakarta Outer Ring Road. Some part is already in operation, and others are still under construction.
(3) Jakarta Outer Outer Ring Road. Some parts are still under construction and others are under investment tender process.

Currently there are three park-and-ride facilities around the BRT terminals, they are: (i) Kalideres (West Jakarta), (ii) Ragunan (South Jakarta) and (iii) Kampung Rambutan (South-East Jakarta). These park-and-ride facilities are still limited based on the number of parking spaces.

In Act No. 22 Year 2009 on Road Traffic and Transport, Article 133 stated that TDM strategy can be used to limit the vehicle in a specific corridor or area in a certain period of time by charging the traffic. This is to achieve traffic performance and public transport improvement. The TDM strategy proposed in the article is congestion charge, using the term of electronic road pricing. This strategy is one of the policies stated by the Vice President to alleviate the Jakarta worsening congestion (Berita Jakarta 2011). The Act on Road Traffic and Transport has been enumerated in a Government Regulation No. 32 Year 2011 on Traffic Management, Impact Analysis and Traffic Demand Management.

Chapter 5: Research Findings and Analysis

5.1 Introduction

Chapter five presents the practical understanding of the possibilities of implementing congestion charge in Jakarta. Based on the literatures, interviews (with the government officials, NGOs, donor agency, police agency, private sector and academia), and questionnaires, this chapter seeks to respond each research questions. This chapter is divided into four broad sections that are classified based on the research questions as follows:

(1) Section one, which looks at the ways to apply congestion charge as road pricing mechanism of TDM.
(2) Section two, which describes the transportation policies that fit in with congestion charge implementation in Jakarta.
(3) Section three, which looks at opportunities and challenges of implementing congestion charge in Jakarta based on five indicators. They are: (i) institutional capacity, (ii) political support, (iii) public transportation system, (iv) road network system, and (v) public acceptability.
(4) Finally, section four, which describes the necessary measures needed to implement congestion charge based on the five indicators.

5.2 Ways to Apply Congestion Charge as Road Pricing Mechanism of TDM

It is found through the literature review that TDM are strategies to change travel behaviour through demand-based approach in order to achieve efficient transport resources, improved environmental condition, and revenue generation. TDM strategies may lead to the principle of sustainable transport. Several TDM strategies can act as incentives to use alternative modes and reduce driving, one of them is road pricing.

Road pricing has been considered as one way to solve congestion problems since it limits the number of vehicle in a particular road or area through a certain tariff/charge that has been set up. Besides reducing congestion, applying road pricing can also generate revenue. Major categories of road pricing are road toll (fixed rates), congestion charge (time-variable), cordon fees, HOT lanes, distance-based fees, pay-as-you-drive insurance, and road space rationing.

Congestion charge is one of the categories in the road pricing mechanism. It is a fee that can vary depends on the condition of the traffic (higher prices under congested conditions and lower prices at less congested times and locations) or based on a fixed schedule. Congestion charge has been implemented in several cities around the world; most are located in developed countries. Description of the cities that have already implemented congestion charge has been shown in this research by taking example from Singapore's, London's and Stockholm's experiences which all of them are cities in developed countries. Several important technologies have been proven on implementing congestion charge or closely related road pricing applications in order to achieve flexibility, they are: (i) camera based recognition, (ii) dedicated short-range communications, and (iii) global positioning satellite systems combined with cellular radio communications.

The traffic congestion and emission in cities that have been applying congestion charge had decreased, travel times became shorter and more reliable, and revenues are also generated from the charges. Though congestion charge has benefits, based on experiences it is not an easy task to implement the system because of the challenges that might need to be dealt. In order to apply the congestion charge policy in Jakarta, there are implementation measures

needed. Those measures were developed by looking at the challenges and opportunities on implementing congestion charge in the literature review chapter as presented in the conceptual framework. They are: (i) institutional capacity, including legal framework, human resource and technology, (ii) political support, (iii) public acceptability, (iv) road network system, and (v) public transportation system. Those measures were used in this research to seek the possibilities of implementing congestion charge in Jakarta further.

5.3 Transportation Policy Related With Congestion Charge

The context chapter gives further explanation regarding the transportation policy in Jakarta in general. In addition, information given by respondents from the in-depth interview and questionnaires will be presented in this sub chapter.

Jakarta transportation policy refers to the Governor Regulation No. 103 Year 2007 on Macro Transportation Model (MTM) which mentions three main strategies to improve Jakarta's traffic condition. They are: (i) public transportation development, (ii) network capacity development, and (iii) traffic restraint. The central government also has its own concern on solving Jakarta's transportation problem with its 17 Action Plans to overcome Jakarta's transportation problem. Both policies had been discussed previously in Chapter 4. There are similarities on strategies mentioned in those two policy documents. Both of the policy documents gave extra attention to public transportation improvement and traffic restraint. Nonetheless, the implementations of the plans are still questioned.

> *"...The government tries to solve the congestion problem, but in reality it causes another problem. For example, making a new regulation on the school starting half an hour earlier, is just moving the congestion to another period of time. Another issue is that the government power to intensify public transportation is weak which is also related with the enforcement of regulations..."* **Max Antameng │ MPW**

> *"...Jakarta's transportation problem occurs because of the incomprehensive transportation master plan (MTM) which does not refer to the spatial plan. The MTM should be legalized in the form of Provincial Regulation; the level of Governor Regulation is not enough..."* **Fransiskus Trisbiantara │ University of Trisakti**

It is found from the interviews that Jakarta does not have a comprehensive master plan yet. Strategies mentioned in MTM and 17 Action Plans are not sufficient enough to overcome the congestion problem. In order to solve the congestion problem, it requires not only Jakarta's government commitment, but also neighbouring provinces, Banten and West Java. This is considering the number of commuters travelling every day from both provinces to Jakarta. The incomprehensiveness of Jakarta's transportation master plan is also caused by not referring the spatial plan.

5.3.1 TDM Strategies in Jakarta

The Jakarta transportation master plan and 17 action plans have considered TDM as one of the strategies to overcome congestion. There are several TDM strategies that have been implemented in Jakarta. They are BRT and three-in-one system. In relation with BRT's influence on Jakarta's traffic condition, since the first corridor was operated in 2004, the BRT system has used existing road lanes, not building new lanes. This condition automatically reduced the capacity of the existing road. Most of the interviewees felt the ineffectiveness of the BRT system in solving Jakarta's transportation problem. The BRT system has been discussed in the previous chapter and will also be discussed in the next sub chapter regarding public transportation system.

"...The BRT system has not yet been effective to solve Jakarta's transportation problem. It still uses the existing road either as a part of the national or provincial road which later on causes another problem..." **Edi Prasetya – MPW**

The three-in-one system is another TDM strategy that has been implemented in Jakarta. It was introduced in 1992. More explanation regarding the three-in-one system definition is found in Chapter 4. Based on the interview with Muhammad Nanang Prayudyanto from GIZ, the trigger of implementing the three-in-one system at that time was political issue regarding the Non-Aligned Movement Summit held in Jakarta. At that time, Jakarta was already congested. Due to the international event, congestion is intolerable because it will hamper the summit and cause delay.

"...The Non-Aligned Movement Summit in 1992 held in Jakarta was the trigger for applying the three-in-one system. Since there were many international guests coming from all over the world, the conference location should be free of congestion. The government started the system only in the morning rush hours, from 07.30 until 10.00 AM. The system was a success since the number of private cars reduced up to 24% and the vehicle speed increased up to 150%. However, there was resistance from private car users, even a shooting incident occur hitting a private car. The traffic kept on reducing especially in 1997 when the country was hit by the economic crisis. The trend changes when the country was starting to recover from the crisis. In 2000, the traffic increased exceeding the number before the crisis. Motorcycles started to dominate the traffic and 'jockeys' started to exist..." **Muhammad Nanang Prayudyanto - GIZ**

The JICA research in 2004 stated that the three-in-one system had shown drawbacks. They are: (i) lack of monitoring and controlling, (ii) the increase of traffic demand on the parallel streets during the restricted hours and the decrease of travel speed. (iii) the existence of temporary passengers called jockeys, (iv) inflexibility, and (v) no revenue is collected for the local government while cost is incurred by the traffic police for enforcement. The JICA research results are also in line with most of the respondents' opinion regarding the ineffective three-in-one system. The three-in-one system was introduced to reduce the number of private vehicle in the restraint area. Nevertheless, there are ways to still use private cars during the restricted times. From the questionnaires spread to common people of Jakarta who are working in the three-in-one corridor and still bring their own private cars, they have strategies to avoid the three-in-one system when they need to travel around the restraint times as shown in Chart 5.1.

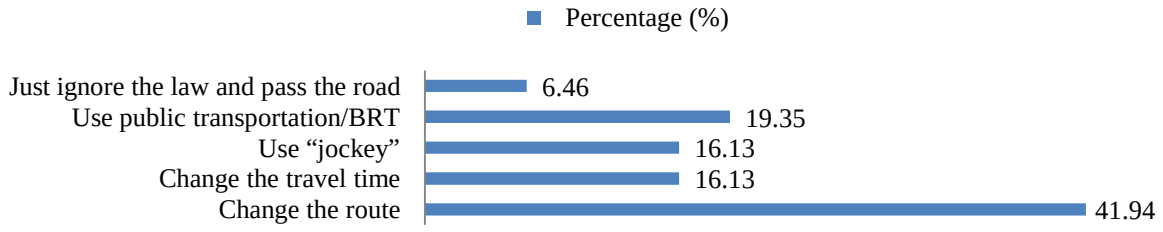


Chart 5. 1. Strategies to Avoid Three-in-One
Source: Common people questionnaires 2011

Most of the respondents answered that they changed their route to avoid the three-in-one system. This situation is possible because there are parallel roads along the existing three-in-one corridors. Some buildings even have their own entrance access from the parallel roads. As a result, workers in the building can avoid the three-in-one corridors. There are also alternative roads as shortcuts to avoid the three-in-one corridor (refer Figure 5.1). Therefore, people can still use their car during the restricted hours without passing through the three-in-one corridor. Another group of respondents used public transportation/BRT to avoid the

three-one-system. BRT is the most comfortable public transportation and served the existing three-in-one corridors. There are also a group of respondents that used 'jockeys' to avoid the restriction. This is also stated by the transportation experts. A small group of respondents just ignore the regulation and pass the road. Based on field observation, 'jockey' is paid around IDR 20,000 to IDR 30,000 per person. The certain amount of money paid for the jockey is considered a loss for the government of Jakarta, but for the 'jockey' itself it is their daily income. This situation later on creates social problems as stated by Dedy Gunawan from MPW. Due to these drawbacks, the government planned to change the three-in-one system to congestion charge as road pricing mechanism of TDM.

Reflecting from the arguments on BRT's and three-in-one system as TDM strategies implemented in Jakarta, both of the system are seen not yet effective. As stated by Pradono from Bandung Institute of Technology, TDM strategies should overcome the pressure form transportation demand. He adds that TDM strategies implementation in Jakarta is still not effective, too late and partial.

The traffic restraint from the plate license using odd and even numbers is another approach to solve Jakarta's transportation problem. This approach is planned to be implemented in the end of 2011 in relation with the ASEAN Summit and Sea Games in Jakarta. However, interviewees such as Fransiskus Trisbiantara from University of Trisakti and Max Antameng from the Ministry of Public Works (MPW) have doubts whether this system can be implemented or not. From the interview with Benhard Hutajulu from JTO, the odd and even numbers traffic restraint is still under discussion with the Governor and the study is still undergoing. This is considered quite late if the system was planned to be implemented in the end of 2011.

> *"...A vehicle with an odd number can only pass the road on a certain day, and vehicles with even numbers on any other days. However, there is still doubt on the implementation because of the law enforcement..."*
> **Max Antameng | MPW**

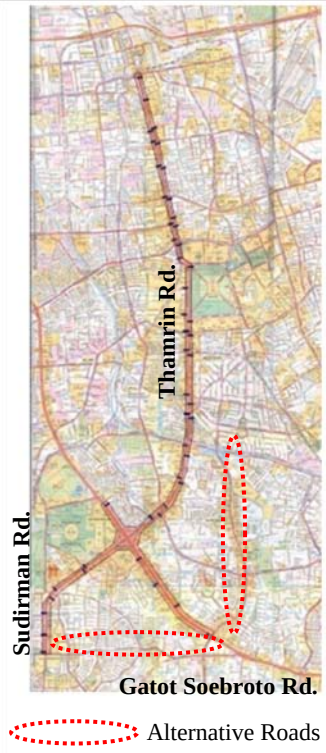


Figure 5. 1. Three-in-One Corridor and Alternative Roads
Source: Field Observation 2011

Parking policy is another TDM approach that is still under process. This was explained by the Institute of Transportation and Development Policy (ITDP) team. They stated that parking policy is the easiest TDM strategy compared to others. Currently they are trying to advocate the parking policy in buildings along Sudirman Rd. and Gatot Soebroto Rd. where the high rise buildings are located. This statement is also agreed by Azaz Tigor Nainggolan from the Jakarta City Council for Transportation (JCCT).

5.3.2 Road Pricing in Jakarta

The road pricing system was introduced in Jakarta in the form of toll road in 1978. More details regarding the existing toll road network in Jakarta is discussed in the Chapter 4. Most of the respondents' from the interviews argued that toll road in Jakarta is not part of TDM strategy (refer Table 5.1.).

Table 5. 1. Opinion on Toll Road in Solving Traffic Congestion

Answers	Frequency
Not solving congestion	7/25
Solving congestion	1/25
No response	17/25

Source: Transportation expert in-depth interviews 2011

Toll road is a part of road pricing. The objective of toll road is not focusing on traffic restraint but for reaching investment return. Since the government does not have enough funds to build the toll road, then the government tendered the proposed toll road corridor to private sectors. In relation with the government plan to build 6 corridors of inner toll road in Jakarta, some of them argued that building toll road will increase the use of private vehicles which will not solve congestion problem.

> *"...Toll road in Jakarta is more likely intended to reach investment return, not for pricing policy, so it is not considered as TDM...."* **Dedi Krisnawan – PT. Jasa Marga**

The idea of implementing congestion charge as a part of road pricing mechanism of TDM in Jakarta is stated in the Jakarta's master plan and the '17 action plans' to overcome Jakarta's transportation problem. In Act No. 22 Year 2009 on Road Traffic and Transport, Article 133 stated that TDM strategy can be used to limit the vehicle in a specific corridor or area in a certain period of time by charging the traffic in order to achieve traffic performance and public transport improvement which refers to congestion charge. Moreover, the Act on Road Traffic and Transport has been enumerated in the Government Regulation No. 32 Year 2011 on Traffic Management, Impact Analysis and Traffic Demand Management. The term which is used mainly in Jakarta is Electronic Road Pricing (ERP). From the concept point of view is closer to the concept of congestion charge. The term 'congestion charge' is also more agreed by the interviewees. From those policies, law, and regulation, the technical point of view of congestion charge is already supported legally by law and government regulation in the national.

5.4 Opportunities and Challenges of Implementing Congestion Charge

This sub chapter is divided into five main sections that are classified according to five important aspects for implementing congestion charge in Jakarta. These topics are: (i) institutional capacity (including legal framework, technology and enforcement), (ii) political support, (iii) public transportation system, (iv) road network system and (v) public acceptability. These topics have been derived from the literature review.

5.4.1 Institutional Capacity

The implementation of congestion charge in Jakarta involves several institutions in the central government level and the provincial government level. Institutions involved from the central government are Ministry of Transportation (MOT), Ministry of Finance (MOF), MPW, Ministry of Home Affairs, CMEA, NPDA and Police Agency. In the provincial level, the implementation of congestion charge does not only involve Jakarta provincial government, but also Banten and West Java provincial government as well as Bogor, Depok, Tangerang Selatan, Tangerang , Bekasi city and regency government because Jakarta cannot be separated from its neighbouring provinces and cities. As per the interviewees, they felt that there are no coordination between Jakarta and its neighbouring provinces and cities/regency yet.

According to the data given by MOT and JTO during fieldwork, the main institutions with their responsibilities on preparing the legal framework for congestion charge are as follow:

(1) The MOT, which is responsible for the legal framework for applying congestion charge in the form of Government Regulation No. 32 Year 2011 on Traffic Management, Impact Analysis and Traffic Demand Management. This regulation only covers the technical aspect of implementing this system including criteria for a road, area or corridor to implement congestion charge as stated in the government regulation article 79. However, this government regulation only allows cars to be charged, motorcycle are not yet to be

included. With this situation, there is a risk that private car users will change their mode of transportation to motorcycle which will not solve the congestion problem.

> *"...The Government Regulation No. 32 Year 2011 does not cover motorcycle as the charged object. This might trigger people to change their mode of transportation from car to motorcycle in order to avoid congestion charge. This situation might worsen the traffic condition in Jakarta because of the increased number of motorcycle..."*
>
> **Sutanto Soehodho – Jakarta Deputy Governor on Industry, Trade and Transportation**

(2) The MOF, responsible for the legal framework regarding financial and earmarking issue in a form of government regulation. Most of the respondents' interviewed agreed that the MOF should stated the earmarking concept in the financial regulation.

> *"...The earmarking concept should be stated in the financial regulation to ensure that the charges from ERP will be used for transport facilities improvement, including the public transport..."* **Harno Trimadi │ MOT**

A different opinion on the earmarking concept came from the respondent representing the MOF. Adrian Pratama stated that the earmarking concept on congestion charge should be stated in the regulation on provincial level, not in the central government's regulation.

> *"...The government's regulation regarding the financial aspect is still under discussion within the ministries, has not yet involving Jakarta's government. There are still arguments on tariff setting because of equity and equality issue. Earmarking is not included in the draft of government regulation until now. It is more likely to be the local government concerns..."* **Adrian Pratama │ MOF**

In Indonesia, the earmarking concept is not as familiar as the unified budget system because it is not mentioned explicitly in Act No. 17 Year 2003 on State Finance. The current system that is used in Indonesia is the general fund budget which is also known as unified budget. Another law that does not seem to support congestion charge is Act No. 28 Year 2008 on Local Tax and Levy because it does not mention about congestion charge. This statement is also agreed by Muhammad Nanang Prayudyanto from GIZ, Azas Tigor Nainggolan from JCCT and the ITDP team.

(3) The Provincial Government of Jakarta assigned to the JTO as the leader, is responsible for implementing this system as the pilot project on a national scale. The Government Regulation No. 32 Year 2011 on Traffic Management, Impact Analysis and Traffic Demand Management stated the pre-condition of a city to impose congestion charge. Jakarta's provincial government is still waiting for the financial regulation to be legalized before they can take the next step towards implementing congestion charge which is to form the provincial government's regulation. Congestion charge is also stated in the Jakarta's Regional Mid-Term Development Plan. In the document, the congestion charge is planned to be implemented in 2012 as mentioned by Made from the Jakarta Development and Planning Board.

> *"...Jakarta people think that the government's regulation on congestion charge has been legalized. They do not know that it is only the technical part. We are still waiting for the government's regulation on levy which will put the congestion charge subject. Congestion charge is considered as levy, not a tax..."* **Benhard Hutajulu │ JTO**

Technology and enforcement are also considered as important elements on the institutional capacity in order to implement congestion charge as mentioned in the literature review chapter. Both of them cannot be separated, as mentioned by Adhie Santika from the Greater

Jakarta Police Agency that technology is needed as a tool for enforcement. The main institution in charge of traffic enforcement is the Greater Jakarta Police Agency.

Based on the interviewees from the police agencies, Indra Darmawan and Adhie Santika, the current technology available for enforcing traffic regulation is the Electronic-Traffic Law Enforcement (E-TLE). The trial period has started on 24th February 2011 and the system has officially started since 4th April 2011. The E-TLE is currently only available in Sarinah traffic light (Thamrin Rd.) which is one of the busiest junctions in the three-in-one corridor or proposed congestion charge corridor (refer Figure 5.2.).

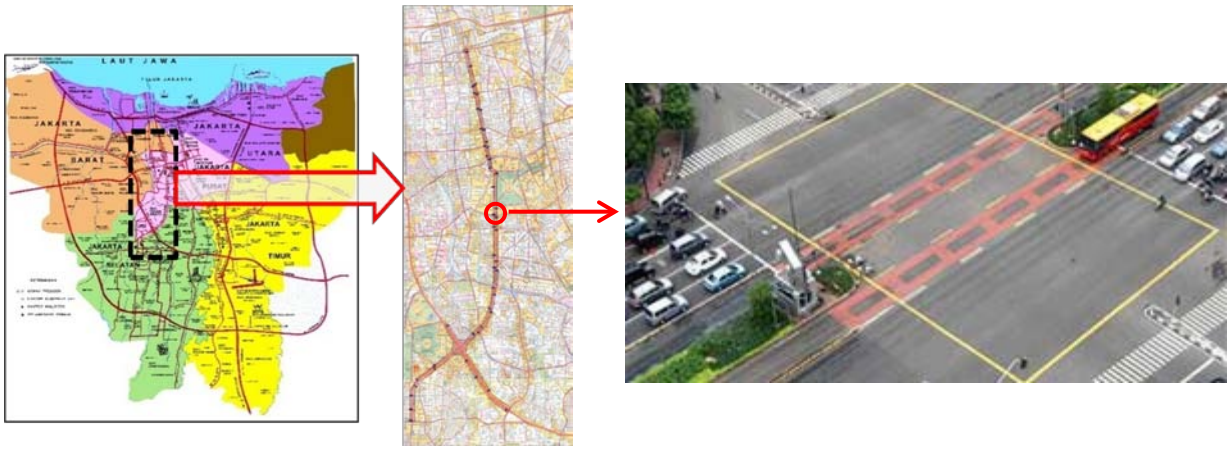


Figure 5. 2. E-TLE Location – Sarinah Junction

> *"...After implementing E-TLE for 2 months, there is a decreased number of traffic violation. Two months before implementation there were approximately 1300 violations, while 2 months after there were approximately 800 violations, around 40% differences. This system may support the future congestion charge, because technology without enforcement is nothing and enforcement will not be effective if not supported by infrastructure. People will still violate the rules as long as there is no enforcement..."*
>
> **Adhie Santika │Greater Jakarta Police Agency**

As per the E-TLE system, the violators will receive an electronic ticket sent to their addresses as recorded in the police database from the vehicle number registration. There is a chance that the violators are not the owner of the vehicle. In Indonesia, not all people changes their name on the vehicle number registration number when they sell their vehicle. The old owner might receive the violation ticket because their name is still registered in the police database. According to the Law, it is obliged when one sells his/her vehicle; he/she needs to change their name/ownership. Based on the interview with the police agency, the system in the Traffic Management Centre is not showing the real time condition yet. Sometimes there is interference because of the wireless signal and camera that is not functioning well to send the data to the Traffic Management Centre which creates unclear image of violators. This will affect the enforcement of traffic regulation.

From the Jakarta's provincial government's point of view, according to Wirawan from JTO, they are also preparing its own Intelligent Transportation System which integrates three sub systems: (i) advance traffic control system, (ii) bus tracking system, and (iii) traffic information system. However, the system has not been developed further for congestion charge implementation, as stated by Benhard Hutajulu from JTO. Another opinion regarding technology and enforcement came from Dedi Krisnawan which represents PT. Jasa Marga, the largest toll road operator in Indonesia. PT. Jasa Marga has developed an intelligent transportation system to monitor the toll road situation by installing cameras in several spots along the toll road. Vandalism of traffic cameras are the most common thing that PT. Jasa

Marga needs to face. They put extra security approach by wrapping the camera with wires and putting it in a box to prevent vandalism action. The literature review also stated that vandalism action is one of the challenges commonly faced in developing countries.

Jakarta's government formed a team regarding the preparation for congestion charge. The team consisting of officers from JTO, Tax Office, Economic Bureau, and Greater Jakarta Police Agency has done a comparative study by visiting three cities that is known to be successful on implementing congestion charge. They are: (i) London, (ii) Stockholm, and (iii) Singapore. Two of the interviewees, Benhard Hutajulu from JTO and Azas Tigor Nainggolan from JCCT were participants of the comparative study. Based on the interviews, they mentioned that they have already made a recommendation to the governor regarding the results of the comparative study. The recommendation will help to decide the type of technology that will be used. Benhard Hutajulu also mentioned that until the interview was conducted there has not been final decision on which type of technology will be used to support congestion charge, either using the on-board unit like the Singapore system or post-paid/pre-paid card like the Stockholm system.

JTO had prepared for congestion charge implementation from the technology aspect. Based on the interview with Indra Darmawan from the National Police Agency, on April 2011 the Head of JTO held a seminar on introducing the technology for congestion charge from 4 vendors. They are: (i) IBM, (ii) IForte, (iii) Mitsubishi, and (iv) QFree. Each vendor presented their technology that might be suitable for congestion charge implementation in Jakarta. He added that there is no coordination yet between the police agency and JTO regarding the technology and enforcement that will be used when implementing congestion charge. This is also stated by JTO because JTO and the police agency are still waiting for the provincial government regulation as the legal framework. Although there are still uncertainty regarding the type of technology that will be used for implementing congestion charge, there is a huge amount of money needed for investment. Hans Ulrich Fuhrke from GIZ stated that congestion charge is a high-cost system. He used Singapore as a comparison for Jakarta.

> *"...Singapore, a small sized country, has already implemented the system and it cost them US$ 200 million. However, within 2 years Singapore already got the money back from the charges..."* **Hans Ulrich Fuhrke │ GIZ**

5.4.2 Political Support

The political support for implementing congestion charge is recognized either from the central government side, or the provincial government side. From the central government support, congestion charge has already gotten special attention, even up to the Vice President because it is one of the '17 Action Plans' to overcome Jakarta's transportation problem. However, from the provincial government point of view, the support seemed to be not enough because they are still waiting for the financial regulation, as stated previously by Benhard Hutajulu from JTO and also agreed by Azas Tigor Nainggolan from JCCT.

> *"...The strongest support for implementing congestion charge in Jakarta is from the political point of view. This system is strongly supported by the Governor, provincial legislative and its technical officers. However, there is still lack of support from the central government..."* **Azas Tigor Nainggolan │ JCCT**

As per the interviewees, there are two different opinions regarding political support from the central government. A group of interviewees mentioned that the support from the Jakarta government is already huge. There is also an opinion regarding the leadership of the incumbent governor which is not as strong as the previous governor. This was stated by one of the government officers interviewed. The incumbent governor is just continuing the

previous governor program and its actions are more reactive to problems rather than preventive since the idea of congestion charge was known from the previous governor.

> *"...Regarding the political support, the former governor, Mr. Sutiyoso, is considered to have strong leadership. However, the incumbent's, Mr. Fauzi Bowo, leadership is still being questioned..."* **Anonymous │ Government Officer**

The political support is also related with the upcoming Jakarta governor election in 2012. From the interviewees, congestion charge is considered as an unpopular decision. It might affect the incumbent governor's position wether this system will be implemented at the end of 2012 as targeted by '17 Action Plans' and Jakarta Provincial Government.

> *"...Changing the current three-in-one system to congestion charge is an unpopular decision. There is a big difference if congestion charge is implemented before or after the election because it will affect the image of the incumbent governor since there is no guarantee that when the system is implemented, there will be a decreased number of traffic congestion..."* **Hendricus Andy Simarmata – University of Indonesia**

Congestion charge is a very sensitive political related issue, as mentioned by Yoga Adiwinarto from ITDP. He referred to London and Stockholm experiences. London had a very strong political leader who initiated the congestion charge implementation, the incumbent Mayor at that period, Ken Livingstone. However, when he widens the charged area, there are protests from people who live in the area, most of which are wealthy people. On the next election, Ken Livingstone did not win the election for his second period. Another example is Stockholm where the trial started in 1970 with a long and intense debate. However, due to lack of public support and unstable political agreement, the issue of congestion charge has been up and down throughout the years.

5.4.3 Public Transportation System

The public transportation system is one of the important elements to implement congestion charge in Jakarta. The most comfortable and affordable public transportation system in Jakarta is the BRT system. Although it is considered as the most comfortable and affordable public transportation in Jakarta, most of the respondents interviewed felt that the BRT system still has some drawbacks.

> *"...From 15 corridors planned for the BRT system, 10 corridors are already in operation, though it is not yet effective. The current BRT system is only achieving the affordability point of view, but has not achieved the punctuality, regularity, comfort and convenience..."* **Dedy Gunawan │ MPW**

The BRT system in Jakarta is often over capacity, not only during peak hours, but also non-peak hours. This is also experienced by the researcher during fieldwork. The maximum capacity in a standard single bus is 80 people. However, during peak hours a bus might be filled with 120 people (refer Figur 5.3.). The overcapacity of buses not only made the passenger uncomfortable, but also created another problem such as the rapid road deterioration because of the high pressure from the buses as well as damaging the buses itself. During peak hours, the shelters and terminals are also overcrowded (refer Figure 5.4.).

The exclusive bus lanes that should only be passed by the BRT are still used by other vehicles. This affects the regularity and punctuality of BRT which experienced delays due to its lane being used by other vehicles. According to Adhie Santika from the Greater Jakarta Agency, in the past police officers allow other vehicles to enter the bus lanes in order to reduce congestion. There was a different perception between police officers and JTO. However, both institutions now have the same perception which is to support the BRT system. Police officers had started cracking down violators that uses the bus lanes.

Figure 5. 3. Overcrowded Bus Corridor 2
Source: Detik Foto 2007

Figure 5. 4. Overcrowded BRT Harmoni Shelter
Source: Berita Batavia 2010

> *"...Several bus lanes are not sterilized from other vehicles which affect the reliability of the BRT system. Feeder buses are also crucial to support the BRT system to serve commuters. Therefore, the Jakarta's government needs to have good cooperation with its neighbouring cities (Bogor, Depok, Tangerang, Tangerang Selatan and Bekasi), not just for the BRT system but also the commuter train..."* **Edi Prasetya – MPW**

The BRT system coverage is not yet accessible to all people living in Jakarta and also to the surroundings. The proposed 15 corridors in the master plan need to be implement as soon as possible and adding also feeder buses to widen the network coverage especially for the Bodetabek region because of large number of commuters travelling to Jakarta. Currently, the feeder buses are provided by the housing complexes in the outskirts of Jakarta.

In addition, the BRT terminals have not provided sufficient parking space for people to park their vehicle either car or motorcycle which is in line with the park-and-ride concept. As mentioned in Chapter 4, currently there are three park-and-ride facilities around the BRT terminals, located in: (i) Kalideres (West Jakarta), Ragunan (South Jakarta), and (iii) Kampung Rambutan (South-East Jakarta). Those facilities have limited parking space.

There are other public transportation systems planned in the MTM. Most of them are still under preparation, such as MRT/subway, LRT/monorail, and waterways on *Kanal Banjir Timur* and *Kanal Banjir Barat*. The MRT is still under tender preparation and targeted to start the construction phase in 2012 as stated by Douglas Batubara from Jakarta Planning and Development Board. The LRT construction started in 2004 but the investors failed to meet their agreement. The waterways pilot project started in 2007 using the Ciliwung River. The project was only operated for 3 months. Therefore, only the BRT system is considered the most comfortable public transportation compared to regular buses.

5.4.4 Road Network System

The Jakarta road network system based on its function is classified into primary arterial, primary collector, secondary arterial, secondary collector, and city road, as well as toll road with the total length of 7,616 KM (refer Figure 5.5.). Based on the road classification by its function (arterial, collector and local), then the road is classified by its status which is related to the road manager that is responsible for the road: national and provincial. As stated by Danang Parikesit from the Indonesia Transportation Society (ITS) and Sutanto Soehodho form the Deputy Governor on Industry, Trade and Transportation, the current road hierarchy is not clear.

> *"...Arterial roads should have less direct access to other roads. It should be connected with collector roads, and then collector roads will be connected with local roads. However, in Jakarta several local roads have direct access to arterial roads..."*
>
> **Danang Parikesit | ITS**

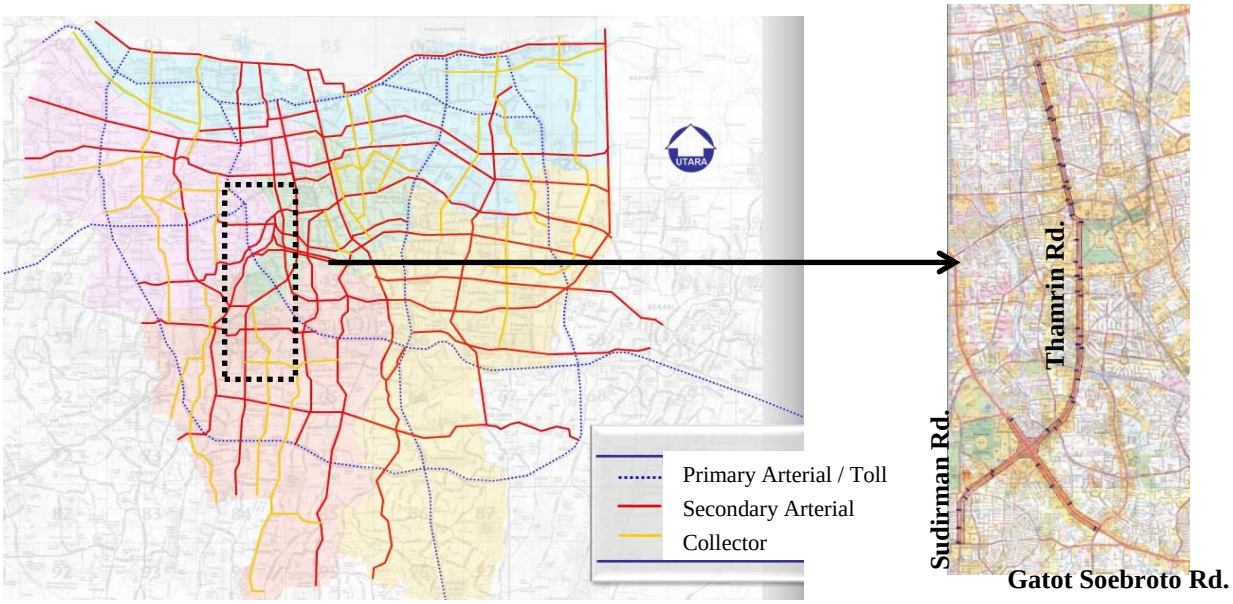


Figure 5. 5. Jakarta Road Network and Proposed Congestion Charge Corridor
Source: Modified from JTO 2011

Experts believed that the current road network hierarchy does not follow the standards as stated in Act No. 38 Year 2004 on Road. This law mention standards on arterial, collector and local road based on its function, as well as national, provincial and city roads based on its status. There is also the Government Regulation No. 34 Year 2006 on Road which gives more details on road standards.

As per interviews with the JTO, the proposed congestion charge corridor is the current three-in-one corridor. Nevertheless, referring to the previous sub chapter, there are drawbacks of the system. Some buildings in the three-in-one corridor have their own entrance access from the parallel roads. As a result, workers in the building can avoid the three-in-one corridors. There are also alternative roads as shortcuts to avoid the three-in-one corridor (refer Figure 5.1). Therefore, people can still use their car during the restricted hours without passing through the three-in-one corridor.

Compared with the road network system in Singapore, Stockholm and London, the road network system in Jakarta is more similar to London situation. This statement is also agreed by respondents such as Sutanto Soehodho from the Deputy Governor on Industry, Trade and Transportation, Yoga Adiwinarto from ITDP, also Danang Parikesit from ITS. Singapore is an island country and its area is small. Stockholm is also an island like city where the boundaries of the charged area are bridges that connects the city with its outskirts. London has a similar situation with Jakarta, a huge city in size of area. It uses its ring road as the border for the charged area.

5.4.5 Public Acceptability

Public acceptability is an important element on implementing congestion charge in Jakarta since the people of Jakarta will experience this system. This aspect is also mentioned in the literature review because the experiences from cities that have implemented congestion charge considered the public acceptability carefully. Referring to the results from the in-depth interviews with the transportation experts, most of them agreed that public acceptability is one of the challenges on implementing congestion charge. Public acceptability within the common people might be different when comparing the reaction of private vehicle users with public transportation users. According to Azas Tigor Nainggolan from JCCT, rejection on congestion charge will be more dominant from the private car users.

"...Public acceptability from the private vehicle users and public transportation users will be different, especially when there is no socialization from the government about the system. There is no study on their willingness-to-pay which is important for the tariff setting. In contrast, there are already issues on the proposed tariff stated by the government. Moreover, people are more concerned about the results that they will get when the system is implemented. Where will the money from the charge go to?..."

Yoga Adiwinarto | ITDP

A different opinion came from Max Antameng, one of the representatives from MPW. He stated that the public acceptability is considered as an opportunity for implementing congestion charge. This is because there were no protests from the people regarding the plan for implementing congestion charge in Jakarta.

As per the interviews, there is not yet a public hearing or socialization conducted by the government to introduce congestion charge to common people of Jakarta. This statement was also agreed by Benhard Hutajulu from JTO. He added that Jakarta's government cannot conduct a public hearing or socialization because the system is not fixed yet. Jakarta's government does not want to give uncertain information to people regarding congestion charge because the system is still under discussion. Even though the Jakarta's government has not yet conducted a formal socialization, ITDP in cooperation with NGOs related with transportation issues such as Jakarta Citizen Forum and Elimination of Leaded Gasoline Commission, have spread brochures regarding the plan of congestion charge implementation in Jakarta.

Since public acceptability is a significant element on implementing congestion charge, this research also looks from the perception of common people in Jakarta regarding congestion charge. As mentioned in the research methodology chapter, a short questionnaire was spread to respondents using purposive random sampling and snowball technique in order to get a general idea of common people perception. The respondents chosen were common people in Jakarta who use car and their main activity location (work place) is located along the proposed congestion charge corridor/existing three-in-one corridor. The backgrounds of respondents based on gender (refer Figure 5.6.), profession (refer Figure 5.7.), education (refer Figure 5.8), and economy situation (refer Figure 5.9.) are as below.

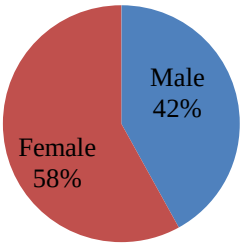


Figure 5. 6.Gender Backgrounds
Source: Common people questionnaires 2011

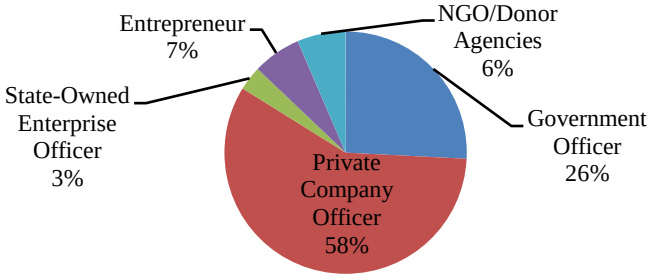


Figure 5. 7. Professional Backgrounds
Source: Common people questionnaires 2011

The purposive sampling technique already specified the criteria of the respondents. As a result, the backgrounds of the respondents are quite similar. All of them have high educational backgrounds, at least a bachelor degree. This condition relates also with their economic backgrounds which are considered as middle to high income group. As a comparison, the minimum need for decent living in Jakarta is IDR1.401.829 (± € 116) per month per person.

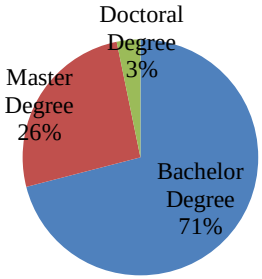


Figure 5. 8. Educational Backgrounds
Source: Common people questionnaires 2011

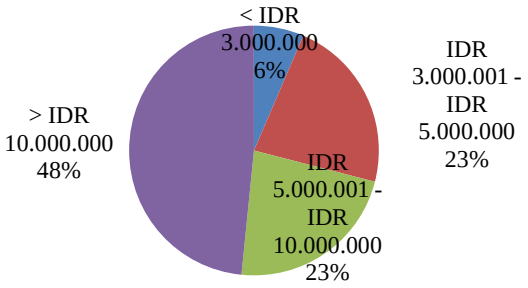


Figure 5. 9. Economic Backgrounds (Monthly)
Source: Common people questionnaires 2011

Public acceptability in congestion charge is related with common people's perception on the system regarding on how they evaluate the system before its implementation. Since the most common term used in Jakarta is ERP, the questionnaire used both terms, ERP or Congestion Charge. The respondents were asked about their familiarity or knowledge about the government's plan to implement congestion charge (refer Figure 5.10.). Most of the respondents were familiar with the congestion charge (74%). This condition is related with their high educational backgrounds where all of them minimum hold a bachelor degree minimum. However, when the respondents were asked about their perception on congestion charge as a strategy to solve traffic congestion in Jakarta, most of them answered 'no' (refer Figure 5.11.).

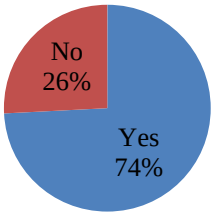


Figure 5. 10. Familiarity on Government's Plan to Implement Congestion Charge
Source: Common people questionnaires 2011

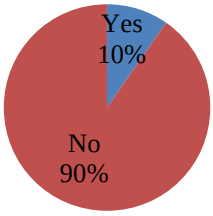


Figure 5. 11. Perception on Congestion Charge Will Solve Traffic Congestion
Source: Common people questionnaires 2011

As per the respondents, the results of the questionnaires showed that there might be resistance from the people when the system is implemented. This is because most of them thought that congestion charge will not solve traffic congestion (90%). Based on the questionnaires, some of the respondents stated that congestion charge will not solve traffic congestion in Jakarta because there are no convenient and sufficient public transportation. Therefore, people will still use their private car and traffic congestion will still exist. Moreover, the respondents were also asked about their perception on possible challenges faced when congestion charge is implemented in Jakarta (refer Chart 5.2.). Options for the challenges asked to the common people were gained from the in-depth interviews where interviewees stated that the most possible challenges of implementing congestion charge.

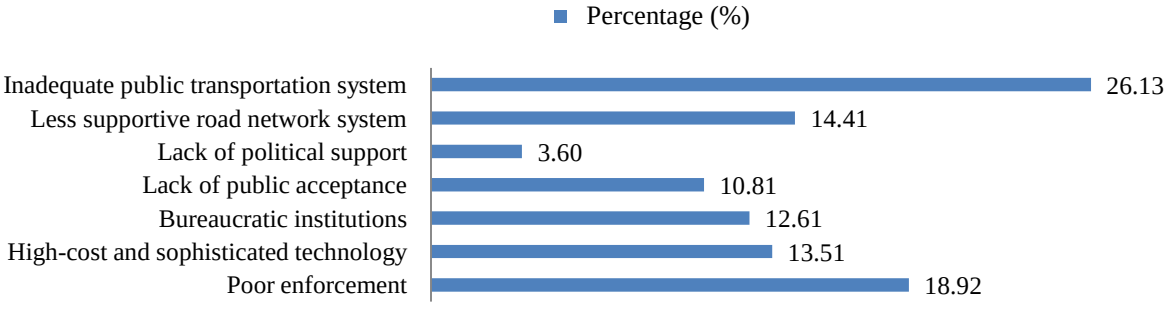


Chart 5. 2. Perception on Challenges of Implementing Congestion Charge
Source: Common people questionnaires 2011

Most of the respondents stated that the 'in-adequate public transportation system' (26.13%) is the biggest challenge. This is because people need other options to travel along the charged corridor but they want to avoid paying for the charge. The second biggest challenge is regarding 'poor enforcement' (18.92%). Respondents might refer to the three-in-one system which one of the drawbacks is poor enforcement as already mentioned in the previous sub chapter where enforcement has close relation with technology. Least respondent choose 'lack of political support' (3.60%) as the challenges of implementing congestion charge. This is also in line with the in-depth interview results where most of the interviewee also agreed that political support has already given by the national and provincial government.

5.5 Necessary Measures Needed to Implement Congestion Charge

This sub chapter is divided into five main sections that are classified according to five important aspects for implementing congestion charge in Jakarta. These aspects are: (i) institutional capacity (including legal framework, technology and enforcement), (ii) political support, (iii) public transportation system, (iv) road network system, and (v) public acceptability. These aspects are derived from the literature review and discussed in the previous sub chapter regarding its opportunities and challenges.

5.5.1 Institutional Capacity

The institutional capacity needed to implement congestion charge is related with the legal framework, technology and enforcement. In relation with the legal framework, the Government Regulation No. 32 Year 2011 on Traffic Management, Impact Analysis and Traffic Demand Management has not yet been enumerated in a Provincial Government Regulation which needs to be executed according to Indonesia legislation under Act No. 10 Year 2004 on Formulation of Laws and Regulations. Following is the order of Laws and Regulation in Indonesia from the highest hierarchy to the lowest (refer Figure 5.12.). The required legal framework to implement congestion charge is from the law, the national government regulation, and finally the local/provincial government regulation (refer grey area in Figure 5.13.).

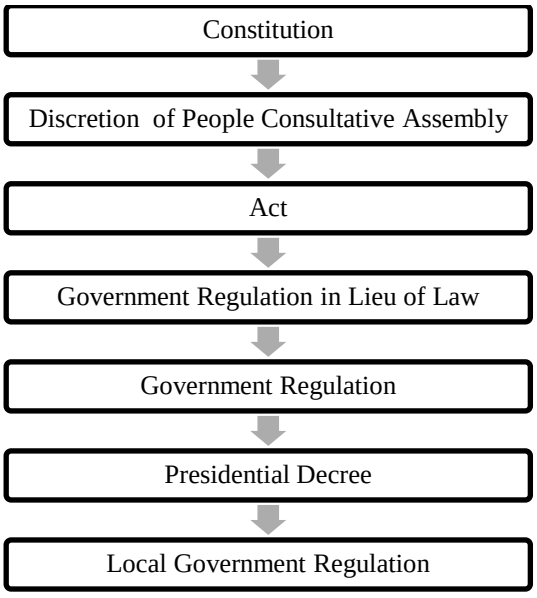


Figure 5. 12. Indonesia Laws and Regulation Hierarchy
Source: Act No. 10 Year 2004

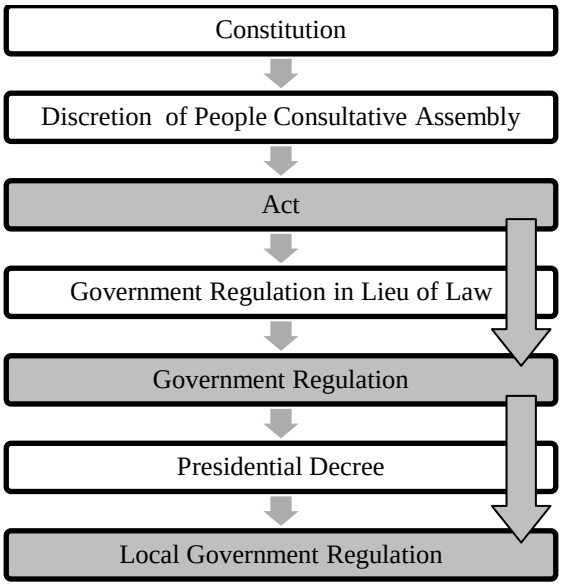


Figure 5. 13. Legal Framework Required for Congestion Charge

The central government should speed up the process on preparing the financial regulation. Currently the financial regulation is under the responsibility of MOF. The financial regulation should state the earmarking concept, as suggested previously by Harno Trimadi from MOT. This is to ensure that the revenue gathered from congestion charge will be used for public transportation improvement which then adds the importance of transparency. The idea of earmarking is already stated in Government Regulation No. 32 Year 2011 on Traffic Management, Impact Analysis and Traffic Demand Management article 79, the money from traffic control charge or congestion charge can only be used for traffic performance and public transportation improvement. As suggested by Muhammad Nanang Prayudyanto from GIZ, the Jakarta's government should have a separated account in the local bank for congestion charge which is related with the earmarking concept. The legal framework needed to implement congestion charge in Jakarta with its organization in charge can be summarised as shown in Figure 5.14. The grey areas in Figure 5.14 represent the legal framework required to implement congestion charge.

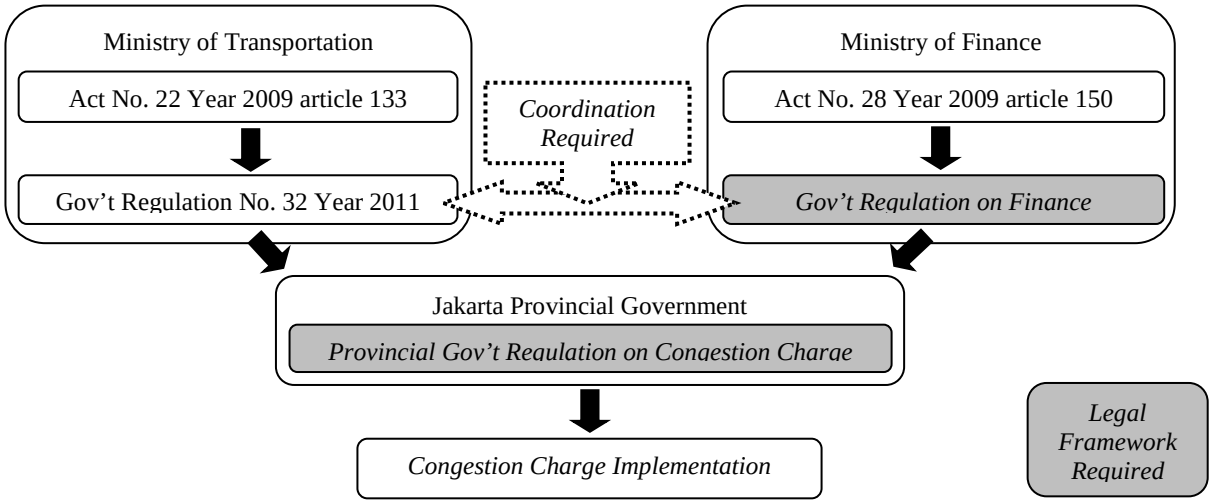


Figure 5. 14. Legal Framework for Congestion Charge in Jakarta

> *"...The local bank or Bank DKI should have a separate account for earmarking from ERP. Currently, all of the income is put in one pot and then distributed without any specific proportion for every sector..."* **Muhammad Nanang Prayudyanto – GIZ**

Looking from its position, Jakarta needs to have coordination among its neighbouring cities and regencies (refer Figure 5.15.). The Jabodetabek region has the Development Coordination Agency which was established in 1976. This agency does not have the power on decision making. It can only give advisory services when needed. It has limited power because each region has its own power to control their region since the decentralization era in 1999. Coordination among Jakarta and its neighbouring cities are required especially with Tangerang, Tangerang Selatan, Depok and Bekasi city as shown in the grey area of Figure 5.16.

> *"...Jakarta's government is still working on its own. Since the regional autonomy/decentralization era, each province/city/regency has its own power to control their region. Though there is already the Development Coordination Agency* (DCA) *Jabodetabek, it seems there is no coordination regarding the congestion charge plan yet. Transportation policy cannot be limited by administration boundaries..."*
>
> **Aryawan – NPDA**

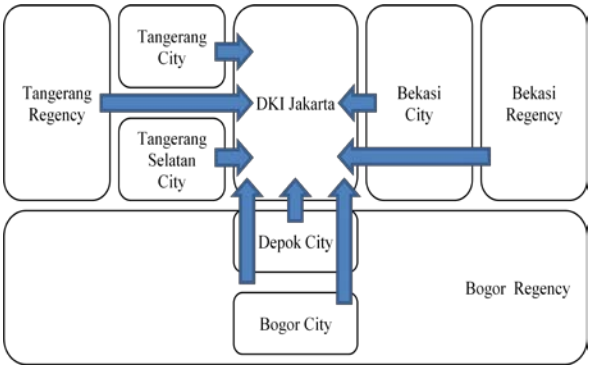


Figure 5. 15. Jakarta and Surrounding Municipalities and Regencies
Source: *Preliminary Figures of JUTPI Commuter Survey 2011*

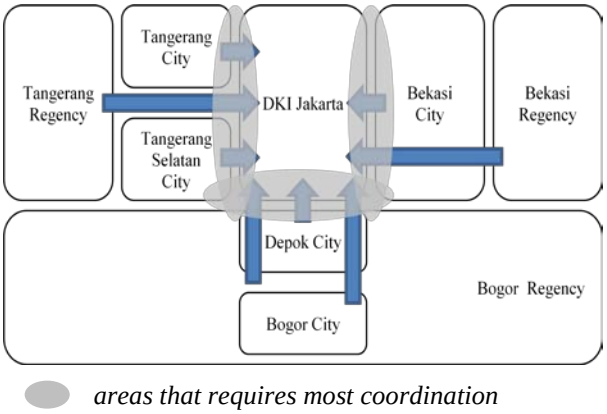


Figure 5. 16. Coordination Between Jakarta and Surrounding Municipalities and Regencies
Source: *Modified from Preliminary Figures of JUTPI Commuter Survey 2011*

As stated earlier, technology and enforcement are two elements that cannot be separated in relation with implementing congestion charge in Jakarta. This statement is agreed by Adhie Santika from the Greater Jakarta Police Agency and Dedy Gunawan from MPW. In addition, Wirawan from JTO stated that there is a plan to use the on-board unit (OBU) as a device to keep the data from a vehicle. For the trial period, public transportation will be the first object installed.

> *"...From the technology point of view, there are two options: manual, using toll booth, and electronic, using gantries. This is also related with the enforcement. If the electronic system is chosen, then vehicles need to have on-board unit (OBU) or card in order to be detected from the gantries. There will be a problem later on if the vehicles come from outside of Jakarta..."* **Dedy Gunawan | MPW**

> *"...The public transport vehicles are the first priority to use the OBU including buses, taxis and trucks, with the total approximately 100,000 vehicle..."* **Wirawan | JTO**

On contrary, Benhard Hutajulu from the JTO mentioned that there is no decision yet on what kind of technology will be used for implementing congestion charge. Underlining this statement, Sutanto Soedhoho, the Deputy Governor on Industry, Trade and Transportation, also stated that the most important thing that needs to be prepared is not concerning the type of technology, but defining the manuals and standards that can be used all over the country, not just Jakarta. If Jakarta is implementing congestion charge, the effect will not only felt by Jakarta itself, but also its surroundings provinces/cities/regencies as mentioned by Danang Parikesit from ITS. The manuals and standards for implementing congestion charge should be a national policy, not just for Jakarta. This is to prevent the tendency of other cities to propose congestion charge. The decentralization era might make the local leader (governor/mayor/regent) of a province/city/regency want to propose the implementation of congestion charge, whereas it might not yet necessary. There is a concern that implementing congestion charge is a way to gain more revenue which is not the main objective of congestion charge as stated by Fransiskus Trisbiantara from University of Trisakti.

The Government Regulation No. 32 Year 2011 on Traffic Management, Impact Analysis and Traffic Demand Management did not include motorcycle as their charged object. Nevertheless, in the future regulation, motorcycle should also be included as the charged object regarding its significant growth in the last decade. This statement is also agreed by Sutanto Soedhoho, Jakarta Deputy Governor for Industry, Trade and Transportation, and Max Antameng from MPW.

"...Regulation regarding motor cycle as well as the type of technology for enforcement needs to be considered since the number of motor cycles had increased rapidly within the last decade. This is also related with the automotive industry policy..."

Max Antameng │MPW

5.5.2 Political Support

The political support to implement congestion charge in Jakarta is needed both from the central and provincial government since it is considered as an unpopular decision because it charges people. Referring Figure 5.13, the central government support is needed to speed up the process of the financial regulation, and from the provincial government for the provincial government regulation on congestion charge.

Political support may refer to the executive board and also the legislative board. From the respondents that have been interviewed, most of them concern only the political support from the executive board, not the legislative board. The legislative board is considered as the representative of the people. More on public acceptability regarding congestion charge implementation in Jakarta will be discussed on the next sub chapter.

5.5.3 Public Transportation System

A reliable, affordable and comfortable public transportation system is needed to support the implementation of congestion charge in Jakarta. Based on the literature review chapter regarding cities that have already implemented congestion charge, all of them have a comprehensive and well-functioning public transportation system. A good public transportation system offers good alternatives to road user including railway, subway and bus system.

The Government Regulation No. 32 Year 2011 on Traffic Management, Impact Analysis and Traffic Demand Management article 79 stated the criteria a corridor or road needs to have if a traffic restriction method is proposed, including congestion charge. One of the criteria stated that the road should have available networks and services of mass public transportation in the trajectory that meets the minimum level of service standards. Based on the interview with Harno Trimadi from MOT, the BRT system is the most similar mass public transportation as stated in the article. Nevertheless, from the previous sub chapter regarding the BRT system in Jakarta, there are several aspects that need to be improved from the current BRT system.

The planned 15 corridors of BRT system should be implemented as soon as possible to support the congestion charge implementation. The widening coverage area of the BRT system will attract more people to change their mode of transportation from using private vehicles, either car or motorcycle, to use the BRT system. The BRT terminals should be completed with sufficient parking space for cars and motorcycles to promote the park-and-ride system. Another supporting facility for the BRT system is the feeder buses that should serve all the neighbouring provinces/cities/regencies.

There are concerns that if congestion charge is implemented in Jakarta, the number of motorcycles will increase. This is because the Government Regulation No. 32 Year 2011 on Traffic Management, Impact Analysis and Traffic Demand Management did not mention motorcycle as one the object to be charged. It is crucial that the public transportation system gradually improved, in this case, the BRT system. This is to ensure that there is a change of mode of transportation from private vehicles (cars and motorcycles) to the BRT system, not from cars to motorcycles which may worsen the traffic situation in Jakarta.

5.5.4 Road Network System

The road network hierarchy in Jakarta should be reviewed by referring the Law and Government Regulation on Road. Regarding the road hierarchy, arterial roads should have less direct access to other roads, and it should be connected with collector roads. Then the collector roads will be connected with local roads.

In the Government Regulation No. 32 Year 2011 on Traffic Management, Impact Analysis and Traffic Demand Management article 79, the criteria of implementing electronic road pricing or traffic control charge have been stated in this research named congestion charge. The traffic restriction can be implemented in a road, area or corridor with these criteria:

(1) The traffic volume of motor vehicles per capacity of one lane road on the road is equal to or greater than 0.9 (nought point nine);
(2) Has 2 (two) way roads where each line has 2 (two) lanes;
(3) Vehicles can only be traversed with an average speed at peak hour is equal to or less than 10 (ten) kilometres per hour; and,
(4) Networks and services of mass public transport in the trajectory that meets the minimum service standards are available.

The Government Regulation No. 32 Year 2011 on Traffic Management, Impact Analysis and Traffic Demand Management article 81 also stated that if a city wants to impose the traffic control charge, the local government should:

(1) Provide roads that meet minimum standards requirements;
(2) Install, repair, and maintain road equipments in the area, corridor, or a particular road that are directly related to road users on roads and / or intersection; and,
(3) Supply systems and equipment necessary to implement the individual vehicle traffic restrictions and goods vehicles.

Based on the government regulation mentioned above, the Jakarta's government has to prepare not only the legal framework, but also physical works. The Jakarta's government should improve and maintain the road physical condition as one of the pre-conditions needed to impose congestion charge.

The proposed congestion charge corridor is the current three-in-one corridor. As per the interviewees, most of them stated that it is better to use an area-based charge. They did not recommend the corridor-based charge. This is stated by Sutanto Soehodho, Jakarta Deputy Governor on Industry, Trade and Transportation, and Dedy Gunawan from MPW.

> *"...Congestion charge will only move congestion from the charged area/corridor to another corridor. For example, if the congestion charge is implemented in Gatot Soebroto Rd., then the Casablanca Rd. and Tendean Rd. will become more congested. It is preferable to use the cordon pricing system which is area based, not corridor based, because it will be more effective compared with if it is only applied at the three-in-one corridor..."* **Dedy Gunawan │ MPW**

5.5.5 Public Acceptability

Public acceptability is vital due to the implementation of congestion charge. This is based on the experiences from cities that have been applying it as stated in the literature review. Socializing the concept to common people of Jakarta is crucial. Conducting public hearing or socialization is needed to gain public acceptability on congestion charge. This statement is agreed by most of the transportation experts interviewed.

> *"...All groups in the society should be involved since the idea was introduced, feasibility studies were conducted, dissemination, until implementation. A successful policy is*

consumer oriented, where the welfare gain is not measured by income alone, but a variety of sizes indicating a better quality of life..."

Tri Basuki Joewono | University of Parahyangan

As per the ITDP team, they stated that the socialization process should invite all Jakarta citizen especially road users. This is because road users are the one that will be affected from the system. Jakarta citizen should have the idea on what the system is and how the system will be significant on solving Jakarta's traffic congestion. This is learnt from Stockholm experiences where they conduct a referendum after the congestion charge trial period.

There is a need to identify what kind of charging system that the people of Jakarta prefer. This is to gain public acceptability. The questionnaire asked the respondents about the payment method and also the maximum charge or willingness-to-pay for entering the charged road. The results are shown in Figure 5.17 and 5.18. Based on the interviews with the transportation experts, there is not yet a comprehensive study which assesses the willingness-to-pay and people perception on congestion charge in Jakarta.

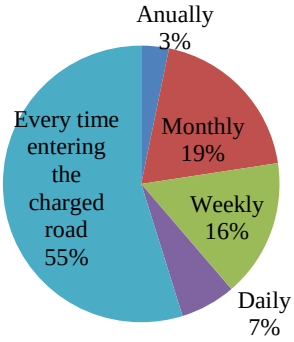


Figure 5. 17. Payment Method
Source: Common people questionnaires 2011

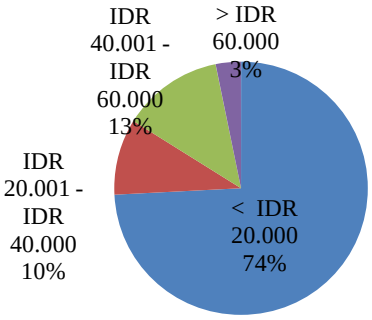


Figure 5. 18. Willingness-To-Pay Every Time Entering the Charged Road
Source: Common people questionnaires 2011

As shown in Figure 5.17, most of the respondents chose to pay every time they enter the charged road (55%), while only few chose the monthly (19%), weekly (16%), daily (7%) and annually (3%). The type of payment chosen by respondent is affected by their frequency on passing by the charged corridor and also practical reason. The type of payment is based on their perception regarding efficiency issues.

As per Figure 5.18, the willingness-to-pay for congestion charge is assumed if they were paying for every time entering the charged road payment method. The charge is ranged every IDR 20.000 using the minimum 'jockey' payment as the basis. As mentioned in the previous sub chapter regarding the drawbacks of the three-in-one system. One of the drawbacks is 'jockey' existence. It is assumed that if people are willing to pay for the 'jockey', then it should not be a problem when they need to pay for congestion charge. The questionnaire result shows that most of the respondents are only willing-to-pay less than IDR 20.000 (€ 1,66). From the media and interview with Indra Darmawan from the National Police Agency, it is mentioned that the proposed charge might be around IDR 100.000 (€ 8,33). From the questionnaires, there is only one person from the respondents that chose option > IDR 60.000 (> € 5). The economic background of the respondents and the frequency on entering the charged road affects the willingness-to-pay.

Chapter 6: Conclusions and Recommendations

6.1 Introduction

Chapter six presents a critical overview of the overall findings including the literature review. The chapter is divided into four sections. Section one is conclusion which looks at the research findings by answering each research questions and achieve the objective of this research. Section two gives the reflection upon the literature. Section three gives lesson learnt from the research. The chapter ends with recommendations.

6.2 Conclusions

This sub chapter contributes to achieving the objective of this research which is, *'to assess the possibility of implementing congestion charge, as a road pricing mechanism of TDM, in Jakarta.'* The answers to the research questions are based on the analyses carried out in the literature review and in the case study. It also includes the critical remarks by the researcher. The research questions are answered first and then concluded by answering to the main research objective. Followings are the findings from the research:

1. What are the ways to apply congestion charge as a road pricing mechanism of TDM?

TDM are strategies to change travel behaviour through demand-based approach in order to achieve efficient transport resources, improved environmental condition, and to generate revenue. This leads to the principle of sustainable transport. Several TDM strategies are incentives to use alternative modes and reduce driving, one of which is road pricing. Road pricing has been considered as a way to solve congestion problems since it limits the number of vehicle in a particular road or area through a certain tariff/charge that has been set up. The application of road pricing does not only reduce congestion, but will also generate revenue.

Congestion charge is one of the categories in the road pricing mechanism. It is a fee that can vary depends on the condition of the traffic (higher prices under congested conditions and lower prices at less congested times and locations) or based on a fixed schedule. Congestion charge has been implemented in several cities around the world; most of which are located in developed countries. Description of cities that have already implemented congestion charge has been shown in this research by taking example from Singapore, London and Stockholm.

The application of the congestion charge policy in Jakarta requires measures by looking at the challenges and opportunities. These measures are developed and presented as the conceptual framework in the literature review chapter. They are: (i) institutional capacity, including legal framework, human resource and technology, (ii) political support, (iii) public acceptability, (iv) road network system, and (v) public transportation system. Those measures were used in this research to seek further the possibilities of implementing congestion charge in Jakarta.

2. What is the current policy on the transportation framework that fits with congestion charge in Jakarta?

Jakarta transportation policy refers to the Governor Regulation No. 103 Year 2007 on MTM which mentioned three main strategies to improve Jakarta's traffic condition. They are: (i) public transportation development, (ii) network capacity development, and (iii) traffic restraint. The central government also has its own concern on solving Jakarta transportation problem with its 17 Action Plans to overcome Jakarta transportation problem. There are similarities on strategies mentioned in those two policy documents. Both policies gave extra attention to public transportation improvement and traffic restraint.

The idea of implementing congestion charge as part of road pricing mechanism of TDM in Jakarta has been stated in the Jakarta transportation master plan and '17 action plans' to overcome Jakarta's transportation problem. Congestion charge is considered as a traffic restraint measurement. In Act No. 22 Year 2009 on Road Traffic and Transport, Article 133 stated that TDM strategy can be used to limit the vehicle in a specific corridor or area in a certain period of time by charging the traffic in order to achieve traffic performance and improvement public transport, referring to congestion charge. Moreover, the Act on Road Traffic and Transport has been enumerated in the Government Regulation No. 32 Year 2011 on Traffic Management, Impact Analysis and Traffic Demand Management.

3. What are the opportunities and challenges of implementing congestion charge in Jakarta?

The opportunities and challenges of implementing congestion charge in Jakarta are derived from five important aspects. They are: (i) institutional capacity (including legal framework, technology and enforcement), (ii) political support, (iii) public transportation system, (iv) road network system, and (v) public acceptability. These aspects were obtained from the literature review chapter based on theories and practices.

The analysis of Jakarta's **institutional capacity** shows that there are opportunities and challenges of implementing congestion charge from this aspect. From the legal framework point of view, the government regulation regarding congestion charge only allows cars to be charged, does not include motorcycle. The government regulation regarding financial aspect on congestion charge is still under discussion. There is a lack of coordination between Jakarta and its neighbouring provinces and cities/regency although Jakarta cannot be separated from its neighbours. From the technology and enforcement point of view, the current technology available for enforcing traffic regulation is the E-TLE which is still limited. There are concerns on vandalism of traffic cameras. Congestion charge is a high-cost system. Coordination between the police agency and JTO regarding the technology and enforcement that will be used when implementing congestion charge is not established yet.

In terms of **political support**, the analysis shows that there is significant support from the provincial government compare with the national government. However, leadership of the incumbent governor is still being questioned. There is also another concern about the upcoming Jakarta governor election in 2012 which will affect the political support.

From the analysis of **public transportation system**, the BRT system still faces various problems. The BRT system in Jakarta is often over capacity. The BRT lanes are also used by other vehicles which affects regularity and punctuality of BRT. The BRT coverage is not yet accessible to all people living in Jakarta and also to the surroundings, BRT terminals have not provided sufficient parking space for people to park their vehicle either car or motorcycle; and other public transportation system which is planned in the MTM is still under preparation, such as MRT/subway, LRT/monorail, and waterways on *Kanal Banjir Timur* and *Kanal Banjir Barat.*

The analysis of the **road network system** confirms that the current road network hierarchy does not follow the standards as stated in Act No. 38 Year 2004 on Road also the Government Regulation No. 34 Year 2006 on Road. The proposed congestion charge corridors have parallel roads that some buildings have their own entrance access. This situation gives opportunities for people to avoid the congestion charge corridors.

The **public acceptability** is considered as a challenge because there is has not been any socialization specifically to introduced congestion charge by the government to common people. There are also no in-depth studies on willingness-to-pay and public acceptability.

4. What are the necessary measures needed to implement congestion charge in Jakarta?

The necessary measures needed to implement congestion charge in Jakarta are classified according to five important aspects. They are: (i) institutional capacity (including legal framework, technology and enforcement), (ii) political support, (iii) public transportation system, (iv) road network system, and (v) public acceptability. These aspects were obtained from the literature review chapter based on theories and practices.

From the **institutional capacity's** point of view, measures needed to implement congestion charge in Jakarta are speeding up the process on preparing the provincial government regulation and financial regulation which states the earmarking concept, and technology and enforcement as two elements that cannot be separated. Other measures are the type of institution that will be in charge of congestion charge, manuals and standards of congestion charge that should be stipulated in a national policy. In the future, motorcycle should also be included as the charged object. Coordination between neighbouring provinces/regencies/ cities is also an important measure to implement congestion charge in Jakarta.

From the **political support** point of view, measures needed to implement congestion charge in Jakarta are optimizing the support from central and provincial government.

A reliable, affordable and comfortable **public transportation system** is needed to support the implementation of congestion charge in Jakarta. The planned 15 corridors of BRT system should be implemented as soon as possible. Supporting BRT facilities such as terminals should be completed with sufficient parking space for cars and motorcycles to promote the park-and-ride system, and feeder buses should serve all the neighbouring provinces/cities/regencies. As per the literature review, a comprehensive and well-functioning public transport system is needed to implement congestion charge.

The **road network** hierarchy in Jakarta should be reviewed by referring the Law and Government Regulation on Road. Government Regulation No. 32 Year 2011 on Traffic Management, Impact Analysis and Traffic Demand Management which explains criteria on implementing congestion charge as reference. The Jakarta government should also improve and maintain the road physical condition as one of the pre-conditions needed to impose the charge. It is better to use an area-based charge, not corridor-based.

Socializing the concept to common people of Jakarta is crucial in order to gain public **acceptability**. Another important measure needed in conducting an assessment on willingness-to-pay and people perception regarding congestion charge.

Research Objective: to assess the possibility of implementing congestion charge, as a road pricing mechanism of TDM, in Jakarta

Congestion charge is possible to be implemented in Jakarta as a road pricing mechanism of TDM as long as measures on implementation as mentioned in research question four is fulfilled. However, looking at the target of implementation that has been defined by the government which is the end of 2012, it is considered pessimistic to reach the target.

6.3 Reflection upon the Literature

The reflection on the literature is put here in order of appearance in the description and analysis in chapter two and five. From the observation, there are resemblances in the literature studied and in Jakarta. This is because of the fact that most literatures are based on what is happening in reality by taking examples from other cities. The research confirms the existing theories and experiences regarding congestion charge implementation, that:

- Institutional capacity is a challenge on implementing congestion charge in Jakarta. As stated by Cracknell (2000), reasons for lack of implementation of congestion charge in relation with institutional capacity are: (i) lack of legal framework dealing with violators, (ii) institutional weakness to plan, design, implement and manage scheme on a continuous basis, and (iii) a tendency to regard congestion charge as a stand-alone scheme. Mahendra (2004) added challenges related with institutional capacity. They are: (i) fragmented institutions, (ii) lack of funds, (iii) vandalism of traffic cameras, and (iv) poor enforcement. Those situations are reflected in Jakarta.
- Experiences from London, Stockholm and Singapore show that there was strong political support on their phase of implementing congestion charge. This is stated by Cracknell (2000) and Mahendra (2004) that political conflicts are part of the challenges on implementing congestion charge. This is relevant with Jakarta's condition because the political support plays an important influence on implementing congestion charge.
- Cracknell (2000) stated that the poor quality public transport as an alternative to car use is a challenge to implement congestion charge. This is relevant with Jakarta's condition because the public transportation system is still insufficient.
- Experiences from Singapore, London and Stockholm show the importance of the existing road network system to support congestion charge implementation. The research shows that the road network system in Jakarta is considered less supportive for congestion charge implementation.
- Public acceptability is the significant barrier to implement congestion charge in many countries (Gaunt, Rye & Allen 2007). Cracknell (2000) and Mahendra (2004) agreed that public opposition and resistance are challenges on implementing congestion charge. This is also reflected from other countries experience. The research shows that possible opposition and resistance will come from the private car users.

6.4 Lesson Learnt

This research has gone through modification of methodology during fieldwork. At first, this research is only a qualitative research using in-depth interviews as instruments and transportation experts as its unit of analysis. However, during fieldwork it is felt necessary to consider people's perception which relates to the public acceptability indicator. Therefore, this research was modified from a qualitative research into a quantitative and qualitative research using in-depth interviews and questionnaires as instruments and transportation experts as well as common people of Jakarta as its unit of analysis. A researcher should be open minded on facing changes during the research is conducted whenever it is felt necessary and important for the research itself.

The research is an ex-ante research where the event has not occurred. Based on interviews with transportation experts, the Stated-Preference Method can be used to compare the imaginary situation in the future if the system is implemented. Options of the amount of charge and travel speed can be calculated by using this method. Another method suggested is the Analytical Hierarchy Process for interviewing transportation experts.

The most important lesson to take forward is that each city has its own specific characteristic. There is no single formula to solve congestion problem in a city. Learning from other city experiences does not mean to copy all the things, but modification is needed.

6.5 Recommendations

This study leads to several recommendations especially to enhance the possibilities on implementing congestion charge in Jakarta. A specific research on people perception is necessary to assess the public acceptability of congestion charge implementation. The

research should cover a comprehensive assessment on the ability-to-pay and willingness-to-pay of common people using a representative sampling method. Another recommendation regarding the research methodology is using the Stated-Preference Method or Analytical Hierarchy Process for an ex-ante research.

The effect that will be caused by implementing congestion charge in Jakarta should be assessed further in order to know the impacts people would feel if the system is implemented. Impacts can be measured by time saving or money saving because it is the most sensitive issue on transportation. Detailed calculation on the impacts is needed to socialize the system to Jakarta people.

Due to decentralization era, there is a tendency that each local government works on its own without concerning their neighbours. In the case of Jakarta, the neighbouring provinces/cities/regencies should also be involved in discussions concerning transportation issue. There is a plan to establish the Jakarta Transportation Authority to cope with the transportation issue in Jakarta and its surroundings.

Bibliography

Berita Jakarta 2011, 2 June 2011, *The 17 Steps to Overcome Traffic Congestion Hampered* [Homepage of Berita Jakarta], [Online]. Available: http://www.beritajakarta.com/2008/en/newsview.aspx?idwil=0&id=19155 [2011, 3 June].

Berita Batavia 2010, 11 September 2010, *Busway ke Tempat Wisata Padat Penumpang* [Homepage of Berita Batavia], [Online]. Available: http://beritabatavia.com/berita-3241-busway-ke-tempat-wisata-padat-penumpang.html [2011, 14 August].

Black, T.T. 1993. *Evaluating social science research.* Sage, London.

Blythe, P.T. 2005, "Congestion charging: Technical options for the delivery of future UK policy", *Transportation Research Part A: Policy and Practice*, vol. 39, no. 7-9, pp. 571-587.

CAI-Asia Centre 2009, *Indonesia Country Profile: Focus on Smaller Cities*, Clean Air Initiative dor Asian Cities Centre, Phillippine.

Cracknell, J.A. 2000, *Experience in Urban Traffic Management and Demand Management in Developing Countries*, World Bank, United Kingdom.

Dennis, S., Kuipers, J., Kile, J. & Moore, D. 2009, *A Congressional Budget Office Study: Using Pricing to Reduce Traffic Congestion*, The Congress of United States, United States.

Detik Foto 2007, 1 July 2007, *Liburan Sekolah Busway Penuh* [Homepage of Detik Foto], [Online]. Available: http://us.foto.detik.com/readfoto/2007/07/01/162844/799748/157/1/liburan-sekolah-busway-penuh [2011, 14 August].

Djaja, R., Rais, J., Abidin, H.Z. & Wedyanto, K. 2004, "Land Subsidence of Jakarta Metropolitan Area", *3rd FIG Regional Conference*FIG, Jakarta, 2004.

Emmerink, R.H.M., Nijkamp, P. & Rietveld, P. 1995, "Is Congestion Pricing a First-Best Strategy in Transport Policy? A Critical Review of Arguments", *Environment and Planning B: Planning and Design*, vol. 22, pp. 581-602.

EPOMM 2009, , *General Information: Mobility Management* [Homepage of European Platform on Mobility Management], [Online]. Available: http://www.epomm.eu/index.phtml?Main_ID=820 [2011, 18 May].

Gaunt, M., Rye, T. & Allen, S. 2007, "Public Acceptability of Road User Charging: The Case of Edinburgh and the 2005 Referendum", *Transport Reviews*, vol. 27, no. 1, pp. 85-102.

Geerlings, H. & Lohuis, J. 2008, *The Emerging Concept of Transition Management in the Transport Sector: an Opportunity to Introduce New Policy Concepts for Transport Policy Making*, Erasmus University Rotterdam, Department of Public Administration, Rotterdam.

Goh, M. 2002, "Congestion Management and Electronic Road Pricing in Singapore", *Journal of Transport Geography*, vol. 10, pp. 29-38.

Hensher, A.D. & Pucket, S.M. 2007, "Congestion and Variable User Charging as an Effective Travel Demand Management Instrument", *Transporation Research*, vol. Part A, no. 41, pp. 615-626.

Indonesia Central Statistic Bureau 2010, , *Population of Indonesia* [Homepage of Indonesia Central Statistic Bureau], [Online]. Available: http://dds.bps.go.id/eng/tab_sub/view.php?tabel=1&daftar=1&id_subyek=12&notab=1 [2011, 1 June].

Jakarta Transportation Office 2010. Jakarta Transportation Office in Numbers Year 2010. Provincial Government of DKI Jakarta.

Jakobsson, C., Fujii, S. & Garling, T. 2000, "Determinants of Private Car Users' Acceptance of Road Pricing", *Transport Policy*, vol. 7, pp. 153-158.

Jansson, J.O. 2010, "Road Pricing and Parking Policy", *Transportation Economics*, vol. 29, pp. 346-353.

JETRO 2008, *The Study on Jakarta Road Pricing in the Republic of Indonesia*, Japan External Trade Organization

JICA 2004, *The Study on Integrated Transportation Master Plan for Jabodetabek (Phase II)*, JICA.

Kusumastuti, D. 2006, *The Impact of Changing Bus Rapid Transport (BRT) System Lanes on the Spatial Distribution of Economic Activity within the Jakarta Metropolitan Area*, IHS Erasmus Universitet Rotterdam.

Leape, J. 2006, "The London Congestion Charge", *Journal of Economic Perspective*, vol. 20, no. 4, pp. 157-176.

Link, H. & Stewart-Ladewig, L. 2005, "2. Basic road pricing solutions", *Research in Transportation Economics*, vol. 11, pp. 9-26.

Litman, T. 2002, "Module 2b: Mobility Management" in *Sustainable Transport: A Sourcebook for Policy Makers in Developing Cities*, eds. K. Fjellstrom & M. Breithaup, 2004th edn, GTZ, Germany.

Litman, T. & Burwell, D. 2006, "Issues in Sustainable Transportation", *Int. J. Global Environmental Issues*, vol. 6, no. 4, pp. 331-347.

Mahendra, A. 2004, *Congestion Pricing in Cities of the Developing World: Exploring Prospects in Mexico City*, Massachusetts Institute of Technology.

Mingardo, G. 2008, "Cities and Innovative Urban Transport Policies", *Innovation: Management, Policy & Practice*, vol. 10, no. 2-3, pp. 269-281.

Pike, E. 2010, *Congestion Charging: Challenges and Opportunities*, The International Council on Clean Transportation.

Prelimary Figures of JUTPI Commuter Survey 2011. *Jabodetabek Urban Transportation Policy Integration Project*. Coordinating Ministry of Economic Affairs and JICA.

PT Jasa Marga (Persero) Tbk 2011, , *Company Profile* [Homepage of PT Jasa Marga (Persero) Tbk.], [Online]. Available: http://jasamarga.com/en/company-profile.html [2011, 23 February].

Roberts, J. 2004, *Environmental Policy*, Routledge, London/New York.

Rouwendal, J. & Verhoef, E.T. 2006, "Basic economic principles of road pricing: From theory to applications", *Transport Policy*, vol. 13, no. 2, pp. 106-114.

Saleh, W. & Sammer, G. 2009, "Travel Demand Management and Road User Pricing: Success, Failure and Feasibility" in *Travel Demand Management and Road User Pricing: Success, Failure and Feasibility*, eds. W. Saleh & G. Sammer, 2009th edn, MPG Books Ltd, Great Britian, pp. 1-9.

Saleh, W. 2007, "Success and failure of travel demand management: Is congestion charging the way forward?", *Transportation Research Part A: Policy and Practice*, vol. 41, no. 7, pp. 611-614.

Schuitema, G., Steg, L. & Forward, S. 2010, "Explaining Differences in Acceptability Before and After the Implementation of Congestion Charge in Stockholm", *Transporation Research*, vol. Part A, no. 44, pp. 99-109.

Sebhatu, S.P., Enquisit, B. & Johnson, M. 2010, "Sustainable public transport network development in Developing Countries", International Research Symposium in Service Management, Mauritius, pp. 1.

Singapore Land Transport Authority 2011, , *ERP Gantry Location* [Homepage of Singapore Land Transport Authority], [Online]. Available: http://interactivemap.onemotoring.com.sg/ mapapp/index.html?param=redirect [2011, 18 May].

Small, K.A. & Gomez-Ibanez, J.A. 1998, "Road Pricing for Congestion Management: The Transition from Theory to Policy", *The University of California Transportation Centre, University of California at Berkeley*, vol. 391, pp. 213-246.

Soehodho 2010, *Jakarta Urban Transport Problems and Their Environmental Impacts*, International Climate Change Workshop on Research Priorities and Policy Development.

Swedish Transport Agency 2011, *Location of Control Points: Congestion Tax* [Homepage of Swedish Transport Agency], [Online]. Available: http://www.transportstyrelsen.se/en/road/ Congestion-tax/Congestion-tax-in-stockholm/Location-of-control-points/ [2011, 18 May].

Transjakarta Busway. 2011, *Gambaran Umum* [Homepage of Transjakarta Busway], [Online]. Available: http://www.transjakarta.co.id/page.php#tab-2 [2011, 6 May]

Transport for London 2011, *Congestion Charging Zone* [Homepage of Transport for London], [Online]. Available: http://www.tfl.gov.uk/tfl/roadusers/congestioncharge/whereandwhen/assets/DetailMapECCZ.pdf [2011, 18 May].

Transportation Research Board 2008, *Sustainable Transportation Indicators: A Recommended Program to Define a Standard Set of Indicators for SustainableTransportation Planning*, Victoria Transport Policy Institute.

VTPI 2011, January-last update, *Online TDM Encyclopedia* [Homepage of Victoria Transport Policy Institute], [Online]. Available: http://www.vtpi.org/tdm/index.php#TDM [2011, 27 March].

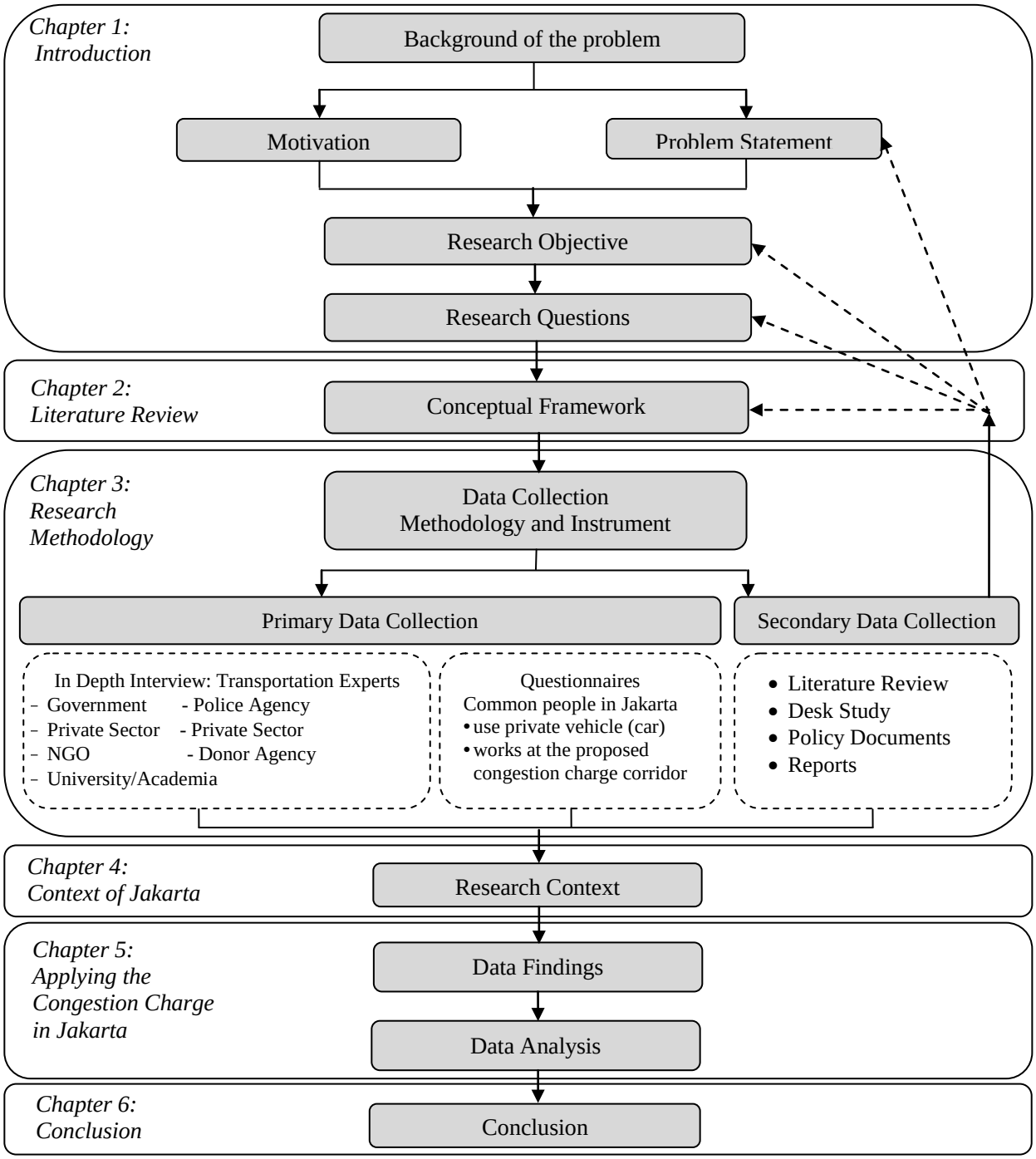
VTPI 2010a, 13 December-last update, *Road Pricing: Congestion Pricing, Value Pricing, Toll Roads and HOT Lanes* [Homepage of Victoria Transport Policy Institute], [Online]. Available: http://www.vtpi.org/tdm/tdm35.htm [2011, 23 February].

VTPI 2010b, 26 January-last update, *Why Manage Transportation Demand?* [Homepage of Victoria Transport Policy Institute], [Online]. Available: http://www.vtpi.org/tdm/tdm51.htm [2011, 1 March].

Annexes

Annex 1 : Thesis Structure

In order to have the general overview of what the thesis process is, the thesis structure is presented below.



Annex 2: TDM Strategies According to How They Affect Travel

Improve Transport Options	Incentives to Reduce Driving	Parking and Land Use Management	Programs and Policy Reforms
• Alternative Work Schedules • Bicycle Improvements • Bike/Transit Integration • Car sharing • Flextime • Guaranteed Ride Home • Individual Actions for Efficient Transport • Park & Ride • Pedestrian Improvements • Ridesharing • Shuttle Services • Small Wheeled Transport • Taxi Service Improvements • Universal Design	• Walking and Cycling Encouragement • Commuter Financial Incentives • Congestion Charge • Distance-Based Pricing • Fuel Taxes • HOV (High Occupant Vehicle) Priority • Parking Pricing • Pay-As-You Drive Vehicle Insurance • Road Pricing • Speed Reductions • Street Reclaiming • Vehicle Use Restrictions	• Bicycle Parking • Car-Free Districts and Pedestrianised Streets • Clustered Land Use • Location Efficient Development • New Urbanism • Parking Management • Parking Solutions • Parking Evolution • Shared Parking • Smart Growth Planning and Policy Reforms • Transit Oriented Development (TOD)	• Access Management • Car-Free Planning • Commute Trip Reduction Programs • Market Reforms • Context Sensitive Design • Freight Transport Management • Institutional Reforms • Least Cost Planning • Regulatory Reform • School Transport Management • Special Event Management • TDM Marketing • Tourist Transport Management • Transport Management Associations

Source: Litman, 2002 and VTPI, 2011

Annex 3: Format of the Correspondence by Email Prior to the Interviews

Subject: Research Student Seeking Appointment

July 1, 2011

Dear Sir/Madam,

I am a full-time student at the Institute for Housing and Urban Development Studies (IHS), Erasmus University Rotterdam. I am pursuing my Masters in Urban Management and Development, with Urban Infrastructure and Energy Management as my specialization. My supervisor is Mansee Bal (bal@fsw.eur.nl). My research topic for the Masters Thesis is,

Application of Congestion Charge in Jakarta

Enclosed, please find the support letter from IHS, research overview and list of questions for your reference. Since, I wish to discuss about my thesis with you, I seek an appointment from you. I will be in Jakarta from 4th till the 27th of July for the field work.

I look forward to your cooperation. Thank you.

Sincerely yours,

Rindy Farrah Indah Dewi

rindyfarrah@gmail.com

+6285718110674

Annex 4: List of Questions

List of Questions for Interviewee

This 'list of questions' is a research instrument of the study on "*assessing the possibilities of implementing congestion charge as a road pricing mechanism of Transportation Demand Management (TDM) in Jakarta*". This survey is strictly confidential and your answers will only appear as totals combined with those of other respondents for academic purposes only.

Purpose of the interview:

1. To understand the current policy on national/provincial transportation frame work that fits in with congestion charge in Jakarta.
2. To determine the opportunities and challenges of implementing congestion charge in Jakarta.

Congestion Charge (also known as Electronic Road Pricing) – Normally Argued Objectives:

- A fee that can vary depends on the condition of the traffic (higher prices under congested conditions and lower prices at less congested times and locations) or based on a fixed schedule.
- Can be implemented on existing roadways as a TDM strategy to avoid the need to expand capacity, or when road tolls are applied to raise revenue.

Date and time of interview:

Background of the interviewee:

Name	:		
Telephone	:		
E-mail address	:		
Name of organization you work for	:		
Type of the organization	:	1. Government	4. Police Agency
		2. Private Sector	5. NGO
		3. University / Academia	6. Other (specifiy):
Your position in the organization	:		
Location of the organization	:		

Current Policy on National/Provincial Transportation Frame Work

1. What do you see in Jakarta's transportation problem?
2. Jakarta traffic congestion has been managed by many policy options; one of it is by Transportation Demand Management (TDM). How do you see the TDM application in Jakarta? (such as Bus Rapid Transit (busway), three-in-one, and toll road system)
3. What is the current status of the implementation of congestion charge from the policy/law/ regulation point of view?

Opportunities, Challenges of Implementing Congestion Charge in Jakarta

Based on the literature review of this research, there are opportunities and challenges identified in theories and practices, such as institutional capacity (legal framework, technology and enforcement, public acceptability, political support, existing road network and public transportation system.

4. What in your opinion are the opportunities of implementing congestion charge in Jakarta?
5. What in your opinion are the challenges of implementing congestion charge in Jakarta?

Final Remarks and Advice

6. What are your final remarks and advice to implement congestion charge in Jakarta?

Annex 5: List of Organizations/Representatives Interviewed

No.	Organizations		Name	Contact	Remarks
Government					
1.	National Planning and Development Agency	Deputy of Infrastructure, Directorate of Transportation	Mr. Aryawan *(Deputy Director of Road Transportation)*	aryawan@bappenas.go.id	Division deals with transportation, including road, railways, waterways, ports and airports
2.	Ministry of Transportation	Directorate General of Land Transport, Directorate of Urban Transportation System	Mr. Harno Trimadi *(Head of Urban Traffic Section)*	h_trimadi@yahoo.com Phone: +62213506160	Division deals with land transportation system specifically for urban areas
3.		Vice Minister's Advisor	Prof. Wimpy Santosa	wimpy.santosa@yahoo.com Phone: +62811208892	
4.	Ministry of Finance	Directorate General of Financial Balance	Mr. Adrian Pratama *(Senior Officer in Directorate of Regional Tax and Toll)*	akp22606@yahoo.co.id	
5.	Ministry of Public Works	Directorate General of Highways, Directorate of Planning	Dr. Slamet Muljono *(Deputy Director of Policy and Strategy)*	s_muljono@yahoo.com	Division deals with policy and planning in road development
6.			Mr. Dedy Gunawan *(Head of Policy Section)*	dedygw@yahoo.co.id	
7.			Dr. Max Antameng *(Senior Transport Economist)*	cenrma@yahoo.com	Expert on Transport Economy
8.			Mr. Edi Prasetya *(Senior Road Network Planner)*	eprasetyo54@yahoo.co.id	Expert on Road Network Planning
9.		Indonesia Toll Road Authority	Mr. Herry Trisaputra Zuna *(Head of Investment Division)*	hatezet@gmail.com	Board of toll road regulator, business management and monitoring of toll road enterprises
10.		Centre for Research and Development of Road and Bridge	Mr. Erwin Koesnandar, Ms. Rahayu and Mr. Harlan *(Researchers)*	erwin.koesnandar@gmail.com	
11.	Jakarta Deputy Governor on Industry, Trade and Transportation		Prof. Sutanto Soehodho	ssoehodho@yahoo.com	
12.	Jakarta Planning and Development Board	Economic Division	Mr. Made *(Head)*, Mr. Tulus *(Head of Regional Development Section)* and Mr. Douglas Batubara *(Senior Officer)*	Phone: +6281310714990	Division deals with infrastructure provision, public works, including transportation system
13.	Jakarta Municipality Transportation Office	Traffic Management Division	Mr. Benhard *(Head)* and Mr. Agung Hehakaya *(Senior Officer)*		Division deals with traffic management
14.		Traffic Control Unit	Mr. Wirawan	gnwirawan@gmail.com Phone: +62213452668	
Police Agency					
15.	Indonesian National Police	Directorate of Traffic Management	Mr. Indra Darmawan *(Head of Traffic Management Assessment Sub-Division)*	Phone: +6281219685105	Division deals with traffic management for national level
16.	Greater Jakarta Region Police	Traffic Management Division	Mr. Adhie Santika *(Head of Enforcement and Violation Section)*	Phone: +6281388959173	Division deals with traffic management for Greater Jakarta
Private Sector					
17.	PT. Jasa Marga		Mr. Dedi Krisnawan *(Head of Toll Road Development Division)*	dedi_ks@yahoo.com Phone: +628129904223	Major toll road operator in Indonesia

No.	Organizations	Name	Contact	Remarks
NGO				
18.	*Dewan Transportasi Kota Jakarta* (Jakarta City Council for Transportation)	Mr. Azas Tigor Nainggolan *(Head)*	azastigor@yahoo.com Phone: +828159977041	A multi-stakeholder organization that is formed by the government of Jakarta, in charge of transportation development
19.	*Masyarakat Transportasi Indonesia* (Indonesia Transportation Society)	Prof. Danang Parikesit *(Head)*	dan-dan@indo.net.id	NGO with special concern to transportation sector
20.	ITDP (Institute of Transportation and Development Policy)	Mr. Yoga Adiwinarto, Ms. Indira Kusuma Dewi and Mr. StevanusAlbertus Ayal *(Researchers)*	yoga.adwinarto@itdp.org indira@itgp.org stevanus.ayal@itdp.org	NGO working together with the United Nations Environment Programme promoting TDM in Jakarta
Donor Agency				
21.	GIZ – SUTP (Deutsche Gesellschaft für Internationale Zusammenarbei – Sustainable Urban Transport)	Mr. Hans Ulrich Fuhrke *(Principal Adisor)* and	hans.fuhrke@giz.de	German donor agency which assist developing cities achieve their sustainable transport goals
22.		Mr. Muhammad Nanang Prayudyanto *(Senior Advisor/Transport Engineer)*	nanang@sutip.org Phone: +628119301767	
Academia/University				
23.	University of Indonesia	Mr. Hendricus Andy Simarmata	andybanjar@yahoo.com	Transportation experts from universities
24.	University of Trisakti	Dr. Fransiskus Trisbiantara	fransiskus.trisbiantara@gmail.com	
25.	University of Parahyangan	Mr. Tri Basuki Joewono	vtribas@yahoo.com	
26.	Bandung Institute of Technology	Dr. Pradono	pradono@itb.ac.id	

Annex 6: Excerpt from Interviews

12.30 Hrs., 4 July 2011, DR. Max Antameng. DR. Antameng is working under the Ministry of Public Works, Directorate General of Highways, Directorate of Planning. He was the former Deputy Director of General Planning and now he is positioned as Senior Transport Economist. He was actively involved in the preparation of Act No. 22 Year 2009 on Road Traffic and Transport as well as Government Regulation No. 32 Year 2011 on Traffic Management, Impact Analysis and Traffic Demand Management.

Jakarta's transportation problem is basically because of the growth of vehicles exceeding the growth of road which then causes congestion. With the increase number of vehicles, the number of charge from vehicle taxes increases as well, especially since the government have introduce the progressive tax which added 75% more budget for road sector. However, not all of the income is used for road development and improvement. Approximately only 15-20% of the annual provincial income is earmarked for the road sector. An addition of 1 vehicle will need a certain addition length of road should be calculated in order to fill the gap.

The government tries to solve the congestion problem, but in reality it causes another problem. For example, making a new regulation on the school starting hour's an half hour earlier, from 7.00 am to 6.30 am, is just moving the congestion to another period of time. Another issue is the government power to intensify public transportation is weak which is also related with the law enforcement of regulations. There is a need to change the mode of transportation from using private car to public transport.

The BRT system has not yet solved the congestion problem because the bus lane uses the existing road, not constructing a new lane. Therefore, it reduces the existing road capacity. The three-in-one system is the transition phase to electronic road pricing, or congestion charge. For the toll road system in Jakarta, the inner ring road is supposed to be the outer ring road. However, the city expanded, and then outer ring road became the inner ring road. The inner-inner ring toll road project has not yet being constructed due to land acquisition problems. Therefore, the inner-inner ring toll road project needs to be considered again as way to solve the congestion problem.

Another new approach of solving Jakarta's transportation problem is by traffic restriction from the plate license. A vehicle with an odd number can only pass the road on a certain day, and this also for even numbers. However, there is still doubt on the implementation because of the law enforcement.

The current status of the implementation of congestion charge is still on process for legalising the financial issue in a form of a Government Regulation by involving the Ministry of Finance. However, the technical issue is already stated in the Government Regulation No. 32 Year 2011.

The congestion charge is one of the 17 actions declared by the Vice President of the Republic of Indonesia to overcome congestion problem in Jakarta.

The opportunities of implementing congestion charge in Jakarta are the public acceptability since there has not been protest from people, and also the strong political support from the Vice President and Governor.

The challenges of implementing congestion charge in Jakarta are related with the insufficient public transportation system to fulfil the needs of the citizen (the number of taxi increases) and the readiness of its institutional capacity. The institutional capacity covers the legal framework regarding the board that might be needed for managing the system and also the technology. The Australian Government through the Indonesia Infrastructure Initiative (IndII) project is starting a scoping study for the suitable technology that will be used in Jakarta. Enforcement is another big challenge which is also related with the technology applied.

In the future, congestion charge will not only be implemented in Jakarta, but also other metropolitan cities such as Surabaya or Medan. Jakarta will start as the pilot project for congestion charge in Indonesia.

There is a need for socializing the congestion charge concept to the society in order to gain public acceptability by convincing them that this system will make them use money more efficient and realized that comfort is not free.

Regulation regarding motor cycle as well as the type of technology for enforcement needs to be considered since the number of motor cycles had increased rapidly within the last decade. This is also related with the automotive industry policy.

Unification of identity card or *Kartu Tanda Penduduk* and driving license or *Surat Izin Mengemudi* is necessary for enforcement and charging the penalty.

14.30 Hrs., 4 July 2011, Mr. Edi Prasetya. Mr. Prasetya is working under the Ministry of Public Works, Directorate General of Highways, Directorate of Planning. He was former the Chief Section of National Road Network and now positioned as Senior Road Network Specialist.

Jakarta has many policies to solve congestion, but the implementations are mostly delayed, such as subway, monorail and BRT system. The delays are mainly because of the government does not have sufficient fund to implement the projects and also improve the road network system. Moreover, the automotive industries have ease of entry to sell their products which affected the increase number of vehicle each year. Currently, the government is planning introduce a new policy to solve the congestion with the odd-even plate number regulation in order to restrict certain vehicles on the road. Several policies are considered against the society; however, defining the society is another issue. Because of the high land price in the centre of the city, then people tend to live at the suburbs, which then create movement and the city became expanding. Since the government has not yet provide safe and comfortable public transport, people tend to have their own car and use it for their daily activities.

The BRT system has not yet been effective to solve Jakarta's transportation problem. It still uses the existing road either it is part of the national or provincial road which later on bring another problem of the responsibilities. Several bus lanes are not sterilized from other vehicles which affects the reliability of the BRT system. Feeder buses are also crucial to support the BRT system to serve commuters. Therefore, the Jakarta government needs to have good cooperation with its neighbouring cities (Bogor, Depok, Tangerang, Tangerang Selatan and Bekasi), not just for the BRT system but also the commuter train.

The toll road system, specifically the planned 6 routes inner city is not well connected with the current road network.

The three-in-one system is not effective since it gave social impacts through 'jockeys' who offered their service to vehicles that has less than three people in one car. Actually the three-in-one system is the transition phase towards congestion charge or electronic road pricing.

The legal framework regarding congestion charge finance system is still in process. Currently, the technical aspect is already mentioned in a small part of the Government Regulation No. 32 Year 2011. This regulation needs to be detailed especially for the financing method.

The strongest support for implementing congestion charge in Jakarta is from the political point of view. This system is strongly supported by the Governor, provincial legislative and its technical officers.

The challenges will be mostly related with public acceptability, especially if the initial tariff is much higher compare when the driver needs to pay for the 'jockey' service. However, this might be more effective to reduce the number of vehicles passing by the road. Technology and enforcement are also challenges for implementing congestion charge in Jakarta, and both of them are related. The current road network system in Jakarta is divided into national, provincial and local road. This will also affect the implementation of congestion charge since each road classification has its own manager. In relation with the area limitation of the congestion charge will also be the challenges of implementing it. Congestion charge may solve the congestion problem in a specific road or area, but there is a chance that the alternative road or area will be congested.

Additional remarks for implementing congestion charge in Jakarta are socialization of the system to the society in order to gain public acceptability. Identifying the public acceptability is also important which can be identified through surveys. Tariff setting and improving the public transportation system is also crucial in this issue, as well as trying to enforce the former policy/regulation on road network.

08.00 Hrs., 5 July 2011, Mr. Dedy Gunawan. Mr. Gunawan is working under the Ministry of Public Works, Directorate General of Highways, Directorate of Planning. He was former Senior Officer in the Directorate of Freeways and Urban Road and now positioned as Chief Section of National Road Strategy.

Based on an article, Jakarta's traffic condition is positioned number third the worst in the world. The public transportation system is really poor, and open spaces for road expansion is very limited. BRT is only a short term solution for Jakarta's traffic problem. The railway system should be the long term solution to solve Jakarta's traffic problem.

From 15 corridors planned for the BRT system, 10 corridors are already in operation, though it is not yet effective. The current BRT system is only achieving the affordability point of view, but not yet achieving punctuality, regularity, comfort and convenience. The three-in-one system has created social problem from the existence of 'jockeys'. The toll road system is also not a problem solver for the congestion in Jakarta since toll road functions as alternative road as stated in the Law of Road.

In order to implement congestion charge, there is a need for legal framework in form of the Provincial Regulation which will give more details and specify the method. Congestion charge is planned to be implemented in 5 big cities in Indonesia. Jakarta is the pilot project of congestion charge which is also stated by the Vice President of the Republic of Indonesia as one of the actions to solve Jakarta's congestion problem.

Congestion charge will not solve Jakarta's traffic problem if the public transportation is not also improved. The public transportation in Jakarta should be punctual, regular, affordable, comfortable and convenience. Another pessimist point of view is congestion charge will only replace the congestion from the charged area/corridor to another corridor. For example, if the congestion charge is implemented in Gatot Soebroto Rd., then the Casablanca Rd. and Tendean Rd. will become more congested. It is preferable to use the cordon pricing system which is area based, not corridor based, because it will be more effective compare if it is only applied at the three-in-one corridor. However, it is predicted that there will be public resistance if it is applied. There will be pros and cons if the system is implemented.

From the technology point of view, there are two options: manual, using toll booth, and electronic, using gantries. This is also related with the enforcement. If the electronic system is chosen, then vehicles need to have on-board unit (OBU) or card in order to be detected from the gantries. There will be problem later on if the vehicles came from outside of Jakarta.

Regarding the tariff setting, if the government set up the tariff too low, then congestion charge will not make any differences. It is better if the tariff is set-up high, especially when people have the perception that money is not everything, but time is everything. In the end, time is money. A study showed that London in the first three months of implementing congestion charge had transferred 45% of the people from using private vehicle to public transportation. London itself has already good public transportation system. However, the percentage decreased at the six months.

To support the congestion charge, the non-motorized transport should be also taken into consideration in relation with solving Jakarta's transportation problem. For example, providing bicycle lanes and pedestrian ways.

14.45 Hrs., 5 July 2011, DR. Muhammad Nanang Prayudyanto. DR. Prayudyanto is the Senior Advisor or Transport Engineer for the SUTIP. The project is funded by the German government through Deutsche Gesselschaft für Internationale Zusammenarbeit (GIZ) counterpart with the Ministry of Transportation. SUTIP vision is to have car-free cities in Indonesia, and congestion charge/ERP is the transition phase towards achieving the vision. He was involved intensively on the

first BRT corridor preparation and has conducted studies related with application of TDM in Indonesia.

The root of the transportation problem in Jakarta is because of the increased number of car-ownership that is not followed by the increased road length.

The three-in-one system was the first TDM strategy introduced in Jakarta when the traffic congestion has already existed. The Non-Aligned Movement Summit in 1992 held in Jakarta was the trigger for applying the system. Since there were many international guests coming from all over the world, the conference location should be free of congestion. Therefore, the government started the three-in-one system which was only in the morning rush hours, from 07.30 until 10.00 AM. At that time, the system was a success since the number of private cars reduced up to 24% and the vehicle speed increased up to 150%. However, there was resistance from private car users, even a shooting incident occur hitting a private car. The traffic kept on reducing especially in 1997 when the country was hit by the economic crisis. The trend changes when the country was starting to recover from the crisis. In 2000, the traffic increased exceeding the number before the crisis. Motorcycles started to dominate the traffic and 'jockeys' started to exist. In 2004, the first BRT corridor (Blok M-Kota) was operated. This corridor served 3,600 per passenger/hour/direction. Currently, there are 10 BRT corridors in operation.

The congestion charge was firstly introduced in 2004 in a study on Greater Jakarta's transportation master plan (SITRAMP), conducted by JICA and the National Planning and Development Agency (Bappenas). In the legal framework, congestion charge is stated in the Law 22 Year 2009 on Traffic and Road Transport in form of traffic control charge. The law has been specified in the Government Regulation No. 32 Year 2011 on Traffic Management, Impact Analysis and Traffic Demand Management which stated details on Traffic Demand Management especially congestion charge/ERP. Nonetheless, this regulation is more on the technical point of view. Regarding the charging mechanism and funding, there is a need to specify it in another government regulation. If congestion charge/ERP is considered as tax, then it should be under the central government; however, if is as charge, then it should be under the local government. Congestion charge/ERP has not yet been mentioned in Act No. 28 Year 2008 on Local Tax and Levy.

The President of the Republic of Indonesia has formed the President's Delivery Unit for Development Monitoring and Oversight (UKP4). The UKP4 has been given a task to supervise the Vice President Instruction on 17 Action Plans to Overcome Jakarta Transportation Problem which one of it is the implementation of ERP. The Government of Jakarta is the one who is responsible for this action in cooperation with the Ministry of Transportation, Police Agency, and Local Government from neighbouring Province/Regent/City. However, the policy is not enough since there is a need for technical guidelines or manuals. The Government Regulation No. 32 Year 2011 on Traffic Management, Impact Analysis and Traffic Demand Management should be explained more in details in a Ministry Regulation or Decree. On the other hand, Jakarta's provincial government claimed that they are 'ready' to implement the system though the legal framework is not yet completed.

As stated in the Government Regulation No. 32 Year 2011 on Traffic Management, Impact Analysis and Traffic Demand Management article 79, the money from traffic control charge or ERP can only be used for traffic performance and public transportation improvement. However, it does not mentioned about improvement for pedestrian facilities.

The ERP has been stated in Jakarta's Macro Transportation Model (MTM) which is legalized as Governor Regulation No. 103 Year 2007.

The preconditions to implement ERP in Jakarta are:

(1) Have an alternative public transportation. This is a challenge for Jakarta since the BRT system is not sufficient.

(2) Transparency on the financing system which is also a challenge since there has not been a legal institution to handle the financing system. The local bank or Bank DKI (*Daerah Khusus Istimewa*) should have a separate account for earmarking the fund from ERP. Currently, all of the income is putted in one pot and then distributed.

(3) Enforcement for violators of ERP is a challenge, especially for the payment method and mechanism, either using daily or monthly based, etc.

(4) Leadership is an important element in order to implement ERP.

(5) Political support as an opportunity for implementing ERP since the society is already fed-up with the traffic situation in Jakarta. ERP has been a success story in Singapore and has not been tried in Jakarta.

Currently, the transportation policies in Jakarta are considered as low-cost TDM, government initiative with low social impact, starting with the three-in-one system in 1992 and BRT system in 2004. In 2011, there is a new regulation about truck restriction entering the inner toll road of Jakarta. ERP is considered as high-cost TDM with private involvement and high social impact. Using the area pricing in Jakarta is more potential since the type of the city is multi-nucleus.

Land use management is also needed to support improving transportation system in Jakarta from road-based to public transport-based. In the future, public transport-based will be the back bone of Jakarta's transportation system that is low cost. The land use and public transportation development has been developed since the 1990's with the Transit-Oriented-Development approach.

16.00 Hrs., 5 July 2011, Mr. Hans Ulrich Fuhrke. Mr. Fuhrke is the Principal Advisor/Project Director of the Sustainable Urban Transportation Improvement Project (SUTIP). The project is funded by the German government through Deutsche Gesselschaft für Internationale Zusammenarbeit (GIZ) counterpart with the Ministry of Transportation.

SUTIP vision is to have car-free cities in Indonesia, and congestion charge/ERP is the transition phase towards achieving the vision. Singapore has already implemented the system and it cost them US$ 200 million. However, within 2 years Singapore already get the money back from the charges. If Jakarta wanted to implement this system, it will cost approximately US$ 300 million, considering the size of the city and the technology that is needed.

Overall, Jakarta is not yet ready to implement this system because of the technology limitation. The plate license of all cars needs to be registered automatically all over Indonesia, not just in Jakarta, because the traffic in Jakarta comes from all around the country. The person named in the vehicle ownership license needs to be responsible for all the things that happened with the vehicle. However, in Indonesia, if a person buys a used-car, he/she rarely change the name in the vehicle ownership license. Another thing that made Jakarta not yet ready to implement this system is the traffic violation that has not been handled seriously and properly.

The objective of congestion charge is to reduce the congestion in a restrictive way. This approach might invite protest from people. It is better allocating the fund that has been prepared for congestion charge/ERP to public transportation improvement such as BRT system, also park-and-ride to support the BRT which are more supportive and positive approach to reduce congestion.

10.45 Hrs., 6 July 2011, Mr. Indra Darmawan. Mr. Darmawan is working at the National Police Agency, Directorate of Traffic as the Chief of Traffic Management Assessment Sub-Division.

Jakarta's transportation problem is regarding vehicle restriction, infrastructure and public transportation. The current transportation policies are not effective to solve Jakarta's transportation problem, for example the three-in-one system. Another example is the toll roads which mostly are still using manual payment method. The ramp-on and ramp-off are usually causing the traffic congestion. Toll roads are not again as alternative road, but serving as main road. Moreover, the travel time when using the toll road should be maintained to perform its standard.

The ERP is still on discussion within the JTO. From the technology point of view, on April 2011 the Head of JTO held a seminar on introducing the technology for ERP from 4 vendors: IBM, IForte, Mitsubishi and QFree. If Jakarta is going to use gantries, than there should be a lot of it to be build since there are many intersections. There are also possibilities to use stickers with different colours for a specific day. The vehicle licence registration should be completed first in order to support ERP implementation.

From the legal aspect, the regulation regarding finance has not yet been set-up to support ERP especially for earmarking. The status of the road should be taken into consideration when selecting the area. It is against the law if the national road is imposed to the ERP system.

Public opinion and acceptability is also an important aspect to be considered. There is a possibility of rejection from the people as happened in Stockholm.

14.30 Hrs., 6 July 2011, Mr. Harno Trimadi. Mr. Trimadi is working under the Ministry of Transportation, Directorate General of Land Transport, Directorate of Urban Transport. He is positioned as Chief Section of Urban Traffic. He was actively involved in the preparation of Act No. 22 Year 2009 on Road Traffic and Transport as well as Government Regulation No. 32 Year 2011 on Traffic Management, Impact Analysis and Traffic Demand Management. He was also the counterpart from the Ministry of Transportation for SITRAMP.

Jakarta's transportation problem is regarding the increase number of private vehicles, car and motorcycle. There should a regulation to limit the number of motorcycle made by the Jakarta government.

TDM strategies that have been applied in Jakarta are three-in-one system and school time management. Toll road in Jakarta is not considered as TDM because it increased the use of private vehicles.

In the Government Regulation No. 32 Year 2011 article 79, the criteria of implementing ERP or traffic control charge have been stated. The traffic restriction can be implemented in a road, area or corridor with these criteria:

1. The traffic volume of motor vehicles per capacity of one lane road on the road is equal to or greater than 0.9 (zero point nine);
2. Has 2 (two) way road where each line has 2 (two) lanes;
3. Vehicles can only be traversed with an average speed at peak hour is equal to or less than 10 (ten) kilometres / hour, and
4. Available networks and services of mass public transport in the trajectory that meets the minimum service standards.

From the 2nd criteria, an example of a corridor that is already less than 10 kilometres / hour is the H. Rasuna Said Rd. For Sudirman-Thamrin Rd., since three-in-one system has been applied during peak hours, it should be tested again when the three-in-one system is not imposed.

The Jakarta Government proposed the charge area will replace the three-in-one corridor (Sudirman-Thamrin Rd., and part of Gatot Soebroto Rd.). In Article 79 paragraph (2), it is stated that the traffic control charge cannot be imposed on the national road. Gatot Soebroto Rd. status is national road, so the Jakarta Government needs to readjust their proposed area.

In Article 81, it is stated that if a city wants to impose the traffic control charge, the local government should:

1. Provide roads which will be in place restrictions that meet minimum standards requirements;
2. Install, repair, and maintain road equipments in the area, corridor, or a particular road that are directly related to road users on roads and / or intersection, and
3. Supply systems and equipment necessary to implement the individual vehicle traffic restrictions and goods vehicles.

The Jakarta Government should start to prepare the Jakarta Government Regulation on Traffic Control Charge/ERP while waiting for the finalization of the financial regulation that is being prepared by the Ministry of Finance. The earmarking concept should be stated in the financial regulation to ensure the charges from ERP will be use for transport facilities improvement, including the public transport.

The Jakarta Government do not need to wait for a Ministerial Decree or Regulation as stated in the Government Regulation No. 32 Year 2011 article 83. The Jakarta Government should also improve and maintain the road physical condition as one of the pre-conditions needed to impose the charge.

From the opportunity point of view, for people who used to hire 'jockeys' to enter the three-in-one corridor are considered capable to pay for the charge.

There will be challenges to impose the traffic control charge/ERP. For example, people who used to travel with three or more than three people in the car will oppose ERP. People willingness to pay is also a challenge. Another issued that is predicted to rise if ERP is imposed is regarding the increase number of motorcycles. The BRT system should be improved in order to anticipate people changing their mode of transportation from private vehicle to BRT. The existing road condition should be improved to fit the minimum performance standard.

For the type of charge, there has not been a fix decision whether to use the flat or fluctuating rate which depends on the traffic situation. This issue should be stated in the Jakarta Government Regulation. Jakarta Government should learn also from other countries failure. For example, Hongkong experience that set the tariff low which made the price not competitive and traffic congestion still exist.

Regarding the political support, the former governor, Mr. Sutiyoso, is considered to have strong leadership. However, the incumbent's, Mr. Fauzi Bowo, leadership is still questioned.

13.30 Hrs., 8 July 2011, DR. Fransiskus Trisbiantara. DR. Trisbiantara is one of the lectures in Trisakti University in the Faculty of Civil Engineering and Planning. He was former member of Jakarta Transportation Council.

Jakarta's transportation problem occurs because of the incomprehensive transportation master plan (Macro Transportation Model/*Pola Transportasi* Makro) which does not refer the spatial plan. The Macro Transportation Model should be legalized in the level of Jakarta's government regulation, not enough until Jakarta's governor regulation.

The BRT system is not functioning as its capacity. Not only on peak hours, but also on non peak hours the BRT is often over capacity. The maximum number of passenger allowed in the bus legally is 80 people, but in rush hours may reach 120 people. With this condition, it is felt that the people their mobility is restricted, not the traffic. The numbers of buses are also still limited. Then comes the question of when will the 15 corridors be completed.

There is insufficient legal basis for implementing congestion charge that covers the limitation of congestion charge which is not for raising the regional income and traffic restriction. The legal basis should cover the aims of congestion charge which are:

1. To improve the environment though emission reduction
2. To improve the level of service of the road. The higher volume per capacity ratio, the charge will be more expensive or high, and vice versa. The results of it are traffic limitation, traffic speed improvement and accessibility improvement.
3. To collect money from the citizen in order to improve the public transportation system through cross subsidies and developing the mass public transportation system.

There are several pre-conditions that Jakarta needs to have in order to implement congestion charge. The public transportation capacity should be sufficient. If this condition is fulfilled, then the level of acceptance of the society will be high.

8 July 2011, DR. Tri Basuki Joewono. DR. Joewono is one of the lectures in Parahyangan Catholic in the Technical Faculty lecturing on Civil Engineering. He is also member of Inter-Universities Transportation Study Forum.

Jakarta transportation problem has been an issue that has spread in a large scale (eventhough no one has measured the loss due to transport problem), thus forming a vicious circle that is complicated. It is not just a matter of movement, but also the social problem of environmental, cultural, political, even psychological and psychiatric.

There are various causes of Jakarta's transportation problem that are interrelated where each sector has its own plans and their justification. Since there is a weak understanding of the system and willingness to think as a system, as a result there is no coordination happening.

There is a need of more sophisticated approach, but the principle of local wisdom needs to be emphasized. There are many opportunities and resources that can be exploited, but there are fundamental flaws in implementing and improving the plan which makes no significant progress. There are so many initiatives that have been done, but not structured so there is no effect as expected.

The basic/grand transportation policy is not quite operational, so the measure of success and the achievement is not clear. Political will is not supported with integrated capability and effort. A 'strong' leader is needed to bring a plan into reality.

Ideas and initiatives are good and already in the right direction if compared with developments in the world. However, realization, integration, follow-up, and maintenance are not running like it should. Because of this condition, ideas and initiatives does not give expected results. The image built in the society is that implementation of new ideas are mostly detrimental, unserious and experimental. This condition happened due to unprofessional socialization and implementation process.

Academic studies using recent scientific approach do not seem to have a good place. This is shown from the various phenomena of unpreparedness and the emergence of problems in the field during implementation.

Public participation is not adequate since involvement is limited due to the process of representation. This resulted in representation of the needs and approaches used are not matching.

Implementation of the idea is still in the stage of the 'infant' or premature since all of the possibilities have not been taken into consideration. For example, people who are disadvantaged of congestion charge through ERP have not been given new alternatives that they can choose. People are positioned as an object that needs to obey without any favourable option, for instance, the implementation of ERP in Jakarta without sufficient public transportation provision.

The policy plotting sequence does not reflect that the policy is more people oriented, especially the lower classes, for example, the implementation of ERP in Jakarta without sufficient public transportation provision. This situation shows inequality. Ideally, there is a need to provide sufficient public transportation for all classes in the society so they have option. Later on, ERP can be implemented.

In general, congestion charge is not feasible to implement fully, except there is a trial implementation period.

There are resources available and ready to be used to conduct studies in depth. Likewise there are some best practices that can be studied. There is also an opportunity to test and socialize the new system so the best measure can be chosen. There is willingness and understanding of Jakarta transportation issue from the society. Moreover, there is a strong political leader that can carry out plan into implementation.

Externality and equity issues need more attention. In the past, the issue has not been taken fully into consideration. This resulted more pressure for the marginal people in the society.

There is a need to assess the impact experienced by diverse group in the society. The impacts have to be classified properly, such as, direct and indirect impact, single and cumulative impact, etc.

There are a variety of measure and approach that can be selected, but the image of 'trial and error' approach should be avoided. Trials (social experiment) and socialization needs to be done carefully and analyzed with a valid scientific approach. This will help to produce the expected choice of measure more wisely.

There is a need to find the optimal measure (location, methods, rates, incentives, etc) that produce the best welfare gain for the system, and not for specific groups.

The linkage of a measure that is selected by a variety of other measure to achieve sustainable transport needs to be looked at closely. The success of a measure is expected to support another measure of success, rather than conflicting or mutually negating. This suggests the need for coordination between sectors.

Jakarta needs a more sophisticated approach than just a study to prepare a selection of congestion charge. The new approach can be achieved when in depth studies has been done.

Nontechnical aspects need more attention, where "quality of life" should be the ultimate goal. Aspects of "equity" should be emphasized in selecting a measure.

All groups in the society should be involved since the idea was introduced, feasibility studies were conducted, dissemination, until implementation. The key success of a policy is consumer oriented, where the welfare gain is not measured by income alone, but a variety of sizes indicating a better quality of life.

09.30 Hrs., 11 July 2011, Prof. Wimpy Santosa. Prof. Santosa is the advisor of Vice Minister of Transportation and member of the advisory board of Inter-Universities Transportation Study Forum. He is also active giving lectures in Parahyangan Catholic University for transportation studies.

Jakarta does not have a comprehensive strategy to manage the transportation system. The effort to improve the public transportation system is still minim and policies are more likely supporting private vehicles. Moreover, the implementation of the Jakarta transportation master plan or MTM is also weak.

The BRT system has not yet been implemented rapidly. The same situation occurs on other proposed public transportation such as monorail and MRT. This condition result to loss of momentum to implement the system.

14.00 Hrs., 11 July 2011, Mr. Wirawan. Mr. Wirawan is working under the Jakarta Transportation Office as the Chief Section of Traffic Control System.

13.10 Hrs., 12 July 2011, Mr. Azas Tigor Nainggolan. Mr. Nainggolan is the Head of Jakarta City Transportation Council (*Dewan Transportasi Kota Jakarta*) which is an independent organization consists of different stakeholders related in the transportation sector. He is also the Head of Jakarta Citizen Forum (Forum Warga Kota Jakarta) which is a NGO that has concerns on transportation issues.

The strongest support for implementing congestion charge in Jakarta is from the political point of view. This system is strongly supported by the Governor, provincial legislative and its technical officers. However, there is still lack of support from the central government.

16.30 Hrs., 12 July 2011, Mr. Made, Mr. Tulus and Mr. Douglas. Mr. Made, Mr. Tulus and Mr. Douglas Batubara are working under the Jakarta Planning and Development Board, in the Economic Division. Mr. Made is the Head of the Economic Division, Mr. Tulus is the Chief of Regional Development, while Mr. Batubara is a senior officer.

11.30 Hrs., 13 July 2011, Mr. Agung Hehakaya. Mr. Hehakaya is working under the Jakarta Transportation Office as a Senior Officer in the Traffic Management Division.

09.30 Hrs., 14 July 2011, Mr. Erwin Koesnandar, Ms. Rahayu and Mr. Harlan. Mr. Koesnandar, Ms. Rahayu and Mr. Harlan are researchers in the Research and Development Centre of Road and Bridges under the Ministry of Public Works. They are working are senior researchers at the Traffic and Road Environment Office.

15.30 Hrs., 14 July 2011, Mr. Pradono. Mr. Pradono is one of the lectures and associate professors in Bandung Institute of Technology in the School of Architecture, Planning and Policy Development.

He was former the Head of the Master of Transportation Program and currently he is the Head of Regional & City Infrastructure System Research Group.

13.50 Hrs., 15 July 2011, Mr. Aryawan. Mr. Aryawan is working under the National Planning and Development Agency as the Deputy Director of Road Transport.

Jakarta government is still working on its own. Since the regional autonomy/decentralization era, each province/city/regency has its own power to control their region. Though there is already the Development Coordination Agency (Badan Kerjasama Pembangunan/BKSP) Jabodetabek, it seems there not yet any coordination regarding the congestion charge plan. Transportation policy cannot be limited by administration boundaries.

11.00 Hrs., 19 July 2011, Mr. Adhie Santika. Mr. Santika is working under the Jakarta Police Agency, Directorate of Traffic as the Chief of Enforcement and Violation Section.

After 2 months implementing E-TLE, there is a decrease number of traffic violation. Comparing 2 months before implementation there are approximately 1300 violations, while 2 months after implementation there are approximately 800 violations, around 40% decreased number. This system may support the future congestion charge, because technology without enforcement is nothing. People will still violate the rules as long as there is no enforcement.

09.45 Hrs., 20 July 2011, Mr. Yoga Adiwinarto, Ms. Indira Kusuma Dewi and Mr. Stevanus Albertus Ayal. Mr. Adiwinata, Ms. Dewi and Mr. Ayal are researchers under the Institute of Transportation and Development Policy (ITDP) which is an NGO working together with the United Nations Environment Programme promoting TDM in Jakarta. ITDP itself is a leading organization in promoting environmentally sustainable and equitable transportation policies focusing on high-quality, low-cost mass transit, planning and advocacy for non-motorized transportation, and strengthening the non-motorized transportation industries.

13.00 Hrs., 20 July 2011, Mr. Hendricus Andy Simarmata. Mr. Simarmata is the Head of Training, Research and Profession Development of the Planner Association. He is a lecture in University of Indonesia for the Urban Development Studies Program. He is also active as a consultant in various urban related projects.

Changing the current three-in-one system to congestion charge is an unpopular decision. There is a big difference if congestion charge is implemented before or after the election because it will affect the image of the incumbent governor since there is no guarantee that when the system is implemented, there will a decrease number of traffic congestion.

15.10 Hrs., 20 July 2011, Mr. Benhard Hutajulu. Mr. Hutajulu is working under the Jakarta Transportation Office as the Head of Traffic Management Division.

People of Jakarta thought that the government regulation regarding congestion charge has been legalized. They do not know that it is only the technical part. We are still waiting for the government regulation on levy which will put the congestion charge subject. Congestion charge is considered as levy, not a tax.

17.00 Hrs., 20 July 2011, Mr. Adrian Pratama. Mr. Pratama is a Senior Officer in the Ministry of Finance, Directorate General of Financial Balance, Directorate of Regional Tax and Toll. He is involved in the preparation of government regulation on congestion charge regarding the financial issue.

Jakarta transportation problem is complicated. The public transportation system still needs a lot of improvement from the quality and quantity point of view.

BRT has not yet fulfil the needs of Jakarta people because of the number of buses operated and the lines that has not yet cover the city.

The government regulation regarding the financial aspect is still under discussion within the ministries, not yet involving Jakarta's government. There are still arguments on tariff setting because of the equity and equality issue.

Earmarking is not included in the draft government regulation until now. It is more likely the local government concerns.

The opportunities can be seen through the jockey existence to capture the money that people pay for 'jockeys' to improve the transportation system in Jakarta.

Jakarta's government is proposing the Gatot Soebroto Rd which is the national road for implementing congestion charge. However, it is not in line with the Government Regulation No. 32 Year 2011 on Traffic Management, Impact Analysis and Traffic Demand Management.

Jakarta's public transportation system still needs improvement, such as BRT and also other types of buses/mini buses. People needs to have other option before implementing congestion charge.

There is still a question mark whether congestion charge is the right way to improve the traffic condition in Jakarta. Will the congestion disappear when congestion charge is Jakarta is implemented is also questioned.

16.00 Hrs., 21 July 2011, Mr. Dedi Krisnawan. Mr. Krisnawan is the Head of Toll Road Business Development Division of PT. Jasa Marga, the biggest toll road operator in Indonesia.

Toll road is not a solution for solving congestion in Jakarta. It is not possible to add more toll roads in Jakarta.

08.30 Hrs., 22 July 2011, DR. Slamet Muljono. Mr. Mulyono is working under the Ministry of Public Works, Directorate General of Highways, Directorate of Planning as the Deputy Director of Policy and Strategy.

16.30 Hrs., 22 July 2011, Mr. Herry Trisaputra Zuna. Mr. Zuna is working under the Ministry of Public Works, Toll Road Authority Board as the Head of Investment Division. He was former Deputy Director of Freeways and Urban Roads, Directorate of Technical Affairs.

Every day the traffic situation in Jakarta becomes worse. Compare to the traffic situation in 2002, the travel time doubled in 2011. For example, from the Ministry of Public Works to the Ministry of Transportation, around 8 KM, in 2002 it only took 30 minutes, while now it takes 1 hour.

Toll road in Jakarta is more likely to reach investment return, not for pricing policy, so it is not considered as TDM. However in the future toll road can be considered as TDM strategy.

In Jakarta, TDM strategies that have been introduce are BRT and three-in-one system. The difficulties on implementing TDM are related with the government consistency. For example, BRT network is not made based on the origin and destination of people. The three-in-one system was introduced but people do not have choices. As a result, people pay for 'jockey'.

Toll road is considered another transportation mode to improve the traffic condition. The existing demand should be taken care of. The road length ration compare to the traffic is still low.

07.30 Hrs., 27 July 2011, Prof. Sutanto Soehodho. Prof. Soehodho is the Jakarta's Governor Deputy on Industry, Trade and Transportation. He is also one of lectures in University of Indonesia for the Technical Faculty on Civil Engineering.

The Government Regulation No. 32 Year 2011 on Traffic Management, Impact Analysis and Traffic Demand Management does not cover motorcycle as the charge object. This might trigger people to change their mode of transportation from car to motorcycle in order to avoid congestion charge. This situation might worsen the traffic condition in Jakarta because of the increased number of motorcycle

Congestion charge was firstly initiated by the Jakarta Government which is stated in the Macro Transportation Model (MTM).

Annex 7: Questionnaires Addressed to Respondents – Common People of Jakarta

Dear Sir/Madam,

I am a full-time student at the Institute for Housing and Urban Development Studies (IHS), Erasmus University Rotterdam. I am pursuing my Masters in Urban Management and Development and working on my thesis titled Application of Congestion Charge in Jakarta. The objective of this thesis is assessing the possibility of implementing congestion charge, as a road pricing mechanism of Transportation Demand Management, in Jakarta.

One of the variables of my thesis is public perception. Therefore, I would like to kindly ask your participation as a respondent to fill in this questionnaire. The sampling method used is purposive sampling, which the respondents chosen are Jakarta's citizen using private vehicle (car) along the 3-in-1 corridor (Sudirman-Thamrin Street and part of Gatot Soebroto Street).

Thank you for your participation.

Best regards,

Rindy Farrah Indah Dewi

Congestion Charge (also known as Electronic Road Pricing) – Normally Argued Objectives:

- A fee that can vary depends on the condition of the traffic (higher prices under congested conditions and lower prices at less congested times and locations) or based on a fixed schedule.
- Can be implemented on existing roadways as a TDM strategy to avoid the need to expand capacity, or when road tolls are applied to raise revenue.

Questionnaire Number : (filled by researcher)

Date :

Background of the Respondent

1. Sex
    a. Male
    b. Female

2. Age: _____ years old

3. Profession:
    a. Government Officer
    b. Private Company Officer
    c. Entrepreneur
    d. Others: _____

4. Education level :
    a. Elementary school
    b. Junior high school

c. High school
d. University
e. Others:_____

5. Income level:
   a. < € 83 (< Rp 1.000.000,-)
   b. € 83 - € 250 (Rp 1.000.000,- s/d Rp 3.000.000,-)
   c. € 251 - € 415 (Rp 3.000.001,- s/d Rp 5.000.000,-)
   d. > € 416 (> Rp 5.000.001,-)

Perception on Jakarta's Transportation Problem

6. How serious do you consider the problem of traffic congestion in Jakarta today?
   a. Still not a problem
   b. Reasonable problem
   c. Problem in a critical stage

7. Followings are options to overcome Jakarta's traffic congestion.
   Please rank options (1 to 4, 1 is most important).
   ☐ Public transportation improvement
   ☐ Introduce congestion pricing in congested roads
   ☐ Limit the minimum number of passengers in a car
   ☐ Reduce the number of vehicles that can run each day in turn

8. What do you do when you need to travel during the 3-in-1 period?
   a. Change the route
   b. Change the travel time
   c. Use "jockey"
   d. Use public transportation/BRT
   e. Others: _____

9. Do you know about Traffic Restriction Method?
   a. Yes (continue to question number 10)
   b. No (continue to question number 11)

10. If your answer for question number 10 is Yes, is there one or more methods below that you know about?
    ☐ Road Pricing
    ☐ Parking Restriction
    ☐ Plate Based Vehicle Restriction
    ☐ Sticker Based Vehicle Restriction

11. Do you know that the Jakarta Government will introduce congestion charge or electronic road pricing in 3-in-1 corridors in Jakarta?
    a. Yes
    b. No

12. If congestion charge or electronic road pricing is applied in Jakarta, do you think that Jakarta's traffic congestion will be solved?
    a. Yes, because: _____
    b. No, because: _____

13. If 3-in-1 system is replaced with electronic road pricing, what is the maximum charge you are willing to pay for each time you enter the charged road? It is assumed that the more you pay; the traffic condition will be smoother.
    a. < Rp 20.000,-
    b. Rp 20.000,- s/d Rp 40.000,-
    c. Rp 40.000,- s/d Rp 60.000,-
    d. > Rp 60.000,-

14. If 3-in-1 system is replaced with electronic road pricing, what kind of payment system you prefer?
    a. Annually
    b. Monthly
    c. Weekly
    d. Daily
    e. Every time entering the charged road

15. If 3-in-1 system is replaced with electronic road pricing, what do you think is the biggest challenge to implement the system? You can answer more than one.
    a. Poor enforcement
    b. High-cost and sophisticated technology
    c. Bureaucratic institutions
    d. Lack of public acceptance
    e. Lack of political support
    f. Less supportive road network system
    g. Inadequate public transportation system

Thank you for your participation

Annex 8: Data Compilation from Questionnaires

Background of Respondents

1. Sex

Answers	Frequencies	Percentages
Male	13	41.94
Female	18	58.06
Total	**31**	**100.00**

2. Age: _____ years old

Range : 32 (24 to 56)
Average : 30.38
Median : 29
Total Responses : 31
Mode : 27

3. Profession:

Answers	Frequencies	Percentages
Government Officer	8	25.81
Private Company Officer	18	58.06
State-Owned Enterprise Officer	1	3.23
Entrepreneur	2	6.45
NGO/Donor Agencies	2	6.45
Total	**31**	**100.00**

4. Education level :

Answers	Frequencies	Percentages
Bachelor Degree	22	70.97
Master Degree	8	25.81
Doctoral Degree	1	3.23
Total	**31**	**100.00**

5. Income level:

Answers	Frequencies	Procentage
< Rp 3.000.000	2	6.45
Rp 3.000.001 - Rp 5.000.000	7	22.58
Rp 5.000.001 - Rp 10.000.000	7	22.58
> Rp 10.000.000	15	48.39
Total	**31**	**100.00**

Perception on Jakarta's Transportation Problem

6. How serious do you consider the problem of traffic congestion in Jakarta today?

Answers	Frequencies	Percentages
Reasonable problem	1	3.23
Problem in a critical stage	30	96.77
Total	**31**	**100.00**

7. Followings are options to overcome Jakarta's traffic congestion.
   Please rank options (1 to 4, 4 is the most important and 1 is the most least important).

Options to Overcome Jakarta's Traffic Congestion	Weight				Total Weighted
	1	2	3	4	
Public transportation improvement	0	0	1	30	**123**
Introduce congestion pricing in congested roads	7	7	17	0	**72**
Limit the minimum number of passengers in a car	13	13	5	0	**54**
Reduce the number of vehicles that can run each day in turn	11	11	8	1	**61**

8. What do you do when you need to travel during the 3-in-1 period?

Answers	Frequencies	Percentages
Change the route	13	41.94
Change the travel time	5	16.13
Use "jockey"	5	16.13
Use public transportation/BRT	6	19.35
Just ignore the law and pass the road	2	6.46
Total	**31**	**100.00**

9. Do you know about Traffic Restriction Method?

Answers	Frequencies	Percentages
Yes	18	58.06
No	13	41.94
Total	**31**	**100.00**

10. If your answer for question number 10 is Yes, is there one or more methods below that you know about?

Answers	Frequencies	Percentages
Road Pricing	15	29.41
Parking Restriction	10	16.61
Plate Licence Based Vehicle Restriction	13	25.49
Sticker Based Vehicle Restriction	13	25.49
Total	**51**	**100.00**

11. Do you know that the Jakarta Government will introduce congestion charge or electronic road pricing in 3-in-1 corridors in Jakarta?

Answers	Frequencies	Procentage
Yes	23	74.19
No	8	25.81
Total	**31**	**100.00**

12. If congestion charge or electronic road pricing is applied in Jakarta, do you think that Jakarta's traffic congestion will be solved?

Answers	Frequencies	Percentages
Yes	3	9.68
No	28	90.32
Total	**31**	**100.00**

13. If 3-in-1 system is replaced with congestion charge, what is the maximum charge you are willing to pay for each time you enter the charged road? It is assumed that the more you pay; the traffic condition will be smoother.

Answers	Frequencies	Percentages
< Rp 20.000	23	74.19
Rp 20.001 - Rp 40.000	3	9.68
Rp 40.001 - Rp 60.000	4	12.90
> Rp 60.000	1	3.23
Total	**31**	**100.00**

14. If 3-in-1 system is replaced with congestion charge, what kind of payment system you prefer?

Answers	Frequencies	Percentages
Annually	1	3.23
Monthly	6	19.35
Weekly	5	16.13
Daily	2	6.45
Every time entering the charged road	17	54.84
Total	**31**	**100.00**

15. If 3-in-1 system is replaced with congestion charge, what do you think is the biggest challenge to implement the system? You can answer more than one.

Answers	Frequencies	Percentages
Poor enforcement	21	18.92
High-cost and sophisticated technology	15	13.51
Bureaucratic institutions	14	12.61
Lack of public acceptance	12	10.81
Lack of political support	4	3.60
Less supportive road network system	16	14.41
Inadequate public transportation system	29	26.13
Total	**111**	**100.00**

Annex 9: News Archive on Implementing Congestion Charge in Jakarta

The Jakarta Post

Friday, June 24, 2011 03:37 AM

OPINION

Solving gridlock in Jakarta

Deden Rukmana, Savannah, Georgia | Sat, 11/13/2010 11:12 AM

Many policies have been proposed by the central government and the Jakarta city administration to disentangle Jakarta's chronic traffic snarls.

Vice President Boediono, after a meeting with several ministers and Jakarta Governor Fauzi Bowo early in September, proposed 17 policies to alleviate Jakarta's maddening traffic gridlock, including electronic road pricing (ERP), two new Transjakarta bus routes and a program to clear the Transjakarta lanes of private vehicles, development of commuter train routes in Jabodetabek, prioritization of the MRT and monorail projects and the development of the Jakarta inner-ring railroad and six new inner-city toll roads.

The Jakarta city administration added some more policies to alleviate the traffic congestion in Jakarta, including changing traffic regulations in some congested areas (The Jakarta Post, Sept. 24, 2010), staggering office hours by zone in the five municipalities (The Jakarta Post, Nov. 3, 2010), and forming a task force to manage traffic in regular congestion hot spots (The Jakarta Post, Nov. 6, 2010).

The development and expansion of public transportation, including the MRT, monorail, Transjakarta, and commuter trains in the inner-city and suburbs of Jakarta, as recommended by Boediono, is key to reducing traffic congestion in Jakarta. Such developments should be prioritized and expedited.

Traffic management steps, including the application of ERP, the traffic law enforcement and the deployment of task forces to congestion hot spots, will support the effectiveness of mass transportation in alleviating the chronic transportation problems facing Jakarta.

The Jakarta Transportation Agency plans to apply the ERP in major thoroughfares where the three-in-one system is in place (The Jakarta Post, Sept. 23, 2010). The ERP would be an alternative when congestion levels in the restricted zone exceed a threshold. As a result efficient use of the roads and redistribution of trips spatially, temporarily and modally will follow (Albalate and Bel 2009; Goh 2002).

Jakarta needs to learn from the success of Singapore, which has implemented the ERP since April 1998. The ERP in Singapore is an upgrade of a previous congestion charge system, the Area Licensing Scheme (ALS), which was introduced in 1975.

The implementation of the ALS reduced traffic by 45 percent during peak morning rush hour and another 15 percent with the introduction of the ERP. One of the contributing factors to the success of the ERP was the strong commitment of the Singaporean authorities to develop and expand public mass transportation alternatives (Albalate and Bel 2009).

Other cities that have successfully implemented traffic congestion charging measures, including London and Stockholm, also have reliable, accessible and affordable public transportation.

Among the policies proposed by Boediono and the Jakarta city administration, I found two policies that could be counterproductive to the development and expansion of the mass transportation system: the development of six new inner-city toll roads and staggering office hours.

Both policies could ease traffic jams in the short run, but could create more traffic congestion in the long run. The policies will not encourage drivers to switch from their vehicles to mass transportation as their primary transportation mode. They will only undermine efforts to develop the mass transportation system in Jakarta.

Alternatively, many possible policies could be implemented in Jakarta in order to alleviate traffic congestion including introducing shuttle services, carpool matching services, telecommuting and downzoning. Instead of staggering office hours, the Jakarta city administration should encourage private and public companies to expand their shuttle services and develop carpool matching services for their employees.

Telecommuting is a way to reduce commuting by using telecommunication technologies. Employees can work outside the traditional office at remote work locations including their homes. A study in the US showed that telecommuting can reduce commuting by 10.4 percent of the labor force (Cullingworth and Caves 2009).

Downzoning is a measure to reduce development on land zoned for service, retail or commercial development. This measure is typically directed at areas along busy streets to reduce traffic congestion.

In order to support the development and expansion of mass transportation systems, Jakarta also needs to develop more multimodal transportation districts. Such districts provide a mix of land uses, an interconnected network of streets designed to encourage walking and bicycling, and appropriate densities and intensities of land uses within walking distance of transit stops (Cullingworth and Caves 2009).

Jakarta is estimated to lose US$3 billion a year because of traffic congestion. Concerted steps are needed to reduce Jakarta's traffic woes. These steps must be implemented with a strong commitment to develop and expand an integrated, reliable, accessible and affordable mass transportation system in Jakarta.

The writer is an assistant professor and coordinator of urban studies and planning at Savannah State University, US.

http://www.thejakartapost.com/news/2010/11/13/solving-gridlock-jakarta.html

JakartaGlobe
Great Stories. Global News.

Jakarta Sets Out Vision for City's ERP Toll Scheme

Dofa Fasila & Elisabeth Oktofani | March 03, 2011

If the proposed Electronic Road Pricing scheme eventually pushes through, Jakarta motorists may find themselves paying up to Rp 21,000 ($2.40) every time they travel through large parts of the city. That is roughly the price ceiling being considered in the master plan for the ERP by the Jakarta Transportation Office, according to its chief, Udar Pristono.

"We are proposing an average tariff for the ERP ranging from between Rp 6,579 and Rp 21,072," he said. Udar said the prices took into consideration current tariffs on the city's toll roads, comparative rates overseas, consumer surveys and the cost of so-called jockeys, who help motorists circumvent the city's three-in-one carpool regulation. However, he said his office would first propose a set tariff of Rp 12,500 for at least the first phase of the program, after which the price could be reviewed.

To implement the scheme, the office is proposing three electronic toll gates be installed on each stretch of road where the ERP would be implemented. Two gates, at the start and end of the stretch, would verify vehicle license plates, while the other would process how much to automatically deduct from motorists' accounts via the on-board unit.

The ERP scheme is hoped to replace the current three-in-one system that is made redundant by the abundance of jockeys, who offer their services for between Rp 10,000 and Rp 20,000 to help motorists meet the three-passenger minimum needed per vehicle at certain times on certain roads.

Udar said his office had already come up with areas where the ERP could be applied, many of which included roads that were not covered by the three-in-one scheme. But before the project could proceed, Udar said the authorities still needed to wait for government regulation related to the 2009 Law on Traffic and Road Transportation, which is still being debated.

It also needed the 2009 Law on Regional Taxes and Levies to be revised in order to allow the city to receive revenues from the scheme.

Separately, Jakarta motorists said they were already wary of the proposed new system.

Maria Dewi Purwitasari, an office worker, said she worried about how it would impact her family's monthly budget.
"My husband and I often take the Sudirman, Thamrin and Harmoni route to commute between home and work. But if the Jakarta administration implements the ERP like this, we will have to manage our monthly budget again," she said.

Andy Lala, a journalist from Trijaya FM, said the proposed tariffs would probably be fine for most people but questioned what the city would do with those revenues. "Will we have well-maintained roads that won't get flooded during the rainy season or what?" he said.

Udar said the ERP scheme was just one of three immediate steps the city planned to take to alleviate chronic traffic problems. The other two initiatives included the construction of five more busway corridors and the development of an integrated transportation system. "Hopefully those three steps can begin this year," he said. "We will work hard to reduce the capital's traffic congestion."

Meanwhile, Jakarta Deputy Governor Prijanto said the city administration and central government had finally agreed on how to structure the financing for the construction of a 14.3 kilometer-long Monorail project. The project had been dropped in the absence of any investor. The expected Rp 4.42 trillion cost of the project would be divided equally between both parties, he said.

Agus Pambagio, from the Indonesian Transportation Society (MTI), said that to ease traffic, the city should in the short term work to provide an adequate busway fleet, put restrictions on motorcycle numbers, hike parking rates along busway routes, tighten issuance of driver's licenses and create incentives for police to book traffic offenders. "But to do all these things, a strong and daring leadership is needed to make decisions," he said. "A leader should be firm — and even a little bit crazy — in executing his policies."

http://www.thejakartaglobe.com/home/jakarta-sets-out-vision-for-citys-erp-toll-scheme/426319

BeritaJakarta.com - Media Online Pemprov DKI Jakarta
Jl. Merdeka Selatan 8-9 Blok F Lt. 2 Jakarta Indonesia
Telp. +62 21 3822988, 3822488; Fax. +62 21 3822788, 3822846;
Email : redaksi@beritajakarta.com

The 17 Steps to Overcome Traffic Congestion Hampered

BERITAJAKARTA.COM — 6/2/2011 2:57:57 PM

Since the central government enacted 17 steps to overcome traffic congestion supervised by the Head of Presidential Work Unit for Development Control and Monitoring (UKP4) Kuntoro Mangkusubroto in September 2, 2010, Jakarta Provincial City Government immediately perform variety improvements by preparing the infrastructures as well as making regulations. But, its implementation in the field is hampered because waiting for the government regulation (PP) which never issued by the central government.

Jakarta Governor Fauzi Bowo asserted City government never disobey its implementation as alleged Indonesian Transportation Society (MTI) some time ago. He explained the 17 steps to overcome traffic congestion in Jakarta which predicted to be conducted in 2012 is not the instruction of Vice President Boediono only, but also as results of step proposal inventory from the Vice President and a number of central government agencies including the Jakarta Provincial City Government.

"We also contributed. Afterwards, the vice president assigned each agency to conduct those steps," Fauzi stated at the City Hall, Thursday (6/2).

Nevertheless, he understood what was highlighted by MTI which considered City government does not implement the program. However, the program itself is hampered because of external factor outside Jakarta Provincial City Government jurisdiction.

For instance is the implementation of the Electronic Road Pricing (ERP). According to Fauzi, it cannot be done for now due to the PP of Traffic Management has not been issued by the central government, whereas City government is ready for it in terms of system and equipment. "We cannot move if the regulation never issued by central government," he said.

Other problem which claimed not working is the control of street parking. Fauzi said it is targeted by this June the program starts by controlling street parking on Jl. Hayam Wuruk and Jl. Gajah Mada. Moreover, he will also continue to monitor illegal parking and do vehicle registration data collection of traffic violator.

"I assume those who accused City government fails in conducting the 17 steps do not understand and not up to date with the condition and existing problems," he expressed.

Meanwhile, Chairman of Jakarta Transportation Board (DKTJ) Azas Tigor Nainggolan confirmed the 17 steps implementation responsibility lies part in the hand of Jakarta Provincial City Government and central government in the other part. The responsibilities of the City government are review parking policies and law enforcement of street parking as well as on busway lanes.

"The control of illegal on street parking has and running. Moreover, the draft of district regulation for parking has submitted to District Legislation Board (Balegda) to be discussed and ratified," explained Tigor.

City government has also sterilized busway lanes. "There are physical evidences on the field that Jakarta Provincial City Government has added two corridors in Corridor IX and X. You can check it if you do not believe," he told.

In addition, multiyears contract for roads repair has applied by City government. The other is the accelerated development of Mass Rapid Transit (MRT) where the construction starts next year for Lebak Bulus–Indonesia Hotel route. It is planned the beginning of MRT operation is on 2016, two years ahead than preliminary plan which is 2018. Moreover, City government has also prepared park and ride site near Ragunan busway station to increase passenger's volume.

"So, Jakarta Capital City Government has conducted all. In fact, I saw the jammed of the 17 steps implementation as central government failure. I considered they do not serious in helping City government to overcome traffic congestion," he stated.

For instance is the ERP implementation. City government has waited for two years to apply it due to waiting for central government to issue the PP. And also the formation step of the Jabodetabek transportation authority which never establish by central government.

The acceleration of inner ring train (KA) rail project integrated with mass transportation is also never accomplished, whereas City government and DTKJ have encouraged central government to revitalize train through loopline system. Jakarta Governor Fauzi Bowo even has approved the land acquisition in Matraman and Pejompongan for loopline if the plan starts.

"Where are the main plan revisions for integrated transportation, rail train double-double track project especially to Cikarang, the addition of six toll road flyovers, policy formula to overcome the use of vehicles, provision of park and ride at railway station? All of them have not seen done by central government. So, do not accuse immediately. See the problems thoroughly before accuse Jakarta Capital City Government," he asserted.

http://www.beritajakarta.com/2008/en/newsview.aspx?idwil=0&id=19155