FUEL TAXES POLICY TO SUPPORT ROAD FUNDING IN INDONESIA

Lesson learned from New Zealand and The United States

THESIS

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PREFACE

Road funding always become interesting issue in a developing countries like Indonesia. This problem leads to neglect of road maintenance because this type of work is not obvious compare with new roads construction. Lack of fund and the neglect of road maintenance can bring to deterioration of road network. This research aims to study potential to establish road funds to provide stable revenue stream for road maintenance in regional/local roads networks by exploring potential revenue from fuel taxes. I am sure that this research will useful to enhance my capacity as a member of road agency in a local government in Semarang Regency, Central Java Province, Indonesia.

I can complete this thesis because there are many support and assistance for me. First of all, I would like to thank Jesus Christ for giving me strength, patience and always provide me everything that I need. Secondly, I would like to express my gratitude to my supervisors; Dr. Ir. Taede Tillema and Pradono, S.E., M.Ec.Dev.Dr., Eng., who always support and motivate me to enhance my capability in writing thesis and keep my thesis on the right track. Furthermore, I would like to express my appreciation to *Bappenas* and NESO for giving me opportunity to study at ITB Bandung and RUG Groningen, as well as the Government of Semarang Regency which has permit me to do this study.

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Groningen,   August 2010

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Abstract

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Road infrastructure always face the problem with funding in Indonesia. Road maintenance seemed to be neglected compare with other road works. This condition led to higher damage rate of road networks especially in the province and regency or city road level. The deterioration of the roads needed more money to reconstruct the roads. Revenue from road sector taxation like fuel taxes was not fully allocated to fund road works. This revenue was used to fund and provide all kinds of public services.

This research was aimed to understand the fuel tax practice in Indonesia and the possibility to establish the road maintenance fund in Indonesia with fuel tax as revenue source. The research methodology which was used involved the policy document analysis and literature review. This research had been completed systematically, starting from the review of the policy transfer, road maintenance and road funding concepts. Moreover, the fuel taxes and road management in Indonesia and the international practice of road funds were discussed within theoretical framework of source and scope of funds, institutional, legal, and management aspect. The result of the research was possible formulation to establish road funds in Indonesia starting from province level with earmarking of fuel taxes became a potential revenue to support road funds.

Keywords: province road, regency road, city road, road maintenance, road funds, fuel taxes

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CHAPTER 1
INTRODUCTION

1.1. Background

The road transportation sectors is a driver for economic life, social, cultural, political and defense. Reliable and integrated road infrastructure is needed to support and to drive the dynamics of development towards a more established community life. Road maintenance activities are needed to keep the road in a steady state. This requires road maintenance funding, the amount of which depends on the condition of roads and type of maintenance performed. Problems related with road funding are that the revenues not always meet transportation needs. There is no direct connection between finance arrangements and road system performance that should be considered in creating road funding policy. Funding allocation will affect the quality of investment decisions and operation efficiency (Transportation Research Board, 2003).

Richardson (1999) stated that funding is central to sustainable transport policies. These policies are expensive and costly in improvements. Several ways in which this can be done are that citizens must pay road user charges, contribute more taxes, or find innovative ways to increase government revenue. According to economic principles, road users and polluters should pay for the benefits they receive or for the costs that they impose (Asian Development Bank, 2000).

Bousquet and Queiroz (1996) stated that insufficient budgetary allocation for roads creates high vehicle operating costs; losses of time for road users; low economic efficiency and high prices; and constraints on economic development. Adequate road financing is very important to the national economy. Some factors considered in the design of a road financing system are the ease of collection, administration costs, potential for a tax avoidance, and the political acceptability of many instruments.

Some strategies can be implemented to get more revenue to finance roads, such as : fuel taxation, vehicle taxation, road pricing, toll road, etc. Fuel taxes are one strategy that can be increased to help finance transportation programs (Victoria Transport Policy Institute, 2009). Fuel taxes can be an alternative way to finance and manage the demand and become one method that is easy to apply and that also supports sustainable transport policies. Fuel taxes recovering variable cost, improve efficiency and protect the environment. The impact of implementing fuel tax may lead to less private vehicle use and encourages public transport use and fuel efficient technology (Scwabb, 2002).

Total road length in Indonesia is 393,803 km, consists of 34,629 km of national roads, 40,131 km of province roads and 319,043 km of regency/city roads (Transportation Statistic, 2006). Totally 91% of roads network have status as province and regency/city roads. The national roads condition are much better than those of province roads and regency/city roads. Only 61% of province roads and 58% of regency/city roads have good condition. Road damage can be accelerated by bad quality of road construction, extreme weather, too many overload vehicles or lack of road maintenance. Lack of fund always tend to become a problem for local governments to maintain their road networks to keep the road in good condition. Local government also prefer to build new roads network than maintain the existing roads. Local political condition can also contribute to misallocation of road maintenance not based on technical consideration. People that have power tend to interfere government to allocate the budget to their area. There are also tension for local budget to finance other sectors such as health and education sector.

In Indonesia, infrastructure funding usually comes from general treasury. Allocation of funds for financing is determined as part of the determination of the annual budget. Authorized institutions that are responsible for road funding in Indonesia are the Central Government for National Roads, the Province Government for Province Roads and the Local Government for Regency/City Roads. Road funding comes from funding allocation as a part of National or Local Budget. Expenditure for road sector always less than ideal necessity. For example, in Province Lampung, The Province budget only cover 7% of ideal necessity for road maintenance (Kereh, 2004). World Bank (2004) reported that only below 10% of the road budget which was allocated to road maintenance. It is indicated road maintenance is not a priority compared to other road projects such as new construction roads or road betterment (upgrade).

Act Number 22/2009 about Road Traffic and Road Transport, stated that public participation is needed in road maintenance, through a payment of funds. Funds are raised and managed by a board namely the Road Preservation Fund Management Unit (*Unit Pengelola Dana Preservasi Jalan / UPDPJ*). These funds will be used for maintenance, rehabilitation and construction of the road. Funds will be collected from vehicle taxes, vehicle registration fees, fuel taxes, parking fees and road traffic control charges. This board tends to be like the Road Funds that have been implemented on some countries. The implementation of this act is still on the process because it needs Government Regulation as a guideline.

Fuel taxes are part of the provincial tax as mentioned in the Act of Regional Tax and Regional Retribution Number 34/2009. The tax collected up to 10% of the selling price of fuel. Each province can apply different amount of fuel taxes. These fuel taxes have doubled compared to the previous Act. This component of fuel taxes is interesting to study because its proportion to the road sector total revenue is still small. Data from West Java Province in 2001-2005 (West Java Planning Agency, 2007) showed that the fuel taxes only accounted for 5.8% of the total income of the road sector, compared to 60.2% of Vehicles Registration and 33.6% of Vehicle Tax. Fuel taxes in Indonesia are also relatively lower than the fuel tax in developed countries in Europe or America where fuel taxes provide substantial contributions to road funding.

This research aims to identify the conditions of other countries that have implemented fuel taxes to finance roads and identify what can Indonesia learn from their experience under certain conditions. Indonesia did not have much experience about it so it is important to look for other countries' experiences and gain some knowledge to be implemented in Indonesia. This general approach will be to try to make the scheme in accordance with the conditions in Indonesia that more focus to road maintenance funding at regional and local government. The countries used as case study in this research are The United States of America (USA) and New Zealand. Consideration to choose both countries because they had long history in implementing road fund strategies by using fuel taxes and also because of feasibility of data and literature. Both countries have different government system and different road management. USA, a federal country with decentralized government system, finance their roads through Highway Trust Fund since 1956 which mainly revenues come from gasoline taxes. New Zealand, a unitary country, have a more centralized government system. New Zealand have National Road Boards (NRB) since 1954 to fund their roads infrastructure. New Zealand get funding mainly from weight distance for heavy vehicles and also from fuel excise tax. New Zealand also well known because of its good management to organize their Road Funds. From both countries, we try to learn from the perspective of source of funds, institutional, legal and management aspects of their road funding system and the role of fuel taxes to support road funding. Studying the role of fuel taxes in both countries for road funding hopefully can give better consideration to be applied in Indonesia.

1.2. Problem Statement

Lack of funding of road infrastructure will hamper national or regional economic growth. It can happen since road is basic infrastructure that needed to support other sector like transportation. Integrated and reliable road transportation system can support and drive the dynamic development, support mobility of people, goods, and services, support national distribution patterns, and support the regional development and improvement of international relationship toward more stabilized life of community, nation, and state.

Roads infrastructure in the level of province and regency/city have problem with road maintenance funding. It become more severe because road maintenance is not a priority program compared with new roads construction or road rehabilitation. This condition leads to a deterioration of road network and to the higher vehicle operation cost. Moreover, there are also competing local funding needs and tensions between sectors.

One way to increase funding for road is by increasing fuel taxes (Victoria Transport Policy Institute, 2009). Increasing in fuel taxes can trigger opposed reaction from people and automobile industry. Different taxes among provinces also can generate another problem. Thus, it needs appropriate scheme for applying fuel taxes to support road funding. Learning from other countries that have implemented and developed fuel taxes policy for road funding will become one way to enrich the research. Accordingly the main question arises: how extent fuel tax policy can be implemented to support road funding in Indonesia and how to design the scheme?

1.3. Research Objectives

The general purpose objective of this research is to understand the fuel tax practice in Indonesia and the possibility to establish the road maintenance fund in Indonesia with fuel tax as revenue source. However, the main research objective is to find the approach of choosing appropriate fuel taxes idea by constructing the characteristics, conditions and other related variables that correlate to its implementation, as an alternative proposal in implementing fuel taxes in an area.

To fulfill the objective, the specific objectives in this research are:

1. To identify possibility of policy transfer, the road funding strategies, and the role of fuel taxes
2. To identify the characteristics of road funding strategy and the role of fuel taxes based on the cases in USA and New Zealand
3. To identify the current condition of road funding strategies and fuel taxes mechanism in Indonesia
4. To identify the possibility to implement road funding in Indonesia by using revenue gained from fuel taxes and based on the general lessons of international road funds practice

1.4. Research Questions

To obtain the research objectives some research questions are stated in order to identify the main problems and to guide the research flow. The research questions to be answered are listed in sequence as follows:

1. What factors determine possibility of policy transfer? What kinds of road funding strategy have been done in several countries and what are the roles of fuel taxes?
2. How do USA and New Zealand implement the road funding strategy and what is the specific role of fuel taxes for road funding?
3. What is the current condition of that policy in Indonesia case, how they get the fund, and what kind of problem that still occurs?
4. What can Indonesia learn from USA and New Zealand, what kind of problem and advantages of doing this, and how should fuel taxes and road funding be implemented in Indonesia?

1.5. Research Methodology

The research procedures are developed based on three main activities, which are literature review, data collection, and analysis. From the basic framework, these activities are conducted following several methodological steps. Literature review and data collection are done simultaneously to elaborate some countries and Indonesia's case. The analysis used in this study is narrative-descriptive analysis, and evaluative-explanatory analysis.

Firstly, this research will develop basic framework of road funding. The basic framework will explore the concept of road funding and its element based on some countries experience, and also elaborate possibility of policy transfer. This will answer the first research question. After building basic framework, the data collection about the key issues of road funding and fuel taxes in USA, New Zealand and Indonesia are conducted. The collected data are derived from secondary data such as government publications, literature, articles, journals, internet, and other sources. From activities 1 and 2, road funding process and specific role of fuel taxes in USA and New Zealand will be described. Recent condition of Indonesia that concern with road funding and fuel taxes policy also will be described. By doing this step, the second and the third questions will be answered. The answers of the first, second and third questions will be an input for the rest of the research questions. Through the answers, this research will evaluate the fuel taxes policy role to support road funding in USA and New Zealand and what Indonesia can learn from their experience. The end result will make conclusions about the policy recommendation of fuel taxes to support road funding policy in Indonesia. This will provide the answer for the fourth question and conclusions.

1.6. Structure of the Research

In order to synchronize it with the proposed methodological steps, the thesis is divided into six chapters. **Chapter 1** introduce the research design, which consists of study background, problem statement, objectives, research questions and research structure. **Chapter 2** contains a theoretical framework elaborating the possibility of policy transfer, the importance of road maintenance, many type of road funding strategy, and the role of fuel taxes. **Chapter 3** focuses on international experience from countries that have implemented Road Funds in general and the use of Fuel Taxes to support road funds This chapter describes experience from two countries (the USA and New Zealand) that have implemented fuel taxes policy to support road funding. This chapter consists of comparative analyses in USA and New Zealand. The elements to be compared are source and scope of funds, institutional aspect, legal aspect and management aspect. **Chapter 4** describes the road funding strategy and fuel taxes mechanism in Indonesia in general based on current laws and regulations, what make it success and what kind of obstacles founded. **Chapter 5** provides evaluation of road financing mechanism and fuel taxes in Indonesia and explore the possibility to to use the revenue gained from fuel taxes as road maintenance fund in the regional/local budget. The analysis will be based on the lesson learned and the theory explained in the previous chapter. **Chapter 6** summarizes and concludes research findings, recommendations, and reflection of this research.

Structure of the research can be formulated in the figure below:

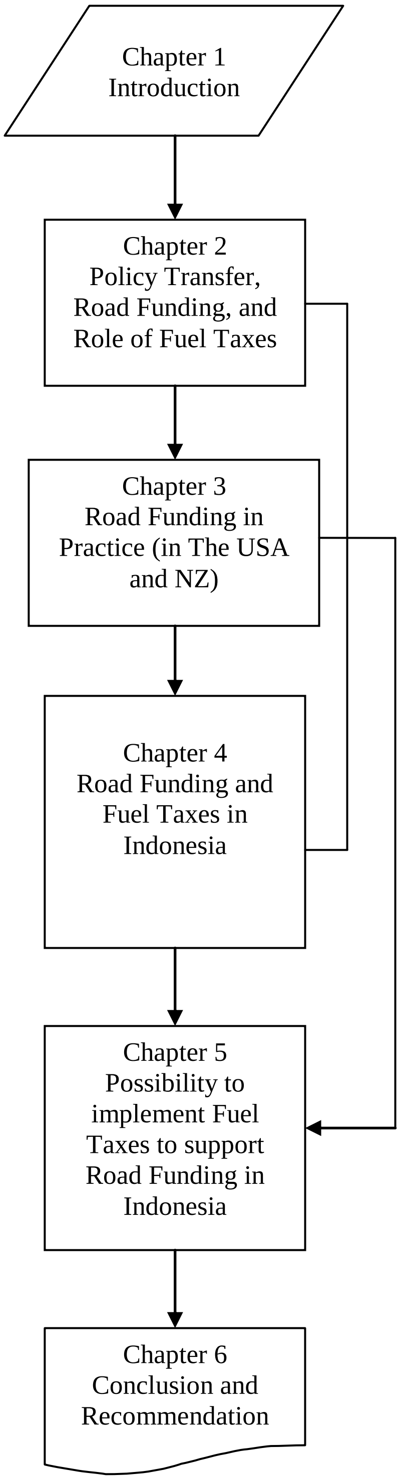

Figure 1.1 Structure of the research

CHAPTER 2
POLICY TRANSFER, ROAD FUNDING STRATEGY, AND ROLE OF FUEL TAXES

This chapter will explain more about Policy Transfer, Road Maintenance, Road Funding, Fuel Taxes, and relationship among them. In the beginning, there will be explanation about policy transfer, to understand the possibility of transferring policies from one country to another, and to identify what factors make success and failure in policy transfer. Afterwards the importance of road maintenance will be described. Road maintenance needs more money so that some countries implemented many strategies of road funding to gain more revenue. In the last part, I will explain fuel taxes that have been implemented in some countries and give significant role to contribute road funding.

2.1. Policy Transfer

Policy transfer is always associated with several similar substance concepts such as policy convergence (Bennet in Evans, 2009), lesson drawing (Rose, 1991), policy diffusion (Majone in Evans, 2009), and policy learning (May in Evans, 2009). Rose (1991) defines lesson drawing is "about whether programmes can transfer from one place to another; it is not about what politicians think ought to be done". Furthermore, Rose explored that a policy lesson is adopted from program elsewhere that may fit in their environment and place because of the dissatisfaction with the status quo of policy. Dolowitz and Marsh (1996) stated that policy transfer refer to a process in which knowledge about policies, administrative arrangements, institution in one country is used in the development the same aspects in another country. His explanation is almost similar with Evans (2009) who argued that policy transfer aims to make sense a process in which knowledge about institutions or policies at one level of governance is used in the development of institutions or policies in another level of governance.

Moreover, Dolowitz and Marsh (1996) also indicated that there are 3 forms of policy transfer: voluntary transfer, direct coercive transfer and indirect coercive transfer. Voluntary transfer triggered because there is dissatisfaction with recent policy condition that make government need to search for lessons to provide solutions for the future. Direct coercive transfer will happen when one government forces another government to adopt policy. Supranational institutions often play a significant role in coercive policy transfer, for example policy from International Monetary Fund that should be implemented for developing countries in order to get loans. Indirect coercive transfer triggered because the significant role of externalities or functional interdependence (Hoberg in Dolowitz and Marsh, 1996). Another push factors for indirect coercive transfer are technology, economic pressures, fears of being left behind another countries, and emergence of international consensus.

There are seven objects of transfer : policy goals, structure and content; policy instruments or administrative techniques; institutions; ideology; attitudes and concepts; and negative lessons. Wolman (in Dolowitz and Marsh, 1996) pointed out that a country can transfer both general policy ideas and specific policy instruments, but it may pick and choose what to transfer. Robertson and Waltman in the same articles also stated that most public policy transferred appears to involve administrative technique rather than policy direction changing. Institution transferring described by Haas (in Dolowitz and Marsh, 1996) by the establishment of many environmental Ministries to protect the Mediterranean. While the development of privatization politics and policies in The UK, France and The United States indicated that other countries sent delegations to The UK to learn about both details of the privatization programme and the ideology used (Henig in Dolowitz and Marsh, 1996). Lesson can be positive as well as negative. Negative lesson give some learning for a country about some policy not to do because it will give negative impact.

Rose (1991) identified that there are different degrees of transfer: copying; emulation; hybridization; synthesis; and inspiration. Copying occurs when a country adopt a policy use in another without any changes. It assumed that many different institutional and contextual variables remain constant. In reality, there are different history, culture and institutions in each country. Therefore, emulation happen when a country didn't copy in detail but only accept particular policy to be transferred considering its national context. Hybridization and Synthesis involve combining some elements of policy found in two or more countries to establish a new best suited policy for another country. Inspiration means that a policy implemented in one country can expand ideas and inspire fresh thinking about what is possible to do to another country.

Dolowitz and Marsh (1996) stated the complexity of a policy affects its transferability. It means that the more complex a policy the harder it will be transferred. Moreover, Rose (1991) indicates that there are some factors that made greater possibility of policy transfer: fewer goals, simpler problems, more direct relationship between the problem and the solution, fewer side effects, more information that agents have about a policy operates in another country and easier predicted outcome of a policy.

In transferring a policy, a country should consider some context matters: institutional constraints, political ideological constraints, bureaucratic capacity, technological abilities, financial resources and physical circumstances (Dolowitz and Marsh,1996). Different structure of government will acted as a constraint in the transfer of policies. Ideological similarities make it more possible to transfer a policy. The simpler and more efficient bureaucratic, the more likely a policy to be transferred. Technological abilities also become a constrain for some developing countries when a policy need a complex technology to be implemented. Implementation of a policy needs money so financial resources are another critical constraint in policy transfer. Physical circumstances regarding with the different size and physical condition among countries that influence possibility to implement a policy.

To identify the success or failure of policy transfer, it can be seen from three factors which are sufficient/insufficient information, complete/incomplete transfer, and sufficient/insufficient attentions for difference the economic, social, political and ideological context in both transferring and borrowing country (Dolowitz and Marsh, 2000, Sanyal, 2005). Sufficient information about the policy, institutions, and how it operates, what are crucial elements of what made the policy or institutional structure are pre-requirements for the policy transfer to be successful.

2.2. Road Maintenance

A key issue of the efficiency of road management relates to how effectively the network is maintained (World Bank, 2004). Road maintenance tends to be neglected in many countries because the results of money spent are not immediately apparent, and the pressure to extend the infrastructure network to undeserved areas tend to be strong (World Bank, 1988). The management of road maintenance has also proved to be more complex than the management of road construction (Robinson et al, 1998).

Level of road deterioration depends on some factors such as vehicle load, pavement strength, climate and environment. If a road had passed its planned technical age, the road will need reconstruction or upgrading which need much money. Effective road maintenance will hamper road deterioration and keep vehicle operating cost at low rate (Robinson et al, 1998). Some arguments above clearly explained the important of road maintenance. Similar with other infrastructures, road maintenance always become not so important factors in funding especially in developing countries. Government prefers to spend the money for build new road network than just maintain existing roads.

Once roads become in a damage condition, those roads are in need of rehabilitation or reconstruction at three to five times the cost of timely preventive maintenance and strengthening (Heggie and Vickers, 1998). Harral and Faiz's (1988) study (in Heggie and Vickers, 1998), showed that rather than spending $40 to $45 billion worldwide for road reconstruction, it can be replaced by spending only $12 billion on preventive maintenance. It means that maintenance of roads can reduce the large amount of funds needed to perform road reconstruction.

There are some treatments that can be taken depending on the condition of the roads that can be classified into road maintenance, road betterment and road construction as seen on Table 2.1. Road maintenance is needed to keep the road on its level of service. A road in good condition needs routine maintenance. Good condition means that the road is in new condition (new construction) or mainly of the road surface is free from any defects. Whereas a road in fair condition needs periodical maintenance. Fair condition means there are structural damage that cause weakening of resistance to traffic loading. A road with light damage needs road betterment, and a road with heavy damage needs road reconstruction. Light damage condition need rehabilitation action soon, including to rebuild deficient parts of the road. Heavy damage condition is caused by heavy structural damage and thus it needs reconstruction (West Java Planning Agency, 2007).

Table 2.1 Road Treatment Type

No	Road Condition	Type of Treatment
1.	Good	Routine Maintenance
2.	Fair	Periodical Maintenance
3.	Light Damage	Road Betterment
4.	Heavy Damage	Road Reconstruction

Source: West Java Planning Agency, 2007

Inadequate maintenance is almost a universal and costly failure of infrastructure providers. A well-maintained paved road surface should last ten to fifteen years before it needs resurfacing, but lack of maintenance can lead to severe deterioration in half that time. Failings in the maintenance are often exacerbated by budget cutting that are not appropriate. The result is that this leads to greater spending on rehabilitation or reconstruction of roads. (Bousquet and Queiroz, 1996)

Proper road maintenance also contributes to lower vehicle operation costs. An improper maintained road can correspond to an increased safety hazard to the road user, leading to more accidents, with their associated human and property costs. World Bank (2000) classified road maintenance activities into four categories:

- **Routine works**. These activities are done annually and funded from the regular budget. There are two activities: cyclic and reactive works types. Cyclic works are activities where the maintenance standard indicates the frequency at which activities should be done. Reactive works are activities with intervention levels, defined in the road maintenance standard, which is used to determine when maintenance is needed.

- **Periodic works.** These activities are done at intervals of several years to maintain the structural strength of the road, or to increase the load capacity of the road. Activities can be grouped into the preventive, resurfacing, overlay and pavement reconstruction. Periodic works are expected at regular, but relatively long, intervals.

- **Special works.** Activities that cannot be predicted because of a disaster or other condition like winter with snow. These activities usually use contingency allowance to fund these works, although separate special contingency funds may also be provided.

- **Development.** These constructions are funded from the capital budget because these are construction works that are identified as part of the national development planning activity. Examples are the construction of by-passes, or the paving of unpaved roads in villages.

Road maintenance aims to keep the road at the same quality level as when it was first built. Road maintenance will protect road investment, safety of road users and reduce Vehicle Operation Costs (VOC). The money needed for road construction and road betterment is always higher than those of road maintenance. In fact, there is always insufficient money for road maintenance because the government always spends more to new road investment (new construction) and road betterment.

2.3 Road Funding

2.3.1. Road Funding and Government System

The constitution and structure of the government of a country can have a significant influence on the arrangements for taxation and spending in the transport sector (ADB, 2000). This is particularly important in the case of federal-type or decentralized systems related with the allocation of responsibilities between the central and lower levels of government. In decentralized system countries, some taxes have been levied by regional or local government and funding authority of infrastructures also be done by lower level government. In a country with a centralized system, the revenue collection is more simple because it is only done by the central government, after which the revenue is distributed by the central government to the lower level government. The government system influences which level of government is responsible for various functions related to roads, and the ability of the various levels of government to raise revenue to finance their responsibilities.

Bousquet and Fayard (1997) indicated that four levels of impact of decentralization can be identified in the road sector, which give a good measure of the importance of the interface between organization and financing. First, a breakdown of the road network into national, regional and local levels. Second, a change in national responsibilities in the road sector, with a transfer of duties and resources to the regions and to local authorities. Third, a change in sources of financing, means that regional authorities have some options to implemented different financing instruments from the system used in central level. Finally, a change in the flow of resources between the central level and the regional and or local level.

2.3.2. Type of Road Funding System

There are many kinds of road funding systems in the world. In some countries, the revenues and the expenditures in the road sector are not clearly linked. In other countries, a real road user charge system is used, based on the economic efficiency principle that charges should equal the short run variable cost of road use, including the damage to road pavement caused by different types of vehicles, the cost of road congestion and road accidents, and environmental costs that vehicles generate on society. Other factors considered in the design of a road funding system are the ease of collection, administration costs, potential for tax avoidance or evasion, and the political acceptability of different instruments. (Bousquet and Queiroz, 1996)

Listed below are some strategies that can be implemented to support road funding:

a. Fuel Taxes

The fuel tax becomes the main source of revenues in most countries. For example, in Russia, it provided 75% of the Federal Road Fund in 1995. In France, the fuel tax collection contributes about 60% of the total road user taxation (Bousquet and Queiroz, 1996). Advantages of fuel taxes are that they are easy to collect and administer, and also are relatively equitable for road user that use fuel for their vehicle. The problem of selecting the rate at which the fuel taxes should be applied always becomes the key issue. In determining this rate, two primary factors that should be considered are the average price of gasoline and diesel, and the ability of road users to pay. Because of their advantages, road user taxes on motor fuels are generally considered to be the most efficient way to charge road users.

b. Vehicle Registration Fees

Registration is generally a process that officially recognizes a person who is legally responsible for a vehicle. In a vehicle registration process, the government adds its details to the Motor Vehicle Register and issues its registration plates (New Zealand Transport Agency, 2010). Indonesian Act number 28/2009 defines Vehicle Registration Fees as a fee on the transfer of vehicle ownership as a result of two-party agreements or unilateral actions or circumstances that occur because the sale and purchase, exchange, grant, legacy, or entry into a business entity.

c. Vehicle License Tax

Vehicle License tax is a tax on ownership and or control of the vehicle and is usually charged annualy. Vehicle licensing is the regular process through which you pay a fee to use your vehicle on public roads. (New Zealand Transport Agency, 2010) Most countries charge an annual fee for a license to operate a specific vehicle. An advantage of this type of tax is that it is easy to collect. However, it does not reflect the extent of road use because the tax is not related directly with the distance travelled (Bousquet and Queiroz, 1996).

d. Axle Weight Distance Tax

The tax requires that all diesel vehicles buy a license graduated according to the axle configuration and gross vehicle-weight of the vehicle. Oregon (USA) introduced the first axle weight-distance tax in 1990 that clearly considers axle weights in the component of the tax rates. The major problem with implementing this tax is the difficulty of enforcement. For example, in New Zealand, it was estimated in 1995 that collection and enforcement costs absorbed about five percent of gross revenues and that tax evasion represented almost 20 percent of potential revenue from the tax. While heavy vehicles consume three to five times as much fuel per kilometer as light vehicles, the cost of road damage attributable to heavy vehicles have a higher proportion of total road costs (Bousquet and Queiroz, 1996).

e. Road Pricing

Road pricing is being considered as an exact and efficient way to charge road users based on their actual road use. It can be differentiated by vehicle type or time of the day. Road pricing is normally applied to selected routes only in order to recover investment costs for expensive infrastructure such as roads and bridges or to impose an extra charge on the use of congested roads (Schwaab and Thielmann, 2002).

Road pricing may take the form of:

- **A general road pricing scheme** that is used for the complete road network. This scheme is a combination of some schemes because different conditions in a road network that need different approaches. This complicated system is considered to be too expensive to be implemented.

- **Tolls** is a fixed fee for driving on a particular road which often used to recover investment and maintenance costs of roads or bridges
- **Urban road pricing** that can be in the form of:
  - **congestion pricing** is a fee that is higher under congested conditions than uncongested conditions, intended to shift some vehicle traffic to other routes, times and modes. It will restricts the use of congested urban roads and reduce the need for network extensions
  - **area licensing** imposes a charge on the actual road use in cities
  - **cordon pricing** is a fee charged for driving in a particular area
- **Vignettes schemes** which can be seen as a fee for temporarily accessing certain road networks, e.g. express motorways;
- **An electronic mileage-tax for Heavy Goods Vehicles** in order to effectively tax transit cargo transport.

f. Parking Fees

In most countries, parking is provided free of charge or at a subsidized rate. Such subsidies are, for example, provided by companies offering parking space free of charge to their employees, or by municipalities that do not charge for on-street parking. Providing parking facilities involves considerable costs that should be beared by motor vehicle users (Schwaab and Thielmann, 2002).

In most European countries, the roads revenue is significantly higher than the road expenditures (Bousquet and Queiroz, 1996).Therefore, road users pay more than enough for the use of the roads, although some road users, particularly the heavy trucks, do not pay enough for the damage they cause. The main reason that the ratio between road revenue and road expenditures is greater than 1 is that, in most countries, a significant part of the road revenue is invested in other sectors of the economy.

2.3.3. Institution of Road Fund

A Road Fund is an institutional device through which a selected stream of revenues is put at the disposal of a government road department or agency without being subjected to general budget procedures and reviews (Gwilliam and Shalizi, 1996). Road Fund is as an alternative concept of road financing by using principal of "cost recovery" and "fee for service" which means that if road users want to get good service of a road, they should collectively bear road maintenance fee to keep sustainability of function and quality of the roads. Road user that feel satisfied of a road service because it can save their vehicle operating cost and time value, will have more willingness to pay. Road Fund will be managed by an independent and professional board that will collect and administer the fund. The member of the boards come from representatives of government and private sector.

Road fund aims to create sustainable road maintenance funds, reliable and not depends on general budget. Road fund will also create planning and funding of road sector mechanism that is transparent, accountable, efficient and professional. By establishing a Road Fund, there is a direct connection between road revenues and expenditures that trigger to road users awareness on time value and money value that makes them wasting time in the road (Suryatmana, 2004).

Kereh (2004) stated that road fund is a road funding mechanism that combines revenues and expenditures function to improve the weakness of government budget system. There are two generations of Road Fund that have been implemented:

a. First generation of Road Fund

Road Fund with special objectives like those established in the United States and Japan to finance road construction or earmarking for road only. There are also some Road Fund establishment in African countries from 1960 to 1970 called "old style funds" which aim to protect road maintenance funds. There are also Road Fund establishment in ex Soviet Union countries like Georgia and Russia that aim to overcome the difficulties of the government budget in terms of road maintenance.

In general, first generation of road fund mainly using earmarking method to gain the revenue for road maintenance. Earmarking is allocating a part of general revenues to finance specific project like road maintenance. Heggie (1999) said that the term "first generation road fund" generally refers to road funds which have no oversight board; rely on earmarked revenues, not always related to road use; are typically managed by the national road agency; have a weak legal basis; do not have published financial rules and regulations; and are not subject to independent technical and financial audits. Most first generation road funds did not generate a secure and stable flow of funds for roads. Strength of this method is they diverted revenues away from other sectors and undermined strict budget discipline. The weakness is there is no oversight board that make some money loss or allocated in wrong way.

b. Second generation of Road Fund

In this era, tax levied not by government anymore, but by an independent board that manage the Road Fund. Road maintenance funds comes from fuel levies, overload fine, international transit, annual vehicle tax and heavy weight levy that consider damage factor triggered by that vehicle. Other taxes such as fuel taxes, vehicle purchase taxes, vehicle registration taxes, spare part taxes like tyre, etc are used to finance construction and rehabilitation program. Road Board's member in the second generation of Road Fund consists of government, private sector and also road users representatives. This road board is more independent than those in first generation and have power to increase or decrease fuel prices or other revenue sources for Road Fund. Some countries that have been implemented this kind of road fund are New Zealand, Sweden and some African countries: Zambia, Malawi and Lesotho.

Heggie and Vickers (1998) argue that charging instruments should be easy to recognize, directly related to road use, easy to separate from indirect taxes and other service charges or fees, simple to administer and not vulnerable to pervasive evasion, avoidance and leakage; in order to control demand and provide a basis for creating linkage between revenues and expenditures. Heggie and Vickers (1998) also show in Table 2.2 below, the appropriateness of different road-user charging instruments for road funding, and propose that the vehicle license fee, heavy-vehicle license fee, and fuel levy are included on the most suitable charging instrument.

Table 2.2 Administrative characteristics of different road-user charging instruments

Charging instrument	Potential role	Related to road use	Separable from general taxes	Easily recognizable	Administrative characteristics			Suitability
					Collection cost (%)	Avoidance or evasion	Ease of collecting by contract	
Tolls	user fee	yes	yes	excellent	10 - 20	moderate	simple	moderate
Vehicle license fee	vehicle access fee	no	yes	Good	10 - 12	high	moderate	high
Heavy Vehicle license fee	vehicle access fee	not directly	yes	Good	unknown	unknown	simple	high
Fuel levy	user fee	partly	can be	Good	negligible	low	simple	high
Weight-distance fee	user fee	yes	yes	excellent	5	moderate	moderate	low
Parking charges	control access	partly	yes	Good	over 50	high	simple	moderate
Cordon charge	congestion charge	partly	yes	moderate	10 - 15	unknown	simple	moderate
Area license	congestion charge	partly	yes	moderate	10 - 15	unknown	simple	moderate
Electronic road pricing	user or congestion charge	can be	yes	Good	less than 10	unknown	simple	low

Source: Heggie &Vickers (1998)

There are some factors that can be successful element in implementing road funds, especially second generation of road funds. Heggie (1999) identifies that there are three key elements responsible for the success of this second generation of road funds: the strategic elements, the technical and policy elements, and the operational elements. The strategic elements involve the scope of road funds (which parts of road network does the funds allocated), the legal basis (rules and regulations used as basis of road funds implementation), the type of oversight arrangements (independent or non independent board, only give advice or also manage the funds, board member composition and member’s responsibility), fund management (by the board or sub commission of the board, including the approval of the proposed road programs, fund disbursement and auditing process), and which expenditure it finances (routine and periodic maintenance or also for new construction). While the technical and policy elements cover how to divide fund between road agencies (based on formulation or assessment of needs), source of revenues (earmarking and road user charges), how to adjust road tariff, how non road users of diesel are exempted from fuel levy (e.g. mining companies, power stations, farmers, etc.), disbursing fund to each road agency (directly pay road agency on regular basis, reimbursement for road agency after the work finished or pay contractor directly based on certification after the work has been completed according to the specification). Moreover, the operational elements consist of daily management (staff responsibility, how to collect the revenue, how to withdraw funds, how to prevent unauthorized withdrawals of the funds), financial rules and regulation used (covering purpose of road funds, methods of distribution, how to choose member, meeting of board member, procedure of dividing funds, etc), and road fund auditing (by independent auditor or by auditor general's office, and which items to audit). Those successful elements become important in implementing the same policy to other countries.

Furthermore, World Bank (2004) suggests to address the legal, regulatory, institutional and procedural requirements in formulating the recommendations of establishing a Road Fund. The legal and regulatory requirement will include reviewing existing acts and regulations, identifying what factors become constrain and how to deal with them, and proposing the legal basis of the establishing of Road Fund, the objective of the road fund, details of revenue streams and expenditure categories. The institutional structure is needed to ensure responsible governance, government and community representation and adequate regulatory control. The structure and institutional linkages, staff composition of the Board and how to finance operational expenditures of the recommended entity to operate the Road Fund should be clearly defined. The procedural requirements contain the way to collect revenues and allocation of funds, the options for disbursing funds (directly to the responsible implementation agencies using an approval or a pre-described arrangement, or directly to the contractor), and the establishment of suitable audit arrangements (by using existing organisation or by the formation of a new private organization).

2.4. Fuel Taxes

There are some objectives of fuel taxes levied by the government, with the most common objective is to gain revenue, both for general government purposes as well as road expenditure. A fuel tax is mildly progressive for car users, in the sense that users of larger cars, which are usually more expensive to purchase, use more fuel and pay higher taxes. However, there has been a traditional concern that a fuel tax is limited when it comes to larger vehicles because the damage caused to roads rises exponentially as axle load rises. Therefore it is argued that a mix of fuel tax and registration charges is needed to ensure an equitable level of cost recovery between different classes of road vehicles (ADB, 2000). Thus it make sense that revenue from transport sector does not come solely from fuel taxes but also combined with other road taxation (vehicle annual tax, vehicle registration fee, etc.) and or road user charges.

2.4.1 Role of Fuel Taxes

The use of motor vehicles produces externalities, for which motorists gain no explicit charge. These externalities include noise, air pollution, greenhouse gas emissions and social disturbance. Most of these externalities are closely linked with the distance travelled by vehicles. A tax on fuel is a practical means for making road users aware of the cost of the externalities that they impose on others. Fuel taxes play a broader role in promoting efficient road transport than simply to recover the direct financial cost of providing and operating roads. (ADB, 2000)

When people make a decision to travel, they will increase congestion, increase travel time and fuel cost to other road users. Driver may not take fuel costs fully into account when making travel decisions because fuel is purchased only periodically. The conditions that travel decision of someone create negative effect for other road user, may make possible the imposition of a specific charge on drivers for their use of the road system by using fuel taxes.

The role of fuel taxes thus exceeds the recovery of the direct cost of providing and operating roads. Other alternatives such as vehicle registration fee, vehicle license fee or road pricing, are unlikely to occur on a widespread basis for some time and fuel taxes will continue to play an important role for the immediate future (ADB, 2000). Some roles of fuel taxes are listed below:

- Fuel taxes are relatively simple to administer, have modest administration costs, and can be collected with current technologies;
- Fuel taxes are related to the quantity of road use, and positively correlated with the cost of accommodating different vehicles on roads;
- Together with travel time, fuel prices are more eagerly perceived by users than other vehicle operating costs, and thus have a more direct impact on vehicle use and, in the longer term, the types of vehicles that are acquired;
- Fuel taxes are, in general terms, accepted broadly by public;

- Fuel has a moderate price elasticity of demand that results in higher rates of tax increasing revenue, with corresponding benefits from improved fuel efficiency and lower environmental pollution; and

- Fuel taxes are an effective means for road use charging more than any other current technology, or technologies that are likely to be broadly available for some time.

Based on the roles of fuel taxes above, it is indicated that fuel taxes are more effective than fixed charges on vehicles or drivers (e.g. vehicle purchase taxes, vehicle registration fees, and vehicle license fees), which have no influence on vehicle use and travel decisions. Some countries in Europe have reduced the relative role of such fixed charges in favor of fuel taxes. It can be expected that fuel taxes will continue to be a significant instrument for achieving transport, social and environmental policy objectives of governments for some time, even while the features, effectiveness, acceptability and ease of implementation of other means for imposing charges on road users continue to be discussed.

2.4.2. Policy Objectives of Fuel Taxes

Governments have a number of policy objectives with regard to taxes they impose and the use of the revenue generated. Some policy objectives can be explained as follows:

- Economic Efficiency: In achieving this objective, more revenue will be generated from fuel taxes than is required to meet the cost of providing and operating roads. This objective has not commonly been given a high priority in determining fuel taxation levels in the past, but concern about rising congestion and the environmental impact of motorization, in particular greenhouse gas emissions, can be expected to raise its importance in future policy considerations (ADB, 2000).

- Commercialization of road management: it can be done by placing road management to the market mechanism by fee for service (paid on the basis of services provided) and manage them like a business. Fuel taxes are one of the models used to provide financing of road infrastructure by bringing to the principle of road user fee for service, which in its application, road users will pay for damages caused by how often to use roads (vehicle utilization) and how heavy the vehicle is driven (impact loading) with payments taken from the purchase of fuel (Santoso, 2008).

- Macro-economic management: Governments need the capacity to change taxation levels, including that on fuel, as part of fiscal policy (ADB, 2000).
- Income redistribution: Governments may search for income redistribution to improve horizontal equity within their people. Fuel consumption is highly elastic with respect to personal income. Use of a fuel tax rather than fixed charges related to car ownership can result in car ownership taxation being more progressive (ADB, 2000).
- Government revenue generation: The demand for road transport fuel is for generating revenue for general government purposes (ADB, 2000).

Thus, fuel taxes not only recover the cost of roads but also have three distinct potential functions: improving the economic efficiency of road transport, financing of roads, and supporting broader government policy objectives.

2.5. Concluding Remarks

In order to get better condition, government of a country can learn from other countries' experience to get some learning from them. In transferring a policy, a country should consider some context matters. If Indonesia want to learn from experience of the USA and New Zealand, it will be important to aware of contextual differences between these countries. The possible contextual differences among them are western versus non western countries, large versus small countries, centralized versus decentralized focus, fuel taxes versus other taxation, road maintenance versus new road construction, etc. More elaboration of these contextual differences will be analyzed in chapter 5.

Road maintenance is often neglected and politically unattractive because the money spent on it does not immediately have a "visible" result. However, to keep road in a good condition, maintenance is always needed. Without maintenance, the road condition will tend to deteriorate faster than the technical planned age.

Road maintenance needs a stable supply in funding. There are some funding system that can be used to gain some revenues for road maintenance. In many countries, main instrument of funding system come from fuel taxes, vehicle registration fees and vehicle license taxes. Road Funds as an institution have been established in some countries to manage some revenues gained from many funding instruments. First generation of Road Funds emphasize in earmarking some money for specific objectives have some weaknesses that have been overcome by second generation of Road Fund. Road Board in second generation of Road Fund make it more reliable than just earmarking method. Countries we use as case studies are representatives of both generation of Road Funds, The United States with its successful earmarking for road sector and New Zealand with its modern Road Funds. International practices from both countries will be describe more in chapter 3. Then in chapter 4 will be describe about recent condition in Indonesia. By comparing two countries with different implementation of Road Funds, there will be more aspects that Indonesia can learn from their experience.

Regarding with the implementation of road fund in certain country, some aspect can become frameworks to evaluate the successful and failure of road funds. The frameworks by World Bank regarding to establish Road Funds above is adapted and modified to some aspects that cover evaluation of implementation of road funds in New Zealand, The USA and recent condition in Indonesia. The framework used to describe and evaluate road funds implementation in this research can be seen in the Table 2.3 below:

Table 2.3 Frameworks for Description and Evaluation of Road Fund

No	**Aspects to be Analyzed**
1	Source and Scope of Funds - Main revenue sources - Scope of funds (which road networks) - Expenditure financed (maintenance or new construction)
2	Institutional Aspect - Road Fund Body/Agency - Oversight body and membership
3	Legal Aspect

	- Rules / regulation as legal basis
4	Management Aspect - Collecting the funds (Deposit mechanism) - Distributing method of the fund - Auditing process

Table 2.3 explain some aspects to be considered in describing and evaluating Road Fund implementation. Firstly, the source and scope of funds will identify all financial instrument which used to support Road Fund and identify scope of funds to which road network (national, regional or local roads network) and to which kind of expenditure (maintenance or new roads construction). Secondly, the institutional aspect will include membership and responsibility of management body and oversight board, also the composition of that body. Thirdly, legal aspect will cover legal basis, rules and regulation to support implementation of Road Fund. And finally, management aspect will comprise daily management, how to collect and distribute fund, and auditing process. That 4 (four) aspects then become analytical framework to do the analysis of recent condition in The USA, New Zealand and Indonesia that will be more elaborate in chapter 5.

Fuel taxes become the main sources of infrastructure funding in some countries. These taxes are relatively simple to administer and broadly accepted by the public. Fuel taxes are one of the models used to provide financing of road infrastructure by using the principle of “the user pays”. Fuel taxes also have great policy objectives in improving the economic efficiency of road transport, financing of roads, and supporting broader government policy objectives. Indonesia will also try to get some lesson learned based on experience of New Zealand and The USA.

CHAPTER 3
ROAD FUNDING STRATEGY IN PRACTICE

This chapter tries to summarize experiences of some countries that have implemented road funding strategy. The countries are New Zealand and The United States of America (USA). Both countries are representatives of different generation of Road Fund. They are chosen based on their long experience with fuel taxes as main source of road funding. Availability of data and documents are also important reason. At first, general information of each country is established including history, policy background and policy objectives. Then we try to see road funding implementation from some aspects : source and scope of funds, institutional, legal and management. Afterwards, the results of implementation are explained, to understand whether the road funds implementation give benefits or not and other effects caused by the implementation.

3.1. General Overview

To generate a clear comparison between The United States and New Zealand in implementation of road funding, we used some aspects namely : source and scope of funds, institutional aspect, legal aspect and management aspect. Source and scope of funds will explain many financial instrument which used as tools to gain revenues to support Road Fund and the coverage of the funds. Institutional aspect will explain about organization that have been established to manage Road Fund, its member and its responsibilities also the road funds oversight body. Moreover, egal aspect related with legal basis used to support implementation of Road Fund. It can be in many form of regulation like Act, Government Regulation, Presidential Decree or Ministerial Decree. Finally, management aspect will explain operational of Road Fund related with how it collect the revenue, and how to distribute it.

3.2. New Zealand

3.2.1. General information

New Zealand is a unitary state which has total area 268,021 km2. It is an island country in the south-western Pacific Ocean comprising two main landmasses (the North Island and the South Island), and numerous smaller islands. The head of the state is a Governor-General, while the head of the government is a Prime Minister. There are three tier of government structure : central government, regions and territorial authorities. New Zealand divided into sixteen regions and 73 territorial authorities. Some of these are called Cities, while most are Districts. Each of the regions and territorial authorities is governed by a council (New Zealand Government, 2010).

New Zealand established National Road Boards (NRB) in 1954 to manage the funding and the development of all New Zealand roads. States highway was managed by the Ministry of Works and Development (MWD), while the remaining public roads were managed by territorial local authorities. They get funding mainly from fuel excise tax, but in 1978 they introduced a new revenue source namely a weight distance charging system for heavy vehicles (Dunlop, 1999).

In 1989 the road fund was changed into the Land Transport Fund and the management of the fund was transferred to Transit New Zealand (TNZ) which had been set up in 1989. In 1 July 1996, the Transit New Zealand Amendment Act created a separate road fund administration called Transfund New Zealand (Transfund). Management of the road fund was therefore separated from TNZ and placed under the authority of a separate management board (Heggie, 1999).

3.2.2. Road funding implementation

a. Source and scope of Funds

The source of funds for the road fund in New Zealand comes from: 1) a fuel excise added to the price of gasoline, that collected by the NZ Customs (NZ$809 million or €463 million in 2007/08 based on 1 NZ$ = €0.572); 2) weight-distance charges paid by diesel vehicles, that managed by a unit within the Land Transport Safety Authority (NZ$881 million or €504 million in 2007/08); 3) motor vehicle registration fees; The collection is managed by the Land Transport Safety Authority (NZ$291 million or €166 million in 2007/08); 4) interest earned on the road fund account; 5) revenues earned from sale of surplus property; and 6) refund of Value Added Tax (VAT). Reimbursement of VAT is at a rate of 1/9 of the expenditures made out of the Land Transport Fund to compensate for payment of VAT on all revenues received by the road fund. (Heggie, 1999). Based on data at the fiscal year 2007/2008 above, weight-distance tax contribute 44.5%, while fuel excise contribute 40.8% and motor vehicle registration fees contribute 14.7% of road fund. Thus, it is identified that the main revenue source of road funds come from weight distance tax and fuel taxes.

Transfund finances the cost of national road network and a part cost of local authority roads in a cost-share basis. It finances 100% of national road network cost and average of 50% of local road network. The actual proportion of finance depends on the size of the local authority road program and the financial resources available. Transfund not only finance road maintenance but also for road improvement (investment). So, Transfund in New Zealand covers for all road networks and finances road maintenance and improvement.

b. Institutional aspect

Transfund is an independent body which has 52 staff as its member, including a Chief Executive who is selected by the board. The Chief Executive selects all staff, including programming and contracts staff, audit and policy staff and other staff in three regional offices.

The specific responsibilities of Transfund are to prepare the Annual National Roading Programme; recommend to Government income and expenditure levels needed to support the Programme; advise in general on the suitability of the Land Transport system; fund the approved projects within the Programme; and make payments to road agencies to finance the approved projects. Organizational structure of Transfund can be seen from figure 3.1 below

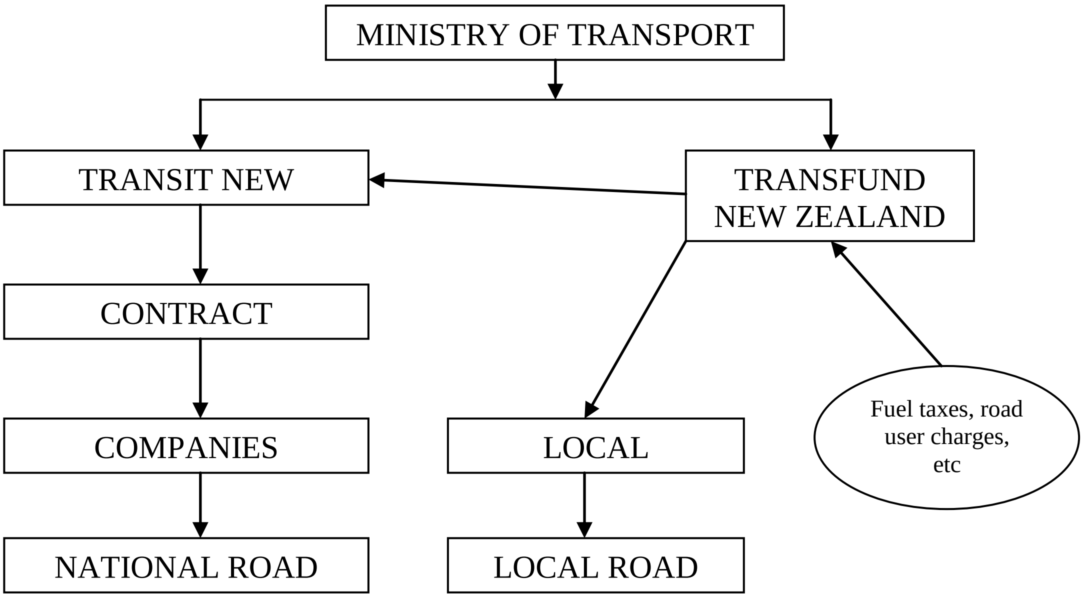

Figure 3.1 Road Fund Scheme in New Zealand

Source : Dunlop (1996)

From the picture, we can see that Transit New Zealand (TNZ) and Transfund responsible to Ministry of Transport. Transfund collect revenues from many sources. Transit New Zealand manage National Road network, otherwise local road maintenance by local authorities.

The Transfund operational are supervised by an oversight board consisting of five members: two representing TNZ (either employees or members of the TNZ Authority); one representing local government; one representing road users; and one representing other aspects of the public interest. Members are selected by the governor general on the recommendation of the Minister, after consultations with people from the land transport industry. The Chairman is appointed by the governor general from the existing members of the board.

The role of the board is to allocate resources to get a safe and efficient road system. It has key functions to: 1) approve and purchase a national road program from the various road agencies, including capital projects, 2) approve the competitive pricing procedures applicable to the road program; 3) audit the performance of TNZ and Local Authorities against their respective road programs; and 4) provide advice and assistance to Local Authorities in relation to the new Transfund Act.

c. Legal aspect

The road fund was established under the 1953 National Roads Act. The act were amended in 1979 about source of revenue and the Transit New Zealand Act in 1989 established the Land Transport Fund and appointed Transit New Zealand to manage the fund. In 1996, after the Transit New Zealand Amendment Act was passed then followed by the establishment of Transfund to manage the road fund. Those acts have been strong legal basis for implementation of road funds in New Zealand.

d. Management aspect

The revenue of Transfund is deposited into the Treasury's bank account, but government pays interest on the balance to recognize that it is a separate account and not part of the government's general revenues.

Dividing funds between road agencies started with bidding from Transit NZ and the Local Authorities to the National Roading Program. The bids then checked by Transfund based on ratio of Benefit and Cost. Maintenance works will get higher priority. Maintenance requirement area based on professional judgments and a computer software, namely Road Assessment Maintenance Management System (RAMM). RAMM is a computerized pavement management system that includes road inventory (road condition) and action selection for determining work programs based on engineering and economic aspects. By this software, road agency can estimate the money that will be received through Transfund. Road authority requests are evaluated by Transfund staff and the Review and Audit Division carries out audits every three years to ensure that minimum maintenance standards and service levels are being maintained by each road authority.

It is usually using reimbursement system to disburse money. TNZ holds out the work, pays for it and then applies for reimbursement. Local authorities, are reimbursed on the basis of monthly claims for work invoiced. This condition reflects the reality that local authorities have less funds for road works. This work is also subject to regular audits and, if a local authority does not fulfill with the procedures by Transfund, it has to repay the funding received.

Auditing process conducted by the Review and Audit Division. The aim of audits is to ensure that the funds have been used in an efficient and effective way. Technical and financial audits are conducted on a regular basis every five years, and procedural audits are conducted every three years to make sure the road agency is complying with the road fund's policies with regard to the protection, recording and utilization of road fund resources (Heggie, 1999).

e. Evaluation of Road Funds Implementation

From implementation of their programs, Transfund gained annual road fund revenues of NZ$2.4 billion or €1.4 billion in 2007/08 (Road User Charge Review Group, 2009). The level of income to Transfund varies with petrol consumption, the distance travelled, and the weight of the diesel vehicle fleet.

Strength factors become successful of implementation are strong oversight board, consistent way of dividing funds between road agencies, sound legislation and strong audit function. The oversight board give significant role in supporting Transfund because the board is independent and involving stakeholders related with road financing sector (combination of public and private sector), with clearly defined responsibilities of the board. This condition bring dedicated fund under control of board and used as the way it is. There also trust from road users because of their involvement in road fund board. Moreover, a consistent way of dividing funds between road agencies in New Zealand (Transit and Local Authorities) give assurance for each road agencies about the availability of money that they will get to conduct the program. Sound legislation made Transfund have strong legitimation and free from political interference. Transfund has strong audit function that ensure the transparency and accountability. Those conditions mentioned above have made road funds in New Zealand become a successful example of second generation road funds.

3.2.3. Fuel Taxes in New Zealand

Fuel taxes in New Zealand only levied on Gasoline and collected by New Zealand Customs. Unleaded petrol is excised at NZ$ 56.1 cents or € 31.3 cents per litre (based on 1 NZ$ = 0.558 € in August 2010), methanol used as a fuel at NZ$ 30.9 cents or € 17.2 cents per litre (cpl), LPG at NZ$10.4 cents or € 5.8 cents per litre, and compressed natural gas (CNG) at NZ$10.5 cents or € 5.9 cents per litre. Diesel is not excised, but all diesel powered vehicles have to pay Road User Charges.

The petrol tax is allocated to the Road Funds (NZ$45.52 cpl or €25.4 cpl), and Accident Compensation Corporation (NZ$ 9.9 cpl or €5.5 cpl). Other additional charges of NZ$0.66 cpl (€0.37 cpl) are levied as a local authority tax and NZ$0.045 cpl (€0.025 cpl) to fund fuel standard monitoring (Ministry of Economic Development, 2010). All of tax from LPG and CNG go directly to Road Funds account. Similarly, all of funds from Road User Charges are dedicated to the Road Funds. The allocation of petrol tax to Road Funds is more than 80% of total petrol tax, whereas allocation of LPG and CNG tax is 100% of its total as well as Road User Charges. It can be identified that the main policy objective of fuel taxes is New Zealand is to gain revenue to support road funds.

3.3. The United States of America (USA)

3.3.1. General information

The United States is a federal system country which have 3 tier of government : Federal, State and Local government. There are 50 states in the USA. Each state comprise counties, municipalities, and such special districts as those for water, sanitation, highways, parks. and recreation. There are more than 3,000 counties in the United States; more than 19,000 municipalities, including cities, villages, towns, and boroughs; nearly 15,000 school districts; and at least 31,000 special districts. Additional townships, authorities, commissions, and boards make up the rest of the nearly 85,000 local governmental units (Encyclopedia of The Nations, 2010).

The United States created the Highway Trust Fund (HTF) in 1956 to finance selected federal road programs. Most states have similar trust funds to finance surface transportation upgrading. These state trust funds are supported by road user charges levied by the states, mainly fuel taxes. The Highway Trust Fund contain revenues from certain highway user taxes (e.g., excise taxes on motor fuel, rubber, and heavy vehicles) and these revenues are reserved for use for highway construction, mass transportation and related objectives. This fund mostly confirms federal assurances to assist in financing multi-year construction projects. (Bousquet and Queiroz, 1996). The HTF was created as a user-supported fund. The revenues of the HTF were projected for financing highways, with the taxes dedicated to the HTF paid by the highway users.

3.3.2. Road funding implementation

a. Source of Funds

Most of the taxes are not collected by the Federal Government directly from road users but are paid to the Internal Revenue Service by the producer or importer of the taxable product. At the federal level, the primary source of funds for highways comes from motor fuel and motor vehicle taxes, that contribute about 90% of the federal funds. At the State level, these two types of taxes are primary revenue sources for road fund. Two other taxes are also significant: tolls and bond issue proceeds. At the local level, generation of funds from fuel taxes by local authorities represent 47% of their road funding.

Trust Fund revenues are consisting of many kinds of road user taxes, including:

(i) motor fuel taxes on gasoline, diesel, and gasohol;

(ii) a graduated tax on tires weighing 40 lbs. (or 18.1 kg) or more;

(iii) a retail tax on selected new trucks and trailers;

(iv) a heavy-vehicle use tax on all trucks with a Gross Vehicle Weight (GVW) over 55,000 lbs (or 24,946 kg); and

(v) interest on the Trust Fund balance. Tax rates are adjusted as part of the regular budgetary process.

Table 3.1 below shows the detail of user fee structure in the federal level and the distribution of tax. In the state level there are another addition of taxes and the amount is different among states. Fuel taxes rates for Gasoline type is US$ 18.4 cents or € 14.5 cents (based on US$ 1 = € 0.79 in 2010) per gallon. For diesel, the tax is USD 24.4 cents or € 19.3 cents per gallon. Almost 84% of the tax are earmarked to Highway account. The table clearly shows that fuel taxes creates the main revenues for Highway Trust Fund.

Table 3.1 User Fee Structure at Federal Level

Fuel Type	Tax Rate (US$ cents per gallon)	Distribution of Tax (US$ cents per gallon)		
		Highway Trust Fund		Leaking
		Highway Account	Mass Transit Account	Underground Storage Tank Trust Fund
Gasoline	18.4	15.44	2.86	0.1
Diesel	24.4	21.44	2.86	0.1
Gasohol	18.4	15.44	2.86	0.1
Special Fuels:				
General rate	18.4	15.44	2.86	0.1
Liquefied petroleum gas	18.3	16.17	2.13	-
Liquefied natural gas	24.3	22.44	1.86	-
M85 (from natural gas)	9.25	7.72	1.43	0.1
Compressed natural gas (cents per thousand cu. ft.)	48.54	38.83	9.71	-
Truck Related Taxes – All Proceeds to Highway Account				
Tire Tax	9.45 cents for each 10 lbs (4.5 kg) so much of the maximum rated load capacity thereof as exceeds 3,500 lbs (1,587.6 kg).			
Truck and Trailer Sales Tax	12 percent of retailer's sales price for tractors and truck over 33,000 lbs (14,968 kg) Gross Vehicle Weight (GVW) and trailers over 26,000 lbs (11,793) GVW			
Heavy Vehicle Use Tax	Annual tax: Trucks 55,000 lbs (24,947 kg) and over GVW, \$100 plus \$22 for each 1,000 lbs (453.6 kg) or fraction thereof, in excess of 55,000 lbs (24,947 kg). Maximum tax: \$550			

Notes : All prices are in US$; US$ 1 = € 0.79 in 2010 (www.xe.com)

Source : Federal Highway Administration, 2010

The United States established the Highway Trust Fund (HTF) in 1956 to finance the federal aid highway program and also carry most other Federal-aid highway projects (Heggie, 1999). Some amendments extended financing to other transport programs as follows:

- The Highway Safety Act of 1966 generate funds for state and community road safety programs.
- In 1982, the scope was broadened to permit the funding of mass transit.
- In 1991 the Intermodal Surface Transportation Efficiency Act (ISTEA) established the new role of the Highway Trust Fund as an "Intermodal Fund" by extending support to high speed rail lines and bike trails.

Revenues of the Highway Trust Fund are used to reimburse states for expenditures on approved projects, including heavy maintenance (reconstruction, rehabilitation and resurfacing), road improvement, new construction, road safety programs, studies, and other highway related expenditures (Heggie, 1999). Allocations from the HTF do not cover all costs, except in a certain conditions. They usually cover a fixed 80% of cost, except for interstate construction and maintenance where they cover 90% of cost. It is clearly indicated that Highway Trust Fund in the USA cover highway road network and spend the money on several expenditure not only for roads maintenance but also for new roads construction and other programs.

b. Institutional aspect

The Highway Transportation Funds have around 3,000 staff who manage the federal-aid highway program. They are located in Washington and in each of the states. There is no independent oversight board. Oversight is conducted by two committees of Congress: one from the House of Representatives and the other from the Senate. The main role of this board is to handle the authorizing legislation which regularly continues the Federal-Aid Highway Program. Implementation of the program is then delegated to the Secretary for Transportation. The USA has different condition compared with New Zealand that have independent oversight board comprises of all interests.

c. Legal aspect

The Federal Highway Trust Funds was established based on Highway Revenue Act of 1956. The Act states that revenues from certain user taxes would be credited to a highway trust fund to finance the highway program issued in the Federal Aid Highway Act of 1956. The Federal-Aid Highway Act of 1956, and the Highway Revenue Act of that same year, improved authorizations for the Federal-aid Primary and Secondary Systems, authorized significant funding of the Interstate System, and established the HTF as a mechanism for financing the accelerated highway program. The life of HTF has been extended several times by subsequent legislation, most recently with Transportation Efficiency Act. Other acts such as The Highway Safety Act 1966 and the Intermodal Surface Transportation Efficiency Act (ISTEA) 1991 also give little contributions to extend the coverage of the funds. It is indicated that there are little changes in the development of the acts, mostly only to extend the function of Highway Trust Funds.

d. Management aspect

Daily management of the Highway Trust Fund is closely related to the entire Federal-Aided highway program. The activities involve working with the states when preparing the program, disbursing funds to finance implementation of the program, followed by successive auditing of completed works.

The taxes earmarked for the Trust Fund are deposited into the general fund of the US Treasury and the amounts equivalent to these taxes are then transferred on paper to the HTF (Heggie, 1999). Transfers are made at least monthly based on estimation by the Secretary of the treasury and later adjusted based on actual taxes receipt. The Trust Fund finances the federal-aid highway program, managed by the Federal Highway Administration (FHWA).

The federal aid highway program is a reimbursable program. The states are billed a line of credit against which they can draw to meet the requirement. Funds are allocated on the basis of formulas. The formulas are relatively simple and commonly use variables like population, road mileage, and traffic density. The formulas for the National Highway System use some variables includes lane miles on principal arterial routes, vehicle miles, amount of diesel used on highways and state population.

Payment for work financed through the Highway Trust Fund is made in the following way. After work is done by a contractor, then state pay the contractor. Thereafter, state sent Vouchers for reimbursement to Federal Highway Administration (FHWA) for review and approval. FHWA check the voucher and certified it. Afterwards, certified schedules are submitted to Treasury. Finally, Federal share is transferred to state bank account by electronic funds transfer.

Annual audit required to be done by each state. The audits are normally carried out by outside auditors and cover financial matters and compliance and internal control procedures. Staff from FHWA also check these procedures based on an ad-hoc basis. There is no formal technical audit. Staff from FHWA used to carry out field inspections occasionally (Heggie, 1999).

e. Evaluation of Road Funds Implementation

Since the establishment of the Highway Trust Fund in 1956, the Federal Government share of total road financing has ranged from 19.5% to 28.5%. Highway user charges accounted for 60% of revenues used for highways in 1991. General fund appropriations are the second largest source of revenue (16 %). Benefit charges provide 9 %, investment income and other receipts 7 %, and finally bond issue income 8 %. These percentages have been almost unchanged since 1989 (Bousquet and Queiroz, 1996).

In 1997 the revenues from the above tax rates for highway purposes were US$18.5 billion or €16.8 billion mainly from gasoline - less than 30 percent comes from diesel, $299.7 million or €272.7 million from tires, $1,674.3 million or €1523.6 million from truck sales, and $761.8 million or €693.2 million from Gross Vehicle Weight (GVW) tax. After credits and refunds, and some minor transfers for non-highway uses, the net revenue for 1997 was $21.2 billion or €19.3 billion. Thus it is identified clearly that fuel taxes give the biggest contribution of 87.1% of total revenues.

Some successful factors are sound way of dividing funds between states that has cleared distribution, and strong auditing practices. Highway Trust Fund developed some formulas based on variables such as population, road mileage, and traffic density that clearly indicated how much money that will be allocated to each state. This will give assurance for each state about money allocation for road works. The strong auditing process also assure the accountability of HTF and road agencies that use the money, even there is lack independent oversight board.

3.3.3. Fuel Taxes in USA

Fuel taxation in the United States is aimed to raise revenue for mostly road funding, at federal and state levels for federal-aid highways network. Fuel taxes rates for Gasoline type is US$ 18.4 cents or € 14.5 cents (based on US$ 1 = € 0.79 in 2010) per gallon. For diesel, the tax is US$ 24.4 cents or € 19.3 cents per gallon Additional local taxes add about US$ 2 cents or €1.6 cents per gallon. Almost 84% of the fuel tax are earmarked to Highway Trust Funds account. Fuel Taxes contribute to Highway Trust Fund around 90% at federal level and 47% at local level of total HTF revenues. It means fuel taxes give biggest contribution to support road funding in the USA.

Dunn (1993) described that state and federal governments in the USA share authority in fuel taxation. Fuel taxes revenue are mostly dedicated to highway infrastructure funds. Fuel taxes rates should be no higher than needed for the roads and any increases of them need consensus among highway tax payers and infrastructure providers. State highway departments actually contract to build the roads and federal role is to dispense financial aid, set regulatory standards, and coordinate planning. His statement clearly indicated the use of earmarking in the road funding of the USA and that the fund only used to financed highway road network.

3.4. Concluding remarks

Based on the experiences from New Zealand and The United States, we can conclude that from a source of funds perspective, both countries get money for road fund mainly from fuel taxes, but also from motor vehicle registration fees, heavy vehicle taxes and interest from institution bank account. From an institutional point of view, New Zealand has Transfund to manage road fund and the fund used to finance all public roads. This is different from the Highway Trust Fund in USA that only finances the highway network. Transfund has responsibilities not only for programming but also for auditing. It also has an independent board to oversee the implementation of the road funds by Transfund. In the USA, there is no independent oversight board to do the auditing process. From a legal perspective, both countries have established some acts and amendments to support implementation of road funds. From a management point of view, both countries use a reimbursement system to get the money. It means that the providers should finish the project first and finance the project. Then they make a report for the Road Funds to get reimbursement of the money. New Zealand also use a computer programme to make a judgement of the quality of road construction and maintenance. In the USA, they use voucher for reimbursement. Overall, we can see that fuel taxes have a significant role to support road funds especially in The United States. We can see the comparison between both countries in the following table 3.2.

Table 3.2 Road Funding in New Zealand and the United States

No	Parameter	New Zealand	The United States
1.	Government Structure	Unitary, more centralized, 3 tier of government : central government, regions and territorial authorities	Federal, decentralized, 3 tier of government : federal, state, local government
2.	Road Management responsibility	States highway by Central Government, the other by Local Government	Federal highway by Federal Government, State highway by state government
3.	Road Fund Board	Transfund NZ	Federal Highway Trust Fund (FHTF)
4.	Source and Scope of Funds - Main revenue sources - Scope of funds (which road networks) - Expenditure financed (maintenance or new construction)	 - Weight distance charges, and fuel taxes - All of national roads and but cost share for local authority roads netwoks - All expenditure (maintenance, improvement and road construction)	 - Fuel taxes - Federal-aid highway - All expenditure (heavy maintenance, road improvement, new construction, road safety programs, studies, and other highway related expenditures)

No	Parameter	New Zealand	The United States
5.	Institutional Aspect - Road Fund Body/Agency - Oversight body and membership	 - Transfund NZ, independent board - Independent oversight body, member from road agencies and road users	 - Federal Highway Trust Fund (FHTF), independent board - No independent oversight body, Oversight by committees of congress
6.	Legal Aspect - Rules / regulation as legal basis	 - Legislation 1953, Amended 1996	 - Legislation 1956
7.	Management Aspect - Collecting the funds (Deposit mechanism) - Distributing method of the fund - Auditing process	 - Separated account from other general tax revenues (direct deposit) - Allocation of funds based on bidding judgments by road agencies; disbursing funds via reimbursement system - Yes, conduct by the Review and Audit Division; technical and financial audit every 5 years and procedural audit every 3 years.	 - Road fund is in line of credit by earmarking of taxes - Allocation of funds based on formulas; Distribute funds via reimbursement system - Yes, by independent auditors and FHWA staff; financial audit each year, no formal technical audit
8.	Role of fuel taxes	- Mainly to gain revenue for financing roads - Contribute 40% of road fund	- Mainly to gain revenues for financing roads - Contribute 90% at federal level and 47% at local level of road funds

CHAPTER 4
ROAD FUNDING IN INDONESIA

This chapter describes the recent financing condition of roads in Indonesia. It starts with general information that contains an explanation about the government system and the central and regional government relations regarding to the development of decentralization system in connection with the roads funding in Indonesia. Moreover, in the next sub chapter, we describe the road network system and the level of government that is responsible for the roads. Afterwards, there are more detailed explanation about road funding implementation in Indonesia based on source and scope of funds, institutional, legal and financial aspect. Finally, taxes levied related with the use of the road in Indonesia are described.

4.1. Decentralization Process and Road Financing Mechanism in Indonesia

Government structure of Indonesia consists of three tiers, they are National Government, Provincial Government and Regency/City Government. Up to now, Indonesia have 33 provinces that divided into 399 regencies and 98 cities (Internal Affair Department, 2009). Indonesia has long history in decentralization process. Since 1900s, there has been 8 decentralization acts that have been enacted (Syafrizan, 2008). It can be traced back to period of Dutch colony of Indonesia. During Dutch colonialism, there are three acts enacted by Dutch colonial government in 1903, 1905 and 1922. The implementation was very limited, it is not pure decentralization instead of deconcentration (Suwandi,2004 in Syafrizan, 2008). Dutch colonial government preferred to efficiency rather than political objectives or democratization.

In 1942, Japan colonial government inherited all of Dutch decentralization structure but they did not make any significant changes. During 1942-1945, Japan’s focus was on exploitation of natural resources and preparing people for war. During the revolutionary years, 1945 - 1949, issues of decentralization reappeared by the publishment of Act 1 in 1945. This act, concerning Regional Government, was elaborated later by Act 22 / 1948. But, this act was not able to be implemented because Jakarta, as capital city of Indonesia, is lacked of power and political uncertainty control due to war with the Dutch. Several conferences held at this period to discuss government form for Indonesia. At the end of Round Table Conference (*Konferensi Meja Bundar*) in 1949, the Dutch only admitted independence of Indonesia provided that Indonesia remain the form of federal country.

Moreover, during period 1949-1950, Indonesia was a federal country namely United States of Indonesia (RIS). During this period, although there were no new laws concerning decentralization there was a new regulation to implement Act 22 / 1948. During 1950-1965, Indonesia returned to Unitary State of Indonesia. This periods also known as Old Order era. During this period, issues of decentralization reappeared by the issue of Act 1 / 1957 on Regional Government. This law did not stay for a long time since The Presidential Decree of 1959 which announced the return to the Constitution of 1945 due to regional rebellions in Sumatera, Sulawesi and West Java (Hofman and Kaiser in Syafrizan, 2008) brought to its replacement by a new Act 18 / 1965. During New Order era, the government put new set regulations on regional governments by the issue of Act 5 / 1974 on Regional Government. This act was never fully implemented and the progress of decentralization in Indonesia was still similar to previous laws. This act held on until the late 1990s after the collapse of New Order era, during Reformation era (1999 until now), it has been replaced by Act 22 / 1999 on Local Government and finally, then, it was revised by Act 32 / 2004.

Indonesia became more decentralized in 1999, in line with the enact of the Act Number 22 / 1999 with regard to Regional Government (as amended by Act Number 32 / 2004) and the Act Number 25 / 1999 about the Central and Regional Financial Balance (Act Number 33 / 2004) which opened the larger authority of regional government to administer their own government. Delegation of authority to the financial management in accordance with Act number 33/2004 provides an opportunity for regions to maximize their potential. Regional governments in Indonesia, based on the act, consists of the Provinces and Regencies/Cities Governments.

Article 1 paragraph 3 of Law No. 33 of 2004 on Central and Regional Government Financial Balance states a government financing system in the framework of a unitary state. It regulates the financial distribution between the central and the regional government and the equal, democratic, fair and transparent inter-regional balance funds with regard to the potential, condition and local needs.

In the decentralization era, the allocation of funds for development activities is determined more by regions derived from 1) The Regional Income (*Pendapatan Asli Daerah*), 2) Balance Fund and 3)The Regional Loan Fund. The Regional Income can come from Regional Taxes, Regional Retribution, Regional enterprise's benefits, Royalties or revenues sharing or other revenue's sources. Balance Fund is a source of local revenue that comes from the national budget and used to support the implementation of the Regional Government authority with a priority to improve the welfare of the community. The Balance Fund consists of The General Allocation Fund (*Dana Alokasi Umum*) and The Special Allocation Fund (*Dana Alokasi Khusus*). The General Allocation Fund that will be given to the regions in general is not sufficient to fund development activities because most of the money is used to finance the regular budget, and vice versa. The transport sector funds from the payment of taxes and charges are still not sufficient. Otherwise, Special Allocation Fund is still sectoral and only to most regions in need. The Regional Loan Fund are an alternative source of local financing in the implementation of decentralization that used to finance activities that based on local initiatives and local authority with regard to legislation. In brief, decentralization process in Indonesia influence financing system of road networks that give more authority for regional and local governments to administer the roads netwoks in their area. However, it still needs intervention in form of "balance fund" from central government to reduce financial disparity among regional or local government. Disparity among regions not only in financial aspect but also on human resources aspect. Regarding with this issue, central government also have transfer some of their staff to regional and local government during implementation of decentralization. There is also problem of instable revenue stream for regional and local government especially to finance road infrastructure that could be tackled with the establishment road funds. In short, Indonesia's road financing mechanism in the regional and local level of government is shown in Figure 4.1.

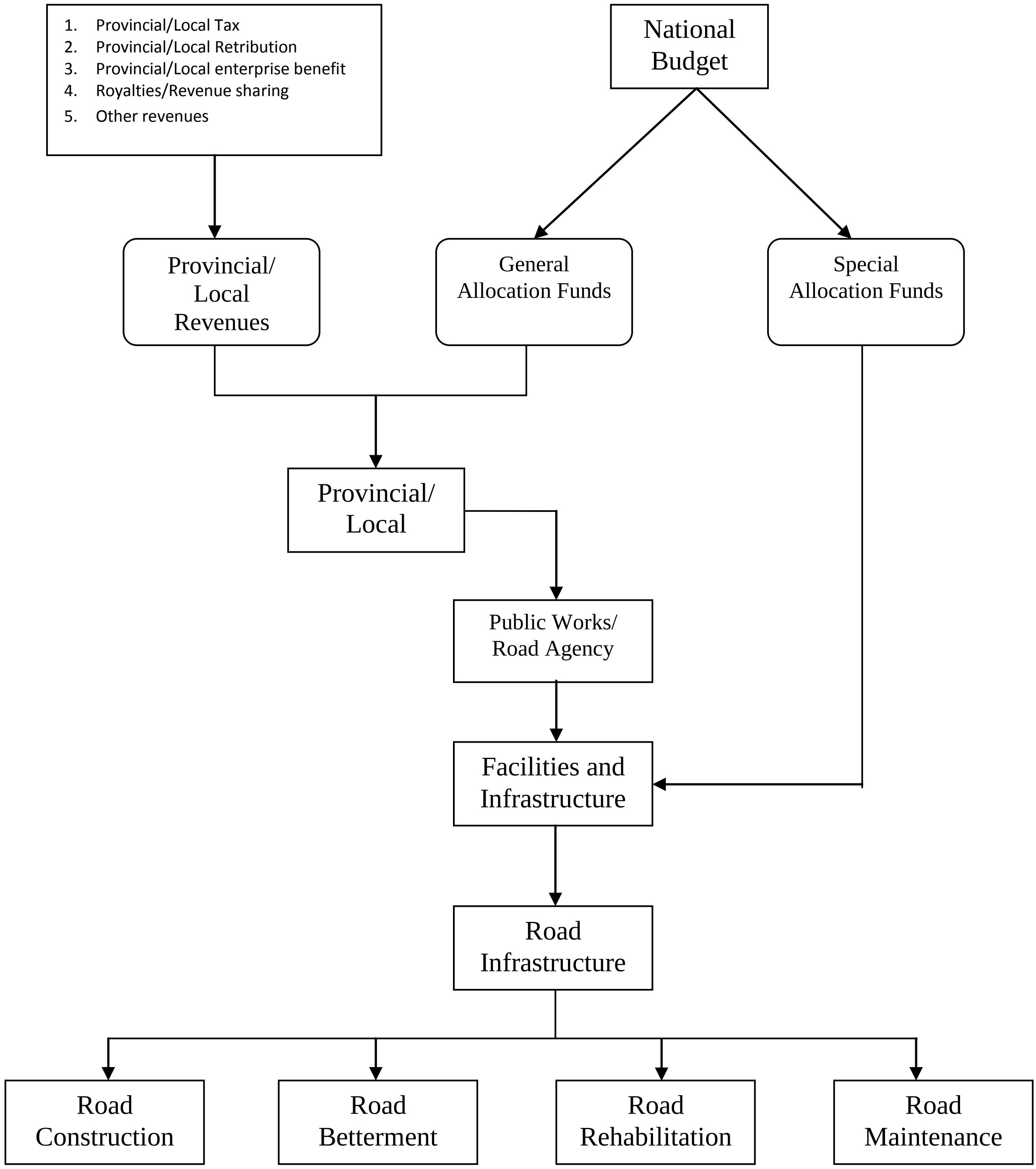

Figure 4.1 Road Funding Mechanism in Indonesia

Source : Modified from Alie, 2006

4.2. Road network system based on its authority and responsibility

Within the framework of the regional autonomy there are 4 (four) duties in responding to the needs of road transportation sector, namely: arrangement, coaching, development and supervision as stated in Act number 38 / 2004 about road and Government Regulation Number 34 / 2006 about road. Arrangement of the roads is the formulation of policy planning activities, preparation of general planning, and preparation of laws and regulations of the road. While coaching of the roads refers to the activity of the preparation of guidelines and technical standards, services, empowerment of human resources, and research and development of roads. Moreover, development of the roads includes the programming and budgeting activities, technical planning, construction, and operation and maintenance of roads. And finally, supervision of the roads covers an activity undertaken to achieve an orderly arrangement, coaching, and development of roads.

Road classification based on management authority is divided into 2 (two) groups, namely the central and regional government. The central government has the authority in managing the national road network system, while the regional government has the authority to manage the network system of provincial roads, regency/city roads and village roads. According to the authority of management, the road network can be classified into the National Roads, Provincial Roads, Regency Roads, City Roads, and Village Roads. The authority managing the National Road is the Minister of Public Works Based on the principle of assistance duty within the framework of regional autonomy, the management of national road authorities have been delegated to provincial governments. While Provincial roads administered by the provincial government. Then, roads authority to manage the Regency roads is Regency Government and to manage city (urban) roads are City Government. The Village Road is a public road connecting the area and / or settlements in villages. This kind of road managed by The Village/Subdistrict Government.

In table 4.1 below, we can see the data of road length in Indonesia in year 2006 based on road authority and road conditions. Total road length in Indonesia is 393,803 km, consists of 34,629 km of national roads, 40,131 km of province roads and 319,043 km of regency/city roads. Totally 91% of roads network have status as province and regency/city roads. The national roads condition are much better than those of province roads and regency/city roads. While 79% of national roads have good and moderate condition, only 61% of province roads and 58% of regency/city roads have the same condition. It is indicated that national roads is better administered than regional or local roads. This condition could happen because local government does not always have sufficient funds to maintenance their road network.

Table 4.1 Road authority and Condition in Indonesia year 2006

No	Road Classification	Total length (km)	Conditions (%)			
			Good	Moderate	Damage	Heavy damage
1	National roads	34,629	49%	30%	9%	12%
2	Province roads	40,131	26%	35%	15%	24%
3	Regency/city roads	319,043	36%	22%	26%	17%
	Total	393,803				

Source: Modified from Transportation Statistic, 2006

4.3. The Road Funding Implementation

4.3.1. Source and Scope of Funds

In Indonesia there are no special road funding institutions. Thus, funds for the development or the maintenance of roads are drawn from the general budget (National or regional budget) and also of the loan. Funding of National roads comes from the National Budget while funding of Provincial Roads covered by The Provincial Budget. Moreover, regency/city budget finances regency/city roads. Technically, financing of roads in Indonesia is based on proposals from the government agency responsible for road maintenance. They discuss the proposed budget with the legislative for approval of a predetermined amount of budget. In implementation, there are many political interests of legislators who can modify the plan and the budget allocation of the proposed project.

Based on Act number 28/2009 on Regional Taxes and Levies, some revenue sources related to the road sector give contribution to the local revenues, they are:

1. Annual Motor Vehicle Tax

   Annual Motor Vehicle Tax is a tax on the ownership and or vehicle control. These taxes are levied by the provincial governments. The sharing of income is

70% for the province government and 30% for the regency / city government. This tax is collected annually and the rates of personal income tax is determined based on the number of motor vehicles ownership. The basis of tax computation is the product of two main elements: the value of vehicle sales and the weight factor that reflects the relative level of environmental degradation and pollution resulting from the use of motor vehicles. The first registration of the motor vehicles will be levied 1-2% and for the second vehicle ownership and so on is determined progressively from 10 to 20%. Tax for public transport and government owned vehicles assigned 0.5 to 1% lower than for private vehicles.

Act number 28/2009 Article 8 paragraph 5 mandated at least 10% (ten percent), of the motor vehicle taxes, should allocated for the construction and or maintenance of roads and the improvement of public transport modes and facilities. In this sense, Indonesia tries to apply the concept of earmarking (allocating funds) to support the road works.

2. Motor Vehicle Registration Fees

Motor Vehicle Registration Fees is a tax on the transfer of vehicle ownership as a result of two-party agreements or unilateral actions or circumstances that occurs due to the sale and purchase, exchange, gift, or inheritance process. These taxes are levied by provincial governments, with income sharing 70% of tax revenue goes to the province and 30% of the tax revenue goes to regencies/cities. The Tariff is set up to the highest 20% of the selling price of motor vehicles for the first hand over and 1% of the selling price for the second hand over and so on.

3. Fuel Taxes

Fuel Tax is a tax on motor vehicle fuel usage. This tax is levied by the provincial government with the sharing of income 30% for the provincial government and 70% for regencies / cities government. The basis of Fuel Tax computation is the sale price of the fuel before the imposed of value added tax. The highest tax rate is set at 10%. For public transport, the tax set at least 50% lower than the tariff that applied to private vehicles. There will be more discussion about fuel taxes in sub chapter 4.4.

4. Retribution (such as for parking and motor vehicle test)

Retribution/Levy is a levy as a payment for services or a payment of certain permit that specifically provided and or given by local governments for the benefit of individuals or institutions. Total levy is calculated based on the level of services used multiplied by unit retribution tariffs.

4.3.2. Institutional Aspect

With the implementation of regional autonomy, road management moves its authority to the regional government. The Central Government manages national roads, the provincial government manages the provincial roads, and the Regency/City Government manages regency/city roads. Provincial Roads managed by a provincial coach team that consists of The Provincial Finance Bureau of the Provincial Government, The Provincial Planning Agency, The Provincial Public Works Agency. The Provincial Government will cooperate with the provincial legislative in determining the programs and funding for provincial roads. Whereas, regency / city roads administered by a Regency / City coach team responsible to the Regent / Mayor as head of the regency/city. The team involves The Finance Bureau of the local district government, The Regency/City Planning Agency and The Regency/City Public Works Agency. The Regency/city government coordinate with the local legislative in specifying the programs and funding for regency/city roads.

Act number 32 / 2004 mentions that the Central Government may assign certain tasks to the regional government in the context of assistance duty with financing, facilities, and human resources from the central government. In addition, the regional governments must made a report to the Central Government about the implementation of the tasks. The technical implementation of the National Road can be done with the principle of assistance duty. This assistance duty can be given to the Provincial Government or District Government. The road administration is assigned to the level of province to make technical implementation of the road assistance task become simpler, since the number of provinces are less than the number of regencies/cities. Then it is become a consideration factor to establish the road funds in the level of province also since it will be easier to manage road funds in the level of province than in lower level (local government).

4.3.3. Legal Aspect

Some rules become the legal basis for financing roads in Indonesia. These are Act Number 38/2004 on Roads and Government Regulation 34/2006 on Road that governing road management authority. Act No. 32/2004 on Regional Governance and Act No. 33/2004 on The Financial Balance between The Central and Regional Government manage the relationship between the Central and Regional Government in the division of authority and financing systems. Moreover, there is also Government Regulation Number 58/2005 that covers management of regional financial. Each region has also published regional regulation for implementing the budget.

Act number 28/2009 on Regional Taxes and Levies regulates a sets of taxes and levies in the regional level including those related to the transportation sector. Taxes associated with the transport sector are the Annual Motor Vehicle Tax, Motor Vehicles Registration Fees and Fuel Taxes. Implementation of this act still requires technical assistance which will be explained in the Government Regulation which is still under discussion. Article 8 paragraph 5 of this act also mandated the earmarking of at least 10% of annual vehicle taxes to allocate to road maintenance or construction and improvement of public transportation modes and facilities.

Those regulations above become strong legal basis in financing infrastructure including road sector in the level of regional and local government. However, it still not clear the allocation of 10 % of annual vehicle taxes will go to which level of roads, how much the proportion of funds to road maintenance, road construction or public transport improvement and how the mechanism to disburse the funds. This made the regulation tend to raise different assumption between stakeholders (regional and local government). This also generates some questions: why only the annual vehicle tax to be earmarked? What about other road sector taxes such as fuel taxes and vehicle registration fees? Two latter taxes also give significant revenue for regional government. Regarding to fuel taxes, the new act number 28/2009 also mandates increasing of fuel taxes up to 10 %. This new act is enacted to change the Act number 34/2000. The previous act only stated that the amount of fuel taxes is 5% of fuel price. It means that there will be increasing of revenue from fuel taxes. Another problem could be generate because the new act made it possible to implement different rate of fuel taxes among provinces. This can generate social problem like oil smuggling to other provinces that have lower tax rates.

In the other hand, Act number 22/2009 on Road Traffic and Transportation Section 29 specifies the need of a Road Preservation Fund (*Dana Preservasi Jalan*) for maintenance, rehabilitation and reconstruction activities of the road. The Road Preservation Fund may get funds from road user taxes and manages them in accordance with statutory provisions. The Road Preservation Fund is managed by the Road Maintenance Fund management unit that is responsible to the Minister (in this case the Minister of Public Works). Implementation of this act still requires technical guidance covered in the Government Regulation that is still under discussion. The enact of this act made it possible to establish road funds body. But, it still not clear in which level of government the body will be established. The other problem is that financing system of Indonesia did not recognize Road Funds yet. Thus, if in the future this body will be implemented, it also need a new regulation to make it clear the position of Road Funds in the Indonesian financing system.

4.3.4. Management Aspect

The road maintenance proposal process begins with identification of road sections that need maintenance. Afterwards, by conducting surveys, investigations, and measurements, relevant data are collected. The technical planning conducted by the Department of Public Works or Road Agency using both field surveys and technical analysis to calculate the costs and then reported in a Technical Planning Document. This document becomes reference for preparing the budget plan. Deliberation process of the local budget plan is undertaken together with other agencies in a forum called Development Planning Board (*Musyawah Perencanaan Pembangunan/Musrenbang*). Here, the amount of road maintenance funding is determined and allocated according to the priority.

The results of *Musrenbang* become the basis for the Executive Budget Committee to assess the feasibility and priority of activities. The assessment result from Executive Budget Committee will be documented as local budget plan proposal. Then together with the Legislative Budget Committee, they will conduct intensive discussions to produce a draft of a budget plan that will be documented as regional regulation as the guidelines in the implementation of the regional budget. Thus, from the description above, it can be identified that the fund allocated for regional/local road financing comes from consolidated fund in the regional/local budget and may be fluctuate each year depending on the availability of local revenues and the tension with other sectors in the budget deliberation process.

The disbursement of fund in the regional budget for road maintenance is following several steps. For the routine maintenance which self managed by regional road agency, it started with proposal from local road agency submitted to finance department of Regional Secretariat. Afterwards, finance bureau releases funds quarterly to the head of regional road agency which allocates the funds for the monthly payment for routine maintenance works. Then, regional road agency submits an accountability report to the finance department of Regional Secretariat, which reports detail use of the funds released to it.

For periodic maintenance, road maintenance works usually contracted to the third party by using procurement process. Contractor created monthly certificates for completed works and then send to the assigned official in regional road agency for approval. The assigned official submits the payment request for the contractor to the head of regional road agency. The head of regional road agency submits the payment request to the finance department of Regional Secretariat in the approved form & content. Finance department disburses funds straight to the contractor.

Auditing process in road maintenance works in Indonesia is consist of Internal and External Audit. Internal audit conducted by Local Supervision Board (*Badan Pengawasan Daerah/Bawasda*) for road works which used local budget and by Province Supervision Board (*Badan Pengawas Provinsi/Bawasprov*) for road works which used province budget. Moreover, road works that used General Allocation Funds (*Dana Alokasi Umum*) or Special Allocation Funds (*Dana Alokasi Khusus*) also supervised by National Financial and Development Supervision Board (*Badan Pengawasan Keuangan dan Pembangunan/BPKP*). In the other side, external audit conducted by Financial Inspectorate Board (*Badan Pemeriksa Keuangan/BPK*). The audit conducted each year and cover technical and financial procedural audit. Technical audit conducted by board staff in the field to checked whether the road maintenance works has been done according to the technical specification or not. Financial audit aims to check whether the disbursement of money has been follow standard procedural and whether the money allocated to the right activities as documented in the task lists. In reality the internal audit is not effective because the board are not independent. Both of road agency and the auditing board responsible to the same person, Governor as The Head of Province or Regent/Mayor as The Head of Regency/City. Lack of integrity of some government staffs sometimes worsening the condition. Even for auditing board in the national level such as BPKP and BPK still prone to corruption.

4.4. Fuel Taxes in Indonesia

Mechanism of collecting and disbursing fuel tax in Indonesia refers to Minister of Finance Decree no. 539/KMK.017/1998 on Fuel Taxes sharing revenue Administration. There are some parties involved in the process : Road Users, Pump Station, *PERTAMINA* (National Oil Mining Company of Indonesia), Finance Department, Province Government and Regency/City Government. Procedure to levy and distribute fuel taxes is as seen on figure 4.2.

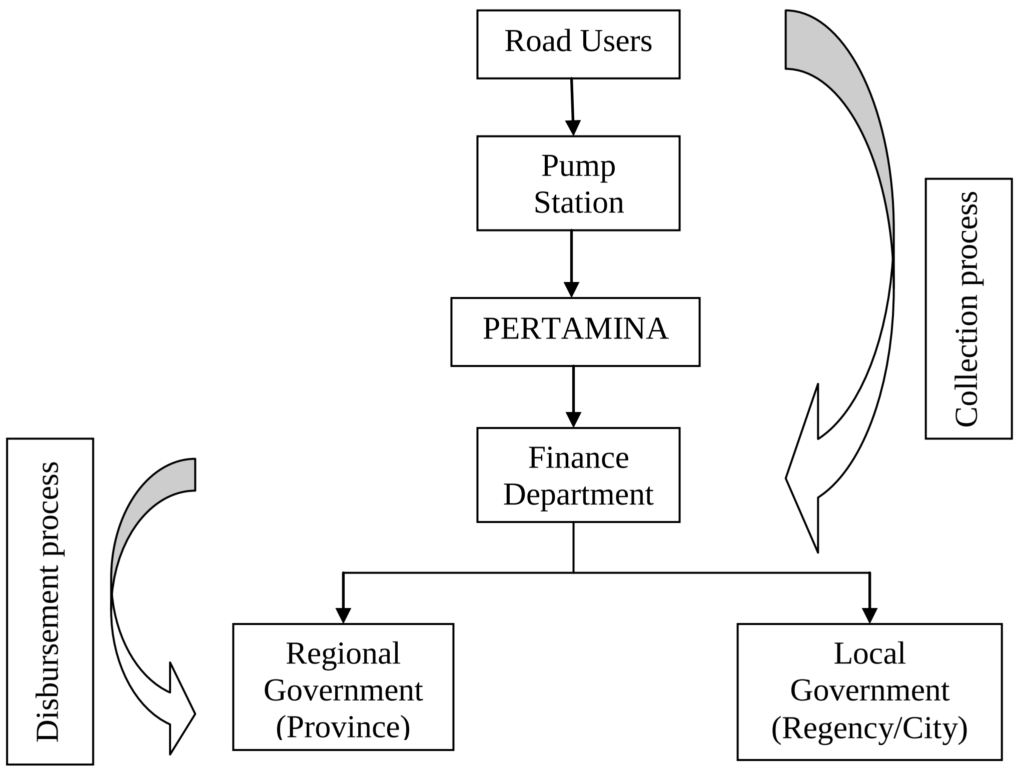

Figure 4.2. Mechanism of Fuel Taxes Collection and Disbursement in Indonesia

From that figure, it is clear that road users pay fuel taxes when they fill their vehicles in a pump station. Then pump station send the amount of fuel taxes to *Pertamina* (National Oil Company). Afterwards, *Pertamina* deposit the money to Fuel Taxes account of Bank Indonesia (central bank of Indonesia) owned by Finance Department. Finance department will calculate and distribute the revenue to Province and Regency/city government according to the proportion determined for each government level. The revenue received from this taxes combined with other revenues will be used to support local budget.

Currently the fuel taxation in Indonesia is still based on Government of Indonesia, Government Regulation No. 21/1997 on Fuel Taxes. According to the regulation mentioned above, the fuel tax until now still set at 5% of the selling price of motor vehicle fuel. The newest Act number 28/2009 about Regional Taxes and Retributions is on the beginning process of implementation because it still needs Government Regulation and Regional Government Regulation as guidelines. There are some changes between newest and previous act regarding to fuel tax rate and sharing revenue. The new act mandate that fuel taxes can be levied up to 10% and possibility of each province to levied taxes on different rate. Thus, it is indicated that there will be increasing revenue from fuel taxes because of the possibility to raise taxes up to 10% of fuel prices.

Fuel taxes have policy role to add more revenue for government budget. Fuel taxes levied by Province Government and the money shared with Regency/City Government with proportion 30% for Province and 70% for Regency/City government. The latest issues concerning the taxation of fuel is still under discussion in the preparation of guidelines for implementation (Government Regulation) on tax rates and plan of implementation that allows each province has different tax rates. The same applies to differentiation of public transport and Government-owned vehicles that have different tax rates are still being discussed of the plan implementation.

4.5. Concluding remarks

Indonesia has a long history in the decentralization process since the Dutch colonialism until the reformation era. Decentralization in Indonesia offers a stronger position for regional government in the organization and functioning of their own regions, even to increase regional income. Funding for province and regency/city roads infrastructure come from general budget that consists of Province/Regency Budget and General Allocation Funds from central government. Some strategic road infrastructure may also get additional funds from Special Allocation Funds.

The main institution responsible for road maintenance in regional/local level is Road Agency (or Public Works Agency), cooperate with Finance Bureau, and Planning Agency. Some regulations have been enacted regarding to road funding, decentralization and regional/local taxation. But, not all regulations have been implemented because some of them are quite new (issued in 2009) and still wait for another lower regulation as guidelines.

The relatively large contribution of the road sector to regional income must be followed by increased funding for the road sector to support the capacity and level of service. The New Traffic and Transportation Act that gives directives for Road Fund forming and new Regional Taxes and Levies has stated that 10% of the annual motor vehicle tax can be allocated to road maintenance. The fuel taxes tariff increase from 5% to 10%. Still it has to be considered how much of this fuel tax can be assigned to support the road fund.

CHAPTER 5
POSSIBILITY TO EXPLORE FUEL TAXES POLICY TO SUPPORT ROAD FUNDING IN INDONESIA

This chapter describes the analysis of what Indonesia can learned from New Zealand and The United States in applying fuel taxes policy to support road funding in Indonesia. It starts with a general overview about the description of conditions in those three countries. The analysis will also consider some contextual differences among those countries. Then we try to emphasize more about what Indonesia can learn from road fund implementation based on several aspects that are used in the two previous chapters, that elaborates source and scope of funds, institutional aspect, legal aspect and financial aspect, with emphasizing the role of fuel taxes.

5.1. General Overview

From the degree of transfer as stated by Rose (1991), this policy transfer can be categorized in *hybridization* because it will combine some elements of policy found in two countries (the USA and New Zealand) to propose or suggest a new best suited policy for Indonesia. Furthermore, the analysis will done by elaborating each aspect as synthesized in chapter 2 and considering with Indonesian context.

Possibility to transfer policy from the USA and New Zealand to Indonesia should consider contextual differences among these countries because they can become constraint to successful of policy transfer (Dolowith and Marsh, 1996). By comparing both The USA and New Zealand (as depicted in chapter 3) and Indonesia (as described in chapter 4), it can be identified some issues related with contextual differences, such as : developing versus developed countries, large versus small countries, centralized versus decentralized, fuel taxes versus other taxation, and road maintenance versus new road construction.

Regarding to Indonesian status as developing country, it could be one of constraints to enable policy transfer. One indicator to categorized whether a country in a developing or a developed country is from Gross National Income per capita. Based on World Development Indicator (World Bank, 2010), Gross National Income (GNI) per capita of Indonesia is US$1,880. If we compare that data with GNI per capita of New

Zealand US$27,830 and the USA $47,930, it is obvious that GNI of Indonesia is lower than both developed countries. Indonesia also still faces some social problems, such as high rate of unemployment, lower rate of education, also low level of law awareness. However, reformation era that have been implemented since 1998 bring many developments that made Indonesia's governance more democratic, more transparent and more accountable. If Indonesia want to reach more rapid development progress, it is recommended that they should learn from developed countries experience and prepare the condition to reach the objectives. This research also focus only some aspects that Indonesia can learn and consider the recent condition of Indonesia and it does not matter if Indonesia as one of developing countries learn from developed countries experiences as long as the resources is ready in Indonesia. Thus the readiness of Indonesia to implement new policy like road funds also should be increased.

From the perspective size of the country, Indonesia (1,904,569 km^2) is bigger than New Zealand (267,710 km^2) and smaller than the USA (9,826,675 km^2). In fact, the smaller country tend to have more similar community condition that made it easier to introduce new regulation or policy. Indonesia can be categorized as big country regarding to their area. They consist of 5 big islands and thousands of small islands. Indonesia have various cultures that made the complex community, thus maybe it become harder and need longer time to introduce and implement new policy. Indonesia can learn more from the USA as a big country on how they manage the big country. It is also need good coordination among each government level from central, regional and local government to achieve policy objectives.

The government system in Indonesia that has embraced decentralization makes the condition is not much different from the federal system in the USA, while the unitary system adopted in New Zealand makes this country centralized system but it also shares responsibilities for road management. So the road management authority in these three countries is not only done by the central government but also by sharing responsibilities with local governments. Both USA and New Zealand already have experience with road funds since the year 50's, and they are successfully implemented. Even both of them have different government system and implementation of road funds, the main objective of road funds is similar to provide sufficient funds for road maintenance and other road works.

Government system of the USA is more decentralized because of their federal system. This condition is almost similar with decentralization process in Indonesia. But, allocations of funds for road funding are only for highways. In Indonesia, road network that need more attention is regional and local roads. Based on table 4.1, national roads have better condition than regional and local roads. Thus, it maybe better also if we can learn from New Zealand that even more centralized but they have allocated the funds not only for national roads but also for regional and local roads. In the context of decentralization process of Indonesia, Road Funds should be also integrated with this recent change. Of the decentralization process that has been accomplished, province roads are managed by the province government, while regency roads are managed by regency governments. This condition almost similar with road management in the USA. But in federal system in the USA, authority of states is bigger compare with authority of local government in Indonesia. Central government in Indonesia still can intervene policy of local government. The amount of province in Indonesia are fewer than the amount of Regency/City. It will make the management of the fund at province level will be simpler than at regency/city level. The national road network still can be handled by central government through National Budget. Hence, it will be better if Road Funds established in province level.

5.2. Source and Scope of Funds

5.2.1. Lesson learned from New Zealand and the United States

Both countries source of revenue to support road funding mainly come from fuel taxes or fuel levy, vehicle registration fee, vehicle sales tax, and heavy vehicle taxes. The contribution of fuel taxes for the Road Fund programs of both countries is also significant, for which the USA contributed 90% for the federal level and 47% for state level and New Zealand contributes approximately 40% of its total road funds. It means that even in the developed countries, revenue from fuel taxes still become the main instrument to gain more revenue to support road funding. Other new instrument like weight distance that developed in New Zealand recently become the biggest sources of revenue in that country. But this instrument is more complex than fuel taxes and need more resources to be implemented.

Scope of the road funds in the USA is only for Federal Highways but in New Zealand not only national road network but also local road network. Most of the expenditure financed is for road maintenance for both countries, although other road works also include the scope of expenditure. It can be interpreted that road funds can be used to support all level of road network and all type of road works.

5.2.2. What can Indonesia learn from the lesson of both countries?

The establishment of suggested road funds in Indonesia in the level of the province refers to the decentralization effort to begin to transfer the management and financing of the road sector (which consists of maintenance, upgrading, and construction of roads) from the central government to the provinces.

Recently, major contribution of taxes from road sector in Indonesia come from Vehicle Tax, Vehicle Registration Fee and Fuel Taxes. Those taxes are part of regional taxes now, and province government has responsible to levy the taxes and share the revenue with regency/city government. To implement other strategy like New Zealand's weight distance taxes, still need more technology and resources. In the USA, there are two component of taxes, federal and state level taxes, each states can have its own rates. It may be implemented in Indonesia too for each province to have different rates of fuel taxes. But recent discussion from some experts aware of some problems that can be triggered if different fuel taxes of provinces applied, such as oil smuggling to other provinces. Price disparity factor would certainly encourage the flow of fuel distribution to choose provinces with more profitable selling price. In my opinion, it would be better if government implement the same rates for all province, at least in the first 3 years, because there also different capacity of province governments who will manage the taxes. Difference quality in human resources among provinces in Indonesia creates those different capacity because in centralization era, the development of Indonesia only centralized in Java island where Jakarta, capital city of Indonesia, is located. With same rates of fuel taxes, any problems that may be triggered can be reduced. Optimizing existing taxes be the best choice up to now, especially with fuel taxes that are easy to implement and broadly accepted by public.

Government of Indonesia Act number 34/2000 on Regional Taxes and Regional Retribution has been declared an earmarking 10% of the Annual Vehicle Tax for road maintenance. This act has indicates some efforts of the government to create the way for possible development of road funds in Indonesia. It should be also examined whether the amount is adequate to cover the cost of road maintenance and will be allocated to national roads, province or district. Because of limited road maintenance budget data that can be obtained, we use the example data from Study of Road Maintenance Arrangement with the concept of Road Fund in the Province of West Java (2007) for a description of the condition of road maintenance in West Java Province.

This study performs the calculation of estimated needs of road maintenance in the Province of West Java province in 2007 for Province Road are IDR 227.86 billion (€19.8 million, based on currency €1 = IDR 11,500) and for district roads are IDR 1,420.93 billion (€123.6 million). In the period 2001-2005, the contribution of Vehicle Registration is 60.2% of the total income of the road sector and it was the largest, followed by 33.6% contributions from annual Vehicle Tax, 5.8% from Fuel Tax and another levy 0.5%. In 2005, revenue contribution from the road sector amounted to IDR 1703 billion (€148 million) of the total regional income in IDR 2956 billion (€257 million), so the road sector contributed about 57.6% of total regional income. From the average income of the road sector amounted to IDR 1204 billion (around €104.7 million) 2001-2005 only 20.2% of them were used for the road sector expenditure. While the average expenditure of the road sector in the same period only 32.5% were allocated for road maintenance. During 2001-2005, average road maintenance expenditure is about IDR 78.8 billion (€6.9 million). It means that it only realize 4.8% of the ideal needs of the provincial road maintenance and regency / city (which estimated total of IDR 1648.79 billion or around €143.4 million). By looking at the conditions at one of the provinces in the allocation of funds, it can be concluded that earmarking 10% of the Annual Vehicle Tax is still not appropriate to meet the needs of ideally road maintenance funds. Thus it needs more support from other taxation especially fuel taxes.

Regarding to fuel taxes, we can learn more from both countries experience because they get funding mainly from earmarking of fuel taxes. In the USA, most of fuel taxes are dedicated to Highway Account (around 84%), the rests are for Mass Transit Account and Underground Storage Tank Trust Fund. In New Zealand, all of fuel taxes go to Transfund account. There is possibility to explore fuel taxes because of the potential increase from the previous 5% become 10% from fuel prices according to the Government of Indonesia Act number 34/2000. This can be done by earmarking as conducted to the annual motor vehicle tax. Earmarking of 100% fuel taxes in Indonesia to Road Funds, like in New Zealand, seems to be impossible to implement now because government still need more money for other sectors. Earmarking can be applied by increasing gradually each year to achieve adequate revenues to support the road fund.

New act also open the possibility to add more revenue through fuel levy, separated from fuel taxes. Fuel levy is additional levy on fuel prices that separated from fuel taxes. Fuel levy can be illustrated in fuel price component as seen on figure 5.1. below.

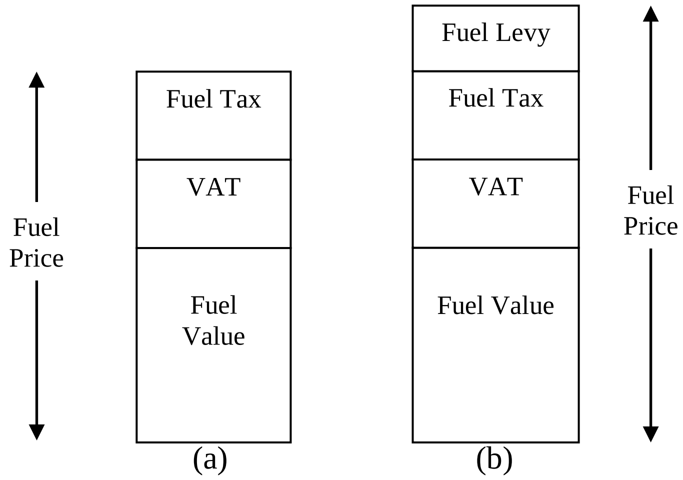

Figure 5.1. Comparison of Fuel Price without (a) and with (b) fuel levy component

Components of fuel prices include fuel value, value added tax (VAT), fuel tax and another levy. Fuel levy is made possible by Act number 34/2000 on Regional Taxes and Retribution as additional tax may be levied by regional government to provide more flexibility in anticipating situations and conditions as well as local economic development in the future that resulted in the potential development of the greater tax. This tax can be added outside the fuel tax which stipulated in Act number 34/2000. Kereh (2004) suggested that the fuel levy may be applied at 2% - 5% of the price of fuel, depending on the needs of the existing maintenance fund. However, the addition of fuel levy will increase fuel price, thus it needs more consideration regarding to public acceptance and also needs more regulations if government want to implement this policy.

To give clearer image of potential revenue can be gained through fuel taxes, we used serial data from World Bank. The data provides road sector fuel (gasoline and diesel) consumption in Indonesia from 2002 to 2007. Based on the data, we can calculate the average consumption of gasoline and diesel and then make estimation of revenue gain from earmarking of fuel taxes.

Table 5.1. Estimation of revenue from fuel taxes by earmarking 10% for road funds

Year	Gasoline kilolitre	Diesel kilolitre
2002	11,773,256	9,355,102
2003	12,558,140	8,943,878
2004	14,558,140	9,336,735
2005	15,048,837	8,662,245
2006	15,180,233	8,158,163
2007	16,139,535	7,414,286
Average consumption (kilolitres)	14,209,690	8,645,068
Fuel prices (US$ per litre)	0.60	0.46
Total selling (US$)	8,525,813,953	3,976,731,293
Total tax 10% (US$)	852,581,395	397,673,129
Earmark 10% (US$)	85,258,140	39,767,313
Revenue for road funds (US$)	125,025,452	

Source : World Bank, 2010 and analysis result

From table 5.1, it is obvious that average consumption of gasoline in Indonesia is 14,209,690 kilolitres and for diesel is 8,645,068 kilolitres. By using assumption 10% earmarking of fuel taxes, it can be calculated that revenue for road funds from fuel taxes is US$ 125 millions (IDR 1,12 trillion, based on US$1 = IDR 9,015) per year. This amount of money is not so big especially when distribute to each province and regency/city, because it only focus to fuel taxes that is scope of this research. But if the revenue stream is stable, it will give more assurance for better road maintenance works.

By initiating road funds in province level, thus the scope of road funds in Indonesia will finance province roads and regency/city roads. It is different with the USA experience because the Highway Trust Fund allocated the fund for federal-aided highway only. We can learn from New Zealand that also allocate funds for local road networks. The method of disbursing fund to lower level of governance will be elaborated in subchapter 5.5 about management aspect. The kind of expenditure financed by road funds in the USA and New Zealand is mostly to road maintenance as well as for other road works. The road funds in Indonesia should focus more to road maintenance because it does not need money as large as for new roads construction.

5.3. Institutional Aspect

5.3.1. Lesson learned from New Zealand and The United States

Transfund in New Zealand is independent organization. It also has oversight board as well. Different with Highway Trust Fund in the USA that only act as an accounting mechanism managed by treasury. The oversight board in the USA also is not as independent as Transfund in New Zealand. The member of oversight board in Transfund have represented many stakeholder from government, private sector, and road user. In USA, it only representative of legislator and senate. The independence oversight board can make road funds more reliable and accountable. Transfund in New Zealand can be categorized as second generation of road funds because it have more revenue source not only from road taxation but also from road user charges. It also have established independent oversight board to supervise the management of the funds. While Highway Trust Fund in the USA is categorized in first generation of road fund because it emphasize the earmarking of road taxation.

5.3.2. What can Indonesia learn from the lesson of both countries?

Learned from both countries that success in establishing Road Funds, Indonesia can also establish Road Funds which concern with Indonesian context. The institution that build in province level will be better if have independent position like in New Zealand. It also needs independent road funds board as oversight agency to ensure the management. The USA experience in institutional point of view will be hard to implement in Indonesia to get success because the human resources are in different condition. As a developing country, Indonesia still have some problems regarding to transparency and accountability. If there is no strong oversight board, some problem like misallocation of funds could be happen. The member of road fund board as oversight board should also learn from New Zealand experience that include government, private sector, NGO, academic and road users to make this Road Funds more reliable.

Within the institutional structure, suggested Road Fund is basically responsible to the Governor as head of the provincial and to community users of motor vehicles as well as public in general. We also suggest some improvements to deal with Indonesian context. To deal with accountability issue, there should be regularly meeting of road fund board meetings involving representatives of local government, users of motor vehicles, industry associations, professional organizations and relevant NGOs, and academics. In the public consultation, road fund management shall publish widely all reports of road fund performance and the results of technical and financial audits conducted by public auditors.

Road fund board will play an active role in planning and monitoring the implementation and management of the funds. It assisted by the Executive Secretary that participated in the process of planning, implementing and monitoring road fund implementation in the province. Road Fund board reflect on representatives of all parties involved in the road funds, with the composition of its membership is a combination of elements of the government, private and public users of motor vehicles.

Reflect on New Zealand Transfund, we suggest that membership of Road Fund Management consist of government representative from relevant institution with the policy of transportation sector : Planning Agency (Bappeda), Revenue Agency (*Dinas Pendapatan Daerah*), Road Agency (*Dinas Bina Marga*), Transportation Agency (*Dinas Perhubungan*) and Regional Secretariat (*Sekretariat Daerah*), and representative from regency/city government, road user society which represented by road user organization.

Furthermore there also good lesson from oversight board of Transfund that can be adapted. From the lesson, we suggest that membership of Road Fund Board in the province consists of 10-12 people representing all the elements associated with the implementation of the road fund in the province level of Indonesia, as follows:

1. Head of Provincial Roads Agency
2. Head of Provincial Transportation Agency
3. Head of Provincial Revenue Agency
4. Head of Provincial Planning Agency
5. Representatives of Local Government

6. Representative of Industry Association
7. Representative of Regional Transport Organization
8. Representatives of Consumer Organization
9. Representatives of Academic
10. Representatives of Transportation professional organizations
11. Executive Secretary

In the early period of the a road funds agency, proposed road funds management in the province level is more suitable than in the other government level to consolidate the various parties involved in the decision making process as illustrated in figure 5.2. below.

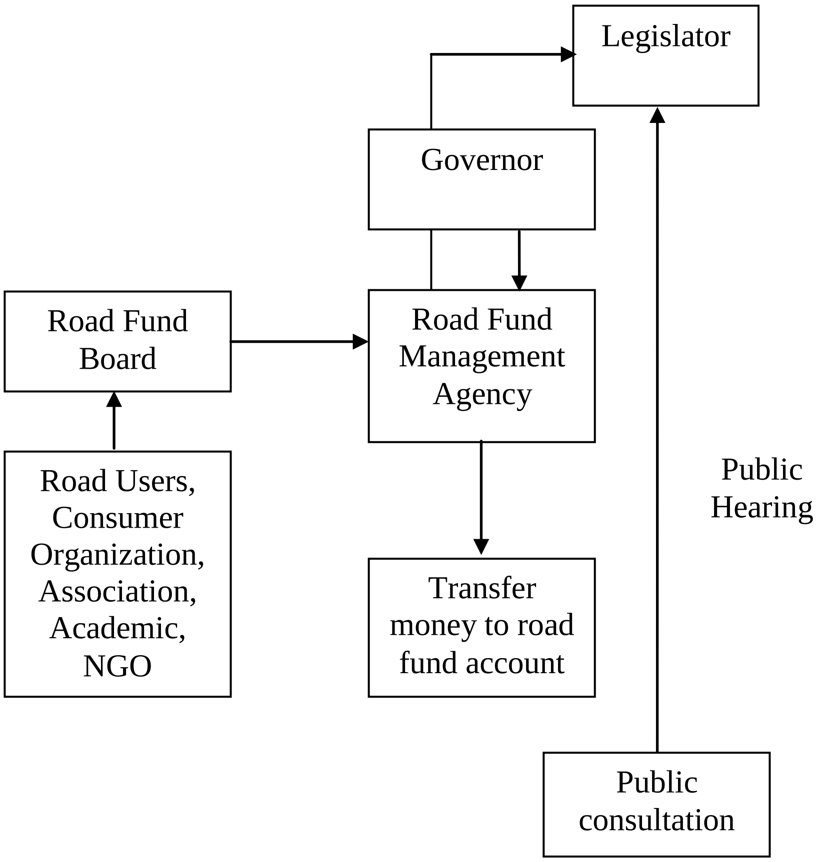

Figure 5.2 Proposed Road Fund Organization

From the picture, the mechanism of proposed road funds is as follows: Road Fund received money from road user and the money goes to road fund account. Performance of Road Fund Management supervised by Road Fund Board whose member is representatives from government, private sector and road users. Road Fund

Management responsible to the Governor. In the public consultation between road fund management, legislator and road fund board, all reports of road fund performance publish widely by road fund management.

5.4. Legal Aspect

5.4.1. Lesson learned from New Zealand and The United States

Some acts, regulations and rules have been issued regarding to road funding in both countries to support the implementation from the legal framework. There are some amendments in New Zealand that indicate the dynamics in the road fund implementation thus it is important to renew the regulation. In USA, the regulation relative stagnant only for the extended of active period of the Highway Trust Funds. Both countries create the same level of legal arrangement by enacting Act. Based on their experience, it is indicated that the rules and regulation give guarantee to government to conduct the policy and also gain more public acceptance. The certainty of legal arrangement protect government to conduct policy that free from political interference. Indonesia can learn from both countries that Road Funds should support with Acts, rules or regulations as a legal basis for a policy to be implemented. The rule will regulate the position of Road Funds in government system, tasks of Road Funds management, the members and their responsibility.

5.4.2. What can Indonesia learn from the lesson of both countries?

Decentralization in Indonesia mainly have similar condition with federal system of the USA. As a new country that want to implement road fund, Indonesia can learn from the legal perspective from the USA that more simple than New Zealand's rules on Road Funds to make it clear the position of Road Funds in government system, the objective and operational of the institution. Based on recent condition in Indonesia, there are some Acts as legal basis that support the implementation of Road Funds. However, there should be more regulation under the Acts as guidelines to implement this policy in province and regency/city level.

The existence of the Government of Indonesia Act number 32/2004 on Regional Government and Government of Indonesia Act number 33/2004 on financial balance between central and regional governments become the basis of decentralization in era of regional autonomy. Both Acts provides greater powers for regional / local governments to regulate their authorities. In this case also included in the road management, in which, regional governments can also optimize the potential of the region to finance the construction and maintenance of road infrastructure. Another thing that needs to be done is the regional cooperation inter-district / inter-city or inter-provincial road sector because it is related to the strategic road network which through some areas that need harmony in the level of service.

The road funds establishment has been supported by the Government of Indonesia Act number 22/2009 on Road Traffic and Transportation regarding the Road Preservation Fund. This Act stated that Road Preservation Fund is a special fund used for maintenance activities, rehabilitation and reconstruction in a sustainable way in accordance with the standards established. Road Preservation Fund may be sourced from road users and managed in accordance with the legislation. Based on this act, Road Preservation Fund is managed by a Road Preservation Fund Management Unit that is responsible to the Minister of Public Works or Transportation. In my opinion, the aims of Road Preservation Funds mentioned in this act have appropriate with experience from New Zealand and The USA mentioned before. But, this act should be amended regarding to establishing Road Funds in province level. In this level, road funds management responsible to Governor as the head of the province government.

The provisions concerning the organization and working procedures of the Road Preservation Fund management unit shall be arranged by government regulations. While the government regulation is still in the process, it is necessary to strengthen the capacity of stakeholders associated with the road fund in particular at the provincial level and regency/city level, through various socializations and discourses about the road fund.

Government of Indonesia Act number 34/2000 on Regional Taxes and Levies have set the taxes on the road sector, namely Fuel Tax, Annual Vehicle Tax and Vehicle Registration Fee, which is authorized for the provincial government in the collection process. Results from these taxes will be shared in a certain proportion between the provincial and regency/city governments. This act is still waiting for government regulation and regional regulation for the implementation. If the planned fuel levy implemented, then it can be done by the provincial government through regional regulation that will regulate this.

Other legal issue related with road funds is that this proposed body is not recognized in financial system of Indonesia. If proposed roads funds use public money, it should be involved in financial system. Thus it will also needs new regulation or to arrange the position of road funds body in financial system and the responsibility of this body.

It can be interpreted that there are political will of Indonesia's government to prepare for road funds establishment in the future. However, it still needs to be supported by enacting some acts, regulations, rules, or guidances to make the position of road funds body have strong legal basis.

5.5. Management Aspect

5.5.1. Lesson learned from New Zealand and The United States

Because Transfund in New Zealand is an independent organization, hence it has own account to receive the money and separated from general budget of the government. In USA, the condition is different. Highway Trust Funds is still a part of general budget, hence the money from road sector first come to general treasury and then earmarked to Highway Trust Fund programs. There is a clear designation of both countries to separate road fund from other general revenues.

They also show clear channel of distributing fund to road agencies. Distributing method of fund in New Zealand based on competitive procurement from road agency while in the USA based on formula that influences by some variables such as population, road mileage, and traffic density. Both countries use reimbursement system to pay the funds to contractor or road agency. Auditing system in New Zealand conduct by Review and Audit Division of Transfund, with technical and financial audit done every 5 years and procedural audit made every 3 years. Whereas independent staff and FHWA staff carry out financial audit of The Highway Trust Fund in the USA each year, but there is no formal technical audit. Both countries have conduct management of road funds in clear and organized ways.

5.5.2. What can Indonesia learn from the lesson of both countries?

Indonesia can learn from New Zealand's experience regarding to management of Road Funds as an independent organization. The allocation of funds in New Zealand is not only to national roads but also to regional and local roads. Proposed Road Fund in Indonesia will mainly finance province roads and regency/city road, the national roads still become responsibility of national government and can be burden by national budget. Separated account that use in New Zealand can also be used in Indonesia. For reimbursement system, may be hard to implement because of lack financial capacity of many contractors and consultants in Indonesia. Payment system can still use the same mechanism in Indonesia, where contractors can get 20-30% of total budget as down payment in the beginning of project. Then they can ask for monthly payment according to their progress.

According to the lesson learned from both countries, the proposed road fund in the province will also serves to allocate and distribute the funds to the regencies/cities governments through the agency involved, or can be directly channeled to the contractor that implements the road maintenance works under contract with the regency / city, or go directly to fund road districts, as long as it meets the requirements of administration and management which have been defined previously.

The authority to collect these taxes will be carried by the province government and the results are distributed to the general budget of the provincial and the regency / city with a certain proportion. The proportion can adopt the formula which used by Highway Trus Fund in the USA based on some aspect such as population, traffic density and road length in each regency/city. In the initial phase of operation (e.g. the first five years), Proposed Province Road Fund should establish province road maintenance as priorities, because it is impossible to handle all existing roads in provincial areas, such as for routine or periodic maintenance on province roads to maintain the smooth of inter-regional economy. Afterwards, the next five years program will expand in scope to deal with routine or periodic maintenance on provincial and regency roads.

Determination of the scale priority of proposed road funds allocations in the province must be done objectively, based on existing road conditions, traffic density, and will support by the analysis that provides high value added economy to the investment made. The use of road management software namely Indonesian Integrated Road Management System (IIRMS) in the province and regency / city will be helpful to carry on this tasks.

The revenue of the proposed road funds come from earmarked of fuel taxes that collected by Pump Station and Pertamina as described in subchapter 4.4. Calculation of earmarking conducted by Finance Department, then the money deposited in the road fund account. Determining of the road that will be handled, work schedules and cost estimates are based on accurate data analysis and IIRMS. Then, proposed Road Fund Board will verify the amount of road maintenance costs that must be provided by considering the long-term maintenance plans and schedules made by the related offices in the region. Proposed road fund board also makes the allocation of road funds in the provincial budget for relevant agencies based on road maintenance plan that has been previously set and by considering the capability and professionalism of these agencies in managing road maintenance program.

Regarding to the payment method, we can also learn from the USA and New Zealand experience, but will not fully adopted the reimbursement system. Payments made to the road agency or directly to contractors and consultants who working under contract in accordance with the work schedule and payments certificate approved by the agencies involved. Payment can be done monthly as ongoing condition now. Related agencies periodically reported the use road funds and explains the use when there are deviations.

Some auditing process of both countries have been implemented in Indonesia by conducting technical and financial audit. Specifically in the proposed road funds should conduct according to the implementation of road maintenance works. Technical audit should be done in the field to ensure that road agency, contractor or consultant have implemented their tasks in accordance with the specification or terms of references. Whereas financial audit is need to ensure that the money is used and distributed in the correct procedure.

5.6. Concluding remarks

Decentralized systems provide greater opportunities for regional governments to handle the financing of roads in each region, especially through the road fund. Based on lesson learned from New Zealand and the USA and also recent condition in

Indonesia, it can be proposed that Road Fund should be established in Province level to support road maintenance funding in Provinces and Regencies/Cities Roads. New legislation has been an opportunity to accommodate the establishment of road funds. Some sources of funds can be optimized as a component of this road fund. Taxes related with fuel usage, can still be optimized to support the road fund for new legislation allows the increase of fuel taxes rates and there are opportunities for the region to impose a fuel levy as long as it meets the requirements. For implementation, institutional capacity needs to be prepared in the province and regency/city and also socialization to the community about the importance of road fund and increase in fuel taxes rate.

In brief, we present the analysis of Indonesia context to conduct road funds with source of funds from fuel taxes in table 5.2 below

Table 5.2 Proposed Road Funds for Indonesia

No	Parameter	Indonesia (Proposed)
1.	Road Fund Board	Road Funds Agency in Province Level
2.	Source and Scope of Funds - Main revenue sources - Scope of funds (which road networks) - Expenditure financed (maintenance or new construction)	 - Fuel taxes combine with vehicle annual taxes - Province and Regency/City Roads - Road maintenance
5.	Institutional Aspect - Road Fund Body/Agency - Oversight body and membership	 - Road funds as an independent board - Independent oversight board
6.	Legal Aspect - Rules / regulation as legal basis	 - New act and amendment of some previous regulations (include regulation on financial system)
7.	Management Aspect - Collecting the funds (Deposit mechanism) - Distributing method of the fund	 - Separate account by earmarking of taxes - Allocation of funds based on formulas; Distribute funds via payments certificate

No	Parameter	Indonesia (Proposed)
	- Auditing process	- Technical and financial audit done yearly in accordance with the road maintenance works
8.	Role of fuel taxes	- As the potential revenue to support road funds

CHAPTER 6
CONCLUSION AND RECOMMENDATION

6.1. Outline

This chapter will consist of summary of this research, recommendation and reflection of this research. First, in summarizing results, it will describe the goal and method, then the explanation of each research question and conclusion. Second, from the conclusion, we will give policy recommendation for Indonesian Government in implementing fuel taxes policy to support road funding. Final part of this chapter will try to make a reflection of this thesis to see what the strength and the weakness of this research and what we can suggest for next researcher.

6.2. Summarizing Results

Road infrastructure need maintenance to keep it in its level of service. Maintenance need funds, but it always neglected by decision maker because doesn't give visible result. Government prefer to construct a new road then just maintain existing roads. Funds available for maintenance always didn't meet real necessity. It needs some strategies solution to add more funds. Decentralization has made regional government should find their own source of funds to finance road infrastructure. According to the newest Acts that have stated about road funding for maintenance, it can be implemented regarding to decentralization process in Indonesia by establishing Road Funds. Revenue sources for the road fund can be taken from regional/local taxes and levies. The increase of fuel taxes from 5% to 10% can be followed with some strategies such as earmarking that has also will be implemented to Vehicle License Tax to gain more money to support road funding.

The general objective of this research is to understand the fuel tax practice in Indonesia and the possibility to establish the road maintenance fund in Indonesia with fuel tax as revenue source. To fulfill the objective, the targets in this research are: To identify possibility of policy transfer, the road funding strategies, and the role of fuel taxes; to identify the characteristics of road funding strategy and the role of fuel taxes based on the cases in USA and New Zealand: to identify the current condition of road funding strategies and fuel taxes mechanism in Indonesia; and to identify the possibility to implement road funding in Indonesia by using revenue gained from fuel taxes and based on the general lessons of international road funds practice.

This research methods are literature study and document analysis. The research procedures are developed based on three main activities, which are literature review, data collection, and analysis. From the basic framework, these activities are conducted following several methodological steps. Literature review and data collection are done simultaneously to elaborate some countries and Indonesia's case. The analysis used in this study is narrative-descriptive analysis, and evaluative-explanatory analysis.

Related with the problem and the objective mentioned above, the research questions were raised and have been answered. Herewith we present the research question and how we answer the question.

What factors determine possibility of policy transfer? What kinds of road funding strategy have been done in several countries and what are the roles of fuel taxes?

Each country can learn through some countries experience in implementing a policy. However, to be able to transfer policy should consider the contextual differences among the countries. Similar condition tends to make policy transfer easier to conduct. The degree of the transfer called *Hybridization* if a country to learn from some elements of 2 countries. Main instrument of funding system in several countries are come from fuel taxes,vehicle registration fees and vehicle license tax. The funding mainly used to road maintenance although sometime also for new roads construction. Road Fund as an institution has been established in some countries to manage stable revenues from many funding instruments. Fuel taxes becomes the main sources of road funds in some countries. This taxes are relatively simple to administer and broadly accepted by public.

How do USA and New Zealand implement the road funding strategy and what is the specific role of fuel taxes for road funding?

Based on experience from New Zealand and The United States, we can conclude that from source and scope of funds and aspect, both countries get money for road fund from mainly fuel taxes, and there also contribution from motor vehicle registration fees, heavy vehicle tax. From institutional aspect, New Zealand has Transfund to manage road fund and the funds used to finance all public roads, different with Highway Trust Fund in USA that only finances highway network. Transfund has independent board to supervise the implementation of road fund by Transfund, but there is no independent oversight board in USA. From legal aspect, both countries have established some acts and amendments to support implementation of road fund and to gain public trust. From management aspect, both countries use reimbursement system to get the money. New Zealand also use a computer software to make judgments of road construction and maintenance quality. Fuel taxes have significant role to support road fund especially in The United States, by contributing around 90% of total funds in federal level and around 47% in state level.

What is the current condition of that policy in Indonesia case, how they get the fund, and what kind of problem that still occurs?

Indonesia has long history in decentralization process since the Dutch colonialism until Reformation era. Decentralization in Indonesia offers a stronger position for regional government in the organization and functioning of their own regions to increase regional income. The main institution responsible for road maintenance in Province/Regency/City level is Road Agency (or Public Works Agency) at regional/local level, cooperate with Finance Bureau, and Planning Agency. Some regulations have been enacted regarding to road funding, decentralization and regional/local taxation but some of them still wait for another lower level regulation as guidelines. The New Traffic and Land Transportation Act has give directives for Road Fund establishment and the new Regional Taxes and Levies Act has stated that 10% of the annual motor vehicle tax can be allocated to road maintenance. The Fuel tax tariff increased from 5% to 10% based on later act. Still it has to be considered how much of this fuel tax can be assigned to support the road fund.

What can Indonesia learn from USA and New Zealand, what kind of problem and advantages of doing this, and how should fuel taxes and road funding be implemented in Indonesia?

Based on New Zealand and the USA experience and also recent condition in Indonesia, it can be proposed that Road Fund should be established in Province level to support road maintenance funding in Provinces and Regencies/Cities Roads. New legislation has been an opportunity to accommodate the establishment of road funds, but must followed by some guidelines to implement it. Some sources of funds can be optimized as a component of this road funds. Fuel taxes can still be optimized to support the road fund for new Act allows the increase of fuel taxes rates. There are also opportunities for the region to impose a fuel levy as long as it meets the requirements. Before implementation, institutional capacity needs to be prepared in the province and regency/city level and also socialization to the community about the importance of road fund and increase in fuel taxes rate to get public acceptance.

Conclusion

To gain more revenue to support road maintenance funding in Indonesia, can be done by several ways. One of them is through Road Funds that main revenue is come from fuel taxes policy. Learned from New Zealand and The USA experiences, Indonesia can establish Road Fund according to Indonesia context especially decentralization context. In the decentralization era, where some taxes (including fuel taxes) also levied and managed by regional government, Road Funds will effective if started in province level. Road Funds act as independent board and supervised by an oversight board. The member of road fund management should representatives of government, private sector, and road users. The latest acts are strong enough as legal basis of Road Funds establishment, still it has to be supported by lower level regulation. Fuel taxes is a potential source of the Road Funds after increasing tax rates from 5% to 10%. It can be start by earmarking 10% of fuel taxes to support road funds, and gradually increase in the future.

6.3. Recommendations

Based on this research, I recommend establishing of Road Funds at the level of province. Road fund allocations are preferred for provincial/regency/city roads maintenance works. For development and improvement of roads also for national road handling will be done using general budget.

Mechanism of fuel taxes to support Road Funds is suggested as follows:

1. In the early stages of fuel taxes are counted 10% of fuel prices, according to the applicable act, but in the future should be gradually increased followed by the amendment of Act. Increase of fuel taxes aims to fuel economy, trip efficiency, encourage use of public transport, sustainable transport policy support as well as to increase regional income. Fuel taxes earmarking into the

road fund account could be implemented increased gradually from 10% to the value of fuel tax, then increase to 20%, 30% and so on.

2. Fuel taxes should apply the same rates in all provinces to avoid disparities and abuses of fuel because if there is a price difference there will be the possibility of smuggling fuel out of the area and will trigger social problems.
3. Fuel levy is applied according to regional regulations, collected and managed by the provincial government, shared the results with regency/city governments. The result of this fuel levy could be used all for the road fund account.
4. Every increase of fuel taxes causes intense public discussions and resistance. To reduce friction over an adjustment, public acceptance should be built through awareness campaign and the planning of long and predictable adjustment periods.

6.4. Reflection

This research is become interesting in using international experience comparison. The USA is representatives of first generation of Road Funds, and New Zealand is representatives of second generation of Road Funds. Both countries also have different government system and different implementation scheme. However, because of some different context between both countries and Indonesia, it has to be carefully to adopt their policies. It means not all element of policies can be adopted but some elements that match with Indonesia context maybe adapted with some requirements also. This research also focus on what can Indonesia learn from some elements of two countries (the USA and New Zealand) and try to find some useful learning to be adopt in Indonesia context.

This research only emphasize to fuel taxes as one of the revenue sources. The data used for the analysis is also too general. For further research, it will be better and give more explanation if there are discussions of other revenues sources such as vehicle annual taxes, vehicle registration fee, distance weight taxes, etc. The writer suggest that if we want to make a deeper analysis more, it should be prepared with better data from related agencies.

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