A NATIONAL POLICY FRAMEWORK FOR FINANCING DISTRICT ROAD MAINTENANCE IN INDONESIA

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Abstract

The thesis comprises part of a policy initiative within the Indonesian Government to improve district road conditions within the country. This research project has been commissioned by the Directorate General of Highways in Indonesia to seek and develop an appropriate policy framework for financing district road maintenance. The research has been supported by funding from the World Bank.

The premise of this study was that district road maintenance in Indonesia is rarely given adequate consideration in strategic planning. The research examines the root of the problems of road maintenance internationally, and in Indonesia in particular. There are many interconnected problems in managing road maintenance but they can be divided into two main interrelated issues, namely, institutional and financial aspects.

The research focused upon determining the necessary attributes of practical methods to solve road maintenance problems in Indonesia. Three models have been developed to address this problem. They are:

(1) A short-term reform model simplifying the road central grants mechanisms to district authorities. This model was implemented after the Indonesian General Elections in 1999.
(2) A medium term reform model involving creating a series of task forces.
(3) A long-term reform model involving creating a road maintenance fund. This fund would be overseen by a Road Maintenance Board consisting of a mix of representatives from the public and private sectors and would fully involve road users in road network management. The long-term reform model would also move road network management from a government environment to a private sector company environment.

These models have been built as a three-stage approach to solve the problem as a comprehensive package and without omitting one stage from any of the successive models. Each of the models was validated using the views of decision-makers dealing with road maintenance in Indonesia.

CHAPTER 6

CHAPTER 7

CHAPTER 8

CHAPTER 9

CHAPTER 10

Chapter 1. Introduction

1.1. Introduction

The classified road network in Indonesia has expanded rapidly in the past 25 years, from 82.129km in 1969 to 385,836km in 1996. The road network comprises 71% of district roads and maintenance of the road network up to now has concentrated on national and provincial roads. Road conditions at district road level are much worse compared to that for national and provincial roads, with changes in road conditions a critical factor in managing road assets. Physical treatments are designed to ensure that asset features and condition provide the desired level of performance. However, funding for road maintenance is inadequate and a serious effort is now required to solve the road maintenance issue in Indonesia.

1.2. Research aims

This thesis comprises part of a policy initiative within the Indonesian government to improve district road conditions within the country. The research project has been commissioned by the Directorate General of Highways in Indonesia to seek and develop an appropriate policy framework for financing district road maintenance in the country. In order to undertake this research the author has been supported by funding from the World Bank.

The research has been undertaken by:

1. exploring the issues of financing district road maintenance in Indonesia;
2. investigating the possibility of technology transfer, by comparing with the management of road maintenance in local authorities in England; and

3. investigating and comparing international experiences especially in developing countries with respect to road maintenance.

Based on the above, the thesis makes a series of recommendations that will:

1. improve current practices by adapting or developing an appropriate model or models for Indonesia; and

2. validate these models in Indonesia in order to make them applicable to that country.

Implementation of the policy framework developed within the thesis has already commenced as a direct result of this research.

1.3. The original contribution of the study

The original contribution of the thesis proposes a 3-phase process to solve the existing road maintenance situation:

1. Short-term policy reform, dealing with simplified budgeting systems for district roads and intensive monitoring of the implementation of road maintenance. This requires developing road prioritization based on a road hierarchy as a tool to allocate funds to district roads. The short-term phase will operate during the economic crisis (after the general elections of 1999 and at the beginning of 2000/2001 fiscal year). This has been undertaken by the Minister of Public Works and will start from fiscal year 2000/2001.

2. Medium term policy reform, creating a series of task forces which consist of a Project Management Unit at Central Government level and Project Implementation Units at regional level. The main job of the task forces is the coordination of the actors involved in the road maintenance decision process. Through greater coordination the fragmentation of the road budget (allocated through central grants) will be minimized. Increasing capacity building at

regional level through training or education should also take place. It is proposed to implement the medium term process after the economic crisis has been resolved. This aspect of the research model has been prepared by the Ministry of Public Works, and also involves asking the World Bank to reallocate some of the Public Works sector Loan within the government's Decentralization initiative.

3. Long term policy reform, creating a Road Maintenance Fund managed by a Road Maintenance Board. The Road Maintenance Board would consist of the public and private sectors. The involvement of the private sector through road users and road user associations is important in increasing its willingness to pay for roads. It is proposed that the Road Maintenance Fund should be separate from government budgets. The Road Maintenance Fund should be derived from fuel surcharges, vehicle licences and fines from overload vehicles. This will take between 7 to 8 years to implement.

More specifically, the short and medium term policy reforms are a direct contribution of this research and as a direct result of presentations made to senior people in Indonesia, the implementation of the Project Implementation Units (PIU) is to form part of a pilot project at regional level. 27 PIUs will be established as pilot projects.

1.4. Research methodology

The research methodology used in this study is a qualitative approach and is primarily concerned with model building, testing, validating and limited implementation. The research process has utilised a combination of literature and fieldwork, initially to develop preliminary models. Subsequently, primary fieldwork was undertaken to test the models in Indonesia. The study has adopted non-probability sampling with particular reference to purposive sampling, with questionnaires and interviews used in England for exploratory purposes to gain understanding of road management in a developed country. The questionnaire response rate was 46%.

The primary field research in Indonesia used a combination of presentation, discussions and document analysis. Hence, this study has adopted 'quasi action research' using the primary field research in Indonesia as part of this methodology such that the research models have been taken on board and have and will continue to be implemented in the future by the Indonesian Government.

The research problem statement is set out in Chapter 2; Chapter 3 sets out the literature review of international experience in road maintenance. To get a clear understanding, and as part of the learning process of what has been undertaken in a developed country, the researcher investigated English local authority road management, with the possibility of the transfer of technology explored in Chapter 4. Based on Chapters 2, 3 and 4, preliminary models are then presented. Since the study has adopted a process of explanation and model building the models have been tested and validated in the field to make them applicable for direct implementation in Indonesia.

1.5. Thesis structure

Figure 1-1 indicates that the thesis consists of 10 chapters. It was considered important to set out the research methodology after model building since the presentation of the thesis reflects most accurately the research process undertaken.

Chapter 2 describes the role of the Government of Indonesia in managing road infrastructure. The chapter discusses the current practice of managing road infrastructure from the financial and institutional aspects.

Chapter 3 is a critical review of international experiences in road maintenance both in developing countries and developed nations. It commences with a general description of road maintenance and its role in development. It then looks at the existing problems of road maintenance and the consequences of inadequate maintenance. Lastly, it discusses possible solutions to the problems.

Chapter 4 presents field research in England, combining a literature review of English local authorities' road policy and the results of exploratory fieldwork in county councils to enhance the author's understanding of managing roads in a developed nation.

Chapter 5 derives two policy framework models. One concerns modest reform and is categorized as a medium term reform option. The second model is for major reform, categorized as long term reform. The advantages and disadvantages of both models are also presented in this chapter.

Chapter 6 sets out the research methodology for the study. It discusses the choice between qualitative and quantitative research and provides a detailed explanation of the chosen research design.

Chapter 7 presents the primary field research for the thesis in Indonesia. The purpose of this chapter is to test the preliminary models and whether they will be applicable to Indonesia.

Chapter 8 presents refined models as a result of the validation study presented in Chapter 7. Subsequently, a 3-phase process is presented within the two initial preliminary models. The Medium term reform model is divided into a 2-phase process. One component of the model can be implemented during the economic crisis, a minor reform. The other component of the first model and the second model will have to wait until the effects of the economic crisis subside. The remainder of this chapter presents the action timetable for the modified two models, including the limitations of each being presented.

Chapter 9 presents the implementation of the research model in Indonesia and its progress.

Chapter 10 summarizes the main conclusions and discusses possible areas in which further research might be of practical value.

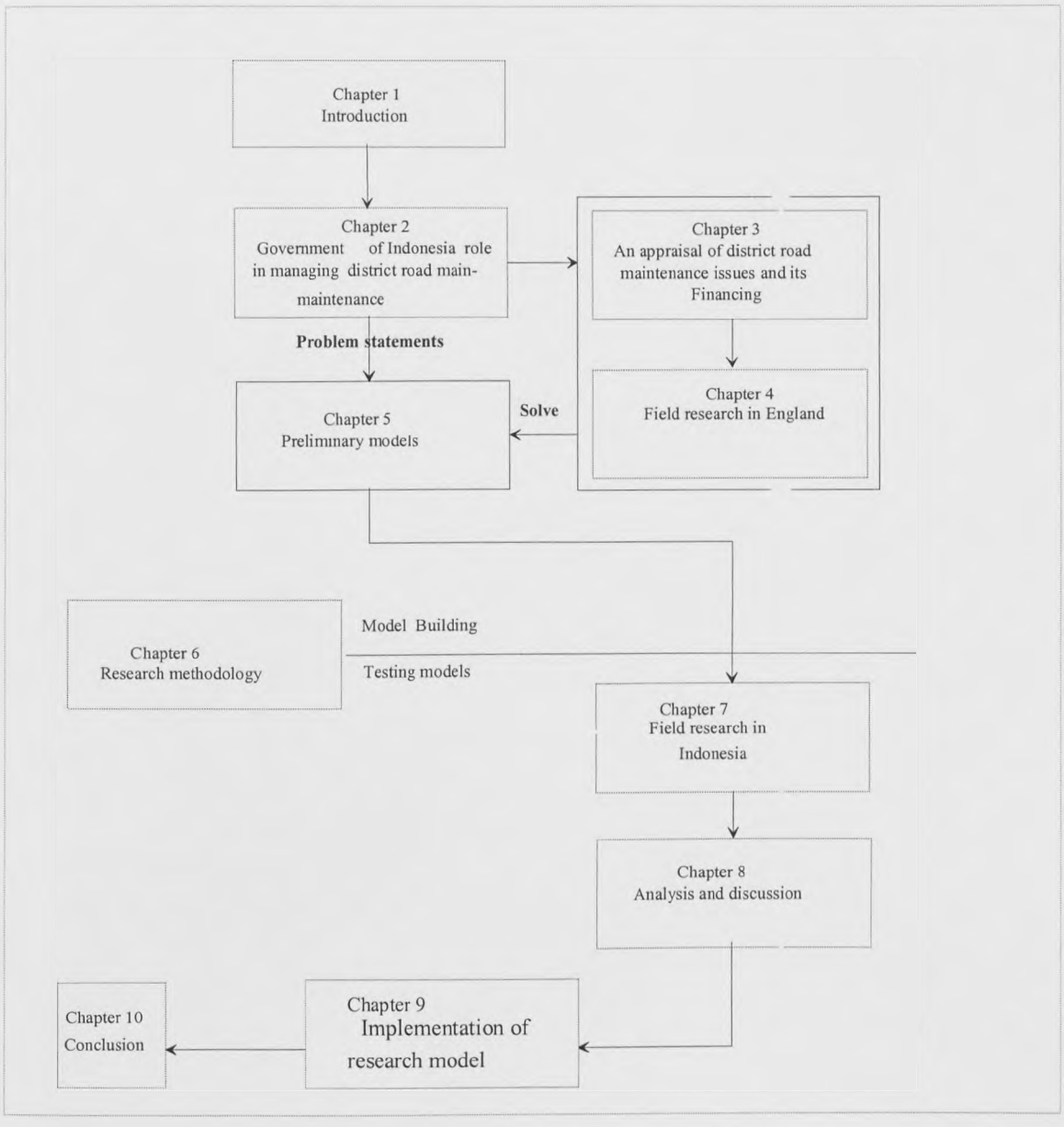


Figure 1-1 The structural flow chart of the thesis. [Source: Author (1998)]

Chapter 2. The Indonesian Government's role in managing district road maintenance

2.1. Introduction

The purpose of this chapter is to explore the way the Indonesian Government deals with local road networks, especially district roads in Indonesia, as well as explaining the current issues of financing district road maintenance. In order to explain district roads there is a need to briefly explain the Government's role in managing the road network in Indonesia. This chapter is a combination of literature review and exploratory fieldwork through interviews. Details on the method for undertaking the fieldwork are in the research methodology in Chapter 6.

Section 2.2 explains the road organisation in Indonesia. Section 2.3 explains the road conditions in Indonesia, indicating they are below its national standard. Section 2.4 presents progress on decentralisation and its constraints. Section 2.5 discusses the issues of financing district road maintenance in Indonesia. Section 2.6 presents a summary of the chapter.

2.2. Government organisation

Indonesia has a 3-tier regional administrative system. The first level, referred to as Daerah Tingkat I, consists of 24 provinces and 3 special districts (Jakarta, Yogyakarta and Aceh). A Governor heads each of the provinces. Each province is subdivided at the second level, or Daerah Tingkat II, into Kabupatens (Districts) that are headed by a Bupati, and into Kotamadyas (municipalities) that are similarly headed by a Walikota. Further administrative subdivision continues along the urban and rural divide. The Kabupaten are subdivided into kecamatan (sub districts). The kecamatan are

further divided into desas, which are basically villages and form the third administrative level, headed by a Kepala Desa. The government organisational structure is shown in Figure 2-1 below.

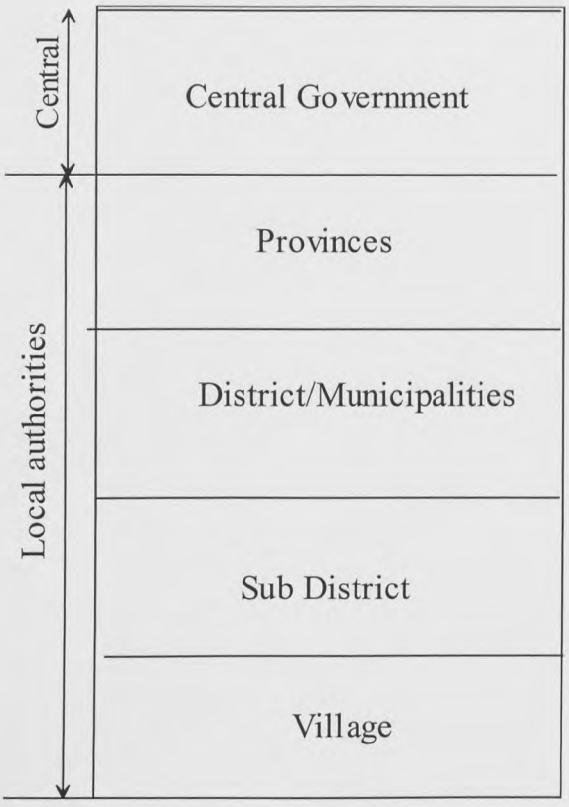


Figure 2-1 Diagramatic representation of the government's organisational structure in Indonesia. [Source: Kailani, 1994, The Government of Indonesia structures, pages 45]

Most of the government ministries have branch offices at provincial level. Central government officers staff the KANWILs and their operations are financed by the central government budget.

2.3. District road organisation

District road organisations in Indonesia can be seen in Figure 2-2 below.

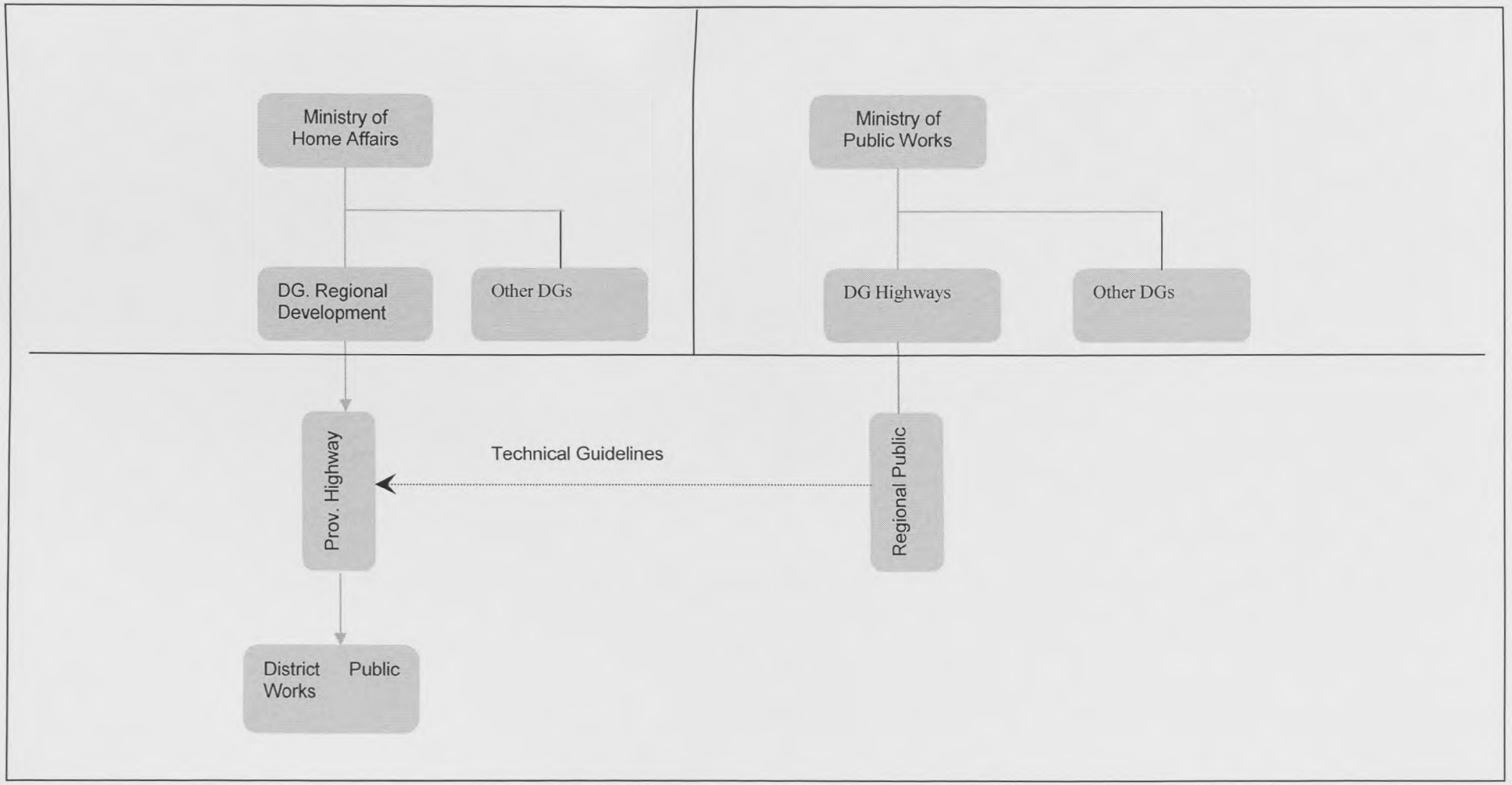


Figure 2-2The Organisational Structures of Local Road Authorities and their relation to the Central Government. [Source: Roads in Indonesia (1995), page 19]

The above figure shows that the Ministry of Home Affairs through to the Directorate General of Regional Development (DGRD) plays an important role in the district road sector. It has line functions to district road organisation. Both are responsible for regulating and monitoring the non-technical aspects of the central government grant program (Inpres program) to lower level government for regulating staffing and salaries, and for the appointment and supervision of provincial and local government's senior officers. The Ministry of Public Works, on the other hand, through the Directorate General of Highways is responsible for technical advice, guidance and setting policies for district road agencies. The Directorate General of Highways is also responsible for operational and technical policies and guidelines as well as for the general planning for all roads and the execution of all projects funded under the central budget. At regional level the road agencies are the Provincial Public Works office (DPUPs) and the District Public Works Office (DPUKs). In principle, DGH, DPUPs and DPUKs are responsible for national, provincial and district roads, respectively. However, the planning and implementation of the maintenance of national roads is now delegated to the DPUPs.

Although the division of work between the technical role of the Ministry of Public Works and the Ministry of Home Affairs is clear, there have been many ambiguities and inefficiencies at district road level in practice. In practice, the technical role of Directorate General of Highways and DPUPs who has been delegated the role of assisting and supervising of district governments was not fully recognised by all parties involved. Other problems are due to the Directorate General of Highways and DPUPs roles in the past, whereby they have only focussed on national and provincial roads. They do not have sufficient capability to work with district governments. District road agencies prefer to rely on the district chief e.g. the Ministry of Home Affairs' senior officer, rather than Public Works Department. The district chief is a politician, who tends to favour politically attractive projects - new road construction - rather than those that are less politically attractive, such as road maintenance. The other side of local-central relations is that at least five ministries deal with the district road organisations, as shown below in Figure 2-3.

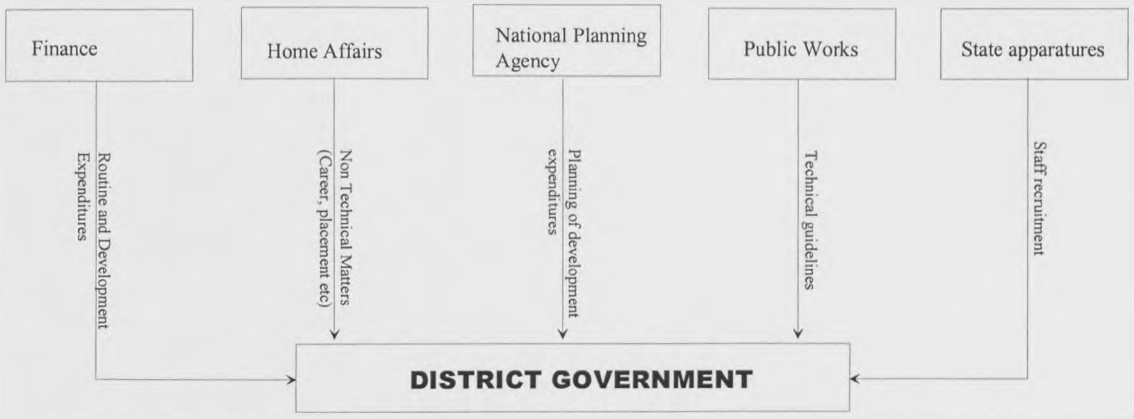


Figure 2-3 Central-local relations. [Source: adapted from Kailani (1994)]

The Ministry of Finance deals with all financial matters, such as routine and development expenditures. The Ministry of Public Works deals with construction and rehabilitation programs as well as technical guidelines for the Authorities. The Ministry of Home Affairs deals with the local authorities' career structures (promotion), placement and recruitment, together with the Minister of State Apparatus. The Bappenas (National Planning Development Agency) is responsible for the planning of development expenditure. All of these relations are an indication that local authorities are dependent very much on Central Government, even for staff recruitment. The World Bank (1995) indicated that the governmental and administrative structure in Indonesia is strongly centralised. When government administration expanded rapidly, the central government bureaucracy was extended to the regions by decentralisation. Sub national levels of government also have administrative arms (Dinas) at the provincial and district (Kabupaten) levels. Politically, the sub national structures (a legislative and an executive at the provincial and district levels) are also dependent on the centre, although they are technically autonomous.

The combination of a system of deconcentrated central institutions (KANWILs) with a parallel system of decentralised province and district institutions (Dinas) leads to duplication and overlap of responsibilities. Accountability in the system is upwards, not downwards. The district chief will

be accountable to the Governor rather than to his/her own people in the district, while the Governor will also be accountable to the President rather his/her own people in the provinces. Central government has relatively tight control and jurisdiction. The lower levels owe their position, salaries and most of their powers, to higher levels and are naturally oriented to those above them rather than those below.

2.3.1. The importance of district roads

Indonesia, as the world's largest archipelago, extends some 5,100 km from east to west and 1.800 km from north to south. It has a land area of about 1.9 million km^2 with a wide diversity of geographic conditions. The population was over 200 million in January 1997 and is very unevenly distributed, with extremes ranging from a density of over 800/km^2 in Java to less than 4/km^2 in Irian Jaya. Despite high growth, about 70% of the population still live in rural areas. Agriculture remains a key sector in the Indonesian economy; it accounts for about 20% of non-oil exports (including timber) and provides employment to more than 50% of the population. Indonesia is divided into 27 provinces and consists of 13,700 islands. The Indonesian map is shown overleaf in Figure 2-4.

Figure 2-4 Map of Indonesia [Source: Indonesian Statistical Office (1996)]

Road infrastructure is needed to transport agricultural goods from districts to the market. Without roads it would be difficult to carry goods either out of or into the districts. It is important to maintain existing district roads. Without proper road maintenance they will deteriorate to a state where they become impassable. Once roads become impassable it is difficult for farmers to sell agricultural products outside their area. If this happens for more than 2-3 days, produce will be spoiled due to delays in moving it to the market. Roads in a poor condition are unsafe and consequently the transportation costs from farm to market will be increased. This leads to increases in the prices of products. Sometimes, if the conditions remain poor for a long time, it is difficult for the people who live in these areas to get daily provisions.

A road hierarchy in Indonesia was stated in the government decree No. 26 of 1995 as can be seen in Figure 2-5 overleaf:

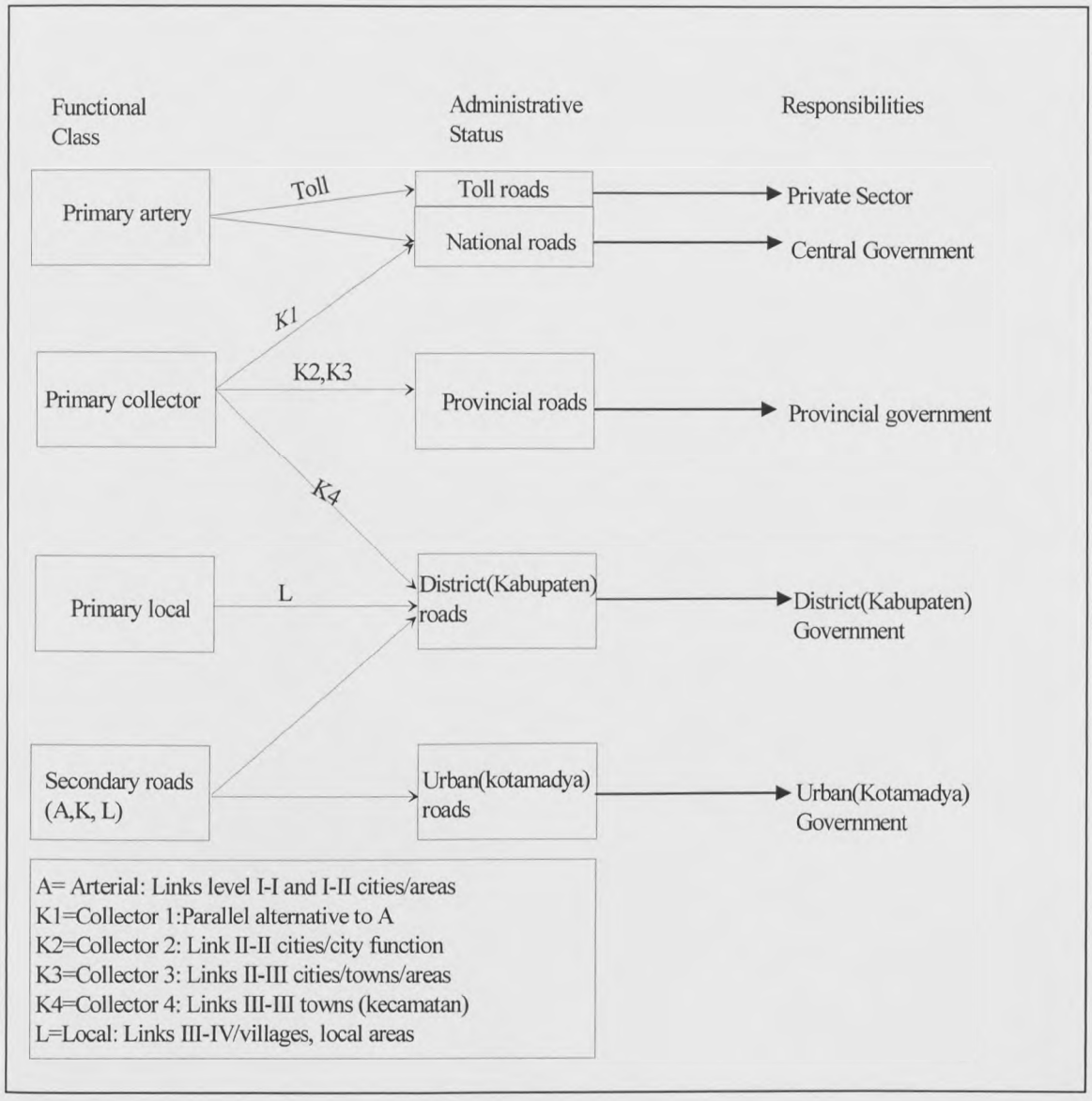


Figure 2-5 Road type and organisation [Source: Adapted from Government decree (PP) No. 26 (1995)]

Using Figure 2.5, district roads are in the third level, coming below national and provincial roads. National and provincial roads are prioritised through their own road management program. There is no standard for district road prioritisation, with each district government level having its own prioritisation.

2.3.2. The road investment and maintenance strategy

To understand road investment and maintenance policies there is a need to look at transport systems as a whole.

Roads exist to transport and move people as passengers or freight from one place to the other by motor vehicle. Road transport systems consist of "costs related to the vehicles" and "costs related to the road" (Schliessler and Bull 1993). "Vehicle related costs" consist of fuel, spare parts, repair, and amortisation of original purchase and, for commercial vehicles, include the driver's salary. "Road related costs" consist of the original cost of road construction and other cost interventions to keep the road functioning. The latter involve mainly maintenance activities. Both costs should be taken into account when roads are being built.

The decision to build roads should be based on the flow of traffic. If the expected traffic is only a few vehicles per day, then a simple track such as a gravel road will be more economical than paved roads. The road investment and maintenance strategy for district roads principally follows the national policy for roads. Road construction and rehabilitation is financed from the development budget. Up to 1990 in Indonesia the road maintenance budget was raided to finance the construction of new roads. This has happened either at the budget allocation stage by district authorities or by the Ministry of Finance or from the diversion of local funds due to political pressure. From a political viewpoint construction of new roads,, or the widening from two to four lanes, requires far greater expense and benefits more contractors. Landowners sell their properties for the road's right of way. Companies that specialise in planning, design, engineering, landscaping, earth removal, and other fields can all obtain contracts. Developers and land speculators profit from increased land value when a new road is built adjacent to their land. Consequently, many politicians benefit from the generous donations of developers and the construction industry. They also take credit for newly opened stretches of highway. On the other hand road maintenance can be labour-intensive; there are only limited professional disciplines and companies that can get involved.

The balance between the construction of new roads and maintenance is similar in process to those involving political considerations (new construction instead of maintenance) since in economic terms the consideration is one of choosing maintenance over new construction because of a higher IRR. The balance between new construction and maintenance is tackled within the "Interurban Road Management Systems (IRMS)". For district roads, however, up until now there are still traditional individual systems at local level.

Design of district roads is cheaper compared with provincial and national roads since design is related to the traffic flow. The government is aware that low traffic at district level means that they will pay more for the road compared to its use. However, it is possible to build 'low maintenance' roads. This may mean that the surface may last 40 years or more without major maintenance works. However, the initial costs of this type of construction is extremely high and there will still be minor work to be carried out each year to keep the road serviceable. This type of road can usually only be justified where traffic flows are many thousands of vehicles per day. For the 'low cost', affordable road, which serves most communities in a district, there is an inherent ongoing maintenance requirement. Therefore, government policy for district roads is one of building them cheaply in line with traffic flows and, once there is an increase in traffic beyond certain limits, there should be capacity extension in line with road design. This method, in the end, will be expensive. However, due to current government management district roads are still built according to traffic volume. Hence, out of the total district roads in Indonesia only 50% have been paved, the rest are either still gravel or earth roads.

2.4. Road conditions

The easy way to assume whether road maintenance is under funded is by inspecting the condition of the road. If the road condition is poor, or very poor, then that signifies that the road

maintenance is under funded, or there is the possibility that the road agency has postponed the road maintenance. Technical terms for the road conditions are described below:

2.4.1. Definition of road conditions

Country road conditions have been categorised into three classes: good, fair and poor, both for paved and unpaved roads. Mason (1985), and, Mason and Miquel (1986) define road conditions as follows:

- **Good**. If the road is free of defects, then there is a need to clean road drainage, side slopes, roadside cleaning and other minor work. Routine maintenance for unpaved roads will be grading and spot repair works. The costs of routine maintenance for national, provincial and district roads, based on FY 97/98 are: the routine maintenance price for primary arterial Rp. 10.000.000, collector Rp. 4.000.000 and local roads Rp. 2.000.000 per km.

- **Fair.** If paved roads start to have significant defects there will be weakened structural resistance. In this case strengthening of the pavement is required. Unpaved roads would require grading and additional new gravel, plus drainage repair in some places. This type of work is called resurfacing or strengthening (periodic maintenance). The costs of periodic maintenance based on FY 97/98 are as follows: the primary arterial Rp 52.000.000, collector Rp 40.000.000, while for local roads Rp 10.000.000 - 17.500.000.

- **Poor.** If the road condition starts to show structural defects, then immediate rehabilitation is needed; this includes the demolition and removal of deficient sections while unpaved roads will require rehabilitation and repair of drainage. The costs of reconstruction are: for the primary arterial Rp 412.000.000, collector Rp. 230.000.000, and for local roads Rp 45.000.000 - 87.000.000.

- **Very poor.** Very poor conditions refer to roads that are mostly impassable especially during the rainy season. This will require **reconstruction** of the road and will cost much more than the rehabilitation.

The different forms of maintenance (routine, periodic and rehabilitation) should be complementary, as each of them will have limited benefits. The relation between the types of maintenance can be illustrated as follows:

If the routine maintenance time is due but not carried out, drainage will be ineffective and surface defects worsen. This will penetrate the structure of the road. The consequences are obvious; the road will need periodic maintenance prematurely. This will cost at least 12 times more than routine/recurrent maintenance. If periodic maintenance is not carried out soon major deterioration will take place and will lead to rehabilitation, which is at least 15 times more than the cost of periodic maintenance (Robinson 1988). The important point is that proper maintenance can reduce road deterioration as long as possible. Robinson presented a simple calculation of the consequences of diverting road maintenance to the construction of new roads. At the end of his calculations, he showed that the result of diverted costs of 200 km of new road resulted in a loss of almost 900-km of existing roads.

Based on Repelita V guidance (Government of Indonesia 1994), the road conditions in Indonesia can be divided into ***stable,*** a combination of good and fair condition for roads, and ***unstable,*** a combination of poor and very poor condition for roads.

2.4.2. Road conditions based on the World Bank report 1988

In the World Bank study of 1988 it was shown that only a third of the countries studied had main paved networks in good condition. The results of 35 out of 85 countries that have been studied are indicated in Figure 2-6, below.

Countries catagories of road maintenance policies

Category	Countries	Indication	Action should be taken
I	a. Chile b. Republic of Korea c. Malawi d. Niger e. Yemen Arab Republic	Used resources for road maintenance in a cost effective manner. It has a serviceable road network	Sustain policy, by accurate prioiritized roads, maintain existing institutional capacity, technology transfer and operational efficiency
II	a. Brazil b. Indonesia c. Kenya d. Nigeria e. Yugoslavia	Underfunded road maintenance, inadequate in quality or quantity	Reallocating domestic and external resources within and to the road sector. Greater emphasis to policy reform to expand institutional capacities and increasing road budget
III A	a. Benin b. Burundi c. Liberia d. Mali e. Senegal f. Nepal	Large backlogs of rehabilitation and maintenance	Priority to resurfacing and strengthening paved and unpaved roads and to build institutional capacities
III B	a. Bolivia b. Ghana c. Laos d. Madagascar e. Siera Leone f. Tanzania	Large backlogs of rehabilitation and maintenance	Need massive rehabilitation. Restore aging road infrastructure and building the institutional capacity in the road Sector
IV	a. Bangladesh b. Burma c. China d. India e. Pakistan	Obsolote network and maintenance technology	Mobilize domestic and extensive resources for modernization. Need emphasis on technology transfer, institutional improvements and development of skills

Figure 2-6 Country categories based on road conditions. [Source: Harral and Faiz (1988), Road deterioration in developing countries: causes and remedies; page 33]

The main reasons for focusing only on main road networks are 2-fold:

1. Main roads are the most important and traffic flows should be highest compared to the other types of road in the countries studied.

2. There were difficulties in getting accurate data from local authorities' roads at that time.

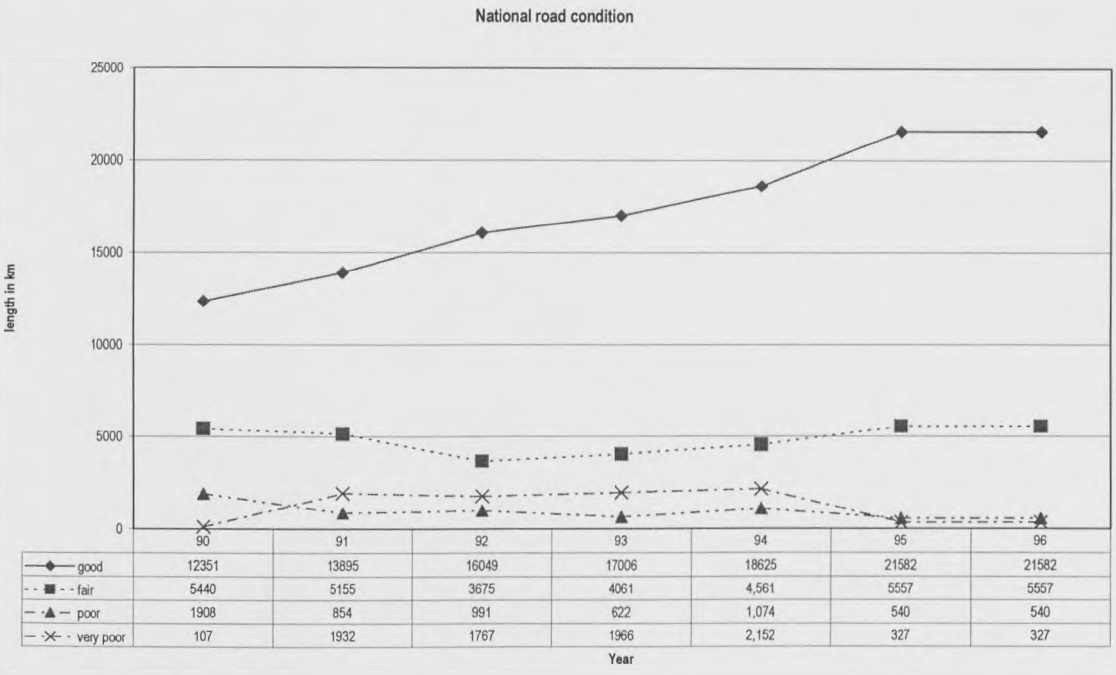
Conditions for main roads in Indonesia at that time (1985 data) were as follows:

- Good (26.8%);
- Fair (36.8%), and,
- Poor (36.4%).

Based on the data available, district road conditions for FY 1986/1987 (DGH 1990) indicated only a third of the district road network was in good and fair condition, while the rest was in poor and very poor condition. As a result of the study on Indonesia, the World Bank recommended shifting the other road programme budgets to road maintenance for at least between 5 to 10 years. The World Bank recommendation has been put forward to the Government, and much effort has been made to repair or improve road conditions since 1989. The results are seen below.

2.4.3. National road conditions; 1990-1996

Since 1989/90 the Government has been trying to improve existing roads by reallocating road budget programs to the rehabilitation of roads, as shown in Figure 2-7 below.



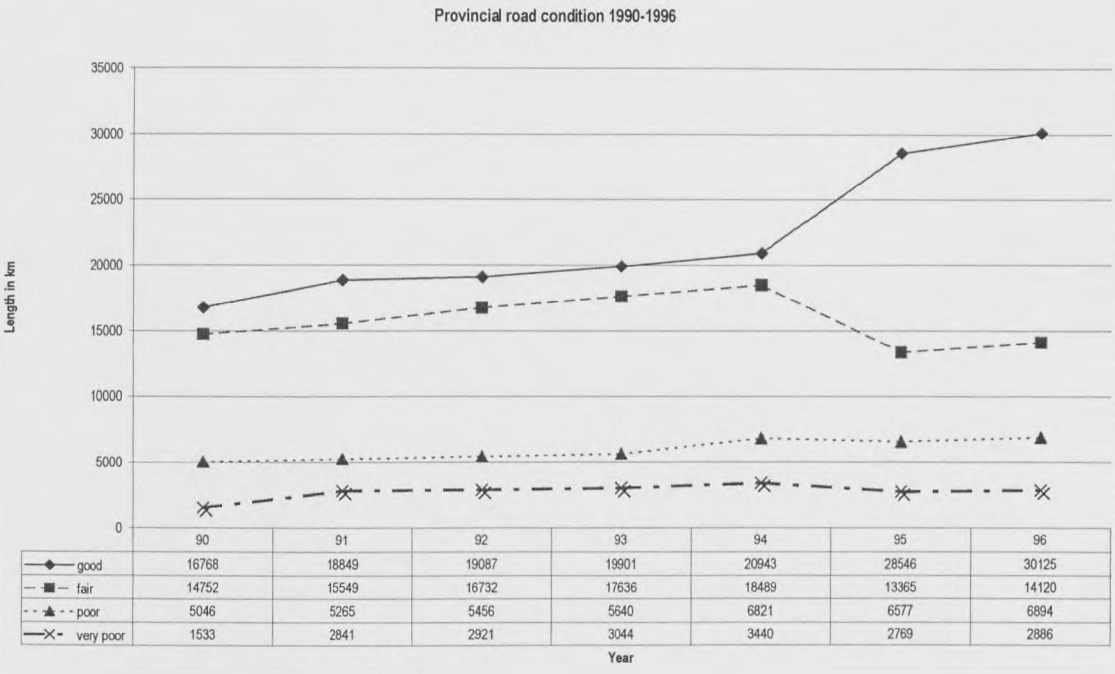
	90	91	92	93	94	95	96
good	12351	13895	16049	17006	18625	21582	21582
fair	5440	5155	3675	4061	4,561	5557	5557
poor	1908	854	991	622	1,074	540	540
very poor	107	1932	1767	1966	2,152	327	327

Figure 2-7 National road conditions 1990-1996. [Source: National Statistical Office (1990-1996)]

Comparing the studies of 1988 and 1996, significant changes in national roads can be seen from Figure 2-6, where road conditions were good roads - 77%; fair -20%; and poor - combining poor and very poor – 3%. This is due to government policies towards national and provincial roads. From 1984/85-1988/89 the government put emphasis on road transport and some 60% of the total transport sector investment budget was directed to road and bridge programmes. This has led to major improvements in the quality of the road network. The funding of roads during that period was from a World Bank loan. Most of the road works refer to rehabilitation and improvement, hence the number of poor and fair roads declined and the number of good roads increased dramatically.

2.4.4. Provincial road conditions

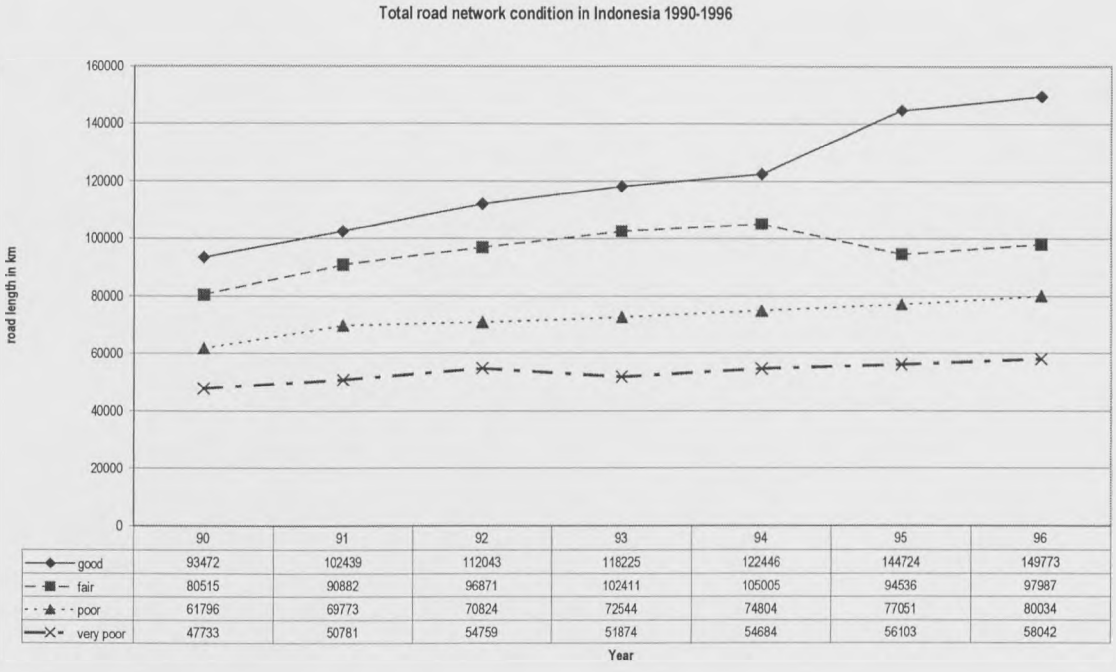
The provincial road conditions can be seen below in Figure 2-8:



	90	91	92	93	94	95	96
good	16768	18849	19087	19901	20943	28546	30125
fair	14752	15549	16732	17636	18489	13365	14120
poor	5046	5265	5456	5640	6821	6577	6894
very poor	1533	2841	2921	3044	3440	2769	2886

Figure 2-8 Provincial road conditions 1990 –1996. [Source: National Statistical Office 1990-1996]

In 1992/1993, through the World Bank loan for the road sector, the government also rehabilitated provincial roads. Therefore, the number of fair roads declined while at the same time good roads increased. In 1996/1997 provincial road conditions were: good roads - 56%; fair roads - 26%; while poor – combining poor and very poor – was 18%. However, for the total road network the road conditions can be seen from Figure 2-9, below:



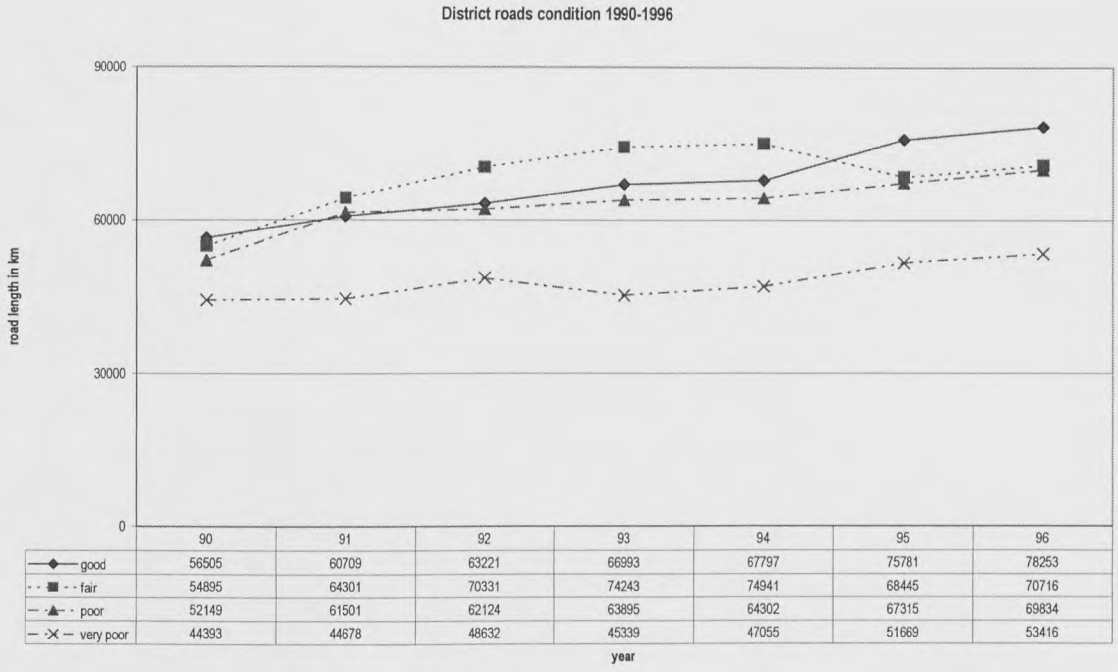
	90	91	92	93	94	95	96
good	93472	102439	112043	118225	122446	144724	149773
fair	80515	90882	96871	102411	105005	94536	97987
poor	61796	69773	70824	72544	74804	77051	80034
very poor	47733	50781	54759	51874	54684	56103	58042

Figure 2-9 Total road network conditions 1990-1996. [Source: National Statistical Office 1990-1996]

The total road network consists of the following condition roads: good condition - 39%; fair - 25%; poor (poor and very poor) - 37%. This is because the majority of the road network comprises district roads (70.7%).

2.4.5. District road conditions

In the roads sector alone in 1989, based on the district road study undertaken by the government, only one quarter of the district roads were in good condition. This is due to shortage of funds, cumbersome procedures for channeling funds, shortages of experienced engineering staff and, in some cases, under-design and poor construction of roads in relation to evolving traffic conditions. Compared to the FY 1986/87 the condition of district roads is now better. Roads in good and fair condition are 54%. Figure 2-10 overleaf shows district road conditions:



	90	91	92	93	94	95	96
good	56505	60709	63221	66993	67797	75781	78253
fair	54895	64301	70331	74243	74941	68445	70716
poor	52149	61501	62124	63895	64302	67315	69834
very poor	44393	44678	48632	45339	47055	51669	53416

Figure 2-10 District roads condition 1990-1996. [Source: National Statistics Office 1990-1996]

Only 29% of the total district roads are good, whilst 26% are fair and 45 % are poor (poor and very poor). This is below the national standard. The figures also show that maintenance performance has been so lacking that only one third of the relatively new all-weather roads are now in good condition, and 46% have deteriorated into a poor condition. Furthermore, this show that maintenance has failed to achieve the Repelita VI (Government of Indonesia 1994) goal of 60% in stable condition.

The next section explores the issues associated with decentralisation.

2.5. Decentralisation and its constraints

There are at least three varieties of decentralisation to local authorities (Bird 1994). ***Deconcentration*** means as a dispersion of responsibilities within a central government to regional

branch offices. ***Delegation*** refers to a situation in which local government act as agents for the central government, executing certain functions on its behalf. ***Devolution*** refers to a situation in which not only implementation but also the authority to decide what is done is in the hands of local government.

Decentralisation in Indonesia started in 1974, by the issuance of Law No. 5 of 1974 (concerning the basis of the regional government). However, the implementation is still far from what was expected. Deconcentration started when the government expanded rapidly. During the 1970s and 1980s the central government was extended or deconcentrated to the provinces and district levels. This branch will carry out national government policy and programs. Delegation is now in progress and many central government functions have been delegated to the local authorities. The central government has started to decentralise many of the Directorate General of Highways functions, including the transfer of appropriate staff to the provincial public works.

The government established a framework for further decentralisation of functions to the district level in Government regulation no. 8 of 1995. These regulations built on the earlier Government regulation No. 45 of 1992 (Implementation of regional autonomy with emphasis on second level regions) which established the basic functions, which were to be transferred gradually to district and provincial levels. Government regulation no. 8 of 1995 established a pilot program for transferring these functions to one district in each province of the country.

The government divided the country's road network into roads of national importance, the national road network and local or regional network. Based on the table below it was shown that "other primary roads" are still under the Central Government's discretion while other types of road are under district responsibilities.

Road authority arrangements

Road status	Road function	Preparation of targets			Implementation		
		long term planning	Med. Term planning	Program	Design	Construction	Maintenance
National roads	PA	DGH	DGH	DGH	DGH/DPUP	DGH/DPUP	DGH/DPUP
	PCAP	DGH	DGH	DGH	DGH/DPUP	DGH/DPUP	DGH/DPUP
	Strategic National	DGH	DGH	DGH	DGH/DPUP	DGH/DPUP	DGH/DPUP
Provincial roads	PCPDM	DGH	DGH	DGH	DPUP	DPUP	DPUP
	PCAD/M	DGH	DGH	DGH	DPUP	DPUP	DPUP
	Strategic provincial	DGH	DGH	DGH	DPUP	DPUP	DPUP
Provincial roads in Jakarta	PRN	DGH	DGH	DGH	DPUP	DPUP	DPUP
	SRN	DKI	DKI	DKI	DPUP	DPUP	DPUP
District roads	OPC	DGH	DGH	DGH	DPUK	DPUK	DPUK
	PL	DGH	DGH	DGH	DPUK	DPUK	DPUK
	SRND	District	District	District	DPUK	DPUK	DPUK
	Strategic District	District	District	District	DPUK	DPUK	DPUK
City roads	SRNM	Municipalities	Municipalities	Municipalities	DPU Kotamadya	DPU Kotamadya	DPU Kotamadya
Village roads	VRN	District	District	District	District	District	District
Toll roads	Primary Arterial/ Secondary arterial	DGH	DGH	DGH	Jasa Marga	Jasa Marga	Jasa Marga
Special roads	Special roads	Concerned agency	Concerned agency	Concerned agency	Concerned agency	Concerned agency	Concerned agency

DGH : Directorate General of Highways
DPUP : Provncial Public Works Authority
DPUK : District Public Works Authority
OPC: Other primary collector
PL: Primary Local
PA: Primary arterial
PCAP: Primary arterial adjacent provinces
SRNM: Secondary road network municipalities
VRN:Village road network
PCPDM: Primary collector connecting provinces with District/Municipalities
PRN: Primary road network
SRN: Secondary Road Network
SRND:Secondary road network on district

Figure 2-11 The road authorities in Indonesia. [Source: Government of Indonesia (1994), Road users study page 23]

Despite the government's willingness to decentralise part of their functions, this should also be followed by fiscal decentralisation. Delegation or decentralisation of both revenues (fiscal) and expenditures is important to make provincial and district government have more responsibility, both for deciding spending priorities and for raising revenue through taxes and/or user fees. However, the success of fiscal decentralisation will depend largely on the institutional capacity of the local governments to use resources efficiently and effectively. This long-term goal should be achieved by:

1. minimising the lack of co-ordination between at least three levels of institutional responsibility for planning, budgeting and implementation in Indonesia. This eliminates overlapping responsibilities;
2. transparency and accountability;
3. salary of civil service; and
4. training.

2.5.1. Recruitment of Engineers for District roads

Under the existing procedures, the recruitment for district engineers is done by the Central Government (Ministry of Home Affairs and Ministry of State Apparatus). The rationale behind this idea is to strengthen district road agencies. Based on the data available from district road agencies, the central government prepares for the recruitment of engineers to be allocated to district roads. The recruitment of 487 newly graduated engineers throughout Indonesia originally was an effort to provide concrete technical support to the districts. Since recruitment is centralised many problems have appeared such as the reluctance of district government to employ the new engineers or engineers being unwilling to be moved to the eastern part of the Indonesian islands.

2.5.2. Fiscal arrangements

Public revenue and expenditure is highly centralized. Central Government revenue financed some 67% of local authorities in 1993/1994 as can be seen from Figure 2-12 below.

1	Central transfer	67%
2	Local government financing	3%
3	Local taxes	8%
4	Local non tax	13%
5	Share in Central Revenues	9%

Figure 2-12 Financing of Local Government expenditures, 1993-1994. [Source: Bappenas 1995: National 2nd Long Term Development Plan]

The consequences of centralisation will cause preferences for working in central government rather than in district government. There is no effort by the district government to mobilise its own revenue and this will cause an increasing burden on central government.

The centralisation of revenue and expenditure is high by international standards. Figure 2-10 shows the ratio of local government revenues to local government expenditures as a proportion of total revenue and expenditure for 11 countries. From that Figure Indonesia ranks the lowest in total national revenues represented by local governments' own source revenues. At the other extreme, the proportion of local government expenditure to local government revenue is the highest of those countries as shown in the Figure 2-13 below.

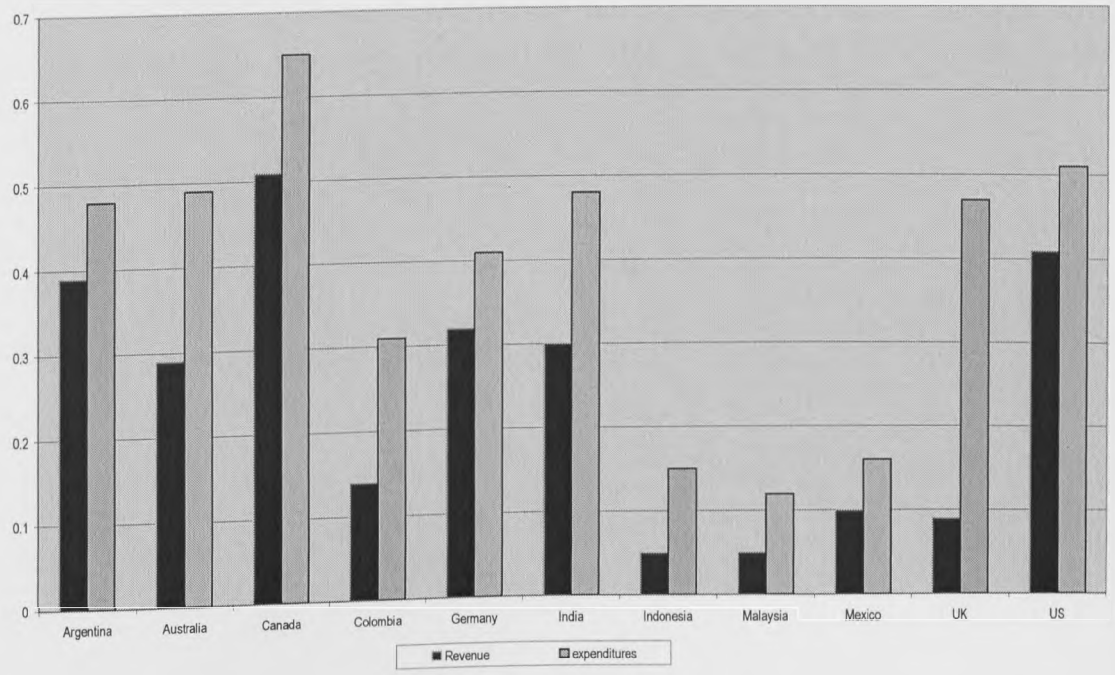


Figure 2-13 Local government revenues and expenditures as a proportion of the national total. [Source: Shah and Qureshi (1994) page 46]

As can be seen in Figure 2-14 below, the degree of fiscal control of central government in Indonesia is also high by international standards. A measure known as the "coefficient of vertical imbalance" indicates the degree of central government fiscal control. Total central control is

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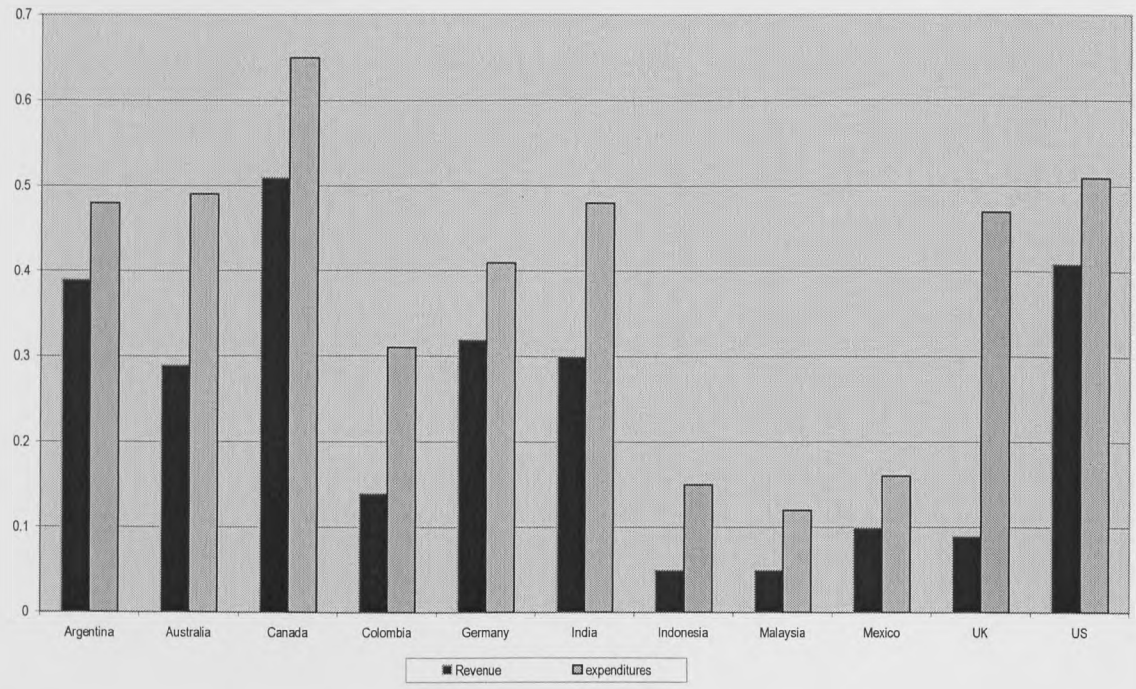

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represented by a coefficient of 0 and total autonomy of sub national government is represented by a coefficient of 1. Indonesia has a small number of vertical imbalances compared to the other countries.

Country	Period	Coefficient of vertical imbalance
Indonesia	1990	0.19
Australia	1987	0.43
India	1982-1986	0.45
Colombia	1973-1983	0.50
Pakistan	1987-88	0.53
Malaysia	1984-1988	0.53
Canada	1988	0.79
Germany	1988	0.79
United States	1988	0.88
Brazil	1988	0.89

Figure 2-14 An international comparison of coefficients of vertical imbalance. [Source: Shah and Qureshi (1994)]

The next section explores the planning and programming of road infrastructure.

2.5.3. Planning and Programming of road infrastructure

Considerable attention has been given in recent years to improving the planning and programming of public expenditure on road transport. A sophisticated computer based road pavement management system (IRMS), designed to optimise the selection and programming of treatments for individual links, has now been implemented for national and provincial road networks. Much simpler manual procedures have been implemented to improve the planning of work on district

(rural) roads. Unlike the national and provincial road networks, the district road network management systems have been developed slowly. The reasons are that the district should provide the hardware (computers) and their peripherals. In 1997, fieldwork in West Java Provinces indicated that out of 21 Districts of West Java, 10 districts still use Lotus programs to do reports, 11 districts used Excel 5. The district systems still have serious deficiencies related to data and especially traffic counts provided by district governments.

2.6. Financing aspects

2.6.1. Sources of funds

Swaroop (1994) indicated that the total revenue accruing to government from road users is mainly from indirect taxes and provincial government fees. Indirect taxes come from vehicles, parts and fuel, while from provincial government; fees for vehicle registration and ownership transfer have been in line with the level of spending on the public road network in recent years. All 3 main forms of road user taxes are: (a) purchase related including import duties, VAT and, in some instances, luxury goods sales tax on new vehicles, and ownership transfer tax when vehicles change hands. (b) Ownership related including the annual registration fee. (c) User related including import duty and VAT on spare parts, tyres, lubricants, and implicit tax elements on the pump price of gasoline and toll fees.

However, it is unclear whether all the indirect taxes levied were designed to recover the costs of road usage. Some of these taxes (e.g. value added tax, import duties, luxury import tax etc.) are levied to generate general fiscal revenue to support the government's overall expenditure plans or as part of its trade and industrial policies. In Indonesia the current structure of annual vehicle registration tax is based on type and age of vehicle and its engine capacity, which does not reflect

the road damaging power of vehicles; in particular, the level of vehicle registration tax is too low for trucks.

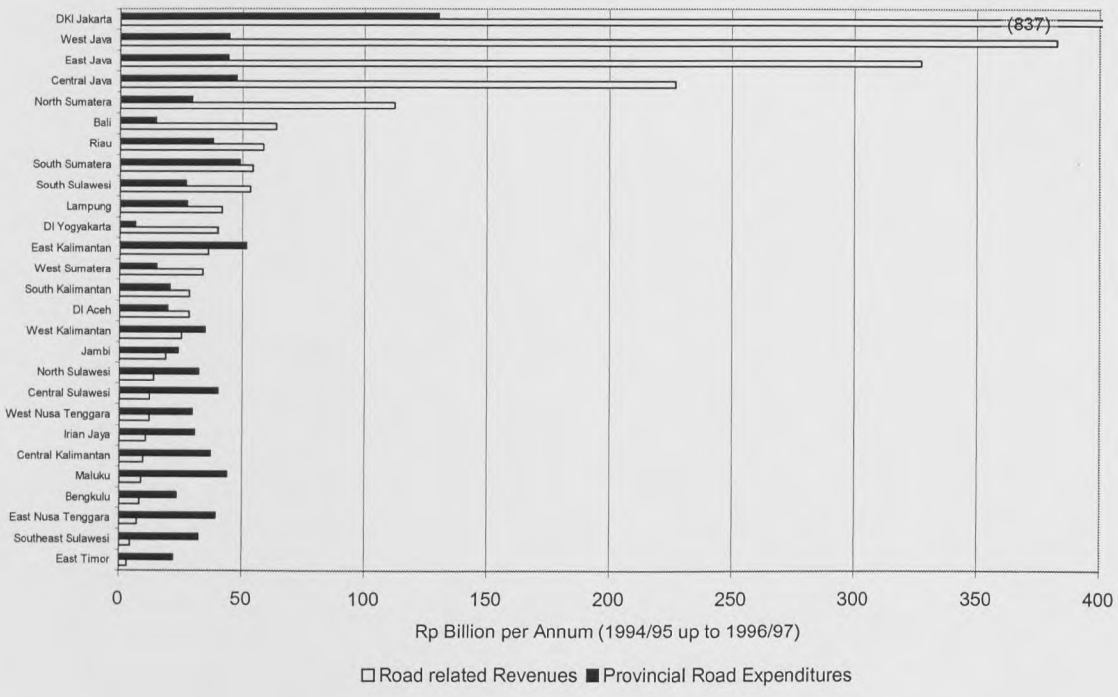


Figure 2-15 Ration of Road User Taxation to Road Expenditure. [Sources: data for 1986/87-1991/92 from LTDP II study, data for 1992/93-1995/96 and Road Expenditures from Bina Marga (1997)]

The road user tax in Indonesia comprises of the following elements:

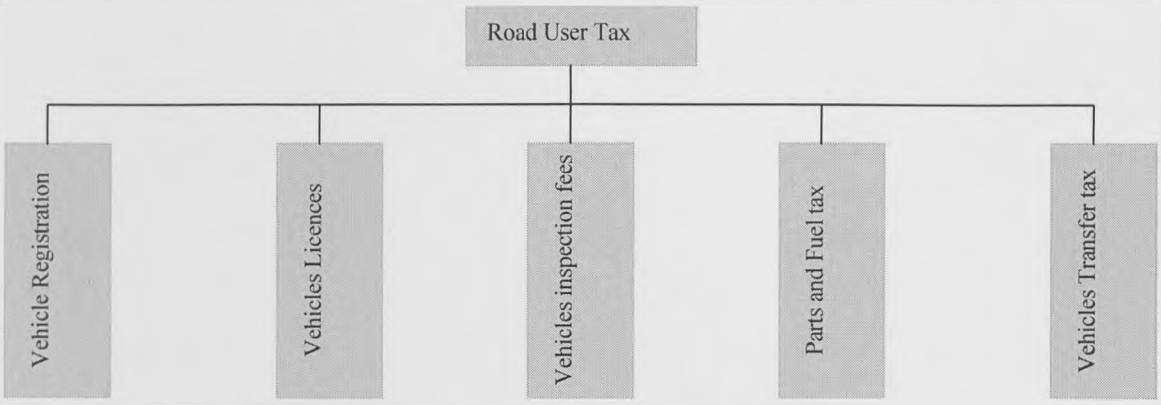


Figure 2-16 Road user tax elements. [Source: Shah (1994), page 24]

2.6.2. Financing district road

District road funding comes from at least three different sources (DGH, 1995): central grants, local authority revenues and foreign loans. The central grant budget divides into development and routine expenditures. The routine part pays for the basic remuneration of personnel in authorised posts and comes from routine grants from central expenditures. Routine grants are under the title of "Subsidi Daerah Otonom" or SDO. The SDO collectively accounted for 54% of the total of all central grants to sub national levels of government (BPS 1996), 93% of the SDO is allocated to finance basic remuneration (salary and allowances) of Provincial and District administration staff occupying authorised posts. The remaining balance goes to operation and maintenance of primary schools, hospitals and tourists facilitates. The Department of Home Affairs is the central agency principally responsible for determining the allocation of the SDO.

Under the development part of the budget, 1of 3 sources can be funded:

1. The general development grant from centre to the regions - Inpres dati I and Dati II – respectively, of which traditionally a high percentage has been used for primary roads.

2. The specific development grants for roads - Inpres Jalan Propinsi (IPJP) and Inpres Jalan Kabupaten (IPJK) - for district roads.

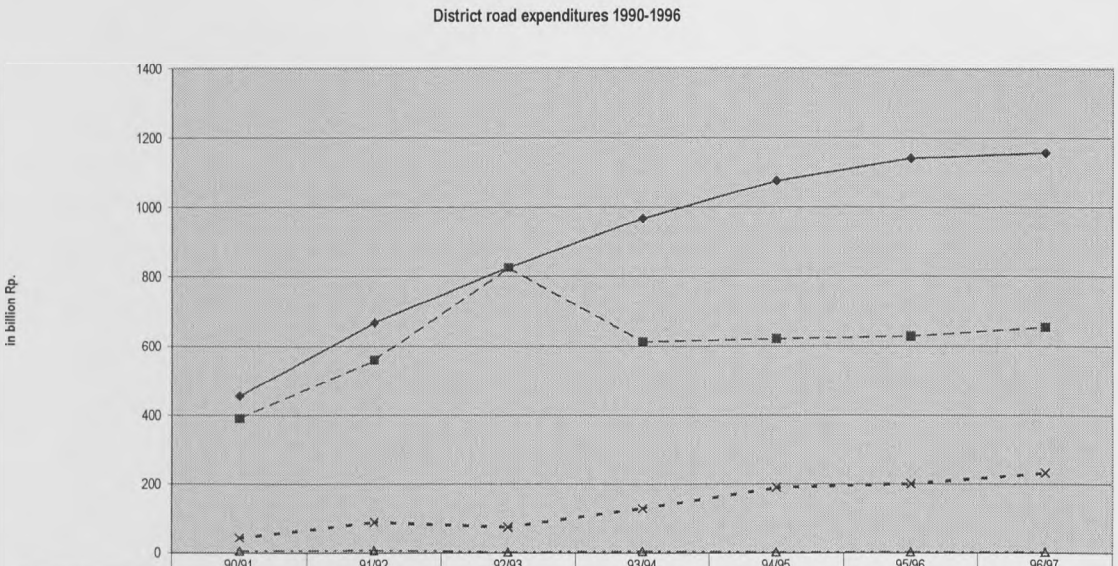
3. The Provincial and District/municipalities government's own or shared revenue.

Provincial Governments frequently contribute financing from regional budget I (APBD I) for projects and services, which fall within the field of responsibility of Regional Government II (Kabupaten/district) either by implementing projects themselves or in the form of finance grants.

Provincial (Dati I) and District (Dati II) governments derive revenue from a variety of local taxes, charges and miscellaneous local sources, and from shares of central government revenue collected within their areas.

Provincial government and districts are permitted to borrow with the approval of the Department of Home Affairs. Such approval is only restricted in the development project. There is a revolving loan accounts, known as the Regional Development Account. Loans from foreign donors are generally separate arrangements under which departments pass the loan funds to the regional levels on terms agreed with the relevant donor under a subsidiary loan agreement. There were at least 6 World Bank loans for district roads, starting in 1985. The budgeting channel from a variety of different sources has its own problems. Each of the budget channels has its own regulations and is ring-fenced. The district government has to follow the rules of the game. It is impossible for the district government to shift between budget headings or between maintenance works because it comes from different sources of funds. The rigidity of funds means the funds cannot be utilised fully. Shifting funds should be approved by the central government. Some budgets are released during rainy seasons and it is hard to do road works during the rainy season.

The district road funds can be seen in Figure 2-17.



	90/91	91/92	92/93	93/94	94/95	95/96	96/97
IPJK	453.7	667.1	826.5	967	1076	1141	1156
Inpres Dati II	390.8	557.6	825.1	612.5	621.2	628.2	654
Other local funds	5.5	7.3	2.2	4.5	2.6	2.9	2.1
Foreign	43.2	89.5	75.5	130	190	201	231

Figure 2-17 District road financing 1990-1996. [Source: Regional statistics 1990-1996]

Figure 2-18 shows that district government capacities to mobilise funds are very low. It is difficult to maintain the district roads through the district roads own revenue. This is due to the fact that the government structures are so centralised and there is no effort to mobilise local funds. Hence, central grants still play an important role in district road maintenance. Most of the new spending was on construction and betterment works through the IPJK budget. The International Bank for Reconstruction and Development (IBRD) loans has provided 8-10% of funding, which was mostly devoted to maintenance.

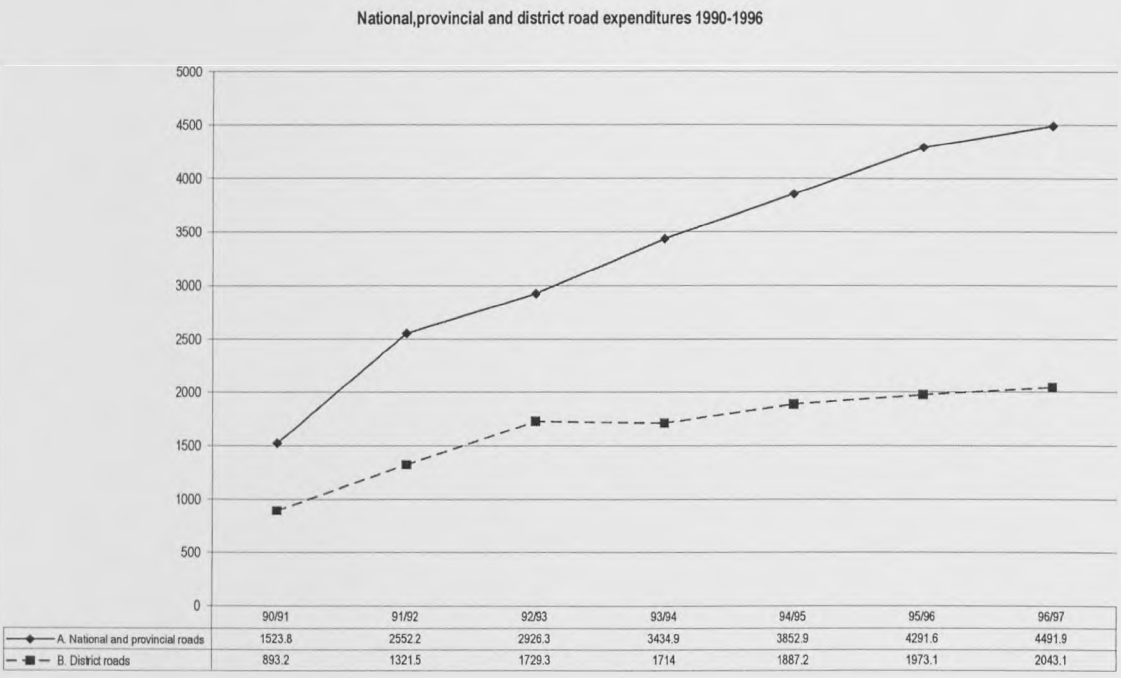


Figure 2-18 District road funding compared to the national and provincial road.

[Source: National Statistical office 1990-1996]

Most of the funding for district roads is in construction and rehabilitation, and only a small part of the funding is for maintenance (see Figure 2-18). The district government is reluctant to fund routine and periodic maintenance as they prefer to see the road deteriorate until it is in a poor condition. If the road is in poor condition central government will take responsibility for the rehabilitation work.

2.7. Chapter summary

More than half of the district road network in Indonesia is in poor condition. This is due to inadequate maintenance of district roads. The budgeting system is one of the factors that make the road maintenance budget allocation difficult. The budget system in Indonesia is still highly centralized. This can be seen from the budget channels between central government and district

level, where at least six budget channels exist. This is compounded by rigidity with funds because each budget channel has its own rules which means that road sector funds cannot be optimized. The other problem is that road user charges in Indonesia still do not take account of the damaging power of heavy goods vehicles. Although the government has been piloting decentralisation since 1995, the budget process is still dominated by central government. Decentralised budgeting should be followed by the improvement of local budget procedures and increasing the capacity building of local government.

The next chapter will be deal with international experience with road maintenance issues.

Chapter 3. An appraisal of district road maintenance issues and its financing

3.1. Introduction

This chapter is an appraisal of existing and available documents of road maintenance studies, including district roads. It relies predominantly on information from World Bank and UN studies of road maintenance. Section 3.2 begins with the economic benefit of proper road maintenance and the negative consequences of inadequate maintenance. Section 3.3 describes international experiences and includes the basic issues of road maintenance. Section 3.4 observes the appropriate way to solve road maintenance problems based on international experiences. The chapter concludes with a discussion on the appropriate model for financing road maintenance in Indonesia.

3.2. Economic justification for road maintenance

The purpose of road maintenance is to ensure that the road does not fail before its design life (Robinson 1988, Robinson et al, 1998). Here, maintenance reduces the rate of road deterioration; it lowers the costs of operating vehicles and keeps the road open on a continuous basis. Ideally, all maintenance should be preventative and designed to take action before failure occurs. In this case, proper and adequate maintenance could postpone road deterioration. Government agencies do not appear to appreciate the importance of road maintenance. New roads are politically more attractive as vote winners than undertaking road maintenance. Jean-Franois Rischard (Vice President of Finance and Private Sector Development of the World Bank, quoted in Heggie 1998) stated that the road sector is big business. If main road agencies were publicly listed companies, they would

rank among the Fortune Global 500. The economic benefit gained from the proper maintenance is illustrated below.

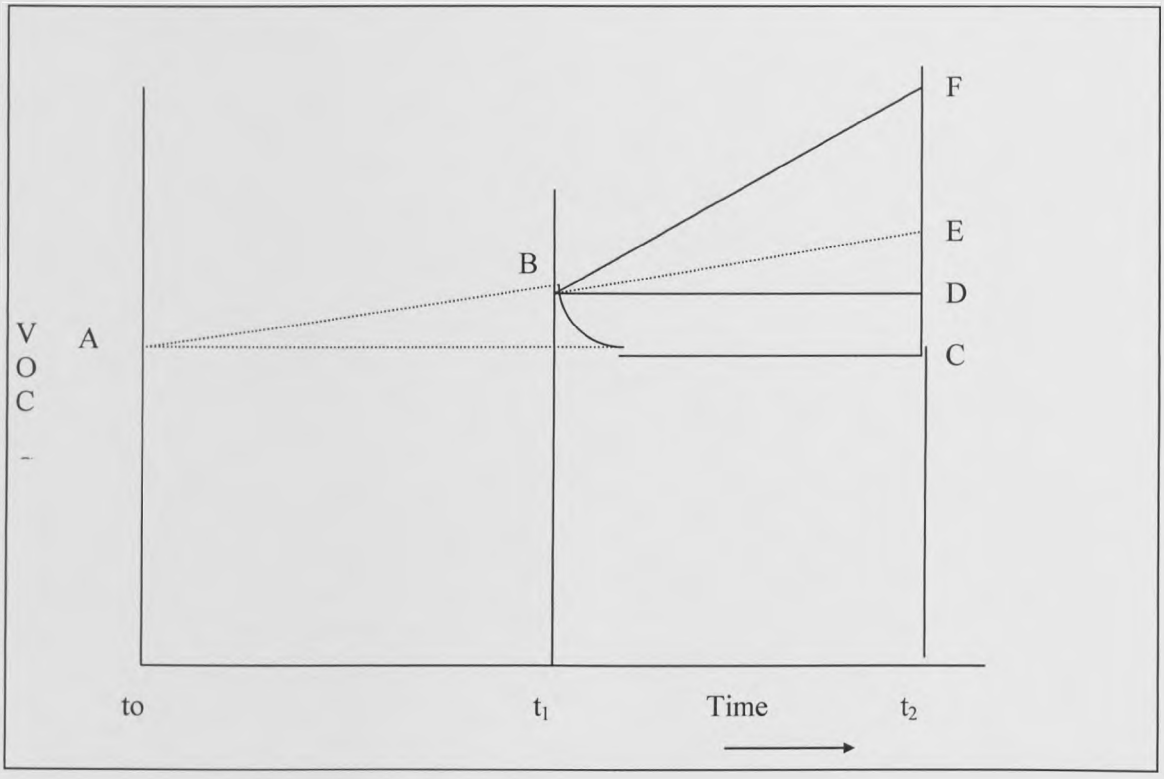


Figure 3-1 Economic level of Maintenance. [Source: Thriscut (1975): A planned approach to Highway maintenance, PTRC 1975 page 12]

The above figure shows the effects on vehicle operating costs due to different maintenance strategies. If a road starts operation at time t_0, with full maintenance, it will keep vehicle-operating costs constant with time (line AC). In practice, the road may be allowed to deteriorate to some extent, so that operating costs rise (line AB). At time t_1, rehabilitation may be carried out to put the road back to its original state, causing a drop in operating costs (line BC). Improved maintenance can be instituted keeping operating costs steady at BD. Current maintenance standards may

continue, causing operating costs to continue to rise (Line BE) or all maintenance may cease, causing a rapid rise in operating costs (Line BF).

Hence, the benefits due to the current level of maintenance, as compared with none at all, are by area BEF over period t_1t_2. The benefits of improved maintenance over the current system are given by area BDE, and the benefits of rehabilitation are given by area BCD, all over the period t_1t_2. The cost of poor road management and inadequate road financing are borne primarily by road users. For example, on bad roads (roads with bad potholes), a driver can either pursue a defensive strategy or ignore the potholes and carry on as usual. If he follows a defensive strategy, he first slows and changes gears. This causes extra stress on the tyres, wheel bearings, spring assemblies, spring hangers, chassis, cross-members, engine mountings, gearbox mountings, brakes, steering assemblies and shock absorbers. Having negotiated the potholes, he accelerates and changes gear again. On the other hand, if he ignores the potholes, he will drive through them at his regular speed resulting in more damage to the vehicle and tyres and increasing the risk of an accident. In rural areas, where roads often become impassable in bad weather, agricultural output suffers.

The cost of neglecting road maintenance can also be found in Canning and Fay (1993), who conclude that the effect of inadequate and unreliable infrastructure cripples the ability of countries to engage in international trade, even traditional export commodities. Gyamfi (1992) and Faiz (1988) found that each dollar which is not allocated to road maintenance can cause vehicle operating costs to increase by \$2-\$3. In most cases, on an annual basis, each dollar expended for routine and periodic maintenance saves at least \$1.4 in vehicle operating costs. The cost of neglecting road maintenance can be seen in Africa, where most roads are poorly managed and badly maintained. Heggie (1994) and (1995) mentions that it would take nearly \$ 43 billion to fully restore all roads classified as being in poor condition (requiring immediate rehabilitation and reconstruction). An example of this is road neglect and restoration in Ghana. Ghana had a good road network before 1970, but due to serious neglect, by 1984 about 60% of the main paving had failed, and a further 27% were in danger of failure. Important sections of the network had become

almost impassable; access to some of the interior of the country was curtailed. Transport costs increased by about 50% on main roads, and by more than 100% on rural roads.

Faiz (1988) raises the following questions - why should the overhaul of the road network have a higher priority than the provision of books for primary school students? A dollar reduction in road maintenance expenditure can increase the cost of vehicle operating by two to three dollars. Reducing expenditure on road maintenance will not serve the intended purpose of releasing resources for other priority sectors such as education. Spending a dollar less on road maintenance will perhaps release a dollar for education expenditure in the public sector but road users, mostly in the private sector, will have two or three dollars less to spend on education. Insufficient spending for road maintenance thus incurs hidden costs several times that of maintaining and restoring roads.

3.3. Basic issues of road maintenance (international experiences)

The basic problems of road maintenance are twofold - inadequate systems for financing road maintenance and inadequate organisational set-ups for road management (Zietlow 1996, Zietlow 1999, Jhala 1998, Heggie 1995, Heggie and Vickers 1998, Harral and Faiz 1988, Schliessler 1993). Another study which focussed on rural roads found similar problems, but to a varying degree (World Bank 1992, Riverson et al 1991). Rural roads suffered more than other types of road due to serious lack of an overall policy framework; clear country road sub-sector strategies and co-ordination. Each is discussed in more detail.

3.3.1. Inadequate institutional set-up

Rural road maintenance is part of the whole road network maintenance problem whilst road maintenance problems due to poor road maintenance policies are a sub set of wider issues of

managing and financing roads as a whole. Although all findings indicate similar problems, the most acute problem occurs with rural roads where institutional weaknesses are greater and finances are in short supply.

Rural roads are different from national, state or federal highways. The institutional setting of rural roads for policy programs such as planning, construction and maintenance require involvement from several agencies i.e. highway/ road agency, regional/ ministry of local government/ ministry of home affairs and ministry of finance, besides local government road authorities. Few co-ordination efforts have been developed. There is a tendency for no local participation in the road decision process, although the experience shows that local participation will be important to prioritise local needs. Although local people are the most familiar with which minor improvement would help facilitate local flows of people and goods, they are often ignored in the decision making process. Riverson et al (1992) observed that the main problems in rural roads in Sub-Saharan Africa as can be seen from Figure 3-2 below:

Identification of Major implementation problems
Percentage of Projecs affected significantly

Type of problem	1964 - 1979		1980 - 1989		1964 - 1989		Total
	(I)	(ii)	(I)	(ii)	(I)	(II)	
Inadequate planning	26	27	0	7	15	22	26
Resource constraint	50	24	11	7	33	20	27
Institutional	47	34	36	20	42	30	37
Technical	26	10	7	0	18	7	13
Other minor	8	15	36	33	20	20	20
None identified	3	5	18	13	9	7	8
No. of projects	39	40	28	15	67	55	122

(I) Rural road components of Agricultural and rural development projects
(ii) rural road components of Road/Transportation projects
Note: Some projets were significantly affected by more than one type of problem

Figure 3-2 Identification of major implementation problems. [Source: Riverson et al (1992), page 8]

Problems occur predominately due to: poor planning at the appraisal or execution stages; inappropriate design standards or technology; difficulties with mobilisation of financial and other resources; and deficient institutional and managerial arrangements. Moreover, Cook (1985), based on an institutional review of 50 rural roads, found that there are at least 6 major institutional issues to be solved on rural road projects:

1. interagency co-ordination;
2. political commitment;
3. beneficiary participation;
4. centralisation versus decentralisation;
5. new versus existing situations; and
6. force account versus use of contractors.

These weaknesses will influence the efficiency of road maintenance and lead to a waste of scarce resources for financing road maintenance.

Planning for rural roads has been driven by a multiplicity of objectives. In most developing countries planning has focused mainly on the development of national and international networks, that serve the major routes of the community. The systems have been designed and planned by central government or foreign experts with highway competent staff. These types of programs will not work in the case of the rural road, where there is a lack of data collection, inadequate data or inappropriate data on which to make decisions. Centralisation of planning will cause a reduction in motivation of local capabilities and no flexibility in response to the local needs. There will be no appropriate design standards for local differences and capabilities, unit costs and local resources. On the other hand, if decentralisation is too rapid and does not take into account the local capabilities there is a possibility of a loss of efficiency. The weakness of local agencies is caused by several factors such as low salaries, which will lead to a lack of qualified staff because most of the qualified staff will move to the private sector where there is the promise of good salaries for engineers. The lack of qualified staff will cause inappropriate local planning. Centralisation of road planning also discourages innovation from the local staff. Local staff tend to agree with what the central planners say, although in most cases central planning is not as good as when local people prioritise the road work.

Procurement of maintenance work is also a factor that should be considered. Most of the local contractors in the districts are weak. They do not have enough capability to carry out maintenance, while at the other extreme the use of Force Accounts in several projects is not efficient due to the inadequate capabilities of staff in road agencies. The other weakness related to procurement of maintenance through contracting out is the short contract duration, which is only limited from between three up to nine months period. This will discourage local contractors to own machines since there is no guarantee they will get similar jobs in the future. Political privileges with particular contractors also hamper the fair play of contracting out maintenance.

3.3.2. Inadequate financing

Heggie (1998) found that most countries suffer from a shortage of funds for both road investment and maintenance. Zietlow (1996) established that most countries in Latin American and the Caribbean regions can only fulfil 20% of the amount necessary to maintain their road networks in adequate conditions. The reason is obvious: the funding itself comes from the general budget. The budget allocation process is flawed and politicised. Budget allocations are often cut at short notice in response to difficult fiscal conditions and funds are rarely released on time. Moreover, in most cases in developing countries funds for road maintenance are allocated as part of the annual budgetary process (Faiz, 1988). At the end of the day road maintenance funds continue to be cut due to other politically attractive projects such as education or new roads. Although in theory funds should be allocated to those expenditures with the highest economic return, allocations for maintenance are below the requirement (Robinson 1988). Some developing countries still spend too much on new roads (mainly upgrading existing roads and building feeder roads), hence scarce resources are misallocated.

3.4. Policy reform

To solve road maintenance problems integration from the stakeholders is important. The inadequate financing problems can be solved through reallocation of funds from other types of road priorities into road maintenance, based on an economic assessment through institutional and financial reforms. The objective of financial reform is to increase the sources of funds for road maintenance, while that for institutional reform is to improve the efficiency. Each will be dealt with overleaf.

3.4.1. Institutional reform

Calvo (1998) established that to overcome institutional problems with rural roads the following policy options could be followed:

1. A centralised model (examples: Tanzania and Nigeria) - through a special purpose rural road agency at central government level which manages the local government roads on behalf of local governments.

2. A decentralised model where:

    a) Local governments manage the roads through their own Works Department (many francophone countries in Africa)

    b) Local governments forming joint services committees (examples: Canada, Guatemala, New Zealand, USA)

    c) Local governments hiring consultants (examples: UK, USA and Zambia)

These models have their own advantages and disadvantages. The advantage of model 1 is the in-depth understanding of local priorities and the high stakes involved in having well-maintained roads. The disadvantages are technical weaknesses because local government agencies operate on a small scale. They also suffer from a shortage of funding and a lack of technical guidance from a focal agency. The advantage of the decentralised Model (a) is that local government plans the work and delegates implementation to an agency that employs consultants and contractors to execute the work. The disadvantage of the model is that it is not subject to competitive bidding. Model (b) has an advantage in that it can overcome the problem of small networks and provide scale economies. Priorities are set locally and are financed by client local governments. A disadvantage is that it requires well-developed local consultants and local government that will be difficult for developing countries.

Decentralisation of rural roads will benefit local residents. Decentralisation of responsibility for local roads is natural. Decentralisation should include implementation of maintenance and also financing to ensure that communities are willing to pay for the quality of road service provided. A review of 42 developing countries found that, where road maintenance was decentralised, backlogs were lower and road conditions were better (World Bank 1994). Cellier (1992) concludes that centralized organisations in many developing countries are exploring ways to decentralise the management of their road networks in order to use funds more efficiently and to reduce the size of central government. He believes that decentralisation means local authorities are generally more responsive to local needs and realities and can be made more easily accountable to road users.

Some institutional aspects should be taken on board to improve the existing road maintenance organisations as follows.

3.4.1.1. Technology transfer

The experience from developed nations can be used by the developing countries perhaps through transfer of appropriate technology (bilateral agreements, twinning programs or other technical assistance). Some evidence for the transfer of technology between developed nations to developing countries is:

1. The experiences of developed countries such as Canada (British Columbia and Ontario), USA (Pennsylvania) in contracting out road maintenance has been adapted and recommended to the Latin American and Caribbean regions and Sub Saharan Africa (Blaine 1984, Cook 1985, Cox 1987). The implementation of routine maintenance by contract in developing countries is also based on the developed countries' experiences (Miquel and Condron 1991, Gyamfie and Ruan 1991, Lantran J.M 1990). Routine maintenance by contract is believed to increase the accountability, cost effectiveness and quality. It develops good quality contractors, simplifies

and expedites the bidding process, encourages sufficient numbers of interested qualified construction and supervision companies.

2. Bilateral agreements or the twinning of road agencies to facilitate technology transfer. Bilateral agreements formed technical corporations between developed and developing countries, for example, France with African countries (Algeria, Cameroon, Cote d'ivore and Senegal) where in this case France provided technical and institutional assistance to their road agencies. The United Kingdom through its transportation road research laboratory has long co-operation and research programs with developing countries (Faiz and Cook 1991). Although twinning arrangements are different with Bilateral Agreements, the objectives are similar when transferring technology from developed countries to developing countries. Twinning can be defined as a technical and professional relationship between an organisation in a developing country and a more mature and advanced partner in another part of the World for the purpose of technology transfer and institutional development (Cooper 1984). An example of successful twinning can be seen in the arrangement between the USA road agency (FHWA) with road agencies in Argentina, Brazil, Ethiopia, Iran, Kuwait, Liberia, Laos, Philippines, Saudi Arabia and Turkey.

3. Competition for road maintenance services. A survey of road maintenance by contract in a number of both developed and developing countries has been undertaken. The survey included:

   a) countries where contract maintenance had been a well-established practice for several years including: Belgium, Kenya, Malaysia and the United Kingdom; and

   b) countries where the transition to contract maintenance was selectively recent include Algeria, Canada, Chile and Pakistan.

In the case of well-established road maintenance, it was found that the contract duration in Canada (British Columbia) was five years, the United Kingdom three years and Malaysia two years. Contractors in these three countries consider five years will provide them with sufficient incentive to invest in costly, specialised equipment. Supervision of the contracts has been done in house in British Columbia and Malaysia. In the United Kingdom, for some of the trunk roads the consultants administer the entire program.

This demonstrates that both developed and developing countries can contribute their technology for use by other developing and developed countries.

3.4.1.2. Co-ordination

This aims to develop a coherent rural road strategy by involving all agencies and institutions with an interest in rural roads at the national, regional, district and local community level. This includes organizations that deal with agriculture, mining, tourism, transport and rural development. They have to clarify the ownership of rural roads and the responsibilities of various institutions for development, maintenance and priority setting.

3.4.1.3. Planning for sustainable rural road maintenance

The first priorities of rural road spending should always be to maintain those roads which are functionally important and currently in reasonably good condition (Riverson et al 1991). In this case there is a need for setting up road hierarchy in order to get road prioritisation in rural areas. Core networks should be defined and should be maintained and kept in good condition with procedures for condition monitoring and maintenance programming. There is a need to set-up road maintenance as the number one priority of the local government. Routine and periodic maintenance should be identified as specific components of rural road spending priorities. The second priority of rural road spending should be to selectively add roads to the maintenance core network through rehabilitation and upgrading. Selection criteria and definition of core network

should take into account traffic flows and functional importance. There is a need for simple prioritisation criteria, which allow participation of various government agencies, commercial interests and local communities. Prioritisation criteria can be selected through the road maintenance management systems, which taken into account traffic flows and seasonal variations.

3.4.1.4. Community participation

Local participation in rural roads may be achieved through local government bodies, local branches of central government bodies, local business representatives, or more direct forms of community consultation. In this case there is a need to involve the local authorities and communities in the planning stages. This can be done through the decentralisation of road maintenance to district or rural government level.

To sum up, to overcome the problems of road maintenance there should be an improvement of the institutional framework and improved planning of work through the following:

1. improving institutional options, for example decentralising rural road management to local authorities (Calvo 1998);
2. reducing financing by lowering technical standards or choosing more appropriate technology standards for rural roads (Riverson et al 1991); and
3. choosing more appropriate methods of procurement (Lantran J.M. 1991).

3.4.2. Financing reforms

There are at least three factors that should be considered when maintaining rural roads:

1. the agency responsible for rural roads;
2. the technical capacity to discharge these responsibilities, and,
3. the revenues to finance the required maintenance.

The first two aspects have been discussed before while the third factor, revenues, will be discussed here. Ideally the first thing that should be done is to calculate the likely maintenance cost of the rural road (maintenance needs). The next step is to ascertain the amount of money available for road maintenance. Sources for financing maintenance include local revenues (modest), and transfers from central government (the major source for investments). Community contributions in cash and in kind are suitable primarily for community roads and paths. Central grants amounts to a significant part of the rural road maintenance fund. Local authorities' own resources, on the other hand, are relatively small and loans are also not as significant as the central grant. Ideally the money available will be higher than the cost of maintenance. However, in the real world the situation is the other way around and the maintenance fund available is less then the cost of maintenance. In this case there should be systems in place that can prioritise which link/type of road will be maintained in any given year.

Prioritisation is usually based on a road hierarchy and this will be related to the traffic flows/volume. The difference between needs and outlay causes a maintenance backlog. A maintenance backlog has not always happened with rural roads alone, but with highway/national and provincial roads. Of these categories of road, the rural road networks will be the worst since they are the lowest in a road hierarchy. A maintenance backlog can easily be eliminated by additional funds for road maintenance. Additional funds theoretically will come from increased local government tax, a central government grant or from loans. However, due to limited resources there are many pressures from the government for increasing local tax. Raising funds at national level for transfer to local authorities is not a realistic idea. It is difficult in practice because central government is often under constant pressure to cut public spending. There are options to decrease the maintenance backlog by:

1. the re-allocation of funds from other road sectors to road maintenance by prioritising road maintenance;

2. improving financing through the existing government budgetary framework;

3. the privatisation of local road networks by involving the private sector in the road sector using concession agreements; and

4. the creation of new financial approach (Road Maintenance Fund) where in this case the road user pay for the road use (Heggie 1995,1998a, 1998 Zietlow 1997).

3.4.2.1. Reallocation of funds

Faiz and Harral (1988) found that reallocation of funds will be one of the solutions to increasing road maintenance funds. The government should declare the importance of road maintenance to district level and set it as a first priority, or re-allocate funds from another road sector, or raise additional revenues through the improvement of road user tax structures. Re-allocation of funds will mean that maintenance funds would be diverted from capital investment programmes.

3.4.2.2. Improve the existing government budgetary framework

Improving the budgetary framework is one of the most promising solutions (Faiz and Harral 1988, Gwilliam and Shalizi 1997 and Porter1997). Reforming the budget process by rebuilding the capability of, and confidence in it, will be a good way to undertake a simplified budget process and ensure full participation of the stakeholders. Both Gwilliam and Porter argue that models of financial reform should be based on a case by case basis through the analysis of country conditions. That means that a good model for one country is not automatically good for another. Talvitie (1995) and Dunlop (1996) also argue that road reforms should be done gradually. They propose introducing steps to improve road management by considering the whole road network instead of rural roads alone. Their argument is that at the end of the day road management should be commercially oriented, requiring commercialisation of road organisations. Indonesia and most developing countries in Latin American, the Caribbean and Sub Saharan Africa are in stage 1 of

the Talvitie (1995) and Dunlop (1996) models, where budget conditions are still poor. The immediate step is to improve budget conditions. Gwilliam and Shalizi (1997), Talvities (1995), Dunlop (1996) and Porter (1997) suggest the following model concerning the applicability of road funds in relation to budget systems, as set out in Figure 3-3 below.

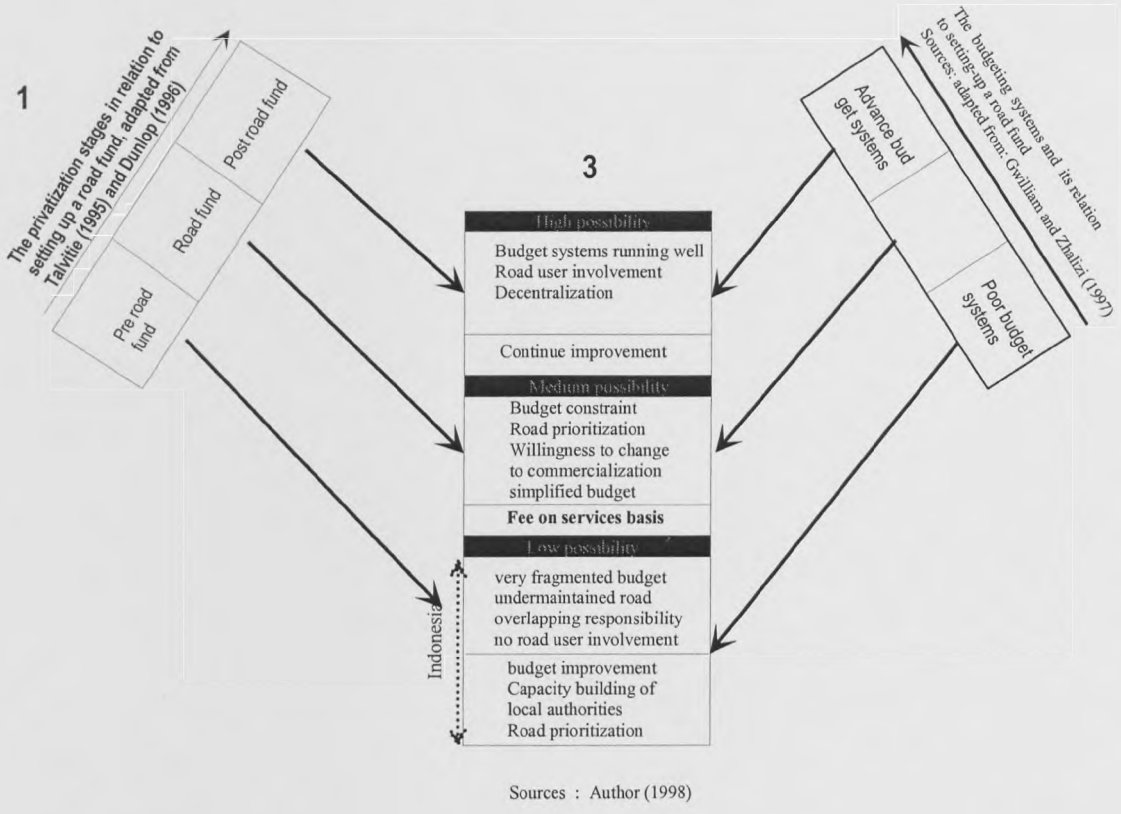


Figure 3-3 The appropriate budget condition applies road fund-closing the gap adapted. [Source: Talvities (1995), Dunlop (1996), Gwilliam and Shalizi (1997), Porter (1997)]

3.4.2.3. Privatisation of roads

Privatisation will only be possible for urban and national roads, not for rural roads. Rural roads serve district or local access transport activities, rather than regional or national functions. Many of these roads have an earth or gravel surface and have low volumes of motorised traffic. Zietlow (1997) concluded that in Latin American and the Caribbean, to set-up toll systems to pay

maintenance should at least cover 1500 vehicles per day. This is only viable for less than 5% of roads in Latin American and the Caribbean. The difficulties of privatising rural road maintenance due to the characteristics of the rural road itself are graphically presented below (World Bank 1994):

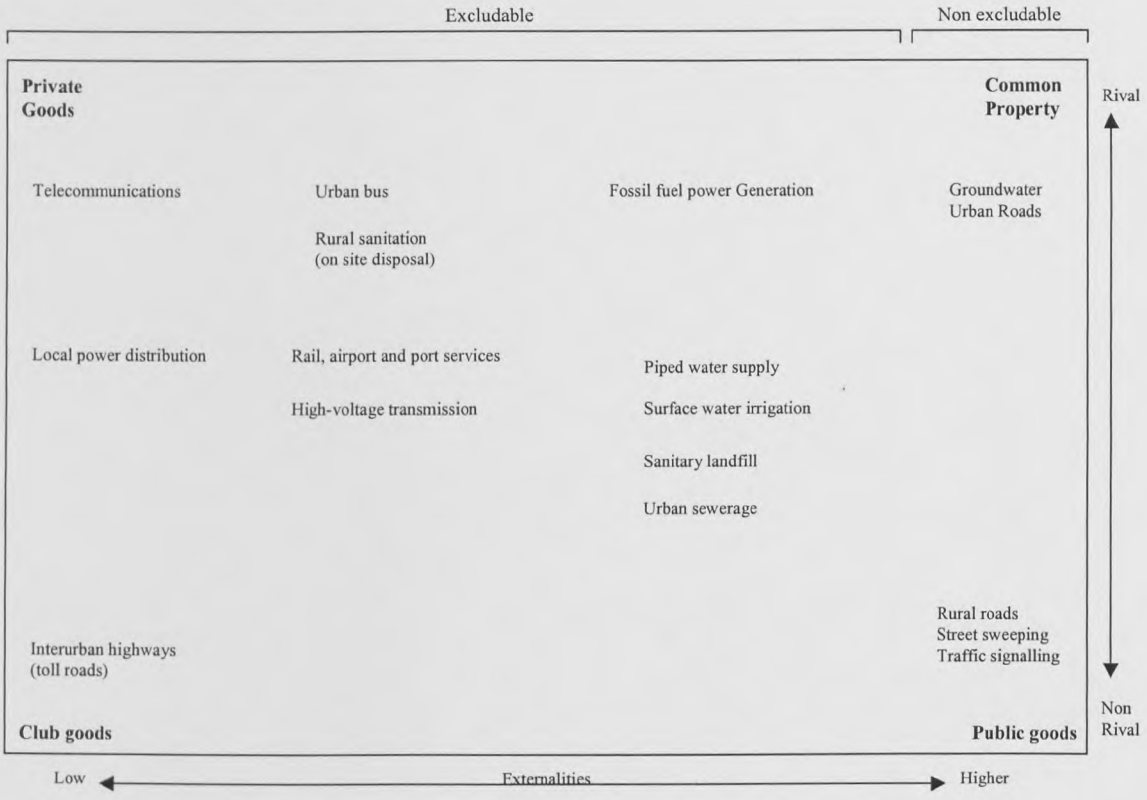


Figure 3-4 The Economic Characteristics of Roads. [Source: World Bank: World Development Report 1994, page 24]

The figure above shows that rural roads are public goods because they are non-excludable and non-rival. While with urban roads the rival is high, the externalities are high and they qualify as common property. Roads are non-excludable, but toll roads are excludable[1]. The economic characteristics of the road itself have hampered the effort to privatise all types of road. The World

[1] Excludable means that a user can be prevented from consuming the good or service. Rival means that consumption by one user reduces the supply available to other users.

Bank (1996) concluded that there are a number of factors that make transport infrastructure less amenable to private financing than other infrastructures:

1. for local roads in urban or rural areas, the physical difficulties of excluding users who do not pay, or the high transaction cost of implementing direct user charges, make a competitive market difficult to achieve;

2. privatisation may not be politically acceptable where there is a perception of large, uncompensated income transfers;

3. where there are substantial externalities (such as road congestion and air pollution effects) that cannot easily be addressed by market based instruments there is a greater likelihood of government intervention; and

4. some transport infrastructure is so intertwined with spatial planning that governments are not willing to leave it entirely to the private sector.

Based on Metschies (1998) study, rural roads that basically carry traffic volumes of up to 25-40 vehicles per day have to follow other principles compared to normal roads which carry a traffic volume between 100 and 1000 vehicles per day. Road costs for normal road will be 10% of the vehicle transport costs; the road costs for rural roads represent more than 100% of the vehicle transport cost. The conclusion is that while normal roads can be financed from road user charges, rural roads are not self-financing. They have to be subsidised. An option for privatising rural roads will not be possible to implement.

3.4.2.4. Financing through Off budget financing(Road Maintenance Fund)

Financing through off budget financing can not only be applied to rural roads but also the whole non-toll road network in the country. Heggie (1992, 1994, 1995, 1998, 1998a), supported by Schliessler (1993), OECD (1995), and Zietlow (1997), clearly indicate that the best way to reduce

road maintenance problems is to bring them into commercialisation. This releases them from a government into a company environment.

The 4 building blocks set out below represent the core of the reforms. They are interdependent and ideally should be implemented together. Without all 4 the reforms may achieve only part of their objective. The financing problem cannot be solved without the strong support of road users. One cannot win the support of road users without taking steps to ensure that resources are used efficiently. Resource use cannot be improved unless one controls monopoly power and constrains road spending to what is affordable, and increases managerial accountability. Further, managers cannot be held accountable unless they have clearly defined responsibilities.

There is nevertheless scope for flexibility. The reforms can be introduced in different ways and the content of each building block may differ, depending on the circumstances of the particular country. They can move sequentially or in parallel, and both sequencing and the pace of reform can vary. The institutional reforms in Sub Saharan African and other developing countries can be done by commercialisation. Commercialisation should be followed by complementary reform in four areas such as: creating ownership, financing, responsibility and management.

3.4.2.5. Heggie's model of financing road maintenance

Heggie's model requires the following:

- There is a need to create ownership. Heggie believes that major policy reform for the road sector will not succeed without the active support of road users and other persons with a vested interest in sound road management. The users of a public utility pay a rate that makes up an income for the utility company. The company is, in a way, most suited to its own purpose, with few restrictions on the use of that income. Consequently, the government in power cannot interfere with how these funds are used. Schliessler (1993)

suggested the electric utility experience is a useful example, whereby the service is financed by rates paid by users according to the amount of electricity they consume.

There are several ways of involving users in the management of roads: either they are involved in the overall management or management of parts of the road network, or in specific aspects of management. Based on Sub Saharan Africa, Latin American and Caribbean country experiences, it was suggested that road users should be involved in a national steering committee or road management board. The members should include both private sector and public sector representatives. The private sector includes the transport sector such as bus companies, car rental, car dealers, chambers of trade. At the other extreme the public sector includes a government officer who is involved in finance (Ministry of Finance), road administrations (Department of Transport/Highways at central level and local government for regional level). Choosing to bring the private sector into the committee will encourage it to be involved in all decisions regarding road use including road user charges.

However, Heggie recommends that before the national steering committee exists information should be made available on the importance of road maintenance. When road users understand the main points of road maintenance, the consequences of a lack of road maintenance and the cost for the road users, they will be more aware of impacts on road conditions. This type of education can be achieved through a national seminar, or through a series of articles in the newspapers or on television.

One aspect of the management of commercialised road systems (which has been applied to US telecommunications) is that there should be owners for the roads. Ownership will encourage the preservation of assets to ensure they are properly maintained. Roth (1996) also believes that roads could be made to earn revenue almost as easily as telephones.

- Financing. The establishment of an adequate and stable flow of funds, which starts by introducing road tariffs and collecting the receipts into a separate fund, should be independent of any government, departmental or municipal funds and makes sure that the proceeds are used for road maintenance only. Zietlow (1996) concluded that routine and periodic maintenance costs only between 2 to 3% of the new investment value of the road network.

- Responsibility. The third area of reform is to clarify responsibility and establish who is responsible for what and to establish a more business-like road agency by introducing sound business practices and strengthening managerial accountability. The arrangement should be based on an accurate road inventory, functional classification of roads, designation of appropriate road agencies, formal assignment of responsibility to each road agency, and clarification of the relationship between road agency and parent ministry.

- A road agency is created as a business entity. When road users are involved in the management of roads, they generally are keen to introduce sound business practices to ensure that they get value for money. This is a very difficult task to perform since current bureaucratic management procedures provide little incentive to do anything about the management. Roth (1996) proposed that the commercialisation of roads should make road systems financially self supporting, as in the telecommunications sectors. Some US telecommunications serve large or wealthy populations, while others serve small or poor ones, but all have to meet their costs out of revenue. Zietlow (1996) and Roth (1996) recommend a shadow toll system that mainly uses the consumption of motor fuels on roads as a "service meter". This implies a service charge or road maintenance tariff should be levied and collected together with the sale of motor fuels.

3.4.2.6. Financing through The Road Maintenance Fund

The road maintenance fund proposed by Heggie (1992, 1994, 1995, 1998,1998a) is not a new concept. This type of earmarking budget has been a success in New Zealand (Dunlop 1996). There are at least three different types of road maintenance funds (Roth 1996, Gwilliam and Shalizi 1997 and Porter 1997):

1. Special purposes road funds. This has been used in Japan and America just after the Second World War and had a very specific purpose. In Japan, the purpose was to modernise the road network rapidly due to increasing traffic. In the USA it was established during the height of the cold war to construct an interstate "defence" network.

2. First-generation road funds, established in the UK between 1909 up to 1936, in Africa during the 1960s and 1970s, were set-up to deal with chaotic budget management. Similar funds have been set-up more recently in the former Federal Soviet Union countries, namely Russia and Georgia, which were faced with a tough budget squeeze and chaotic budget management.

3. A second-generation road fund (the Heggie model). It reflects the view that roads should be managed like a business, not a bureaucracy. The expenditure on roads will be financed from road user charges. Typical road user charges into the road fund would be vehicle licence fees (a charge for access to the road network) and a levy on transport fuels (a charge for use of the road network).

Sources of finance for Road Funds

Sources of funds will be derived from vehicle licence fees, fuel surcharges, a supplementary heavy vehicle fee and fines for overloading as well as interest from the bank (Heggie 1995). There are at least 34 developing countries which have adopted road funds, a sample of which are South Africa, which has the oldest road fund (1935 and reinstated in 1998), Ghana (established 1986 and restructured in 1996), Mozambique (1990) Zambia (1993), and Sierra Leone (1993).

Additional road funds have been installed in the past two or three years in Lesotho, Guatemala, Honduras, Jordan and Yemen. Armenia is in the processes of passing legislation for a road fund. The Philippines and Pakistan are still studying the implications of road funds. The expected fund mechanisms can be seen below in Figure 3-5.

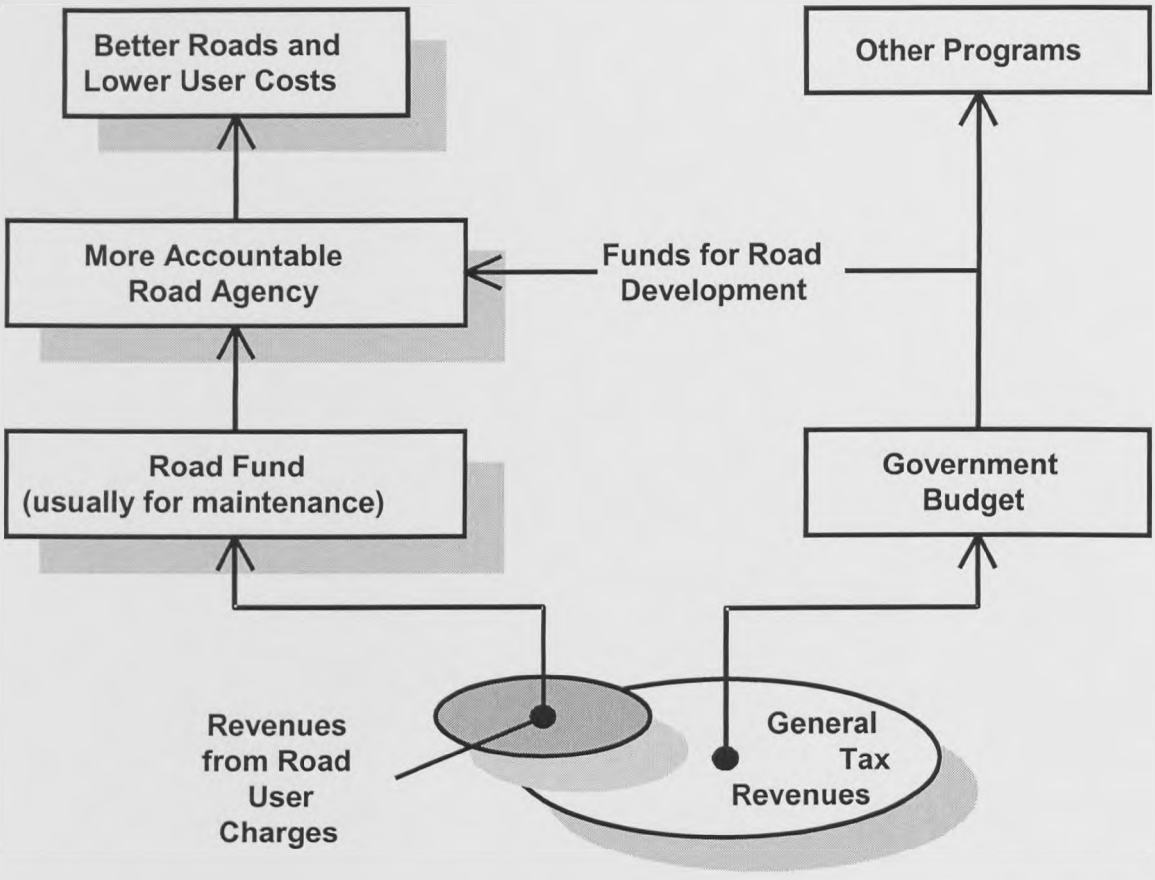


Figure 3-5 The Road maintenance fund mechanisms. [Source: UN (1993) page 49]

Road Maintenance Board

An independent road maintenance board should be set up. The board should consist of the public and private sectors. The involvement of the private sector will be important to involve road users in the management of roads. To deal with daily management the board should appoint an executive secretary.

The impact of the Road Maintenance Fund on rural roads

Some of the revenues are nearly always allocated to finance the maintenance of rural roads. There should be a mechanism to decide:

1. the proportion to be allocated for rural roads;

2. how it will be divided between the various road agencies; and

3. accountability and audit requirements.

The most common method is to allocate a fixed percentage of the total revenue to rural roads (generally 25 to 35%). This should be divided between the road agencies using a formula based on factors such as type and length of road, class of road or volume of traffic, and how much the local government can afford to pay itself. This means that the local government should try and find a way of increasing its own sources of revenue. There is a need for local government to be dependent on its own sources of funds, and that means there should be a serious effort to devolve power to local governments in order to maintain their own roads.

The applicability of Heggie's model

As has been said earlier, Dunlop (1996) and Talvities (1996) introduced road reform steps by considering the whole network of the country. Their model can be related to Heggie's model because they also commented on road funds. The model is set out in Figure 3-6 below.

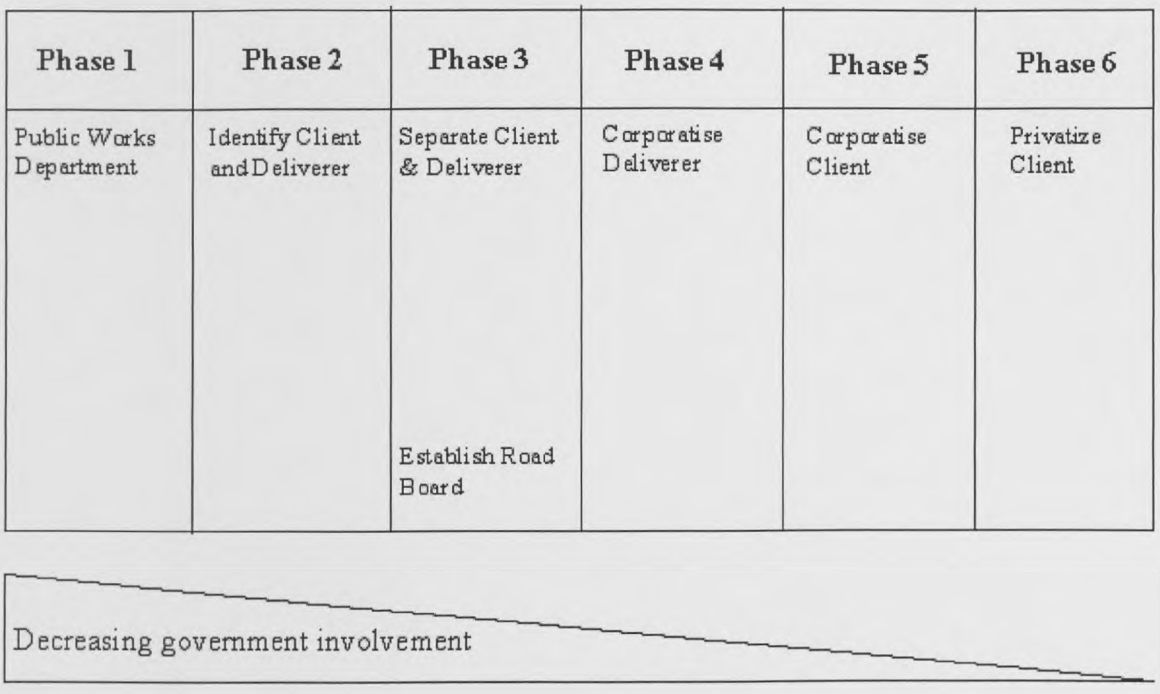


Figure 3-6 Privatisation of road sector stages. [Source: Dunlop (1996), A Road Agency for the Future, New Zealand, page 8]

Phase 1 is the traditional construction and maintenance organisation. A traditional Public Works Ministry which employs a large number of people. ***Phase 2*** is the identification of client and provider functions. In these stages, the Public Works Ministry tends to be replaced by a Ministry of Transport for policy direction. ***Phase 3*** is the separation of client and delivery organisations with emphasis on policy, especially the environmental issues and the continuing drive for more efficiency. This pushes the separation of client and provider. In this stage, the traditional public service providers or deliverers are corporation, and a road board for the management of funding normally appears in these stages. ***Phase 4*** is the corporatisation/privatisation of the deliverer. In this government-owned delivery phase organisations are at least corporatised or more likely privatised by either sale or devolution of these activities to the private sector. In these stages, the dedicated road fund normally appears. ***Phase 5*** is the corporatisation/privatisation of the client organisation. In this phase the client road manager could become the formal owner of the roads on behalf of government and manage them as a government corporation. Finally, ***Phase 6*** involves

privatisation of some or the entire road network. This has occurred to a limited degree throughout the world, although no country has yet privatised or corporatised its entire networks and hence dealt with all the ramifications of a natural monopoly. Road management throughout the world is currently between phases 1 and 4, depending on a particular government's role in directing reform. Each country has adopted different methods of reform, have moved at different rates but nearly all have moved through the phases in sequence, without omitting any stages.

Based on Talvities' model, creating a road fund board occurs in the third phase and setting up a road fund occurs in the fourth phase. Gwilliam and Shalizi (1997) have a similar view to Talvities and Dunlop, who suggest that the benefits of setting a road maintenance fund would not accrue in all circumstances. Porter (IMF, 1997) also mentioned that if the government lacks self discipline, road funds cannot guarantee that the assigned revenue streams will not be raided, or that expenditure will not be misallocated. The World Bank in particular has tried to encourage the development of a second generation of road funds to emphasise its transparency and accountability, financed by user charges. By providing funds, developing countries will be willing to follow the World Bank pattern. The point is that the World Bank, or other donor institutions, can insist that developing countries are self-disciplined, at least for the period of World Bank assistance.

Heggie explained that the road fund could be a useful institutional development if certain conditions are met (based on minutes of a meeting between World Bank roads advisor and Fiscal Affairs Division of IMF 1997):

1. There must be user charges. There should be a separate fund held outside the consolidated funds.

2. The design of the road fund must ensure that funds are not diverted from other sectors - extra spending on roads needs to be financed through extra payments by road users.

3. The fund should have a secretariat responsible for the overview of its finances.

4. It should have a board, at least 50% of the directors being from the private sector.

5. There should be transparent, published, private sector style financial rules and regulations.

6. There should be an annual independent audit.

Out of the above 6 points raised by Heggie, points No. 2 and 5 will be "difficult" or take a lot of time to deal with. In this instance Heggie understands that there should be a minimum set of criteria to be fulfilled before a country is ready to implement a road maintenance fund. However, in the "field" most Sub Saharan African and Latin American and Caribbean countries were "directed and guided" by the World Bank to use road maintenance funds without taking into account the countries' differences in terms of fulfillment of the minimum criteria.

Figure 3-7 shown overleaf suggests that most developing countries were in the first left of the step.

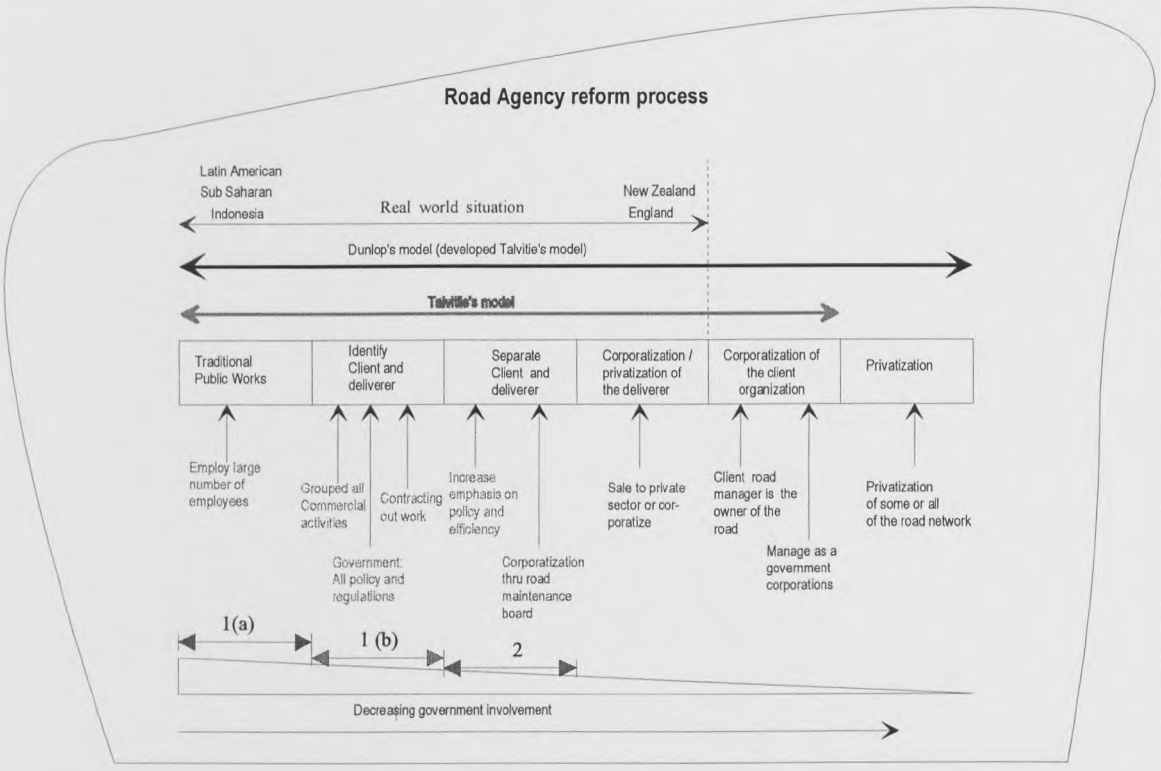


Figure 3-7 Talvities & Dunlop's model and the country locations. [Source: Adapted from Talvities (1995) and Dunlop (1996)]

It is quite certain that developing countries - Sub Saharan Africa, Latin American and the Caribbean, and some of the Asian countries, including Indonesia – are still not prepared to adopt the road maintenance fund concept.

The following table shows the requirements for the countries that wish to implement a road fund:

Introduction of Road Funds may be justified if all the following conditions apply:	**Potential indicators**
1. Maintenance is poor due to: Insufficiency of funds, poor setting of budget priorities with bias in favour of new investments, often donor driven; Unreliable timing of funds, poor budgetary processes with inability to ensure credible commitments and/or disbursements; Inefficient implementation of works, absence of incentives to use resources efficiency in the agency.	Asset condition of "core network" is predicted to decline over the next 10 year period (increasing percentage poor condition by road class); User costs predicted to increase over 10 years (increasing VOC/Vehicle/year by vehicle class); Substantial maintenance foregone (with ERR more than twenty percent); Net present value of near optimal program substantially (> 1.5 times) higher than that of current program; Total costs per mile of road maintained in the core would drop by 25% throughout the life of the fund (relative to current expenditures or future benchmarks).
2. There is political commitment to increase maintenance expenditure on roads.	Cabinet level commitment (acts, regulations, gazetting) to increase road maintenance expenditures; Cabinet level commitment to permit direct user charges (surcharges on fuel taxation) to generate funds; Cabinet level commitment not to reduce parallel funding.
3. There is a political commitment to establish long-term reliable mechanisms for improved allocation and accountability for the "core network". (The core network will vary in size over time as "unused and lightly used" routes are dropped and emerging "heavily used" routes are included.)	Principles exists for major allocation decisions; Representatives of key user groups are included on Board; Economic criteria are accepted as key to setting priorities.

Figure 3-8 Conditions for introducing a road fund. [Source: Gwilliam and Shalizi (1997), page 10]

From the above table, it can be seen that the main point for road maintenance is political commitment, but this is not enough. Political commitment should be followed by improvement in the implementation level. While improvement cannot be achieved "overnight", there should be an interim stage to fulfill the conditions for implementing a Road Maintenance Fund.

Porter (1997) contends the minimum requirements of a road fund will be:

1. A management board with a significant private sector presence but genuinely free from a producer interest.

2. In the form of an agency principally as a purchaser, not as a provider of services. It should have a mission statement, objectives, physical output indicators, and total input cost envelopes. Ideally, provision of services should come from the private sector.

3. The financial management system of the road fund can handle the more complex tasks.

4. It will be involved in managing the total cost and associated accounting requirements.

Bousquet and Fayard (1997) indicate that the appropriate conditions for using a road fund are as indicated in Figure 3-9 overleaf:

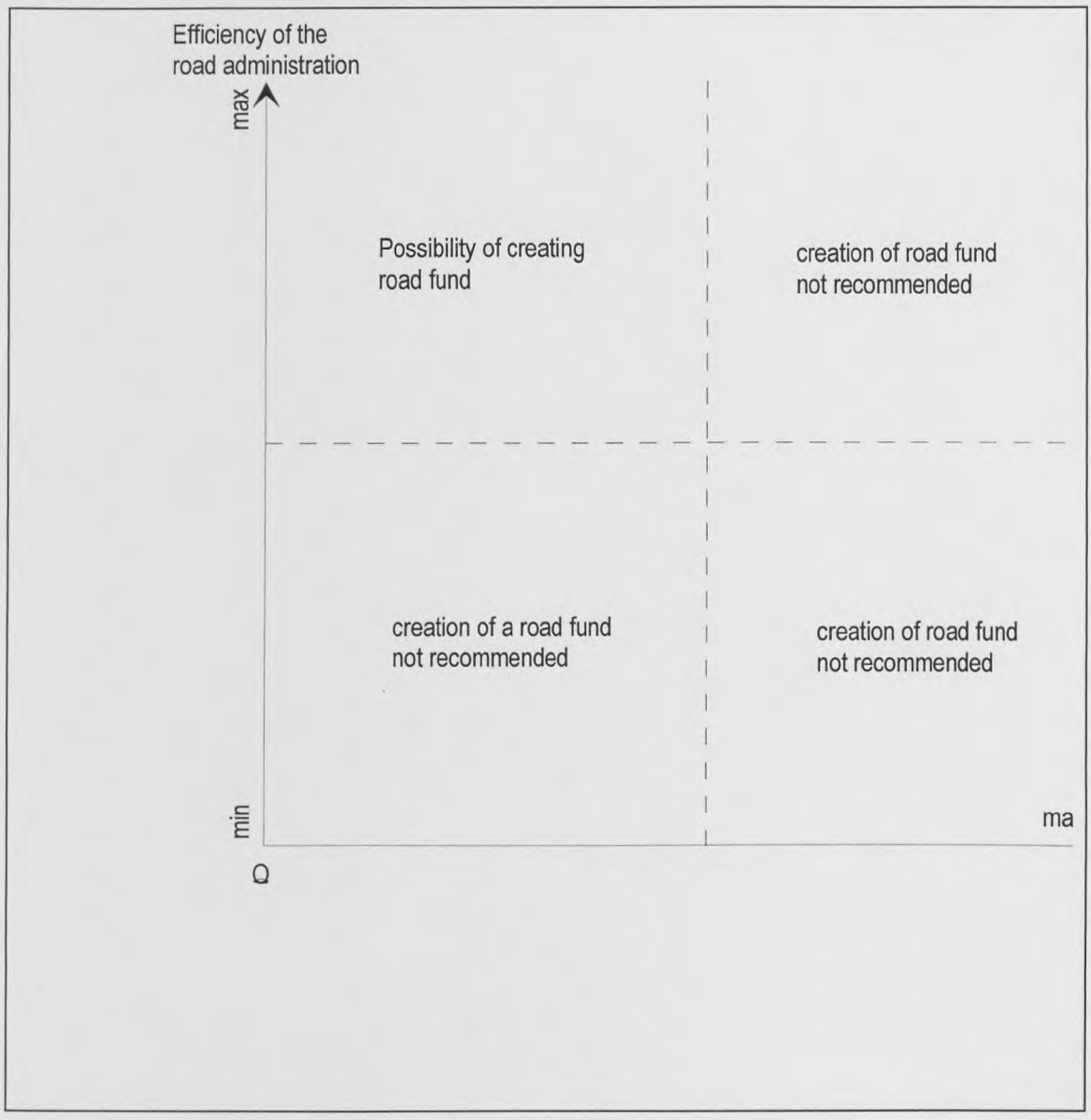


Figure 3-9 Links between tax allocation and road administration efficiency.

[Source: Bousquet and Fayard (1997) page 132]

3.4.3. Applicability of the model of financing district road maintenance to Indonesia

Four important issues are highlighted in this review:

1. The appropriate way to finance district roads will be to improve the existing institutional structures of road maintenance at district level whether by devolving more power to districts, improving the capabilities of the road maintenance staff, or by simplifying budgeting systems. It will require:

   a) better co-ordination between Central Government and Local Government;

   b) devolving power to local level through a co-ordination unit;

   c) capacity building through a learning process to improve planning; and

   d) community involvement to support the decentralisation process.

2. Technology transfer to close the gap between developed and developing countries. Many countries have done both through twinning programs, bilateral agreements and through comparative study.

3. Simplifying or devolving more power and co-ordination between actors at the central level who are in charge of rural roads will be the main way to get the work done efficiently.

4. The possibility of creating a road maintenance fund when the minimum requirements have been fulfilled.

3.5. Summary

District road/rural roads are low in the road hierarchy. They experience inadequate funding, which is not a monopoly of developing nations. It also happens in developed nations like England. What should be done to eliminate this problem? At least 3 factors should be considered:

1. Use of the appropriate technology (lowering technology) to get cheap material costs, improving the institutions to get optimum maintenance results.

2. Increasing revenue for road maintenance through reallocation of funds to road maintenance or by increasing local tax. However, increasing revenues through the reallocation of local tax is not a good idea as there will still be problems in the near future.

3. Technology transfer from developed countries to developing countries to improve the management of local roads was done a long time ago, through either bilateral or twinning agreements. The UK Transport Research Laboratory has a long history of joint research programs with developing countries and the other developed nations such as France to Africa. The main point here is to find a match/appropriate technology to be transferred to developing countries.

The road maintenance fund model, taken from New Zealand's experience, will not work in Indonesia because country conditions will not be ready for its adoption. Most of the developing countries in Sub Saharan Africa, Latin America and the Caribbean (34 countries in total) have adopted the road maintenance fund model but the results are believed to be useless. There are possibilities that governments will raid the money for another politically interesting sector. Improvement of existing budget procedures and the speeding up of the decentralisation process will be the first solution in solving road maintenance issues in Indonesia. If the road administrative and operational conditions improve then the government should set-up a road maintenance fund. Analysis on a case per case basis is a good way, rather than insisting all developing countries adopt a road maintenance fund without preliminary studies as to whether a country is ready to implement this or not.

The next chapter will explore the possibilities of implementing lessons from England using the financing of road maintenance within local authorities.

Chapter 4. Field research in England

4.1. Introduction

The purpose of this chapter is to analyze the possibility of suitable technology transfer from England to Indonesia. Technology transfer will close the gap between Indonesia and England, leading potentially to the improvement of financing local road maintenance in the former. This chapter is divided into literature review based research and field based research. The literature review is based on available documents of local authorities in England. Its purpose is to understand the existing policy of financing local road maintenance in England. Previous literature has suggested there are four factors that should be reviewed in the supporting field research undertaken to complement the literature review, i.e. road maintenance budget allocation, the road maintenance budget process, road surveys, and road maintenance management systems. This chapter is divided into three main sections. Section 4.2 investigates the institutional aspects of local government in England. Section 4.3 explains the financing aspects of local authority road maintenance. Field research in English county councils is explored in section 4.4. The applicability of findings from the field research in England to Indonesia will be explored in section 4.5. Section 4.6 summarises the chapter.

4.1.1. Objectives of using England as a possible source of technology transfer

The objectives of using England as a possible source of technology transfer are:

1. Chapter 3 suggested that the World Bank model of second generation road funds will not work in Indonesia for the moment since there are minimum requirements that should be fulfilled. Chapter 3 highlighted that the World Bank model will only work if a country enters stage 3 of the Talvitie and Dunlop privatization model.

2. Chapter 3 also argues that there is an option to improve the financing of district roads, through the improvement of budgeting systems. This can be achieved through two approaches, either by simplifying budgetary channels or by devolving powers to the local authorities through decentralization.

3. Chapter 3 also highlights well founded experience and technology from developed countries can be transferred through training, twinning, bilateral agreements or comparative study. This thesis falls into the last area.

4. The United Kingdom, through its Transportation Road Research Laboratory, has long standing technical cooperation and research programs with similar institutions in developing countries.

When taking all of the above factors into consideration the author is certain that choosing English local authority road management as a source of technology transfer will be useful for the scope of this research.

4.2. Institutional Aspects

The United Kingdom comprises four countries: England, Scotland, Wales and Northern Ireland. This thesis will focus on England as a part of the United Kingdom in terms of managing its road infrastructures. Within England, the thesis will be limited to local authority roads. At the time of writing the English road administration involves the Department of Transport, Environment and the Regions; the Highways Agency; regional government offices and local authorities. The Highway Agency is responsible for the management and maintenance of the 6,600-mile motorway and trunk road network in England. Local authorities, in this case county councils, devolve the delivery of certain functions to a lower tier of the local government, in this case district councils.

The exact arrangements vary amongst, and within, counties. The local authority road classification is shown in Figure 4-1.

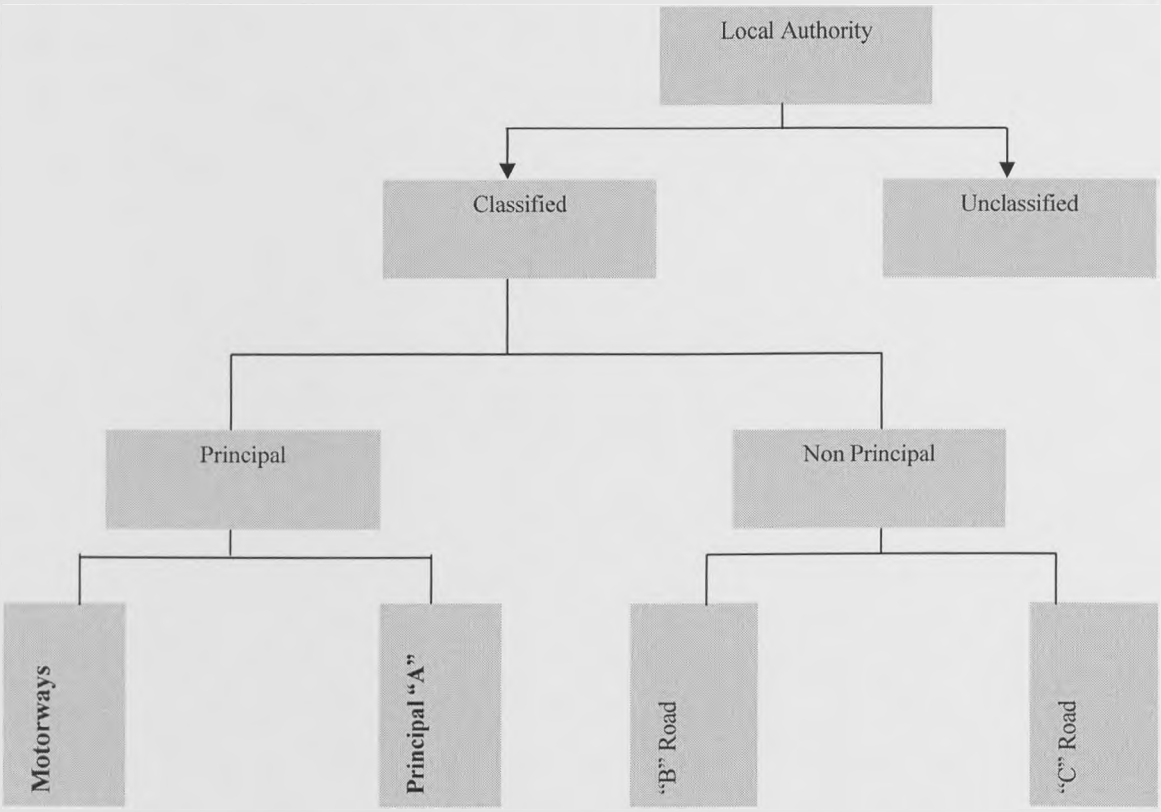


Figure 4-1 Local authority highway network. [Source: Government Statistical Services 1996,Page 2]

Principal roads are similar to the provincial road in Indonesia, while non-principal roads are similar to the district roads in Indonesia. For the purpose of comparison, this thesis will be limited to B and C roads. The field research will, however, focus at county council level as it is they who are the agencies responsible for the local road network as a whole. In Indonesia, responsibility for district roads and the district network is based on the Government regulations devolving powers to the district level.

In England other roads financed by local authorities are: other main roads in rural areas; other rural roads; and urban roads. In Indonesia other rural roads refer to village roads or community roads. Urban roads are divided into a hierarchy of four classes: primary distributors, either radial or circumferential, and they may be built to motorway standards, but are commonly ordinary roads. District distributors connect local areas of the city or town. Local distributors are within local areas. The last type is access roads, which provide access to individual houses, shops and industrial premises.

Central government relations with local authorities in England in terms of road infrastructure are through the Transport Supplementary Grant mechanisms. The Department of Environment, Transport and Regions is responsible for policy in a number of areas of great importance for local government, including (HMSO, 1996):

- the general supervision of local government;
- local government finance;
- housing;
- planning; and
- urban generation.

The Department of Environment Transport and Regions is concerned with transport in local government, especially in broad policy terms. The central government influences local government programs by providing advice, paying specific grant or subsidy, approving programs under certain legislation and controlling capital investment. The main conduit for discussion between the government and local government is through local authority associations, while in Indonesia there are no local authority associations.

4.2.1. Local government reorganization

The Local Government Commission established by the Government in 1993 made recommendations for changes to local government structures. The purpose of the changes is to replace the 2-tier structure of county and district councils in England, with a structure based on unitary authorities that would each be responsible for all local authority functions. Most of the recommendations have been accepted by the Secretary of State (HMSO, 1996, Local Government Reorganization in England, 1998). Based on that recommendation, and with effect from April 1996 until April 1 1998, there was a reorganization of local government in parts of England and all of Scotland and Wales. The units of local government in the UK as at April 1, 1998 were as follows:

- 35 English county councils (not including the Isle of Wight unitary county)
- 33 London boroughs (includes the City of London)
- 36 Metropolitan districts
- 260 District councils
- 46 Unitary councils

4.2.2. The Reorganization of the Department of Transport

Since April 1, 1997 the Secretary of State for Transport's portfolio has been divided into 3 Ministries, as can be seen below:

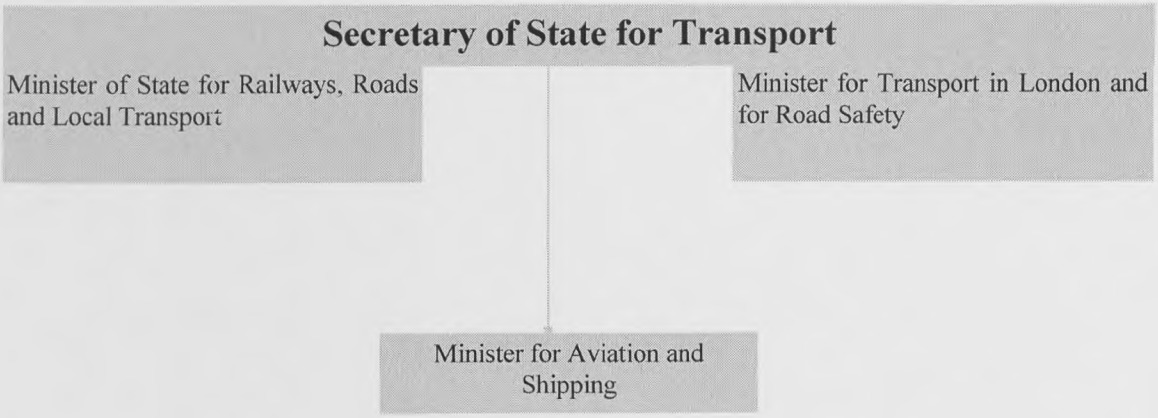


Figure 4-2 The new organisation of the Department of Environment Transport and Regions. [Source: Department of Transport quarterly report, winter 1997, and page 24]

The Secretary of State has overall responsibility for the work of the Department, for financial planning and the environmental aspects of transport. His ministerial team has day to day responsibility for specific programs and policies. The Ministry of State for Railways, Roads and Local Transport is responsible for railways, the Channel Tunnel, road infrastructure, tolling, freight and local and urban transport (outside London). The Minister for Transport in London and for road safety is responsible for transport in London, road safety, taxis, cycling, pedestrians, mobility, aviation, shipping and port matters, House of Commons, deregulation and equal opportunities in the Department. The Ministry for Aviation and Shipping is responsible for civil aviation, shipping and ports, marine safety, export promotion, co-ordination of European issues and all transport matters in the House of Lords. The Department of Environment, Transport and the Regions Report (1997) indicated that the Secretary of State is responsible for general policy on Local Transport in England. The local authorities are responsible for detailed transport planning at local level and the Department provides funding in the form of grants and credit approvals to local authorities for investment in roads.

4.2.3. Local authorities Code of Good Practice for roads and the road hierarchy

LAA Codes of Good Practice are guidance for local authorities to run their own road maintenance business. It is not a regulation. Individual local authorities can adapt it to their own road conditions and funding capacities. The funding method is similar within the local authorities and is based on a road hierarchy. The road hierarchy is stipulated in the LAA Code of Good Practice. For the lowest rated roads in the hierarchy of individual types of road (such as local roads) the funding availability will be relatively small compared with a road higher in the hierarchy. In this case the funding distributions are clear and sound. Based on the LAA Code of Good Practice, the highway network in England is divided into a route hierarchy and is relevant to road financing priorities. The hierarchy of roads is defined in five categories (Stethridge 1997):

1. Primary routes, comprising trunk roads and county roads forming part of the primary route network, cater for through and long distance traffic.

2. Non-primary county routes are major roads linking towns with a population of over 2,500 or providing access to industrial, commercial or tourist areas of county importance.

3. Access routes: other roads serving the larger villages, of those with a population of under 2,500, or providing access for traffic which is predominantly of a local nature.

4. Service roads: Minor roads serving groups of dwellings and farms.

5. Other roads: minor roads serving individual dwellings, farms etc.

4.2.4. Local authority road maintenance

The English county council highway authorities are responsible for control and make final decisions of road maintenance in their jurisdiction. The road maintenance (routine and periodic maintenance) in County Councils has been undertaken through two types of procurement: either private contractor or direct labour (Madelin 1994). The use of private sector and direct labour

organisations to compete will theoretically create competition for road works. Competition for road works can be expected to secure the best selection of contractors concerning price and quality of works (economic effectiveness). It is also capable of adapting supply to actual and varying demand for works, as contractors enter and exit the market (economic efficiency). Although these principles apply to all industries, the road works industry has specific features:

1. The demand for roads comes mainly from government at various levels; toll roads are rare and, where private roads exist, they tend to be short and rare.

2. The industry has high capital requirements except for small routine tasks

3. Leverage is high, since profit and losses are high with regard to equity

4. Poor quality of work may appear only after a long period

5. There is a risk of corruption, made worse because the final users do not buy services.

Beginning in 1980, County Councils in England combined both routine and periodic maintenance works in one contract. The duration for maintenance contracts has been three years, although from the latest survey carried out in England, contractors indicated that they consider five years is appropriate to provide sufficient incentive to invest in costly, specialized equipment (Miquel and Condron 1991).

4.2.5. Road Conditions

There are two perspectives on road conditions. First, formal statements from the Government (Department of the Environment Transport and Regions) and the second, other statements from reports produced by the opposition parties and the Institute of Civil Engineering. The Department of the Environment, Transport and Regions (1997), indicated that for roads overall, the visual condition has remained stable since the mid-1980s. They advocated over this period trunk road

conditions had improved, while the condition of local roads had remained steady. This is despite an increase in total traffic between 1986-1996 of around 35% and in freight traffic (tonnes moved) of around 45%. The defects' index is based on a count of visual defects, increase in the index indicates more faults and, conversely, a decrease shows fewer faults.

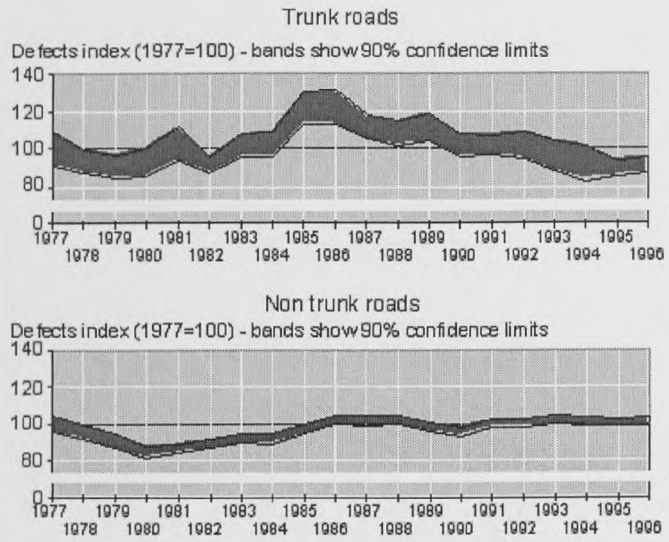


Figure 4-3 The defect index on the road network from 1977-1996. [Source: Statistics Bulletin (spring 1997): NRMCS 1996, pp 5]

As can be seen in the above diagram, for non trunk roads, for example, from 1977 up to 1996 the condition of roads has remained stable. From 1984 up to 1987 the condition of trunk roads indicates more faults, and it is has gradually improved from 1989 up to 1996. However, according to the press release transmitted on behalf of the Labour Party (1997), then in opposition, visual defects on local roads have increased over the past ten years by an average of 67% in England, 41% in Scotland and 82% in London. The average increase in the need for structural maintenance to roads over the past 10 years has been 58% in England, 37% in Scotland and 48% in London. In the United Kingdom a 1996 Institution of Civil Engineers' survey of local authority networks found that maintenance of local roads (96% of the total network) was being under funded by $1,440 million per year and construction and improvement by a further $ 2,260 million.

The detailed explanation on NRMCS (1995) reported that urban classified, rural unclassified conditions are worst compared with other types of road. Although the government statement argued that the road conditions remain stable, that is not true. The truth is that the road conditions have now deteriorated due to under-funded maintenance. This issue will be explored further in interviews with County Councils.

4.2.6. Local Government complaints system

In 1980 the Government launched the Financial Management Initiative to introduce a new financial management and budgetary system with significant delegation of budgets to local managers (Turton, 1996). The Citizen Charter (1991) has given more power to the citizen and proposes that public services should answer more responsively to the needs of ordinary people. The Local Government complaints system aims to support the Citizens Charter. Under this local authorities are encouraged to solve complaints through internal mechanisms. To do this local authorities should appoint a monitoring officer whose duties include ensuring that the mechanisms should work. In the road maintenance sub sector, one of the jobs of the Road Maintenance Area Officer is to receive complaints and make sure that action will be taken.

4.3. Financing aspects

4.3.1. Sources of Funds

Sources of funds for roads come from Road User Taxation (RUT). The rationale behind the RUT is that the road user should pay a sum equal to the costs imposed upon others, i.e. the direct costs arising out of road use. The most commonly used method for charges related to vehicle use is surcharges on fuel. Fuel charges in the UK have gained public acceptability and the amounts paid are related to distance traveled. The motorways have been financed by the private sector through

the Highway Agency using DBFO and shadow tolls. Shadow tolls are amounts paid to road providers in respect of the traffic on their roads, without immediate payment from the road users concerned. In 1994 the Department of Transport announced that private consortia are to be invited to bid for contracts to design, finance, build and operate four new road projects in England. The successful contractors would be paid by shadow tolls.

The road systems in England are funded almost exclusively from Central Government taxation revenues and monies generated by local authorities. Approximately 50% of the total funding for roads is derived from Central Government, while the remaining 50% are from local authorities' own sources including Council Tax. The trunk road network (including motorways) is a Central Government responsibility, while the secondary and local road network comes under Local authorities (although there are substantial transfer payments from Central Government to supplement local rates in the financing of such systems).

Roads in England are largely free at the point of use. Road users do not pay directly for the provision and operation of road networks, including police and ambulance costs. The road user only pays Vehicle Excises Duty (VED) and Fuel Duty (DOT 1993). VED is a flat rate charge imposed on all UK registered vehicles, with the exception of certain exempt categories such as vehicle used by emergency services and by people with disabilities. Road revenues in England go to the General Budget and are not earmarked for road use. There is no relation between road user tax and road expenditures. The total road revenue is collected from general tax, and for road spending purposes, the Department of Environment Transport and Regional submits a bid to Her Majesty's Treasury, competing with other large and attractive spending Departments such as Education and Social Security. Figure 4-4 sets out road tax in England:

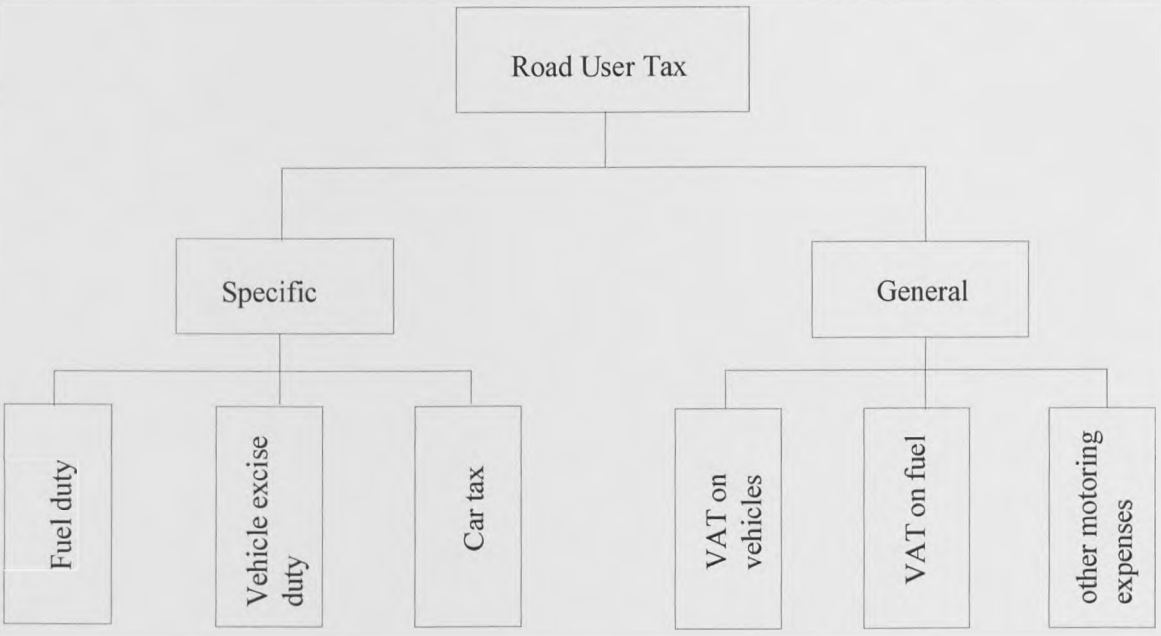


Figure 4-4 Elements of road tax in England. [Source: adapted from British Road Federation (1997)]

A Comparison between road user taxes attributed to road costs is as follows:

Types of vehicles	No. of vehicles (000's)	Fuel duty (£ million)	Vehicle excise duty (£ million)	Total (£ million)	Costs attributed (£ million)	Taxes less costs (£ million)	Ratio of revenue to costs
Cars, light vans and taxis	24,458	13,300	3,590	16,890	4,130	12,760	4.1:1
Motorcycles	658	50	25	75	20	55	4.1:1
Buses and coaches	79	395	25	415	240	175	1.7:1
Goods vehicles	436	2,980	570	3,550	2,160	1,385	1.6:1
Other vehicles	1,486	425	25	450	175	275	2.6:1
All vehicles	27,117	17,150	4,230	21,380	6,725	14,655	3.2:1

Figure 4-5 Ratio between road user revenue and road expenditure. [Source: British Road Federation (1997)]

It can be seen from the table above, road revenues are more than double their expenditure. As previously explained, since there is no link between road expenditure and road revenue, the latter can be diverted into other politically interesting sectors.

The Department of Environment, Transport and Regional obtains funds from Her Majesty's Treasury for all expenditure on national roads and through grants for 50% of expenditure on local roads. The other 50% of expenditure on local roads come from locally allocated revenues. The Department of Transport divides the road budget between its nine regional offices for national roads. The current expenditure pays for items of a relatively short-term nature such as wages and salary. The income that finances that expenditure comes from three main sources: government grants, rates and charges, and miscellaneous. The Government pays grants from general taxation to local authorities. Grants can be paid to support both capital and current expenditure. About a quarter of Government grant is paid over in the form of specific or supplementary grants. There are three main types of grant: rate support grants, specific grants and supplementary grants. The Rate Support Grant is a block grant and is paid in respect of road rate fund expenditure as a whole, and is not earmarked for particular purposes. Specific grant is a type of grant that is paid in respect of particular services or projects and local authorities are obliged to use them for these purposes.

Lagroye (1979) indicates they are commonly but not necessarily paid as a percentage of expenditure. Supplementary grants are paid for transport services and national parks and are available for a variety of purposes within these services. The most important grants are paid over to individual authorities as a block sum. The grant consists of two elements: (a) domestic rate relief paid to enable authorities to relieve domestic ratepayers of a certain proportion of their rates; (b) block grants, to supplement an authority's own finances so that, irrespective of individual local needs and resources, it can provide a similar standard of service for a similar rate to other authorities of the same class.

Each year, following discussions in the Consultative Council on Local Government Finance, Central Government calculates the total amount of revenue spending it will accept for grant

purposes (relevant expenditures) and the percentage of relevant expenditures to be financed by grants. Income from charges is derived from fees, rents, tolls, fares, interests etc. The amount received by individual authorities varies widely, according to the type and range of chargeable services provided, and the levels at which charges are set. Capital expenditure by local authorities is usually spent on longer term items such as the purchase, construction or improvement of land, property, equipment and so forth. The capital income used to finance that expenditure can be raised from several sources, including capital grants from the government or other bodies such as the Sports Council, sales of land, property, equipment loans and so on. Usually capital (due to large investment and long term nature) has been financed through borrowing. However loans or borrowing are controlled by the Central Government, and loan sanctions must usually be obtained from Ministers.

4.3.2. Financing through Privatization

Privatization of roads is not a new thing in Britain. In Great Britain in 1830 there were 1,116 turnpike trusts maintaining 22,000 miles of toll roads, which accounted for about one-fifth of the total road systems. These companies were financed almost entirely by private capital and received tolls (Roth 1996). However, road development was in trouble with the rise of railways and many of the turnpikes were abolished and superseded by public roads.

Rickard (1994) highlights that the Highway Agency of the Department of Transport, a new entity established in April 1994 to manage, maintain and expand the UK's Trunk road network, invited interested parties to compete for selection to negotiate its first "Design, Build, Finance and Operate" (DBFO) projects. The Private Finance Initiative has now been implemented in local authorities. The 4Ps are a local authority funded and sponsored unit whose remit is to assist local authorities exploit and apply Public Private Partnerships. The 4Ps were set up in April 1996 and a board of nine members controls it.

Local authority road and transport projects use the same DBFO type of concessions. The basic concepts of the DBFO projects is that the Highway Agency requires the private sector to finance the design and construction works through a means of equity investments (risk capital), loans, bonds or other forms of financial sources. The winning contractor will be responsible for designing and constructing, operating and monitoring the road for 20 years. One of the aims of the 4Ps is to work with a number of pathfinder projects, with the expectation that pathfinder projects will provide a good example for other authorities to follow. Projects selected to be pathfinder schemes are as follows:

- Essex County Council
- Doncaster Metropolitan Borough - New York Bridge
- North Yorkshire County Council - package of three road schemes
- Devon County Council - Kingskerwell by Pass

The payment mechanism of these 4Ps projects is based on shadow tolls. There is a growing effort by many Local authorities to use Public Private Partnerships and the DBFO route to improve local infrastructure.

4.3.3. Financing local government

Budget channels to local authorities in England are in the form of a Central Government grant or from borrowing. These budget channels are transferred to local authorities, and the implementation of the work depends on local authorities but is in line with Central Government guidance. The following diagram shows the flow of budget to the local authorities:

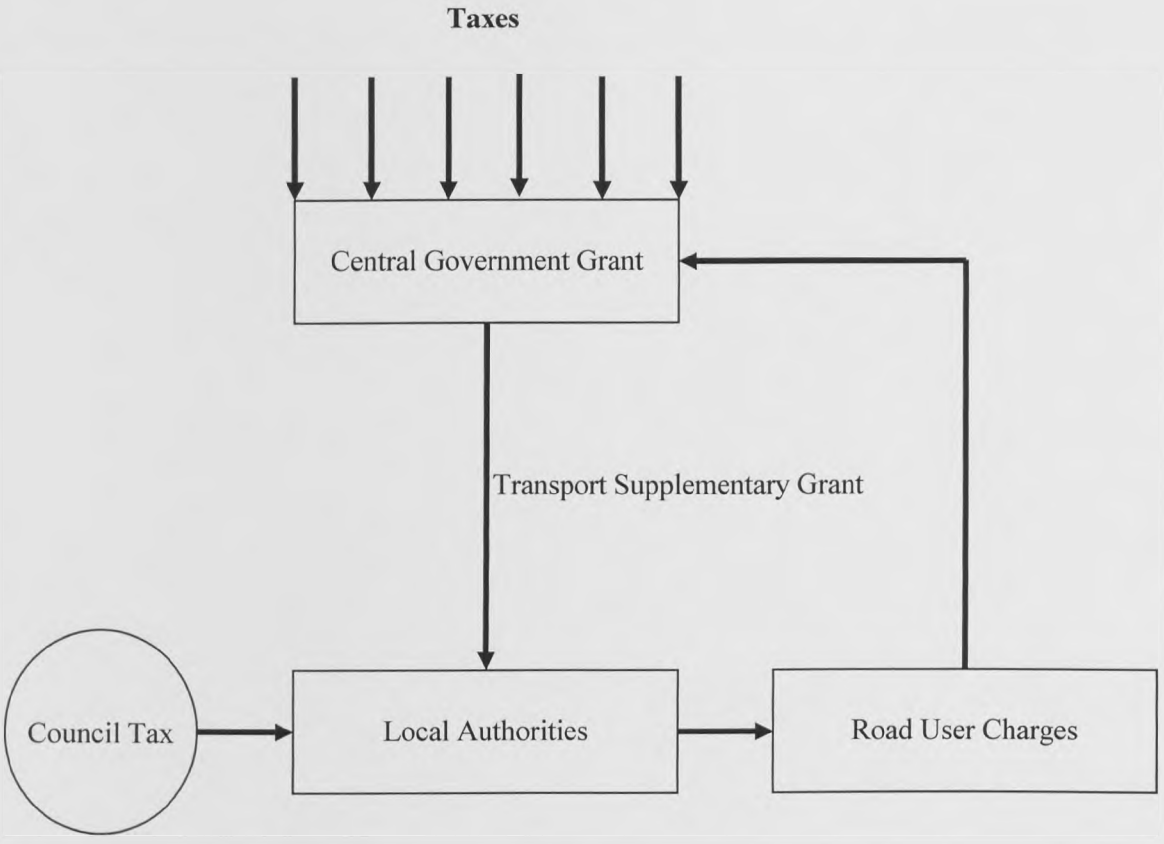


Figure 4-6 Local authority budget channels in England. [Adapted from: Local Government, 1995]

The budget process in local authorities is divided into the following five stages. Stage one, various service Chief Officers in conjunction with the Treasurer calculate the costs (on a fixed price basis) of the on going activity of the local authority plus any necessary further service development.

Stage two, estimates are sent to various spending committees for approval. Stage three, the Treasurer aggregates the various services estimates, makes allowance for inflation and contingencies, calculates the block grant receivable and rate levy necessary to finance the spending proposals of the various committees, and reports on the effects to the Resources Committee. Stage four, various services committees will carry out their final scrutiny of the budget. Stage five, the final stage, is the setting of the level of community charges (district and metropolitan councils) and precept (county councils).

The next section explores field research undertaken in a number of English county councils to expand on, clarify and increase the author's understanding of issues raised in the literature review. It was initially conducted on the basis of a questionnaire survey to gather a wide range of information from different councils. It then focused discussions with a small sample of respondents on issues and themes raised in the questionnaire responses.

4.4. Field Research in England

The purpose of field research in England is the following:

1. To analyse the possibilities of technology transfers from English local authorities to Indonesia through detailed analysis of their financing structure and managing road maintenance.

2. To get additional information in detail on how local authorities manage their road maintenance funding, especially in terms of their policy towards it.

3. To get detailed information on sensitive topics such as maintenance backlog, and how they cope with this problem now and in the near future

This section reports the results of the questionnaires sent to a sample of main actors involved in commissioning and implementing the road maintenance budget systems in England. In addition, local authority senior officers' views were also sought through semi structured interviews. The main section discusses the results of the questionnaire in 5 sub sections, each of which corresponds to one of the issues identified immediately below. The other section also discusses the results of the interview, and the next the implications of the questionnaire to the primary research requirements for Indonesia. The final section summarises the main findings.

4.4.1. Issues for investigation

Respondents were asked about road surveys, budget allocations, and the budget process and road maintenance systems. The total sampling frame consists of 35 county councils in England plus two city councils (Leeds and Wakefield)[2]. The latter were involved in the pilot study. Questionnaires were sent to the whole population (n= 35). A response rate of 57% was obtained with a usable response rate of 46%. The questionnaire provided a wider baseline data set of information for more in-depth interviews. Interviews were conducted with a small sample of local authorities based on their answers to the questionnaire (n=8).

4.4.2. Questionnaire results and discussion

4.4.2.1. Introduction

Three questions were designed to investigate how local authorities undertake road surveys. A road survey is one important element in road maintenance (OECD 1995). It is necessary to know the condition of the road network to assess the maintenance needs. In England, the principle used for maintaining roads is in accordance with their functional importance. The road hierarchy is as follows:

[2] Six local authorities were unable to participate due to the lack of staff. Fifteen local authorities did not respond to the questionnaire. The lists of the local authorities that participated in the research are listed in Appendix B. The respondents had been working in the local authorities for more than 20 years. However, the approximate time in their present positions is five years.

Hierarchy	Description	Road Type
1	Motorways	
2	Strategic Route	Non motorway, trunk, some principal "A" roads between primary destinations
3a	Main distributor	Major urban networks and inter primary links, relatively short O/Ds
3b	Secondary distributor	Class 2 and 3 roads
4	Local roads	Local interconnecting road

Figure 4-7 The road hierarchy in England. [Source: Cornwall, Highway maintenance Code of Good Practice (1996), page 26]

There are three ways of monitoring road conditions from the surface, the pavements (layers) and the structures. **Surface monitoring** is concerned with the impacts of vehicle interaction. The rating used is similar to that in Chapter 2 - Good, Fair and Poor. **Pavement monitoring** is concerned with mechanical fatigue and environmental distress of layers. The distress patterns of pavements generally involve cracking (narrow and wide), materials losses (gravelling, disintegration, potholing and deformation). **Structural controls** are linked to bearing capacity and therefore to service life.

4.4.2.2. Results

Respondents were asked two questions (Q)

Q.1 How often do you carry out area surveys? The purpose of the question is to ascertain how often they conduct the area of survey. The more they carry the area survey the more adequate their prediction on road conditions in the near future.

All of the 14 local authorities have undertaken three types of survey, surface, pavement and structural conditions. The distinction between them is in terms of frequency, particularly of surface surveys. Surface surveys vary between each local authority, ranging from one month to approximately three months. Pavement surveys are usually done within one to three year intervals, depending on the local authorities. The survey frequency is always in line with the road hierarchy. For example, Cornwall County Council's survey is undertaken based on the road hierarchy as detailed in the Local Authority Code of Good Practice as follows:

Road Hierarchy	Maintenance Category	Inspection/Survey Interval	
		Detailed	Safety
2	Strategies road	6 months	1 month
3 (a)	Main distributor	6 months	1 month
3 (b)	Secondary distributor	1 year	1 month
4	Local road (urban)	1 year	3 months
4	Local road (rural)	5 year	1 year

Figure 4-8 Road hierarchy and its relationship to suggested inspection intervals.

[Source: Cornwall City Council (1996) page 55]

Q.2. What types of road maintenance standards do you use? Road standards are essential, especially concerning national roads. If there are no standards, then road users will experience discomfort when they drive from one county council to another. Under a process of road decentralization, especially for national roads, reliance should be placed on national, instead of regional, standards.

The Highway Maintenance - A Code of Good Practice is a national standard for road maintenance works in England. However, the Local Authority Association indicates that authorities tend to adapt it to local authority situations and conditions. Some of the local authorities surveyed developed their own standards according to their own needs. For instance, experience has shown

(HMSO-1992) that authorities tend to undertake more frequent routine maintenance than recommended in the LAA code.

Activity	LAA Code	Typical	Interquartile range (i.e. The range in which half of the authorities lie)	Lowest	Highest
Mechanical sweeping (rural primary)	2	2	2-6	0.8	13
Gully emptying (urban primary)	2	2	2-3	0.75	4
Grass cutting (urban highways)	5	5 or 6	3-6	1	10
Traffic signals (inspection)	1	1	1 – 3	0.3	4
Street lighting (number of summer scout)	6	13 – 26	6 – 25	4	32

Figure 4-9 Examples of different specifications between local authorities and the LAA code. [Source: Improving Highways Maintenance: A Management Handbook, page 19. HMSO (1988)]

4.4.3. Budget Allocations

Seven questions were targeted at investigating the budget allocations of local authorities. Four questions in this sub section were targeted to determine road maintenance expenditure trends, Central Government grants to the road sector, road maintenance budget and total expenditure on highway related matters. A question on in-house direct labour attempted to explain the competitive tendering procedure mechanisms. Empirical studies have shown that contracting out road maintenance based on performance standards will be cost effective compared to using a DLO. Since budget cuts, more local authorities are privatising their DLOs. The remaining three questions were concerned with the role of the transport/highway officer in budget decisions, as well as his/her role in shifting funds between road maintenance budget headings and between

sectors. The role of the transport/highway officer in budgeting is important since he/she knows the importance of highway/road maintenance, and the consequences of lack of maintenance towards the road assets as a whole.

Q.3.1. As a transport officer, are you a member of the policy committee? Since the transport officer is the one who understands road maintenance problems, it is important to accommodate him/her to be a member of policy committee to protect the road conditions.

Only one out of the fourteen respondents stated that as a Transport/Highway Officer they were a member of their local authority Policy Committee, the other officers only assist the Committee in transportation/highway matters, including road maintenance. The prioritization of policy depends largely on the Policy Committee, which will be more interested in politically attractive sectors than road maintenance.

Q.3.2. Which percentages of TSG Bids were allocated by Central Government since 1992-1996? The purpose of the question is to obtain real data on Central Government interference in the local road business.

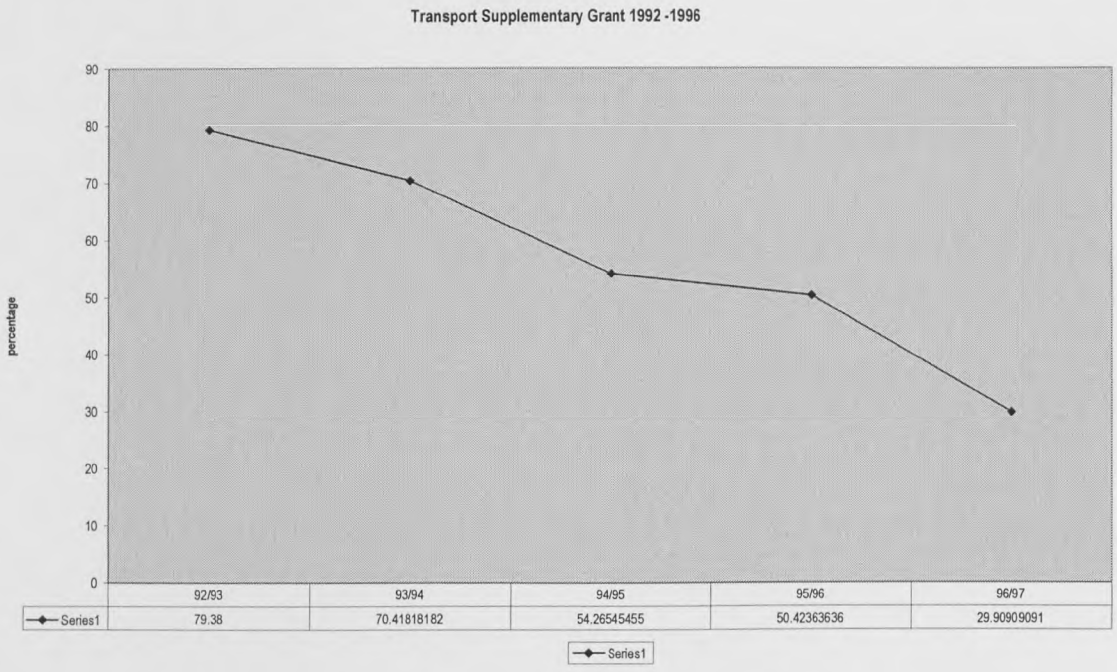


Figure 4-10 Trend of Transport Supplement Grant. [Source: Questionnaire Analysis (1997)]

The major funding (capital resources) source for transport schemes is the Transport Supplementary Grant bid through the Transport Policies and Programs. Transport Policies and programs documents are the documents prepared by the local authorities to bid for capital resources from the Department of Environment, Transport and Local. Transport Supplementary Grant (TSG) is a government grant for capital expenditure on certain types of highway transport schemes. Transport Supplementary Grant is the only grant for roads from the central government. The grant will be transferred into local government account and the local financial manager will deal with this grant.

From the above figure, the percentages of TSG funds are declining between 1992/1993 up to 1996/1997. That means the central Government is gradually leaving road maintenance to the responsibility of authorities. Only one of the local authorities had experience of TSG increasing in 96/97 (Devon 1996/97). According to the regulations, the Transport Supplementary Grant covers

approximately half of the Road Expenditures and Transportation, but the declining figures show that most of the respondents received less than fifty percent.

Q.3.3. What was the total Road Maintenance Budget 1992-1996? The purpose of the question is to disclose the Highway Maintenance Budget over a five-year interval. The rationale of the needs based approach to maintenance is that it will be constantly increased in line with inflation factors.

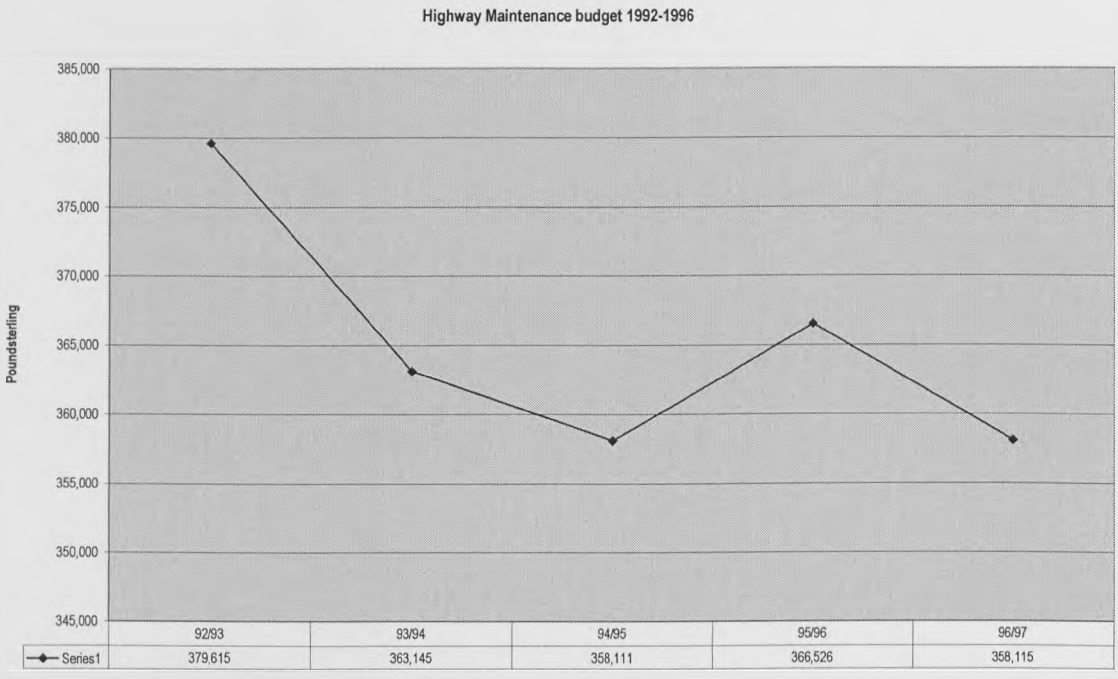


Figure 4-11 Local authorities' highway maintenance budgets 1992-1996. [Source: Questionnaire analysis (1997)]

The revenue maintenance budget includes structural maintenance, winter, street lighting, environmental issues and safety. All maintenance budgets declined in 1996/97, while on the other hand the road length to be maintained remained the same. The approximate amount in 1994/95 is similar to 1996/1997. The consequences are obvious; there will be certain types of roads that are not going to be maintained. Since the funding of road maintenance depends on road hierarchies, rural roads will be the ones that will suffer most as the lowest ranked in the road hierarchy. The decline of the road maintenance budget, followed by the rate of inflation, means that road

maintenance expenditures are declining rapidly. The decline in the highway maintenance budget will have an effect on road conditions; the consequences of the under funding of maintenance will be to sacrifice road conditions, which will be discussed later. The indications are that government statistical data, which has been stated on section 4.2.5, is false; road conditions will deteriorate due to under funding maintenance.

Q.3.4. What was the total expenditure on highway related matters, excluding any grants and external funding, between 1992-1996? The purpose of the question is to find a ratio between highway maintenance and total expenditure of the highway.

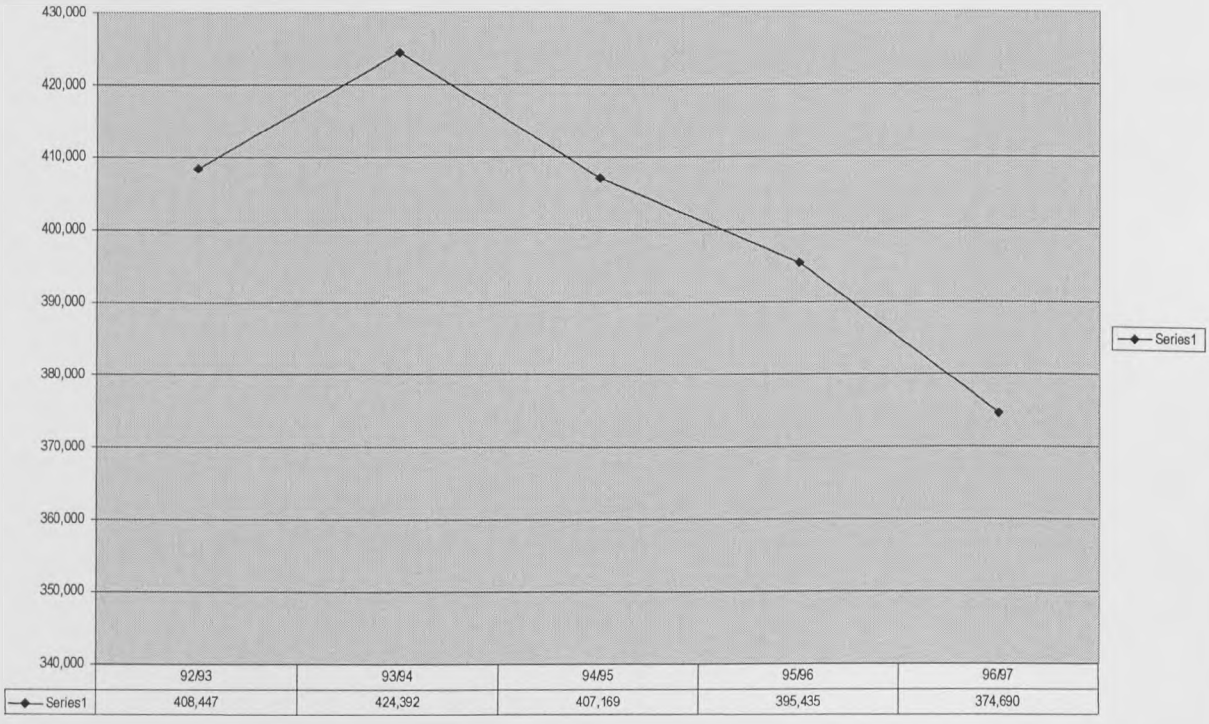


Figure 4-12 Highway related matters 1992-1996. [Source: Questionnaire analysis (1997)]

Highway related matters include operationalization of road, wages and salary and other administration costs related to roads. The decline in expenditure on highway related matters is in line with the decline of Transport Supplementary Grant.

Q.3.5. What was the in house Direct Labor work for road maintenance since 1992 - 1996? The purpose of the question is to find out the willingness of local authorities to introduce the competitive bidding process into practices.

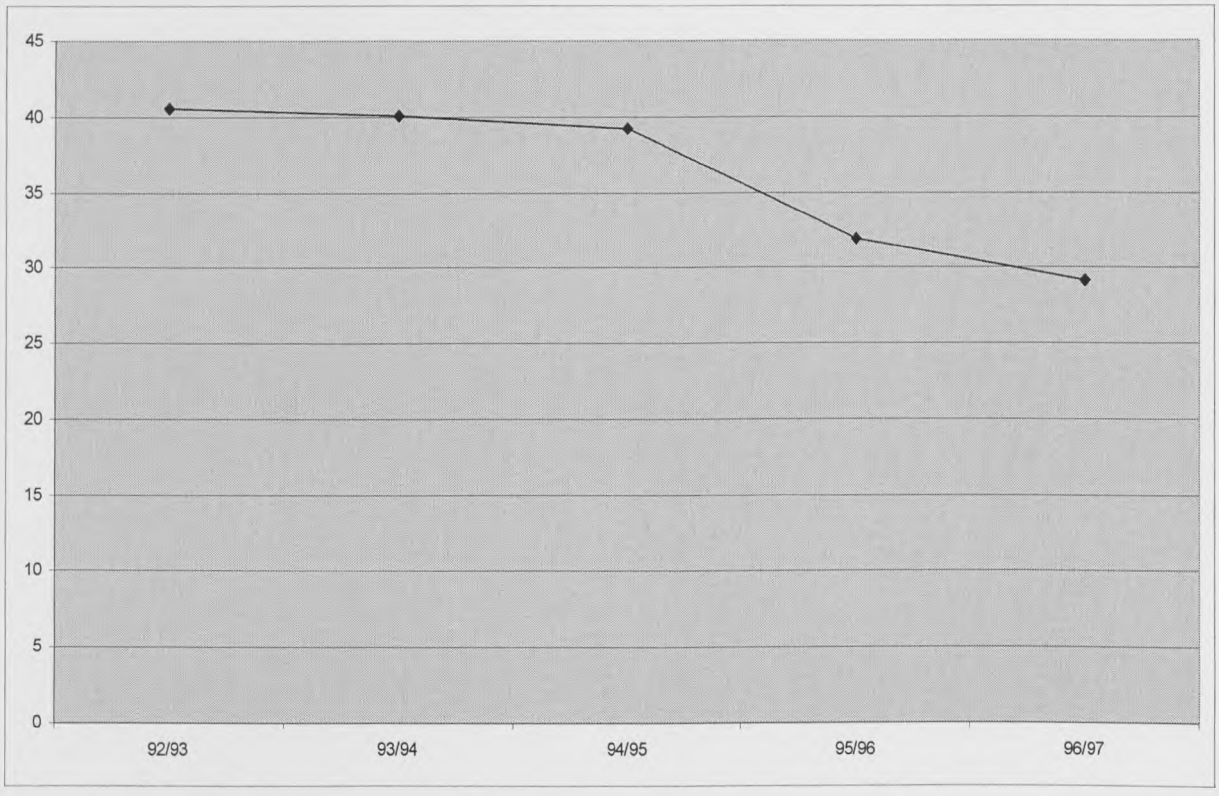


Figure 4-13 In house direct labor trends 1992-1996. [Source: Questionnaire analysis (1997)]

It can be seen from the graph above that more local authorities privatised their Direct Labour Organisation from 1992 onwards. Contracting out the work to the private sector will save money. By privatising the Direct Labor Organisation it will at least release the local government burden towards the operational costs, such as salaries or wages. Road maintenance contracts in local authorities range from between three to five year contracts and multi-year contracts. Contracting out the work to third parties has a great advantage in terms of savings.

The advantage of the ex Direct Labor Organisation is that it is an expert in road maintenance work due to its prior experience. Some of the local authorities used the profit margin from the ex Direct

Labor Organisation to decrease the amount of community charge for the local authorities. Some returned the profit to the general revenue of the local authorities. Routine maintenance has been undertaken either by direct labor or by contracting out to the private sector. Based on the HMSO (1988) an efficient in-house unit will force contractors to cut their margins and, for many jobs, will be able to under-cut the contractors. However, some authorities have a policy of awarding their in-house units as much work as possible without competition. This has been particularly easy to do for routine maintenance. Many of the activities, such as sweeping and gully emptying, are not covered by the Local Government, Planning and Land Act (which sets requirements for work put out to competitive tender).

Other types of work such as road markings often involve small jobs below the threshold at which work must be awarded competitively. Some counties protect the in-house units by using such devices as unrealistically short periods, or unusual or unrealistic work mixes, when seeking tenders. The outdated bonus schemes, traffic signal maintenance, street lighting and electricity board's case study proved that something should be done to get the right price. There are a number of biases in favour of in-house units. For example, one county asked its in-house unit and contractors to price a schedule of rates, i.e. pre-determine the price of a range of commonly occurring jobs. In practice, almost all of the work was awarded to the in-house unit and the schedules were only compared at the end of the year. If the in-house schedule item was less than the lowest contractor's quotation, then the unit was declared to have won the contract (contrary to the requirements of the Act, since the in-house unit was never at risk of losing the work). If the in-house price was higher, the work was treated as part of the work, which could be awarded to the in-house unit. Some authorities seek labour only tenders for surface dressing, and purchase the materials themselves. This may wittingly or unwittingly give advantage to the in-house unit in tendering for the work, since most of the major contractors in the field are subsidiaries of the companies which supply the oil-based material, and are not necessarily interested in labour-only contracts.

Q.3.6. Who is in charge of shifting funds between Highway Maintenance Budget heading and between sectors? The purpose of the question is to see the flexibility and probability of shifting road maintenance funds to other sector activities. Since road maintenance is not politically attractive, there is considerable experience to say that road maintenance funds are often diverted to other activities.

Virement is a shifting of funds between activities or headings in the local authorities. Regarding virement within budget headings, different views on the procedure were identified. The procedures identified are as follows - six respondents replied that minor virement is at the discretion of the Transport Officer or Director of Road Maintenance, while some decisions have to be referred to the Finance Department/Member of Parliaments. One of the respondents stated that virement will be at the discretion of the County Surveyor's Management Board. The remainder said that this type of virement was at the discretion of the Transport Officer. It is very rare that virement will happen during the fiscal year because the budget is very tight. However, if it does happen the local authority approve the virement in terms of shifting of funds between sectors. Only two respondents replied that minor shifting between sectors should be signed by the Transport Officer and approved by the Policy Committee. Shifting of funds across sectors again is very rare. This is because there are contingencies, which vary between local authorities. Usually if there is any adjustment necessary, they will use reserve funds. County councils define virement rules so here the agents and county engineers with similar responsibilities enjoy similar freedom of action.

4.4.4. Budgeting Process

This section tackles the issue of the budgeting process in local authorities. The difficult part of this section is Question 4.2 regarding the budget process. Half of the respondents left these questions blank.

Q.4.1. The way they set-up their budget, either historical cost or needs assessment. It is usual to set up the road maintenance budget based on historical costs, with additional costs included as certain percentages to take into account the inflation factors, ignoring the real condition of the road.

Although a 'needs' based strategy is advocated in the LAA code, many budgets are still based upon historical spending patterns. Some local authorities have found it particularly difficult to change their approach because of the problems of budget constraints faced by the local authorities. Some of the respondents used a needs-based approach to structural maintenance and an historic approach to routine maintenance.

Q.4.2. Budget process by taking into account who reviews I and who within the organisation accepts the proposed budget? As road maintenance is not politically attractive the role of transport/highways Officers is significant in protecting road conditions because they are the ones who understand the problems, not the politicians.

The budget process in local authorities in England differs from one local authority to another. However, they have the same finishing touch whereby the Transport/Highway Officers submit the entire road maintenance budget to the Policy Committee. The Policy Committee decides the amount of the budget. In most cases, the Policy Committee will not revise the budget proposals for road maintenance. This is because the transport/highway officer has been informed that in a particular year the budget proposal will increase or involve savings by a certain percentage. Local authorities that prepare their budgets based on needs, since they know the likely funds for road maintenance, will work it out based on road priorities. Some local authorities calculate the budget using integrated computer maintenance management systems and some work with non-integrated road maintenance budgeting systems. The balance use stand-alone PC programs.

The road survey is the starting point for the budget process. The road survey will take an inventory of the road conditions. Based on road conditions and the availability funds, the highway authority

of the local authority starts to allocate funds between different types of road using road prioritisation.

All of the respondents indicated they have their own budget process. At least six of the respondents did not fill in the process completely. During interviews reported in the results of interview section the author attempted to explore the budget process in detail with each interviewee, and the former was subsequently referred to the Finance Officer responsible for the budget.

Q.4.3. and Q.4.4. The role of the Financial Officer within the Road Maintenance Department. In Indonesia every single Road Maintenance Project has its own financial officer who is in charge of looking after the cash flow of the project

Only 2 out of 14 respondents have their own Financial Officer in the Finance Department of the local authority. Since the local authorities undertake their financial matters they can concentrate on the technical side of the work.

4.4.5. Road maintenance systems

This question was intended to investigate how the local authority Transportation/Highway units manage their organization's maintenance activities.

It was apparent from the responses that 5 out of 14 respondents do not use road maintenance management systems. Four local authorities were going to implement road maintenance management systems in 1998/1999. They are currently working with stand-alone PCs. Two out of nine who use network management systems are using GIS (Geographical Information Systems). By pressing a button the manager of road maintenance will know the progress of a particular link and what kind of works the contractors are undertaking at a particular time. One task that should be performed by this maintenance system is the prioritization of roads. Seven out of nine who

used road maintenance management systems implement it in such a way that inputs from road maintenance can be used by other systems such as a pavement management system or construction planning system. However, none of the local authorities' maintenance management systems is integrated with accounting and recording systems.

The next section reports on interview findings.

4.4.6. Interview analysis

4.4.6.1. Introduction

This section reports on the results of a series of interviews with actors involved in the road maintenance decision making process. The interviewees are a subset of those who responded to the questionnaire. They were selected on the basis that they agreed to be interviewed in the questionnaire. To reconfirm, the overall objectives of the interviews is to gain an in-depth understanding of the outstanding issues from the questionnaire and other road maintenance issues in English local authorities. The interview analysis is split into four sub sections. The first sub section (5.5.2.) serves as a background to questions about the local authority organisation, especially related to the organization of road maintenance. Sub section 5.5.3 examines the local authorities' policy with regard to coping with the existing declining trend of Transport Supplementary Grant, Highway Maintenance budget and other related expenditures to road maintenance. Section 5.5.4 examines local authorities' existing road conditions, including road maintenance backlog. Section 5.5.5 presents the local authorities' views on road maintenance issues.

4.4.6.2. Interview sample protocol and analysis

In total, eight county council officers were interviewed for which the details are shown in Figure 4-14 below. The questions used in the interview are as follows:

Road Maintenance organization

1. The Road Maintenance organization within the local authorities

Budget Allocation

2. Based on questionnaire results, it was shown that theTransport Supplementary Grant has been decreasing since 1992 and the county councils have had to cope with this problem
3. The Highway Maintenance budget trend is declining

Budget Process

4. More details in the budget process in road maintenance
5. Do you experience any virement during the current years?
6. Payment mechanisms in county councils

Road Maintenance

7. How does the procurement of road maintenance work
8. Road maintenance contract work
9. Do you think that road maintenance spending is adequate?
10. Do you think that privatization of roads will be a good solution to release governmental problems in road maintenance.
11. Have you done a survey on public opinion of road maintenance?
12. Do you have any proposal for privatizing the road maintenance components?

Figure 4-14 Interview protocol for questions to eight local authorities. [Source: Author (1997)]

4.4.6.3. Local Authority Organisation

The organization of road maintenance varies between the 8 county councils. Some of the local authorities put their road maintenance organisation under the umbrella of either: an Environment Directorate; the Directorate Environment and Planning; Department of Transportation and Highways; or Department of Transport and Estates. Although each county council has different names for the organisation, the job undertaken by the road maintenance organisation is similar everywhere. They divided road maintenance into several areas, and each road maintenance manager is responsible for his own area.

In Bedfordshire County Council, for example, the road maintenance unit is within the Department of the Environment and Economic Development, under the Transport and Highways Division. This is similar to the other 7 county councils.

4.4.6.4. Road maintenance funding issues

Based on questionnaire results it was shown that all county councils experienced a decrease in the amount of their Transport Supplementary Grant. On the other hand the highway maintenance budget is similar to 1992/1993. This was influencing the county council policy on road spending. They have to fulfil the gap between TSG Bid and TSG Allocations. Most of the respondents have trouble coping with the problems raised. They base their work on the funding available, by considering the most urgent work. On the one hand they have to serve the public, but on the other hand the budget was cut. Some of the respondents replied that they only do patching and potholing to keep the road safe. Most of them agree that the work should be undertaken on a priority basis by taking into account the most seriously damaged roads as a number one priority. Most of the respondents commented that local authorities should ensure that the management of the highways network is safe and efficient for all members of the travelling public and that all the county councils' obligations are met. They also agreed that at the very least they have to maintain the existing highways as far as funds allow.

4.4.6.5. Road conditions and road maintenance backlog

Although some of the local authorities did not comment directly on the road maintenance backlog the majority of them agreed that local roads are not adequately maintained. Based on these interviews it was found that up to 1997 the backlog within the eight county councils range between £7 up to £64 million and this backlog increases from time to time. Most respondents prefer to maintain the backlog, not to expand it any further. They are worried that if the situation continues there is the possibility that highways will deteriorate below a level that is legal or safe. When considering other roads, the non-principal road is the worst in relation to the backlog. One respondent mentioned that the condition of non-principal roads is declining at a rate of 6.2% per year or £3.2 million in value, compared with an investment of only £1.93 million per year.

4.4.6.6. How to minimize the backlog?

It was indicated that the possible way to minimize the backlog is to increase local road maintenance funding as soon as possible. The issue has been taken into the parliamentary agenda. The issue has been raised by the Marquis of Aberdeen and Temain, who asked what proposals the Government had to improve the state of rural roads that were in poor condition due to the shortage of money available to county councils? By asking this question the Marquis raised concerns about the lack of funds within county councils to a higher level of awareness. However, the Government at that time only returned typical answers to this question, namely that it was up to local authorities to decide spending priorities and the question should be addressed to them not to Parliament.

At least 3 county councils have tried to privatize part of the road maintenance work through the Public Private Partnership Program Ltd. They found that there was the possibility of offering the street lighting work to the private sector. Based on Transport Statistics of Great Britain (1997) it was highlighted that in 1994/1995 the total street lighting budget was around 15% out of the road maintenance budget. This is the only work in local road maintenance that can attract the private

sector. The majority of work is unlikely to attract funding or interest under the Private Finance Initiative. The best way to minimize the backlog is ring fencing finding although this is not likely to be politically attractive. It has been shown that the road revenue is three times the cost of road expenditure and this means it is possible to recover the under funded maintenance through earmarking road revenue.

4.4.7. Comparison between England and Indonesia

In Indonesia road surveys are only undertaken twice a year, in comparison to England where some types of survey are done monthly, while other surveys are done annually, or even every three years (deflectograph). The condition survey undertaken in Indonesia is usually before the preparation of the road budget and before the work has been done. Most of the survey is undertaken by the Central Government through its regional staff. Although Central Government has its own type of survey (National Condition Road Maintenance Survey), the local road maintenance condition survey also exists in England. The delegation of the road survey to districts in Indonesia is considered as good practice, provided there is sufficient expertise in that field, in which case it should be contracted out to the private sector.

The implementation of a Local Code of Good Practice or National Code of Good Practice has been mentioned for England, although the activities vary between local authorities. The Government of Indonesia should follow this practice, but the implementation depends on the local authority concerned and ability to fund it.

One of the problems in developing economies is the rigidity of allocation of funds. Shifting of funds will take a great deal of time and of course involves changing bureaucracy. This condition is similar to Indonesia. The District Chief of Public Works is not a member of the Regional Parliament; he only assists Parliament to prepare bids for road maintenance. The only difference between the two countries is on the prioritization of roads. Road maintenance management

systems will be used to prioritize English local authorities' roads. For district roads in Indonesia, the prioritization of roads is based on a road hierarchy that is still not being implemented.

In Indonesia there are at least six budget channels to district level and not all of the six grants go into local authorities. Part goes directly to projects rather than local authorities. There is no flexibility in grants. District authorities in Indonesia have also experienced the same decline in funding. However, there is a huge difference between the two countries in terms of local authorities' highway maintenance budgets. The local authorities' budget is readily visible to the public in England, citizens are well aware of the road conditions and road budgets in their area. This is also a good practice to be followed in district areas in Indonesia. Openness and accountability will be the main factors to be implemented in Indonesia. The appropriate time to implement accountability is now, during the economic crisis, with changes of policy and the Government declaring war against corruption.

Although they have started contracting work out in Indonesia, there is still work to be done by Force Account. The involvement of local contractors in road maintenance is small due to short contracts of only 9 to 12 months' duration. The English type of contract - a multiyear contract - can be adopted to encourage local contractors to bid for road maintenance.

The road maintenance systems in England can help the road authority to prioritize their roads based on the budget available. In Indonesia road maintenance management systems have only been implemented in national and provincial roads and are handled by Central Government. However, in relation to district roads, road maintenance management is still done by stand alone PCs. The introduction of PC networks to assist districts with their road maintenance and other road programs should be taken into serious consideration. Provinces will be the central point for the location of servers. To implement this, the Government should include the costs of training, and hardware for the network. The simple Highway Design Model, or Inter District Road management systems, that are similar to those used in national and provincial governments would make a good starting point.

4.5. The implication from the Fieldwork for district roads in Indonesia

This section explains the relevant points that can be implemented when financing district road maintenance in Indonesia. The comparison in this section between county councils in England and district governments in Indonesia relates to the decentralization of local authority roads. The county council is the highway agency for local roads, while district government is the highway agency for district roads in Indonesia. There are commonalties between them:

1. They have both experienced under funding for maintenance of local roads, which have the lowest priority.

2. There is no relation between expenditure and revenue on roads for both countries.

3. Road maintenance is politically unattractive compared to new road construction or other politically attractive sectors such as Education and Social Policy.

There are also some differences that cannot be implemented in Indonesia:

- Performance assessment for the local authority staff.

- Geographical country differences: England has only a small number of islands, while Indonesia consists of 13,700 islands.

However, some factors can be implemented in Indonesia for the purpose of decentralization of roads, as follows:

1. Implementing guidance such as Local Codes of Good Practice or National Codes of Good Practice should lead district local authorities towards working within a framework of standards. The other positive aspect of the guidance is that it could be adapted to local conditions. The purpose of adopting the Code is to create a framework of road maintenance that is suitable for individual districts. The Local Code of Good Practice can be amended

every year to be suitable for the budget received by the district government. The Regional Auditor would audit road maintenance based on this guidance. The Local Code of Good Practice is adapted from the National Code of Good Practice, which is available in Indonesia. Having a Local Code of Good Practice would make it easier for districts to estimate their own road maintenance funding.

2. The Local Code of Good Practice also takes account of the decision on road prioritization for district roads. This prioritization can be similar for all districts in Indonesia. Prioritization should take into account the road functions from "less important" to "nationally important" and "most dangerous" to "less dangerous". If the condition of the road is dangerous for the road user, then the government should take immediate action to repair that road. Prioritization would help local authorities channel the funds within their budget constraint envelope. Prioritization can be undertaken through maintenance management systems. This system is available for national and provincial roads but not district roads. This can be done through modifying the national systems to district roads. If English county councils have their own maintenance management systems, then in Indonesia the Central Government can help local authorities by providing this type of program. This is a part of the decentralization process.

3. When considering prioritization there should be flexibility for district governments to manage their own jurisdiction without too much interference from central government. In England, local authority road maintenance funds go into county council budgets and are distributed by the county council. This can be implemented in Indonesia by eliminating or putting the entire central grant into one channel. Simplification of budget channels will be useful and increase the road maintenance funding mechanism.

4. When considering decentralization, the virement process in England, either between the road maintenance budget heading within the road sector or between sectors, is under the discretion of county councils. Through a decentralization package this type of policy could be achieved in Indonesia. In Indonesia the virement between sectors happens in the current year, and the

person who approves it depends on the type of project. If the funds come from central government then the virement should be approved by it. This will take about two or three months to process. If the funds come from local sources the virement should wait until the local parliament meeting. The meeting usually takes place every three months or four times a year. The central government grant is about 60% of the total revenue of the district government. This means currently that virement for district roads will have to go to the central government. This is also an indication of how the central government strongly influences district policies. Although the virement is an indication of poor planning, it has to be undertaken at district level. Poor planning can be solved through integrated training that would be one package of the decentralization envelope.

5. Creating a simple budget framework for district government. In England each County Council has its own budget process. In terms of the road sector, the county council (Transport/Highway organisation) prepares the Transport Policies Program (TPP) bids for the major investment work, while road maintenance bids will be submitted to the budget committee in the county council. This could be achieved in Indonesia within the decentralization envelope. Simple budgets will also simplify the virement process as mentioned in point four above.

6. Although the local authorities' highway maintenance budgets of both countries are declining, the main difference in England is that the public is aware of it. In Indonesia the public is not. With the former, the problems are disclosed to the public and this will be a sine qua non condition for accountability. The involvement of road users in road management can also be achieved through the well-informed information about the road sector and its problems communicated to citizens.

7. The privatization of the Direct Labor Organisation has been proved in England so there is a saving for contracting out the roadwork. Contracting out road maintenance work has been done in Indonesia. The only difference between England and Indonesia is the contract period.

As mentioned earlier, the contract period in England is between three to five years, while in Indonesia at present the period is between nine and twelve months. The English type of contract (multiyear contract) can be adapted to encourage local contractors to bid for the road maintenance.

4.6. Chapter Summary

The sample of respondents in local authorities in England was senior officers with work experience from four years up to more than thirty-one years. A road survey is either undertaken based on the National Road Maintenance Condition Survey, or based on local authority conditions. The central grant for roads has been declining during the period 1992 to 1996. The highway road maintenance budget is similar; there has been no significant change of budget. This means that road maintenance is also declining due to inflation or the price of road maintenance materials is increasing. The Direct Labor Organisation is still used by some local authorities, but the trend is for privatising the DLO and competitive tendering most of the road maintenance work. This can save significant amounts of money. The shifting of funds due to unpredictable needs between budget headings, although it exists, is very rare, particularly the shifting of funds between sectors. The most difficult question for local authorities is the budget process; some respondents referred the researcher to finance officers. Although the budget process is not the same between local authorities the final stages are similar, namely, where they have to submit a proposal to the Policy Committee who then decides a budget allocation.

Road maintenance management systems are now in place but are some local authorities still use stand alone PCs to manage their road maintenance rather than the network. Some local authorities are also introducing Geographic Information Systems, the newest and most expensive management system using satellite technology.

Technology transfer from England to Indonesia can be achieved through: adopting guidelines for road maintenance such as Local Code of Good Practice; prioritizing in order to finance different types of road at district level; using simplified budget frameworks to improve the existing budget process; public involvement in the road maintenance sector through complaint mechanisms; using routine maintenance contract durations of about three to five years; and the delegation of more power to the local authority.

The next chapter will create a preliminary model for road maintenance in Indonesia, drawing together findings from Chapter 2, Chapter 3 and this chapter.

Chapter 5. Preliminary models for financing district road maintenance in Indonesia

5.1. Introduction

This chapter builds up the preliminary model of financing road maintenance in Indonesia. It is derived from Chapters 2, 3 and 4. The findings in Chapter 2 provide input on the types of problems that have occurred in district road maintenance in Indonesia. The findings in Chapter 3 highlight international experiences in funding road maintenance. The contribution from that chapter is the identification of the root of the problems and the way developing countries have solved them. Chapter 4 presented the way English local authorities manage their local road maintenance. The chapter highlights suitable technology transfer mechanisms that could be adopted by district governments in Indonesia. The preliminary model is based on the argument that the financing of road maintenance should be on a case by case basis through the analysis of the political, technological and economic situations of an individual country. Models that are successful in one country will not necessarily be a success in another. Section 5.2 establishes the link between Chapter 2, Chapter 3 and Chapter 4 in contributing to the preliminary models. In this section the preliminary models are divided into modest and major reforms. Section 5.3 presents modest reforms with the advantages and disadvantages, complete with the reasons for choosing this type of reform. Section 5.4 presents the major reform, a potential long-term solution, together with the reasons for choosing this type of reform as a continuation of the modest reform above. The final concluding sections summarise the preliminary models.

5.2. Designing policy reforms for financing district road maintenance

5.2.1. Approach to the current problems

As can be seen from Table 5-1 and Table 5-2, district road problems in developed countries are similar to those in developing countries. The two share similar problems, namely, institutional and financial aspects. Institutional aspects play an important role in improving the current condition of the district roads. The current situation can be improved through gradual improvement. Chapter 3 argued that commercialized road maintenance could not be adopted by every country without taking into account their specific conditions. In theory, the commercialization of roads will change the institutional and financing aspects and will move road management into a company environment. Published work reviewed earlier on Latin America and the Caribbean indicated that setting up a road fund now is the number one priority and has proved acceptable in these regions. The World Bank has been pushing very hard in recent times to ensure countries set up a dedicated road fund managed by an independent board. However, a number of commentators are against this idea and argue that setting up a road fund needs some preparation. They believe that to create a road maintenance fund countries have to fulfill certain criteria (see section 3.4.2.10 and Figure 3-3 Chapter 3). On the assumption that the minimum requirement has been fulfilled there is a chance of creating a road maintenance fund. The author set-up appropriate parameters for preliminary policy models for district road maintenance in Indonesia based on this review. These are set out in Figure 5-1 and Figure 5-2 overleaf.

Chapter	Country categories	FINDING		(1) Action have been taken (2) Action should be taken	Contribution to the research model	Proposed model **(Chapter 5)**
		Negative	Positive			
IV	England (Develop Country)	**Institutional:** No link between expenditure and revenue (although revenue approximately 3 times expenditure). Privatization of Direct Labour in most cases not effective, the local government still prefer ex direct labor organisation instead of fully competitive tender. Local roads are politically not attractive compared to local education or other social services **Financial:** Inadequate funding;Central grant declined Highway maintenance budget declined; More highway maintenance backlog; 3. Results: superficial repair, disruption, increased risk for all road users because the road deteriorated further	**Institutional:** Central grant goes directly to county council. CC has the right to decide what will be the best for their area; Road prioritization based on the simple or integrated maintenance management system; Complaint mechanism work through email/mail or telephone of the relevant road maintenance area manager; Local Autho rity Association; Local Authority code of good practice beside National code of good practice for road maintenance;clear road ownership, Technical capabilities, maintenance contract duration 3 years. **Financial:** Start privatization of local roads.This will release the local government burden; Start privatizing some of the road maintenance work such as street lighting. Simple budget process, simple virement process	(2) Earmarking road funds to the road maintenance work will link expenditure to revenue; reallocation of funds to road maintenance to minimize backlog or eliminate them.	**Institutional:** Simplified central grant to the district government; Create road prioritization based on road hierarchy. This can be done through road maintenance management systems; set-up complaint mechanisms; set-up local code of good practice; set-up clear guidance of road ownership; district capacity building **Financial** Simple budget process, simple virement process	Implement decentralization of roads since it has been issued by government. Speed-up decentralization through coordination between road stakeholders both in central and district levels. Coordination can be done through Consolidation unit in central (Project Management Unit) and units in district (Project implementation unit). This task force will work on a pilot basis (27 PIU's). This task force will need additional funds. There is a possibility to ask assistance from World Bank.

Figure 5-1 Findings/contribution of Chapter 2, Chapter 3 and Chapter 4 to preliminary models (Chapter 5). [Source : Author 1998]

Chapter	Country categories	FINDING		(1) Action have been taken (2) Action should be taken	Contribution to the research model	Proposed model **(Chapter 5)**
		Negative	Positive			
II	Indonesia (LDC)	Institutional: high centralization, high dependence on central; Many budget channels from central; Inadequate planning; short term planning for maintenance; trade-off between construction and maintenance (no prioritization of road); ambiguities of division of organisation between Ministry of Public Works vs Ministry of Home Affairs Recruitment of engineers done in central government; Central fiscal arrangement; Little involvement of district road agency in budget decision making;low salaries; no innovation, no link between expenditures and revenues.	Decentralization law is in place but still not implemented yet	Improved institutional framework of (2) financing road maintenance by eliminate negative findings		
		Financial : too much to construction; inadequate funding;late budget release; budget fragmentation in the central; no mobilisation effort to increase local revenue for maintenance.		Improved financial framework of (2) financing road maintenance by eliminating negative findings		
III	Latin American countries and Caribbean Sub Saharan Africa (LDC)	Institutional: Inadequate planning, no prioritization of roads; lack of road maintenance; short term planning for road maintenance; Inadequate capabilities of local government No link between expenditures and revenues No coordination within central government towards local road; no clear division of ownership of local roads, lack of design standard, low salaries of civil servant, no incentives, moonlighting and daylighting		Commercialisation of roads: Fee for (1) services basis. Maintenance will be paid through special fund and this fund will be overseen by independent bodies. The road maintenance funding comes from fuel duty and licence fees. 16 African countries + 6 Asian + (1) 9 Latin American and Caribbean countries have implemented Road maintenance funds (Heggie's model) The other 4 countries: Armenia, Pakistan, Madagascar and Philippines are in the process of applying road maintenance funds.	Although this model works well in the case of developed countries like New Zealand, the result of the implementation to the developing countries not promising yet. There is an example in one of the Sub saharan countries, where the government raids the funds for other purposes than road maintenance. This model will only work if the minimum requirement has been fulfilled by the country. This can be done in Indonesia in Long term reform	There is a possibility of using this model after Indonesia has fulfilled Minimum requirements.The impact of this model to district road is that district roads will accept a subsidy from road maintenance funds This can be done on the long term solution (long term reform)
		Financial: Inadequate funding; unsustainable funding; trade-off between construction and maintenance; No effort to mobilize local revenue (cost sharing between local government and local authorities); road user only pay small amount of money for maintenance				

Figure 5-2 Findings/contribution of Chapter 2, Chapter 3 and Chapter 4 to preliminary models (Chapter 5). [Source : Author 1998]

The tables present findings from previous Chapters under the headings of Institutional and Financial. The positive and negative aspects are both presented. Actions are then identified, either those that have already been taken in Indonesia or those that should be taken. Finally, again under headings of Institutional or Financial, the parameters to be taken forward into the policy models have been identified.

5.2.2. Model formulation and objectives

As can be seen from Table 5-1, most of the developing countries have taken similar steps, especially in the Latin American, Caribbean and Sub Saharan regions. At least 16 African countries, 6 Asian countries and 9 Latin American countries have implemented a road maintenance fund. Another 4 countries including Armenia, Pakistan, Madagascar and the Philippines, are in the process of applying road maintenance funds. Chapter 3, Figure 3-5, has shown that those developing countries have jumped from stage 1 to stage 3 in the Talvities process. This is due to the fact that improvement cannot be done through adopting advanced technology. As explained in Chapter 3, table 3-3, a minimum requirement to be fulfilled should be adopted before achieving stage 3, otherwise they should follow the steps that have been discussed in Chapter 3, Figure 3-5. Indonesia is at Stage 1 (Chapter 3 figures 3-5); it needs to introduce improvements for the financing of district road maintenance problems in the following ways:

1. Increasing efficiency through the improvement in capabilities of district road staff. Efficiency gains can be achieved through the decentralization of road management, which Chapter 3 section 3.4.1 established as having a positive impact on road management and consequently road conditions. Decentralization should be speeded up and devolving power should be achieved through coordination of road stakeholders, both at central government and district government levels. Through a government led decentralization task force the process can be accelerated at district level.

2. Decentralization of roads is only a provisional achievement. It will provide road management with gradual improvement and fulfill the minimum requirements for setting up a road fund. Commercialization of a road organization through a fee on a service basis will have to be done in the future. Linking road expenditure to road revenue will make management aware of how much money they can provide for maintenance. This is likely to happen in Indonesia. The World Bank can insist on its ideas being implemented by developing countries since it has the power to do this. Most of the developing countries that implement a road fund receive either a grant for technical assistance in the reform process or a loan for highway administration improvement. District roads will receive a grant/subsidy to assist in running their own road maintenance program, while a part of the costs will be borne at local district level.

As has been explained in Chapter 2, as from 1974 the Government of Indonesia had decided to carry out the decentralization process. However, during that time period there has been no implementation or good preparation work. Government regulation no. 8/1995 decentralized all road works to district level governments. However, progress is slower than was expected. The evidence shows that the Government still prefers to adopt a centralized approach. Since then the economic crisis of 1997 was followed by riots. This led to a change of president. There was much pressure from the people to implement decentralization to district level. Figure 5-3 shows that the decentralization process will provide streamlining and improve the central government workload. Streamlining the organization means reducing the number of staff centrally. To increase the district capacity central professional staff can be assigned to district government level; however; this will require consideration of the careers and sensitivity of individuals. Decentralization also means that all of the investment planning which used to be done by the central government will have devolved to the district road agencies.

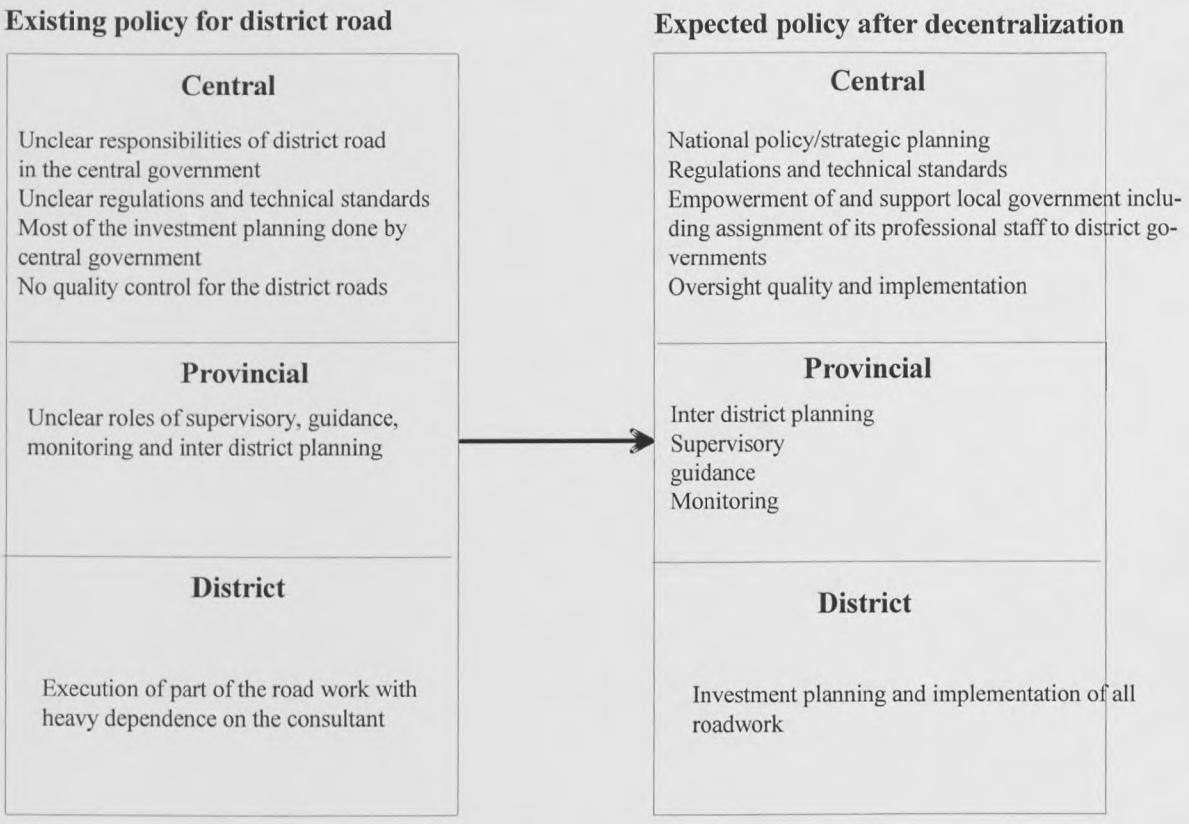


Figure 5-3 The division of work between Central Government, provincial and district level for the decentralization concept. [Sources: Government Regulation no. 8/95 and Author 1998]

The implementation of decentralization should take into account the following aspects (see Figure 5-3 above):

1. Revamp national policy/strategic planning in the road sector including an integrated approach to minimize organizational problems for district roads previously mentioned in Chapter 2. Streamlining the current organization of the central road agency by assigning professional staff to district road agencies.

2. Improve current regulations and technical standards for district roads.

3. Create a quality control unit to overcome poor quality of work on district roads due to a lack of local capabilities.

4. Oversee quality control and implementation of work, which can be done through provincial public works. Provincial public works will be responsible for supervision, guidance and monitoring progress of district roads.

5. Political commitment to prioritize road maintenance as one important aspect for maintaining government assets. There should be a reallocation of funds to district road maintenance.

6. Capacity building of the district road agency and road industry. This can be done through integrated training and career development. Other alternatives are the reallocation of central staff to district level to strengthen the district capacity to carry out the work.

7. Local recruitment, to allow the district road agency to recruit its own staff.

8. Improvement of the existing budget process at district level. This builds on the English experience highlighted in Chapter 4. This can be done both through adopting simplified budgeting channels to the district and improving the current budget process.

9. Local revenue generation and fiscal decentralization.

10. Using a road maintenance management system to assess needs and prioritize roads and to initiate a trade-off among the road program within prescribed budget constraints.

11. Create simple complaint mechanisms in terms of road conditions in the district government to involve road users in the road decision making process. Again, this builds on the English experience highlighted in Chapter 4.

12. Decentralization of roads should involve road stakeholders. The road stakeholders are at central and district level. The stakeholders at each level are presented below.

Stakeholders at Central Government Level

There are at least six different actors in Indonesia who deal with road maintenance:

- Road agency (Directorate General Highways and Local Authorities);
- The planning agency (Bappenas: who are responsible for road programs);
- Finance agency (Ministry of Finance);
- Auditor;
- Human resources agency (Minister of State apparatus and civil servant administration bodies); and
- Road users.

Stakeholders at District Government Level

These include:

- Road agency (District Public Works);
- The regional planning agency (Bappeda: who are responsible for district road program);
- Regional finance agency; and
- Regional auditor.

To make the reform applicable in Indonesia, these actors should be involved in the reform process. Modest reform will not include road users. However, the process of implementation will cause road users to understand the situation and the road conditions. This will make it easier to involve them in the long-term model.

The implementation of a road maintenance fund can be undertaken after the decentralization process has worked well. By then, when the government applies the road maintenance fund the district road agencies' capability to plan and to work on road maintenance should have improved.

District revenue generation will have been established. The road industry would also have improved their capabilities to do the work. Through decentralization, road prioritization based on local priorities would have been developed. Reallocation of part of the fund to road maintenance has been done. The budget process would also have improved such that the conditions will match the minimum requirement for setting up a road maintenance fund. The road maintenance fund will guarantee sustainable road maintenance in the district through subsidizing district roads. The vast majority of the World Bank's road projects deal with maintenance, rehabilitation, and commercialization of road management and finance. The World Bank called this model "commercialization of roads", moving from a bureaucratic environment to a company environment. An increasing number of countries have decided to finance their roads on a fee-for-service basis (e.g., Jordan Third Transport Project, Zambia Road Sector Investment Program, Pakistan Highways Rehabilitation Project).

Heggie (1991) established that policy reform, such as speeding up a decentralization process, would take approximately five years, while creating a road maintenance fund will need at least seven to ten years based on developing countries' experiences of creating them. This is because decentralization will involve more than two ministries and is politically sensitive. Based on these criteria, the model that is presented below is included as a modest reform model. This model introduces the use of a task force to help improve road maintenance aspects and its financing. The medium term reform solution for road maintenance problems is through improvement to the existing government budgetary framework. The implementation of the reforms should gradually start with selected provinces and then the system should be revised accordingly. Finally, implementation should be for all districts. While the road maintenance fund needs approval from the legislative bodies, the decentralization law that is a necessary criterion has already been set-up by the Government.

5.3. Medium term solution

As has been stated in Chapter 2, at central level functions and responsibilities for district roads were not clearly defined among concerned departments in the Ministry of Home Affairs, Ministry of Public Works and Ministry of Finance and Bappenas. At provincial level there was little effective involvement in terms of guidance of the district road programs. Decentralization needs a policy framework for financing district road maintenance. Based on Table 5-3, there should be a coordination unit that handles the improvement of current policies to decentralize the road agency to district level. The preparation for decentralization should involve all the agencies that are dealing with road decision making at district level (see central government actors above). This coordination unit will work together to prepare the decentralization process. The Project Management Unit is a coordination unit in the central government. The setting up of such a unit would overcome the communication gap in involving parties in the district road decision making.

5.3.1. The organization of Project Management Unit

In the model below, the author has named the locus as a Project Management Unit dealing with the district road maintenance issues. The name of the Project Management Units is adopted from the Urban Sector task force (Urban Sector study 1994). However, the Urban Sector task force set up in 1994 was fully technically focused. In the current study, the Project Management Unit work will be mainly on the institutional, management and financing side of road sector maintenance. The other reason to use the name is that it is easy to identify the Project Management Unit as a type of task force dealing with current issues in the road sectors.

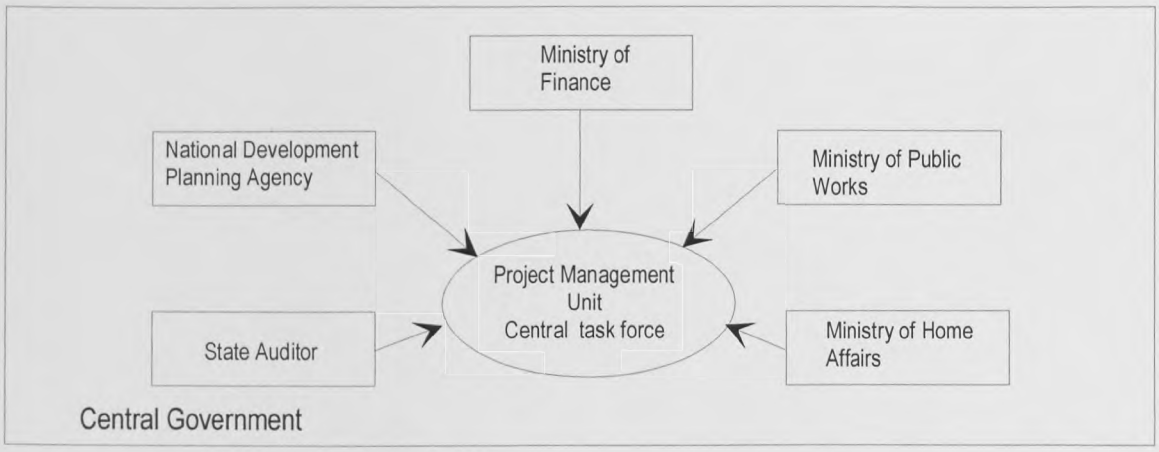


Figure 5-4 Member of the Project Management Unit in Central Government.

[Source: Author 1998]

As shown in Figure 5-4, this task force should consist of those dealing with these issues. First, it would comprise the Deputy for Infrastructure and Deputy for Regional and Local Affairs from National Development Planning Agency (Bappenas). The Deputy for Infrastructure deals with national and provincial roads. The Deputy for Regional and Local Affairs deals with regional development matters and has a major involvement in district roads. He should also be the Chairman of the Project Management Unit. Secondly, the Directorate General of Highways (Direktorat Jenderal Bina Marga) is the organization within the Ministry of Public Works responsible for technical guidance on road maintenance. Thirdly, the Directorate General of Regional Development from the Ministry of Home Affairs is responsible for regional development, including at district level. Fourthly, the Directorate General of Budget within the Ministry of Finance is the organization that is responsible for channeling the budget for either routine or development budgets to the districts. Fifthly, the Deputy of Operations within the organization of the State Auditor deals with the project audit.

5.3.1.1. Project Management Unit agenda

By knowing the real issue, or the root of the problems the Project Management Unit should prepare the following agenda for action.

The Institutional agenda

The institutional agenda would include:

1. Starting with the road maintenance objective, the creation of strategies developed for striking an appropriate balance of operations, routine and periodic maintenance, rehabilitation and investment.

2. The possibility of transferring funds directly to operational units responsible for road maintenance should be explored.

3. The emphasis must be placed on increasing the capacity to undertake road maintenance rather than simply doing road maintenance. This will require the Project Management Unit to focus on the related technical and managerial capacity to undertake road maintenance.

4. Building up this institutional capacity, then strengthening the organizational structure and status of road maintenance.

5. The incentives and disincentives in the civil service compensation system need to be addressed. They have to identify the maintenance content of budget outlays. This point is important but difficult to implement since it will need to address the situation where accountability and transparency exist.

6. Formulation of proposals including the timetables for developing sectoral asset registries of the amount and condition of road maintenance.

7. Consideration of how road maintenance issues can be integrated into the project evaluation process and the development of a computerized system of project profiles.

8. The responsibilities of the Project Management Unit should be to introduce a number of operational mechanisms with regard to budget control and rationalization and the

strengthening of regional institutions in districts similar to that in urban infrastructures. The Project Management Unit will be responsible for that type of program in district areas including local institutional development, which identifies the personnel and training needs of regional governments. These will constitute a medium term program.

Financial agenda

Chapter 2 indicated that one of the problems in road maintenance is inadequate funding. Central grants play a significant part in the district road budget, while district road revenue is small. This is because there is no effort to mobilize district road maintenance funds. Chapter 3 indicated that one of the solutions is to reallocate funds to road maintenance to solve inadequate funding. Chapter 4 established that community or precept is also included in road maintenance spending. Since the road maintenance fund at this stage is still funded from the general budget, there should be government commitment to prioritize road maintenance. This will reallocate some funds to road maintenance.

5.3.2. The organisation of Project Implementation Units

To support the Project Management Unit in the center to do its job there is a need to set up a coordination unit in the district. This coordination unit should consist of involving parties in the road decision making process. Without a coordination unit in the districts it will be difficult for the Project Management Unit to get feedback information from the district government. For this purpose the researcher proposes setting up Project Implementation Units at district government level since they are the ones who are going to implement the policy. Their job will be to provide district data and to implement guidance given by the Project Management Unit at the central level.

The proposed organization of the Project Implementation Units can be seen from Figure 5-5.

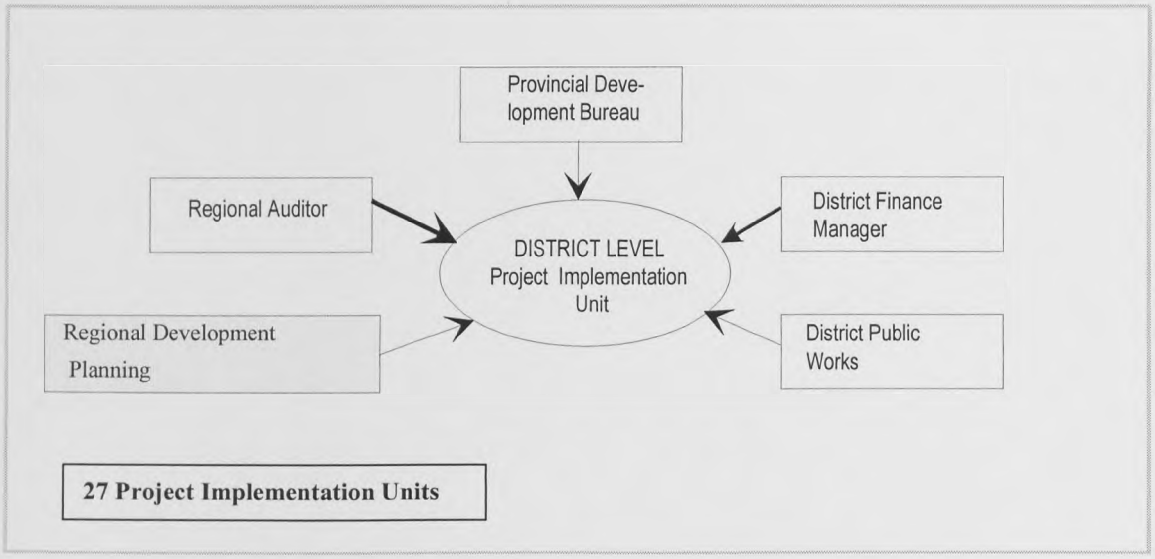


Figure 5-5 Members of the Project Implementation Units. [Source: Author 1998]

Key stakeholders in setting this structure up would include:

- The District Public Road Manager (Kepala Dinas Pekerjaan Umum Kabupaten) who is responsible for the technical works and technical guidance as well as the implementation of Road maintenance works.

- The District Finance Manager (Kepala Bagian Keuangan Kabupaten) who is responsible for channeling budgets to the road maintenance sectors.

- The Regional Development Planning Agency (Badan Perencanaan Pembangunan Daerah).

- The Provincial Development Bureau (Kepala Biro Pembangunan Daerah) who will then monitor the district development.

- The Regional State Auditor, who is responsible for auditing road maintenance in the region.

The organization of the task force is set out below (combining Figure 5-4 and Figure 5-5):

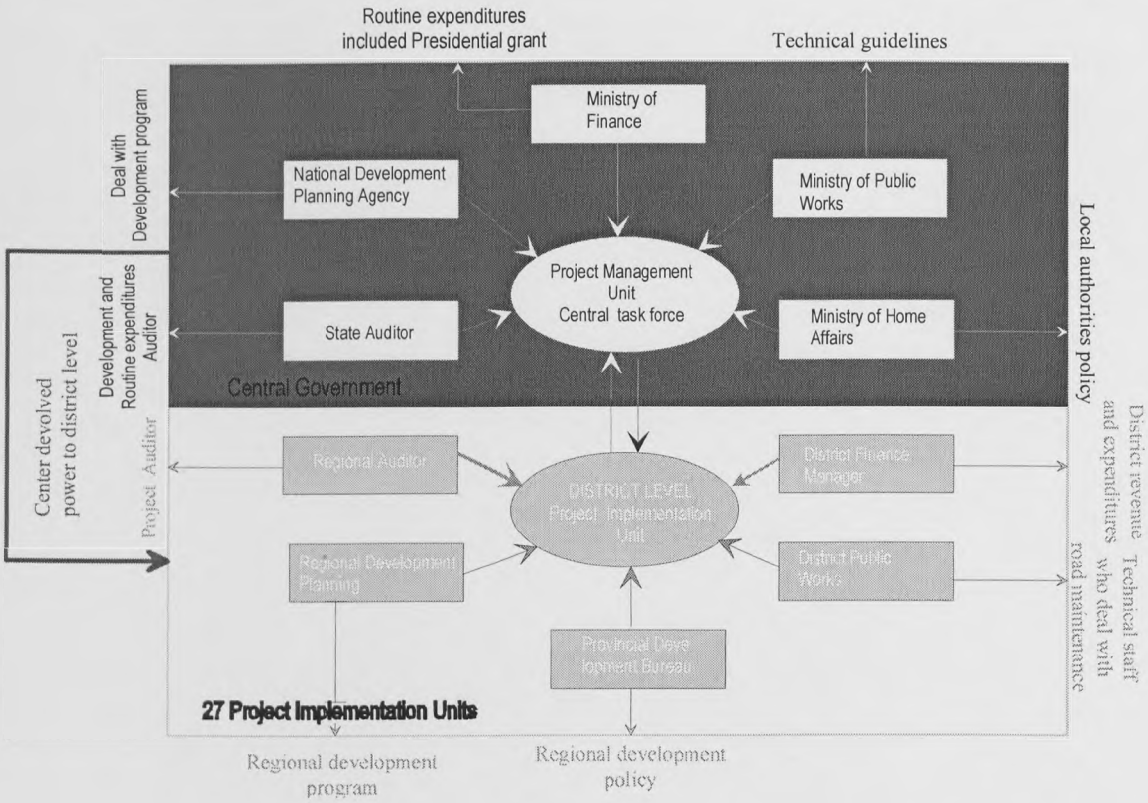


Figure 5-6 The task force for medium term reform. [Source: Author (1998)]

As can be seen from the above diagram, the main job of the task force is to coordinate the parties concerned to achieve the goal of road maintenance coordination. Coordination at central level can be undertaken by disseminating road maintenance information to district levels. Based on the road condition survey, the National Development Planning Agency can set up a national program of road maintenance. The technical aspects of road maintenance will be handled by the Directorate General of Highways. Based on the program and technical guidance above, the Minister of Finance will prepare the allocation of budgets to the national, provincial and district levels as a prescribed grant. The Ministry of Home Affairs, who deals with Local Authority matters, would prepare guidance notes or circulars regarding the implementation of road maintenance. The local authority role in this process would be to provide an output regarding local contents and local problems. The needs of the road user should also be reflected in these decisions. In order to get road users willing to pay they have to be well informed about government decisions on road maintenance. The regional development program would be obtained from the Regional

Development Planning Agency. In this case, the bottom up process is also reflected in the task force.

5.3.2.1. Project Implementation Units agenda

The Institutional Agenda

The proposed agenda for the PIUs is as follows:

1. To update road inventory of district roads based on the road condition survey. The road inventory should be up dated on a yearly basis.

2. To start to involve road users in raising awareness of the local authority road conditions. The involvement of road users can be achieved by providing a road condition complaint mechanism. The Project Implementation Unit should analyze this and make reliable proposals for the introduction of a case by case adjustment procedure, rather than the present practice of requiring a comprehensive revision of the Regional Budget document process. For instance, virement between road maintenance budget headings should only be at the discretion of the Transport/Highway Manager. The local authorities should be given give autonomy to shift funds between sectors at the discretion of the policy committee within the local authority.

3. Improve Regional Government Budget preparation and implementation. The preparation and implementation should include the following:

    - Regional Budget Ratification and Revision. The effectiveness of the present formal procedure for regional government budget ratification by the next higher government level is questionable, particularly with regard to the delays often experienced in its completion. There should be an independent external financial inspection/audit service to certify that the draft of Regional Government Budget complies with regulation and Central/provincial guidance.

- Presidential grants (Inpres Grant). The requirement for each Presidential Grant for District-financed projects to be approved by provincial Governors appears unnecessary. It duplicates the Regional Budget ratification procedure and should be reviewed. Disbursement procedures for some presidential grants can sometimes bypass the Finance Divisions in District Governments, resulting in incomplete bookkeeping records. The Finance Division should be given a formal role in the disbursement of these Presidential Grant funds.

- Regional Government Borrowing. The regional government bookkeeping and financial accounting system has remained essentially unchanged for many years. It is cash-based and single entry in character. In general, there are no comprehensive centralized accounting records of physical assets such as land holdings, infrastructure, buildings, plant and equipment, and stocks and stores. Formal cost accounts, which would be of great potential value, inter alia, in assessing revenue collection efficiency, the degree of cost recovery achieved through service charges and licence fees, and the full costs associated with development projects, together with facilitating inter-authority cost-efficiency comparisons, are generally underdeveloped. The books of account and financial reports are mostly manually prepared. One of the PIU responsibilities should be to try and improve and modernize the financial accounting system in regional government. At the least they have to propose a very good way to solve these problems

- Regional Government Financial Regulation. Consideration should be given to replacing the current large collection of very detailed central regulations on regional government financial management practices with new, consolidated regulation toward broad principles, supported by more detailed implementation guidance from which regional governments would have discretion to depart to suit local needs. A necessary precondition of such an approach would be careful periodic review of each

regional government's chosen arrangements by a competent independent external financial inspection/audit service

- Regional Government Organization for Financial Functions. Centralized financial management responsibilities (aside from financial inspection/audit) within regional administrations are currently divided between three principal agencies. These include Regional Development Planning Agencies (Bappeda) for development expenditure budgeting, Regional Revenue Agency (Dipenda) for revenue budgeting and administration and Finance Division (Bagian Keuangan) for the remainder of budget preparation, expenditure authorization and payment control and central bookkeeping and accounts. An effort should be made to combine these three functions under a single high level body, the chief of which would act as principal financial advisor to the administration and Regional Member of Parliament. This will offer potential advantages in terms of more integrated financial management.

The Financing Agenda

The agenda would be to generate local resources for the main financial agenda, either through fiscal decentralization or by community participation. Trade-off between construction of new roads and road maintenance should balance by taking into account the rate of return. That means that the district should prioritize the road maintenance since the road maintenance has a bigger rate of return compared to the construction of new roads.

5.3.3. The Advantages and disadvantages of the medium solution

The advantages of the medium term solutions are as follows:

- The medium term reform will actually speed up the decentralization process commenced by the Government in 1995. The reforms are only signed by at least three Ministers, between the

National Development Planning Agency and Minister of Finance and Minister of Home Affairs. There is no need to change existing laws or regulations. A change under this reform is the creation of the Project Management Unit. This would consist of involving parties within at least six departments or agencies.

- The objectives of the reform are to also speed up the decentralization process for road maintenance to district level by creating or customizing the coordination process within central government, or between central government and local government or within local government.

- The local content or the local interest is reflected in the decision making process. As mentioned in the World Bank report for Infrastructure Development (1994) decentralization has a positive effect on the road conditions.

- Decentralized structures for road provision cost more initially, mostly through losses in economies of scale. These losses may, however, be outweighed by increases in efficiency when the focus of roadwork is closer to the user.

- The involvement of local authorities in the budget process will encourage the innovation of local authorities towards the road maintenance problems in their own area. This will increase their capability to do their own work.

- The PMU task force will be a better solution for the transfer of knowledge from central to local level as well as understanding the different natures of local authorities.

The disadvantages of the medium term solutions are as follows:

- With this type of reform, the involvement of road users in the decision making process is small or very limited. This will influence the road user willingness to pay. The roads will be

managed like any social service. The proceeds are nearly always treated as general tax revenue. Roads are financed through budget allocations determined as part of the annual budgetary process. These allocations bear little relationship to underlying needs or to road users willingness to pay. Revenues and expenditure are completely unrelated.

- There is still the possibility of political interference with road maintenance funding since the government still remains the sole provider of funding for road maintenance. In the eyes of the government, road maintenance is not politically attractive.

- The government will need to provide additional costs for preparing the task force. The costs will include hiring of systems management consultants, offices, a project secretariat who deals with day to day activities and the procurement of computers to assist district road authorities to prepare road priorities and other administrative costs related to making the task force operational.

The next section will explain the model for a long-term solution model.

5.4. Long term solution model

Section 5.3.3 indicates that there are still some disadvantages of the medium term reforms. The World Bank introduced the concept of a road maintenance fund to tackle unsustainable issues of road maintenance through commercialization of roads, based on fee for services basis.

5.4.1. Road Maintenance Fund

The researcher proposes setting up a road maintenance fund as the long-term solution. Using international experience, there are two types of road funds.

1. Earmark tax. Revenue generated by earmarking taxes, where road related taxes are used for the purpose of road development and maintenance. The consequences from Africa indicate this is not a perfect solution. There are a number of weaknesses in this approach, implemented most predominantly in Africa and Latin America during the period 1960 up to 1970. According to Heggie (1995) the generic problems include, firstly, funding. The Minister of Finance stopped paying money into the road fund, took money out and used it for other purposes. Secondly, the Ministry of Finance and International Monetary Fund oppose traditional earmarking for this type of road fund. Thirdly, without the influence of a strong road fund board there will be difficulty in implementing the road fund.

2. Second generation of the road maintenance fund. It is proposed to adopt this model, which focuses on tariff rather than tax. The main difference between the two approaches lies in their principles. The objectives of the second generation road fund is to bring roads into the market place, put them on a fee for service basis, and manage them like a business.

There are at least five main principles, which underlie the concept of commercialization, as discussed in Chapter 4.

1. Road users should pay for the use of roads through an explicit road tariff, which is clearly different to the government's general taxes. This road tariff will be in the form of annual vehicle licence fee charges, including a vehicle licence fee for heavy vehicles (by the time of starting a road maintenance fund the road user charges will be amended by paying particular attention to heavy goods vehicles). A road maintenance levy will also be added to the price of fuel charges for the use of the road network. Furthermore, the government should indicate that the population (road users) at large will be expected to participate in this effort to deal with the maintenance problem by sharing some of the costs when they derive direct benefits from improved programs.

2. There is a need to get the Ministry of Finance's agreement to create fuel surcharges on top of the price of fuel. This is the main point of the second generation of the road fund where, in this case, road users should be well informed about their responsibility to pay for the road maintenance. This process again will have to be approved by Parliament.

3. The revenue derived from road tariffs will be deposited into a road fund that is managed by an independent board, and that includes representatives of road users and the business community. The Chairman is independent. This will hopefully create a form of surrogate discipline.

4. To run a day to day business there is a need to have a small secretariat to manage the funds and there should be published legal regulations governing the way the funds are managed. Moreover, within the secretariat there should be an independent technical and financial auditor appointed by the private sector or State Auditor General office.

5. The fund should support maintenance of all roads. Responsibility for different parts of the network should be clearly assigned to the road authorities and the road authority should introduce sound business practices.

There are some important steps to be followed when implementing a road maintenance fund (Heggie 1995, 1998):

1. to set-up road maintenance seminars at both national and regional levels;

2. based on the above output there will be preparation for setting-up a road maintenance fund;

3. Parliamentary approval for a road maintenance fund is required;

4. piloting the road maintenance fund into several provinces nationally; and

5. the implementation of the road maintenance fund nationally.

Each will be discussed in turn.

5.4.2. Road fund seminar

A road fund seminar is the first and most important step for the introduction of a road maintenance fund. The aims and objectives of road seminars are at least two-fold:

1. To inform the public and private sectors of the importance of road maintenance for road users and the consequences of not having adequate maintenance

2. To involve the road user and private sectors in road management and to "break the ice" between private and public sectors.

Although the national road fund seminar would only be presented over two or three days, the preparation will take at least one full year. The following preparation is required:

- To focus the perception of the audience on the aim of the seminar and the importance of it to the commercialization of roads. The meeting should be chaired by Bappenas and organized by the Ministry of Public Works (Directorate General of Highways) since it is the only institution that understands road matters. The organizing committee should consist of the Ministry of Public Works, the National Development Planning Agency and the Ministry of Finance. The aim of the seminar should be to raise the participants' understanding and awareness so that in the future road users will be the ones who pay for the road, and their business is dependent on the road network. Since road users are "the road customer" the main vision of the seminar will be to involve the road users in road management.

- The implementation of the seminar needs to consider a number of topics. A detailed program will need to be developed to include: (a) participants; the important point is that the participants should include key organizations/persons that have a strong vested interest in road management and finance. This would include organizations such as the Trade and

Industry Chamber; Transportation Industry; Civil Engineering Society; Agribusiness industry and Indonesian Farmer Associations; (b) experts in the field drawn from those that have experienced success. For example, representatives from New Zealand or from other countries who have experience in road funds, such as Japan, USA and perhaps Zambia or South Africa; (c) facilitators will be needed. They can be consultants from the university sector or economists who are familiar with the road sector; (d) the Directorate General of Highways (Ministry of Public Works) should present a paper outlining the problems of road maintenance as they see them.

5.4.3. Setting up a road fund

When setting up a road fund it is important to ensure that it has a legal basis. There should be a clause included indicating that the road fund should be regularized by the passing of basic legislation or it will be closed down. There should be financial regulations or procedures by the road fund board.

As indicated above, there are many different types of road fund. Some only finance main roads, some finance provincial roads, some finance urban roads, while others finance all roads, including unclassified road networks. In the proposed model the road fund finance would cover the whole network excluding toll roads. This means that this road fund will be designed to finance road maintenance and a number of different road agencies, national, provincial, urban and district roads. It is impossible to create a road fund in districts alone, since traffic flows are low. Road user charging will not be enough to finance road maintenance. The road maintenance fund covering the whole network will be appropriate in Indonesia since, as has been explained in Chapter 3, the district roads will be subsidized by the road maintenance fund. The road fund revenues should consist of:

- fuel levy;

- vehicle licence fees;
- a supplementary heavy vehicle fee; and
- fines for overloading.

Since the road fund is to cover the whole network, there should be a transparent mechanism for dividing funds between national, provincial, district and urban roads that would include well thought out cost-sharing arrangements between these. Based on international experience there are at least three different options to disperse funds to the various agencies (Heggie 1998):

- The road fund can operate as a revolving fund and certify ex-post that withdrawals are in accordance with agreed regulations.

- The fund can reimburse the road agency after the work has been done and payment has been certified.

- The fund can pay contractors directly after certification that the work has been done according to specification.

The last option will be appropriate to Indonesia for the following reasons:

1. This type of payment mechanism has been used in Indonesia, including for district road works.

2. Certification of the work is a mechanism to control the work; either it has been done according to the schedules and specification, or not.

Terms of reference should be prepared by the road maintenance board which will cover the above mentioned subjects.

5.4.3.1. The Legal Basis of a Road Fund

A road fund should have a legal basis in the form of finance regulations and should be approved by Parliament. Based on Heggie (1998), the new legislation should include the following aspects:

- Financial resources of the funds and of the bank account
- Management of the funds which includes establishment of the management board; management of the fund; an allowance for the management board; meetings of the board; charges of the funds; annual road programs and annual expenditure programs; disbursement of the funds; withdrawal procedures
- Financial provision which includes accounts and audit, financial year, annual report

Each will be discussed in turn.

5.4.3.2. Managing the road fund

There are several ways of managing the road fund. When one road agency is responsible for managing the entire network, the road fund can be managed by the same board as the one managing the road network without creating any conflict of interest. There is another possibility which is to create a separate road fund board to channel funds to the various road agencies entitled to draw from the fund. The latter will be used for Indonesia due to the fact that PT Jasa Marga (the road toll company) only deals with the national roads alone (similar to that in England as a Highway Agency). This company board of directors does not include the road users groups and it is important that it should be involved in this reform to increase its awareness to pay for the roads. The road maintenance fund board should consist of the public and private sectors. The public side, such as the Ministry of Finance, the Ministry of Public Works and the National Development Planning Agency, should be directly concerned with roads. Representing the road users, the private sector should include organizations such as the Trade and Industry Chamber,

Transportation Industry, Civil Engineering Society, Indonesian Farmer associations and Agribusiness industry.

Based on the international experiences of countries which set-up the road maintenance funds, the board should only have about nine to twelve members. The Chairperson should be totally independent, and it is better if the chairman is elected amongst the members. An executive secretary appointed by the board should manage the road fund and he/she will, in turn, appoint the staff. He/she is not a member of the board. The secretary should be appointed by the board to ensure his/her independence and that he/she works effectively with the board.

5.4.3.3. Channeling funds between different road agencies

Based on international experience, options to divide funds between different road agencies are as follows:

- Initially dividing local earmarked revenue between road agencies (Japan)

- Dividing revenue based on network and traffic characteristics (USA, Korea, Latvia, and Tanzania). For example: USA develops the following formula: 0.55* (interstate lane miles/total interstate miles) + 0.45* (vehicle miles on interstate roads/total interstate vehicle miles) the formula was similar in Korea.

- Dividing funds on the basis of estimated needs (South Africa, New Zealand). New Zealand has one of the best needs systems for dividing funds between the main road agency and the various regional transport authorities. All road agencies should prepare the road programs on the basis of a standardized road management systems and benefit cost analysis.

The latter will be the most appropriate way to implement this in Indonesia for the following reasons:

1. Indonesia consists of more than 13,000 islands and the traffic flow between the west part of Indonesia (the most densely populated area) and the east part of Indonesia (the least populated area) is very different

2. It will be possible to c alculate the funds based on the road program of standardized road management systems and benefit cost analysis since at that time the program for district roads used the same road maintenance program as that in national or provincial areas.

5.4.3.4. Disbursing road funds to different road agencies

Although there are three methods of disbursing funds to road agencies, the mix between disbursing funds directly to road agencies and paying contractors directly will be useful in Indonesia. Indonesia has been practising two methods of payment in the road sector.

Disbursing funds directly to road agencies will be useful if there is good governance, competent road agencies and highly decentralized systems. These three criteria have to be fulfilled when the government implements model 2. Local authorities will be paid on the basis of monthly claims. If a Local Authority does not comply with the procedures laid down by the road maintenance fund, it has to repay the funding received. The other familiar criteria are paying contractors directly. In this type of funding there should be approval from a supervisory consultant certifying the work for payment, and the road maintenance funds will be paid directly to the contractors. The only difference between the two should be the amount of payment. If, for example, the payment ranges RP 1 million - RP 200 million, the first type of disbursement method will be used (pay directly to the road agency), while the amount between RP201 million beyond will be paid directly to the contractors.

5.4.3.5. Technical and Financial audit

Although there are three options, the road fund should be subject to regular technical and financial audits. The auditor could be one of the following:

- Independent auditor
- State auditor
- Auditors appointed by the state auditor

The option of auditors being appointed by the State Auditor will be the best solution because there would be a transfer of knowledge in the process of the appointment of auditors. The appointment of auditors should involve at least training them to deal with road sectors. The appointed auditor should at least follow the road auditor systems course, organized by the state auditor. Having an additional certification on road knowledge will be of major benefit for the audit results. The technical audit will be done by a local supervision consultant since the State auditor does not have expertise to carry out a technical audit.

5.4.3.6. The impact of Road Maintenance Fund to the district roads

As has been stated earlier, the impact of setting up a road fund on low volume roads, such as district roads, will permit cross-subsidization. There are a number of countries that have implemented cross-subsidies for district roads:

- Finland. Finland has adopted a formula of: 0.75*L*$800*(L-0.1R)*C, where 0.75 is the maximum proportion of costs to be financed i.e. 75%, L is the length of the road, $800 is the estimated average maintenance cost per km, R is the number of permanent residents living along the road, and C is the maintenance class of the road (C=1.50 for class 1 roads, 1.25 for class 2 roads, 1 for class 3 roads and 0.75 for class 4 roads)

- Japan. The Central Government finances half the costs of maintaining directly managed national highways. The remainder is financed by prefecture governments and designated large cities.

- Marieville, Quebec, Canada. This municipality has an interesting approach which could be implemented in Indonesia by a property developer. It requires anyone developing a property to provide all the basic infrastructure services to a specification laid down by the municipalities (including roads). After completion the municipalities take over responsibility for the road maintenance and costs of any future upgrading.

- Villa El Salvador, Peru. Design studies are paid for in full by each community, civil works costs are shared between the community, group, municipality, and central government/metropolitan Lima in proportions 20%, 30% and 50% respectively.

The most appropriate way to implement this in Indonesia will be the Finnish style of cost sharing arrangements. The reasons for adapting this model are that firstly there is a maximum cost to be paid by the road maintenance fund, which means that the regions should pay the rest of the costs from their own resources. Secondly, since there will be fiscal decentralization in Indonesia during this stage, this policy will encourage the regional government to find solutions for the remaining balance of road maintenance funding.

5.4.4. The advantages and disadvantages of the long term solution

5.4.4.1. The advantages

The advantages of the long-term solution will be:

1. The move from a government environment of bureaucracy to a company environment should lead to road maintenance being handled in a more efficient way.

2. A road maintenance fund is a way of putting roads on a fee-for-service basis and depositing the proceeds into a commercially managed road fund.

3. Sustainability of funds will be guaranteed because road users will pay for road maintenance.

4. Transparency and accountability are present, since this model allows road users to be well informed about road conditions through annual reports and audit reports, which are published and disclosed to the public.

5.4.4.2. The disadvantages

The disadvantages will be:

1. Due to poorly designed arrangements for collecting road fund revenue the Ministry of Finance may stop paying money into the road fund or may hold up the release of funds, or take money out of the road fund.

2. If there is insufficient revenue available when the road fund has been set-up to pay the whole costs, the remainder would need to be paid from the government's budget. However, experience indicates that since the road fund has been set up it will be difficult to obtain funds from the government.

3. If the road fund generates excessive revenue because the initial tariff was set too high, other government agencies will be attracted to raid the surplus. To alleviate this, the level of the road tariff needs to be set carefully.

4. If there are no mechanisms for revising the road tariff other than through the normal tax-setting process of government, adjustments may require the approval of several Ministries that have nothing to do with roads. This will make adjustments difficult and very lengthy.

5.5. Chapter Summary

Preliminary models for financing road maintenance have been presented and include medium term and long term solutions. The first model, the medium term solution, is to create a series of task forces to undertake the consolidated budget for district roads. A Project Management Unit is the task force set up within the central government to deal with the national program and deliver budgets at district level. Coordination between the actors in the task force should optimize road maintenance funding. Ring fenced funding will be tightly monitored to minimize the bias of financing road maintenance. A series of Project Implementation Units should be set up in the region to disseminate the regional issues and to have the responsibility of improving budget preparation and implementation procedures. The drawback of this model is that the government will need to provide funds to put it into operation it.

The second model, the long-term solution, is to set up a road maintenance fund (termed a second-generation road fund). The responsibilities for financing road maintenance are placed on road users. Road users should pay an adequate amount of money to use the road. Under this model the expenditures and revenues for roads are linked. The problem with this model is that it is relatively new for developing countries. It commenced in 1989 and up to now the World Bank (who introduced the model) is still monitoring the results in Latin American, the Caribbean and Sub Saharan Africa. This model will require a change in government regulations necessitating approval by Parliament. It will take a considerable time to be discussed and passed through legislature. It is likely that the World Bank would agree to provide a loan, since it is the World Bank's own model, and it is encouraging its use in all developing countries.

The following chapter presents the research methodology of the study whereby the detailed research strategy and data collection will be explored in detailed.

Chapter 6. Research methodology

6.1. Introduction

In order to develop a research model for the district road maintenance policy study a method must be defined for collecting the appropriate data, analyzing it and creating a model to reflect the research objectives. This chapter will review research methods and the theory concerning techniques for collecting and analyzing data to ensure the results are valid and realistically reflect the situation in Indonesia. The way to take representative samples from the population will reflect the validity and accuracy of the results and will be dependent upon the characteristics of the data and organisation within which the research is taking place.

Research can be categorized into two types - qualitative and quantitative. Qualitative research has to do with qualities - basic texture, nature, characteristics and attributes that make something what it is. Qualitative research will be used when the question calls for process, meaning, multiple realities and interpretation. On the other hand quantitative research is viewed as confirmatory and deductive in nature. The data in quantitative research is usually analyzed statistically and clear statements may be made concerning causal and interdependent relationships between variables. The chapter will highlight that the focus will be qualitative due to the nature of the data being collected during the study. Qualitative data can be collected through surveying either from inside, or outside, an organisation. The researcher may take an independent look at an organisation or embark on joint collaboration. The choice of research design will be contingent upon the context within which the research resides.

In the chapter the research design for this study is argued to be that of quasi-action research. Action research intends to introduce changes during the course of a study. In this study, however, only part of the changes will be included since the nature of the policy reform itself usually takes

approximately five years to come to fruition. Because of this the researcher adopted the term 'quasi action research'. This was due to the fact that the participants in the primary fieldwork, the decision-makers who are involved in road maintenance, were deliberately made part of the research process to test and validate possible policy reforms and talk through their implementation. From this process it was hoped that the implementation process would commence. In the event, all the key actors accepted the models presented by the researcher. The chapter concludes with a description of the research methods employed for this study.

6.2. Research design

Research design can be thought of as the structure for undertaking research and provides the glue that holds the research project together. As a structure, research design can show how all of the major parts of the research project, such as samples or groups, measures, treatments or programs and methods of assignment, work together to try and address the central research questions. The choice of research design must be appropriate to the subject under investigation (Patton, 1987). In designing a research methodology it is necessary to identify the aims of the research project.

The first stage of the research design is to delineate the problem (Gill and Johnson 1991). This research project has been commissioned by Directorate General of Highways in Indonesia to seek to develop an appropriate national policy framework for financing district road maintenance in that country. The nature of the research methods should reflect these aims by analysing the following elements of research theory and methodology, namely:

- theory and data;
- sampling the population;
- design of data collection method; and
- data analysis techniques.

6.2.1. Theory and data

Theory may be viewed as a system for ordering concepts in a way that produces understanding. Theory can include more than one concept the manner in which they are linked together (Ghauri, Gronhang, Kristianlund 1995 and Zaltman ET al, 1982). The aim of theory is to simplify reality, allowing a number of interrelated variables to be mapped together showing the overall effect (Martin 1991).

Gill and Johnson (1991) divided data into two broad categories, qualitative and quantitative data. In general data is called quantitative if it is in numerical form and qualitative if it is not. Photographs, videos, sound recordings and so on can be considered qualitative data. The detail of the type of data will be explained below.

6.2.2. Quantitative research

The primary reasons for conducting quantitative research is if there is a need to learn how many people in a population have (or share) particular characteristics or group of characteristics. It is specifically designed to produce accurate and reliable measurements that permit statistical analysis through advanced statistical techniques such as correlation, regression, cluster analysis or factor analysis. Quantitative research can be used to create models that predict whether or not someone holds a particular opinion or would act in certain ways, based on observable characteristics. The main forms of quantitative data collection are experiments, quasi experiments, structured surveys, interview or observation, data sets, manipulation, control and statistical analysis.

The main outcome of quantitative methods is statistical evidence. The benefit of construct and internal validity gained by the quantitative approach is highly suited to large samples to represent the whole population. Experimental research allows the researcher to control which unit is exposed to which condition. Quasi experiments analyze causal relationship between independent and dependent variables. However, when the information required is of a non-quantifiable nature

these benefits are reduced and in this instance experimental research is unsuitable as very often the researcher must record the events as they occur in reality. Experimental techniques are considered to be prone to bias (Gill and Johnson, 1991). As a result of this weakness researchers have taken the experiments out into the field.

6.2.3. Qualitative research

Walker (1995) stated that qualitative research is generally testing for the existence of variables rather than their frequency. Qualitative research should be used when one really wants to understand in detail why an individual does something. Bryman (1988) indicated that qualitative research, as a product of a natural science approach, is associated with a number of different approaches to data collection. The qualitative approach tends to be descriptive, naturalistic and world oriented. This type of research yields large volumes of rich data obtained from a limited number of individuals.

6.2.4. The Use of Quantitative and Qualitative Data research in this Study

Jankowics (1991) diagrammatically presented the implementation of qualitative and quantitative data in

This research adopts a combination of case study, and survey with questionnaire and interview in the earlier stages. The first two earlier stages are problem statements (data collection by interview), comparison with other countries (data collection by interview and questionnaire).

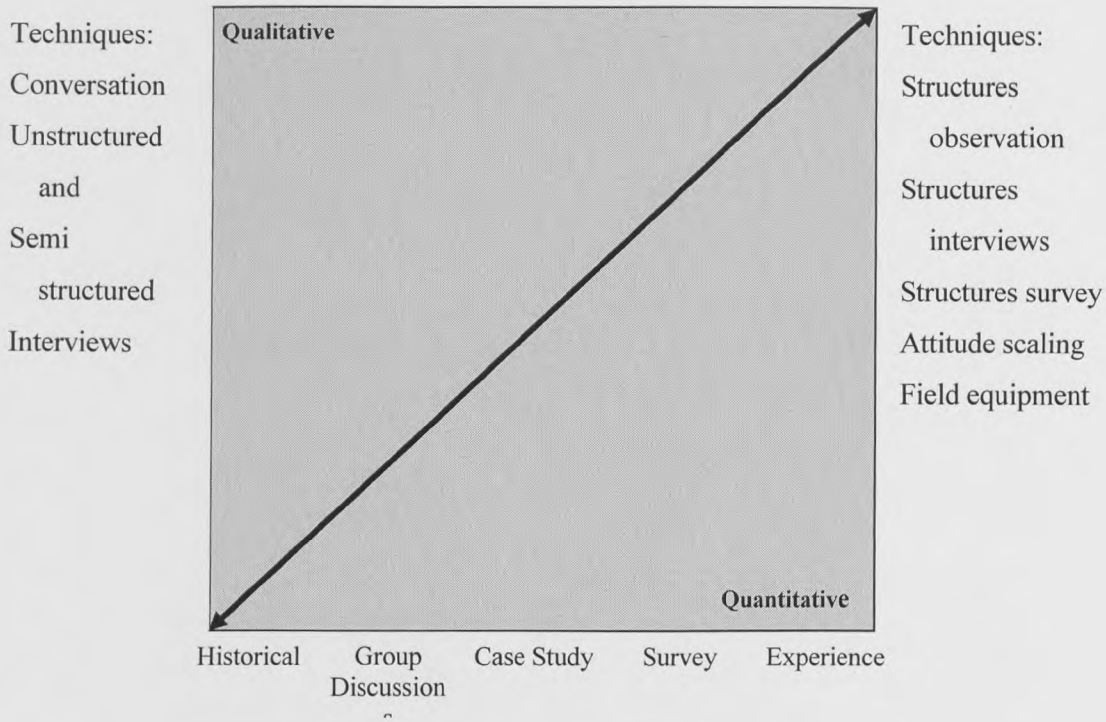


Figure 6-1 Qualitative and quantitative methods of analysis and techniques. [Source: Jankowics (1991) Business research projects for students, page 159.]

Qualitative techniques have been applied in the primary fieldwork phase in Indonesia through presentation, discussion and interview. As Walker (1985) indicated, these techniques might be suited to topics that are complicated or sensitive, concerned with relationship or interaction or with process of change, and if the population is low. This appropriately reflects this research study where actors, departments and ministries within the Indonesian Government are the focus of attention.

Thus, the characteristics of this research project lead toward the use of qualitative methods for the following reasons:

- the research objective is to introduce changes in the existing government policy;

- the research process relies on comparison, interaction and relationship;
- a comparison of techniques or policy reforms and the way Government experiences managing roads will rely, to a degree, on perception;
- the main research uses presentation and interview to change the actor perception in the subject being study;
- in order to gain support from the actors who are involved in the decision-making process, participation will be encouraged to gradually introduce the required changes or, in other words, to implement the proposed changes. This includes the introduction of the models developed through the public awareness campaign; and
- the results will present a more realistic view of the world.

Having defined the nature of the data it is necessary to identify the sampling frame.

6.2.5. Sampling

A sample is described as a portion of the units/elements in a population (Dane, 1990). Cohen (1988) identified that there are two main categories of sampling: probability sampling and non-probability sampling. Probability sampling is a method of sampling that utilizes some form of random selection where every member of the population has an equal chance of selection.

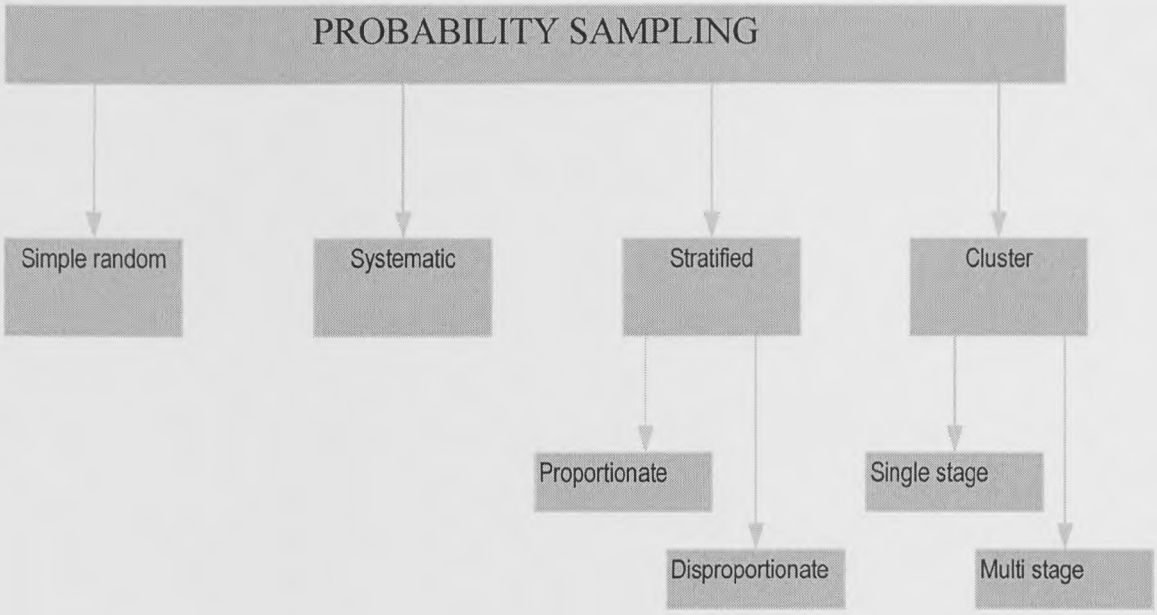


Figure 6-2 Probability methods. [Source: adapted from Trochim 1996]

Figure 6-2 sets out the diagram for probability sampling. Probability sampling was rejected for the following reasons:

1. In the initial exploratory fieldwork to develop preliminary policy models for implementation in Indonesia, samples for this element of the study are all local authority road officers in local authorities in England. Richness of data is a key issue and the total sample of English county councils was included within the sampling frame.

2. In Indonesia, the samples are all from interested parties who deal with the decision making process of road maintenance in central government. Again, due to the nature of policy reform and changes to be implemented, random selection of respondents would have been inappropriate.

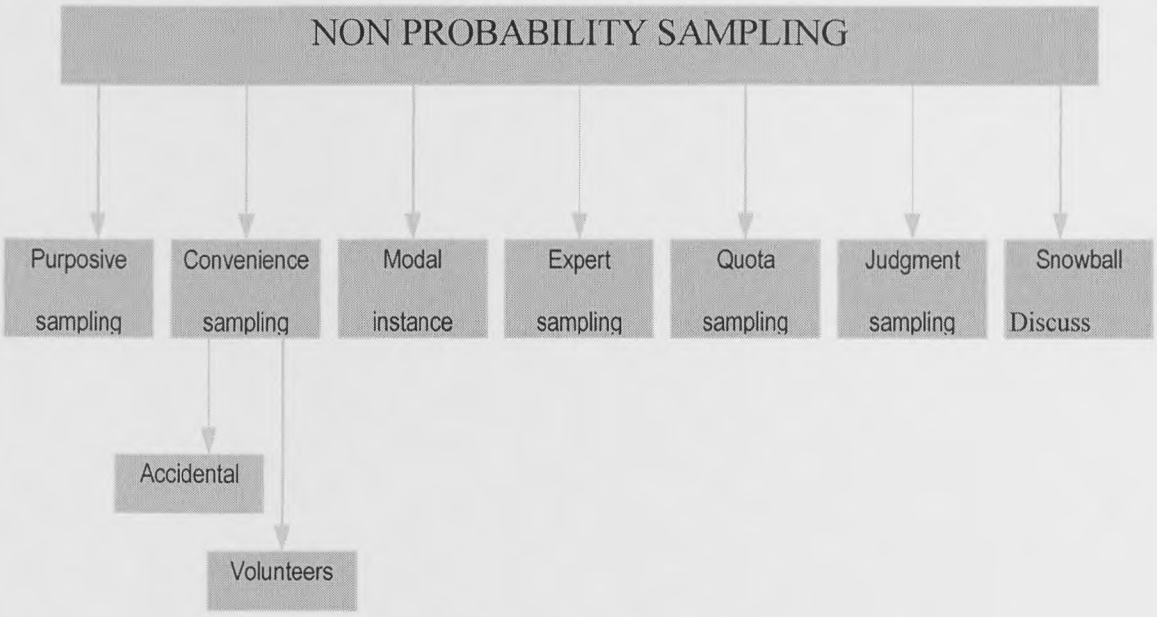


Figure 6-3 Non probability sampling, adapted from Trochim (1996)

Figure 6-3 sets out the diagram for non-probability sampling. Based on this diagram, this research adopts purposive and expert sampling for the following reasons:

1. All local authorities in England, especially transport/highway officers in county councils, are the appropriate place to retrieve information on the subject being studied. Their positions will be in line with their experience of managing roads and how they handled local issues. By using this sample the real issues in local authorities concerning the subject under study would be uncovered.

2. All senior officers comprise the sample of those who represent the five institutions, including World Bank staff in Indonesia dealing with the decision making process for the subject under study. Their inclusion as the sample of experts in the study will allow their ideas to be obtained on the models presented by the researcher.

3. Parts of local authority government in Indonesia have also been included within the sampling frame to find out what has been done at local level. Only a part of the local authorities in Indonesia were sampled due to the following:

- The organization of local authorities in Indonesia is similar so sampling some of them will enable ideas about all local authorities in the country to be extrapolated.

- The local authorities in Indonesia chosen for sampling provided access to officers who have dealt with road sectors for more than 7 years, and who have served in at least 2 or 3 local authorities during the last 10 to 13 years. Their expertise in managing local authority roads will benefit the study considerably.

Based on those considerations, the purposive samples and expert sampling are the right combinations for the study.

6.2.6. Design of data collection

Dane (1990) indicated that research is a process through which questions are asked and answered systematically. It can take a number of forms such as exploration, prediction, explanation and action. Exploration is an attempt to determine whether a particular phenomenon exists: prediction explores the relationship between two variables so that by knowing one the other will be known; explanation determines whether there is a cause-effect relationship between two variables; and, finally, action research involves using research to attempt to solve a social problem.

Yin (1989) comments that if research concerns "what" questions an exploratory study is justified. This type of research objective is to develop hypotheses or propositions, which will be studied later. If the questions relate to "how many" or "how much", then a survey strategy is favored. When questions are related to "how" and "why" then a case study method is favored. The chosen method is dependent upon the above categorization and the nature of data collection.

Due to the nature of the study, the focus will be on qualitative research methods, which include survey research, case study, action research as well as a combination of all these techniques within an interactive strategy. Each is discussed in detail below.

6.2.6.1. Survey research methods

Surveys are a common way of collecting data in market research and in the social sciences. Data collection methods can be divided as set out in Figure 6.4 below.

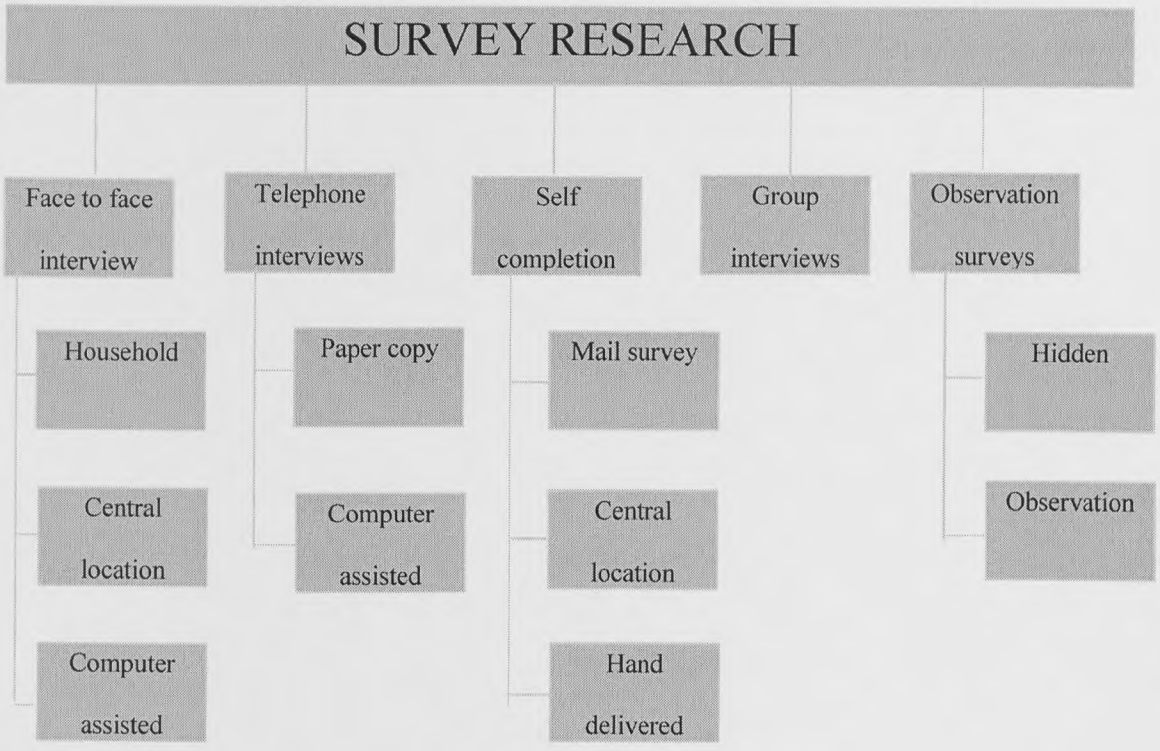


Figure 6-4 The survey research. [Source: Adapted from David Jobber (1991)]

De Vaus (1992) compared the data collection method, which can seen in Figure 6-5 overleaf:

	Mail	Face to face	Telephone
Response rate	Good	Good	Good
Quality of response			
Avoid interviewer bias	Good	Poor	Fair
Avoid item non response	Poor	Good	Good
Representative samples			
Avoiding refusal bias	Poor	Good	Good
Control over the whom completes questionnaire	Good	Good	Satisfactory
Establishing rapport to avoid response	Poor	Good	Good
Effects on questionnaire design			
Long Questionnaire	Satisfactory	Good	Satisfactory
Complex structures	Satisfactory	Good	Poor
Sensitive questions	Good	Good	Satisfactory
Boring questions	Poor	Good	Poor
Filter questions	Poor	Good	Good
Questions sequence control	Poor	Good	Good
Open response questions	Poor	Good	Good
Operational consideration			
Staff costs	Low cost	Expensive	Moderate
Speed of data collection	Slow	Moderate	Fast
Ease of processing	Harder	Harder	Easier
Speed of processing	Slow	Slow	Fast

Figure 6-5 Comparative assessment of data collection method. [Source: Adapted from De Vaus (1992)]

This research adopts a self-completion questionnaire approach for the following reasons:

1. It is cheaper to do mail questionnaire surveys than face-to-face and telephone questionnaire surveys. These will be costly and take up a lot of time due to one-to-one contact and to take account of travel time in the face-to-face surveys. Telephone questionnaire surveys, whilst relatively cheaper than face-to-face surveys, still take a great deal of time.

2. The mail questionnaire is more time flexible and respondents can fill it in when convenient to them. Telephone or face-to-face surveys may disturb respondents during office hours, especially since in this study they are all senior officers.

3. To overcome the lower response rate of mail questionnaires, the researcher sent cards to respondents to remind them to complete the questionnaires.

4. The interviews were held with personnel working in local authorities in England as a follow up to the questionnaires: the interview-based method in local authorities in England was self-selective. The respondents were asked whether they were willing to be interviewed to clarify matters related to the research.

6.2.6.2. Questionnaire design

Factors that play an important role in the financial side of road maintenance are:

1. Survey: This factor is important in relation to the question "How much funding is needed for maintenance"? The survey will determine the road conditions. The road conditions will determine what type of maintenance is needed. The price of each type of road maintenance has been set-up. A survey will also help the decision-makers to predict the maintenance needs for the future.

2. Budget allocations: Based on no.1, there is the possibility of getting the total expenditure of road maintenance from local authorities. To check whether road maintenance is under funded or not can be investigated through data of funding (central grant + local authority own source of revenue or by investigating the local highway maintenance budget) compared to the road conditions as described in the survey.

3. Budget process. England has a decentralization tradition. It will be useful if the budget procedures in England are also part of the investigation including: virement and those in charge of it, the involvement of local legislature; the Transport Supplementary Grant from central government; and the reallocation within budget headings or sectors.

4. Road maintenance management systems also play an important part in prioritizing funds within the budget constraint envelope.

5. To clarify any outstanding issues, including the road maintenance backlog in the local authorities, the respondent has elected to be interviewed.

The questionnaire procedure will be explained in the next sub section

Questionnaire procedures

The following procedures were used to dispatch the final questionnaire and covering letter to respondents (Kanuk and Berenson 1974):

1. The covering letter outlining the research and requesting cooperation in the study was signed by the supervisor (as Head of the School of Civil Engineering, University of Leeds). The letter clearly stated that all replies would be treated strictly anonymously. Arrangements were made for the questionnaire to be return directly to Head of the School for analysis (see Appendix A)

2. The questionnaire was enclosed with a university crest and title on the front cover (Appendix A).

3. A stamped, addressed envelope was included with the questionnaire.

4. Two follow up procedures were used: a reminder letter and a second questionnaire

5. Futrell and Lamb (1981) concluded that a duplicate questionnaire without a follow up letter was insufficient and indicated that at least one follow up letter with questionnaire was required. The second reminder without a copy of the questionnaire was forwarded to unresponsive local authorities after 3 weeks of posting out the initial questionnaire.

6. Respondents were promised feedback of results.

The response rate was approximately 40%. In total 35 questionnaires were sent out, from which 14 were returned. The details of these are found in Appendix A. Analysis was carried out using Microsoft Excel from which simple database style queries were made and graphical and tabulated representation was produced.

6.2.6.3. Case Study

Case study research can be defined as a detailed examination of an event or series of related events which the analyst believes exhibit the operation of some identified general theoretical principles (Mitchell 1983). Gummesson (1991) comments that there are two types of case studies:

1. attempts to derive general conclusions from a limited number of cases; and

2. attempts to derive specific conclusions regarding single cases.

However, Yin (1989) suggests four types of case study design as follows:

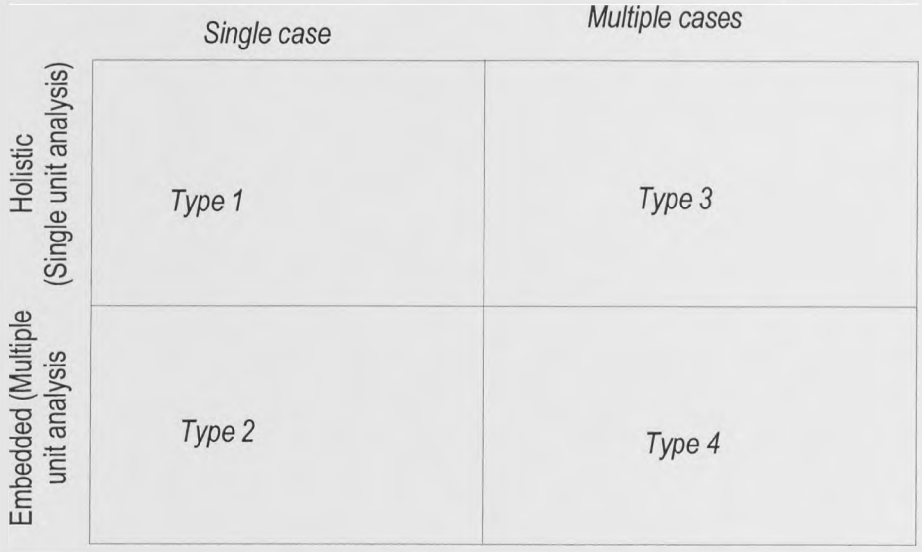


Figure 6-6 Basic designs for case studies. [Source: Yin (1989) page 46]

Yin (1989) has developed sound procedures for undertaking case studies. He listed six sources of evidence for data collection in a case study protocol:

1. documentation;
2. archival records;
3. interviews;
4. direct observation;
5. participant observation; and
6. physical artifacts.

Although Yin concludes that not all of the sources need to be used in every case study (Yin, 1989), in this research most of the sources will be used. Yin also presents the strengths and weakness of the above protocol but weaknesses in this research can be overcome by the author being a staff member of the organization being researched since it is easy for the author to obtain information that would not normally be accessible to most researchers.

Case study research can be based on single or multiple case studies and can also be exploratory, descriptive or explanatory (Yin 1994):

- Exploratory case study research is aimed at defining the questions and hypothesis for a subsequent study or determining the feasibility of a research project. This type of study provides the exploratory research question "what" and "how many" or "how much".

- Descriptive case study research presents a complete description of a phenomenon within its context.

- An explanatory case study presents data with relation to cause and effect relationships explaining which causes produced which effects. This case study provides the explanatory research question "how" and "why".

Single case study research may be used to confirm or challenge a theory, or to represent a unique or extreme case, while multiple case studies permit a degree of generalisation. This research adopts the multiple case approach for the following reasons:

1. The research study uses an inductive approach through comparative case studies of Indonesia, England and other developing countries in Sub Saharan Africa, Latin America and the Caribbean.

2. These comparative case studies will be used to create preliminary models to derive general conclusions from a limited number of cases.

3. Preliminary models derived from 1 and 2 above will be adapted by taking into account individual differences within the country.

6.2.6.4. Action research

Action research will always involve two goals: solving a problem for a client and contributing to science (Gummesson 1991). Here the researcher is not only a researcher but also a consultant. As a researcher there should be a contribution to knowledge of theoretical development and as a

consultant you have to help the client. There will be a give and take process by both the parties, the researcher and client. Argyris et al (1985) indicates that becoming an action researcher involves learning to reflect on reflection-in-action, making explicit theories-in-use from information available, and learning to design and produce new theories to use for reflection and action.

McNeil (1990), commenting on action research, indicates that the researcher is actively involved in planning and introducing some changes in policy and uses his research expertise to monitor and possibly evaluate its effect. Thus, action research involves the planned intervention by a researcher into a naturally occurring event. The effect when monitored is to discern whether or not the action has produced the expected consequences. Gill and Johnson (1991) describe the action research route as an iterative one whereby either the client or the researcher presents the problem at entry and the diagnosis is then a joint one between the two parties.

There are six characteristics to action research (Susman and Evered 1978):

1. it is future oriented, trying to improve the future of the people;

2. it is collaborative, obliging the researcher to clarify and represent his own ethics and values;

3. it implies system development;

4. it generates theory grounded in action; and

5. it is agnostic in that theories and prescriptions for action are themselves the product of previously taken action.

6. It is situation based on actors defining their current situation.

Four types of action research can be identified (Susman and Evered 1978):

1. diagnostic action research - the researcher is only involved in collecting the data for diagnosis and feeding back to it;

2. empirical action research - the researcher only evaluates the options undertaken by the client system and feeds data back to it;

3. participant action research - diagnosing and action planning is carried out in collaboration between the researcher and the client system; and

4. experimental action research – the researcher and client system collaborate in all phases to set up an experiment for taking an action

Winter (1987) has criticized action research, commenting that it is muddled science since it dismisses the outside observer and independent experimenter. Rapoport (1970) highlights 3 dilemmas concerning this method of research. The first dilemma is the matter of ethics in terms of respondent protection, awareness of personal and political motives. A good action researcher will not become captive of one organization. The second dilemma concerns the conflict of goals that may arise between the demands for help by the client organization and the demands of the research.

Finally the third dilemma concerns the shifting focus of initiative from the client to the action researcher as the research progress. The client is often not a simple one and the action researcher must seek multiple support and participation.

Bryman (1995) affirmed that action research steps are as follows:

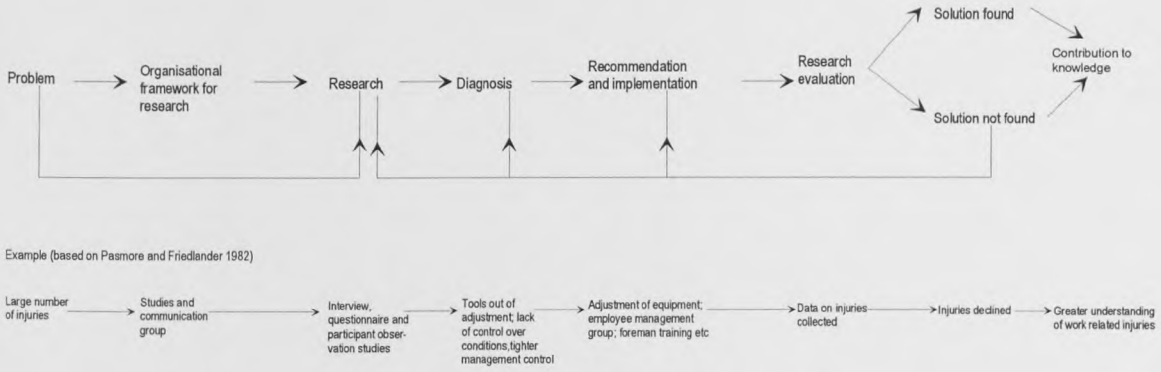


Figure 6-7 The action research steps. [Source: Bryman (1995) Research methods and organisation studies in contemporary social research: 20, London page 180]

Bryman also gives a useful example of his action research steps based on the work of Passmore and Friedlander (1982). Based on the identified problems they assembled Studies and Communication groups that directed the investigation and conveyed results and recommendation. The data collection methods used were questionnaire surveys of employees, interviews and participant observation. This has similarities to this research study.

This research adopts action research for the following reasons:

1. this research is taking place within an organization undergoing changes;

2. one of the research objectives is to introduce change into the process of financing district road maintenance; and

3. in order to gain support from within the organization concerned, participation from the subjects, as actors who are involved, was encouraged in order to gradually introduce the required changes.

This research uses slightly different route from that adopted by Passmore and Friedlander (1982) due to the following factors:

1. This research is taking place not just within an organization that is going to change but also in the country of Indonesia. The expected changes will happen in the policy reform of road maintenance across the entire district road network. Thus, the 'organization' in this research will be the country of Indonesia. Interaction will be inter-ministerial interaction and will involve legislature, both national and regional, rather than just interaction within one department.

2. This research is concerned with transport policy reforms which, according to Heggie, can be divided into three time dimensions - short, medium and long term. Short term will take approximately 1 to 2 years; medium term will take approximately 2 to 4 years. Long term will take approximately 3 to 10 years.

3. The short term will only deal with administrative and organizational aspects where decisions could be made by a single agency. The medium term may require decisions to be made between 2 agencies and deal with administrative, organizational and political aspects. The long term is more complicated, where decisions would be at the discretion of Parliament. For example, one type of major policy reform related to this research, and which is still going on, is taking place in Latin America and the Caribbean. In these countries, policy reform started between 1990 and 1993 with a project that tried to prepare the reform concepts. The United Nations undertook this study. Since 1994 the International Road Federation (IRF) received financial and technical assistance from the government of the Federal Republic of Germany for the execution of a project entitled: "Financial and Institutional Reform of Road Maintenance in Latin America and the Caribbean". The duration of the project will end in June 2000 (Zietlow 1998).

4. To build preliminary models for a policy framework necessitated comparing two major sources of information, developing, and a developed country, to find the most suitable way to address the problems in Indonesia.

5. Testing the models to Indonesia involved seeking approval from interested parties who are involved in the original decisions for this study, asking their opinions and expecting feedback from them to make the models applicable ready for implementation.

6. The research evaluation, as mentioned in Bryman's model, will be done after this research project, while the contribution to knowledge, the fruit of the action research, will appear as a recommendation accepted by a board of decision-makers, as well as permission being granted to implement the research models.

Part of the action research process took place when the author returned to Indonesia. Implementation of the research models has been embraced as part of the validation process and has been implemented in real situations in Indonesia.

6.2.7. Data analysis techniques

Easterby Smith et al (1991) comment that data collected by means of an interactive holistic approach, as recommended here, must be analyzed as a whole. There are two main methods for achieving this:

- The researcher goes by frequency of events, converting qualitative data into numbers which are seen as politically more acceptable.

- Grounded theory allows the researcher to go by feeling and intuition, aiming to produce common and contradictory themes and patterns. Grounded theory is a method that has been used extensively across a variety of social science disciplines. The basic tenet of this approach is that a theory must emerge from data, or in other words, a theory must be grounded in the

data. Hence, the approach purports to be inductive rather than deductive. As defined by Strauss and Corbin (1996) "The grounded theory approach is a qualitative research method that uses a systematic set of procedures to develop an inductively derived grounded theory about a phenomenon" (page 24).

Data analysis is central to grounded theory. For the study as a whole, data collection, data ordering and data analysis are interrelated. Data analysis involves three processes, from which sampling procedures are derived, and which may overlap as follows (Strauss and Corbin 1990).

- Open coding, where data is broken open to identify relevant categories and labeling, and categorizing of phenomena as indicated by the data. Asking questions and making comparisons and similar incidents are grouped into the same category.

- Axial coding, where categories are refined, developed and related. This coding puts the data back together in new ways by making connections between a category and its sub-categories. Axial coding refers to the process of developing main categories and their sub categories.

- Selective coding, where the core category or central category that ties all other categories in the theory together, is identified and related to other categories.

The grounded theory methodology also allows the theory to develop with the research data collection, with the route through the data collection and analysis phase being steered according to the emerging themes. This intent is to develop an account of a phenomenon that identifies the major constructs, or categories, in grounded theory terms, their relationships and the context and process, thus providing a theory of the phenomenon that is much more than a descriptive account (Becker 1993).

Whilst grounded theory requires that theory is emergent from the data, it does not see these as separate. Data collection, analysis and theory formulation is regarded as reciprocally related, and the approach incorporates explicit procedures to guide this. Research questions are open and

general rather than formed as specific hypotheses, and the emergent theory should account for a phenomenon that is relevant and problematic for those involved (Becker 1993).

Strauss and Corbin provide criteria for a good-grounded theory as follows:

- it should fit the phenomenon provided it has been carefully derived from diverse data and is faithful to the everyday reality of the area;

- it should provide understanding and be comprehensible to both the persons studied and others involved in the area;

- It should provide generality, given that the data is comprehensive, the interpretation conceptual and broad, and the theory includes extensive variation and is abstract enough to be applicable to a wide variety of contexts in the area. It should provide control in the sense of starting the conditions under which the theory applies and providing a basis for action in the area.

A grounded theory is inductively derived from the study of the phenomenon it represents. The grounded theory is discovered, developed and provisionally verified through systematic data collection and analysis of data pertaining to that phenomenon. One does not begin with a theory and then set out to prove it. Rather, one begins with an area of study and what is relevant to that area is allowed to emerge (Strauss and Corbin, 1990, page 23).

This research project adopted a grounded theory analysis:

1. The objective of document analysis was to gain an appreciation of the current and past practice on road maintenance in local authorities in England. The document analysis was necessary to back up the information received from the interviews with direct information from documents produced during research and with reference to the research.

2. The analysis of documents and questionnaires allowed the researcher to draw specific information relating to the research. Data analysis in English local authorities was undertaken through frequency distributions of questionnaires. This was supported by secondary data such as technical guidelines of road maintenance in local authorities - the Local Authorities Code of Good Practice, the Maintenance Handbook, budget books, TPP bids, policy notes and other guidance documents for road management in local authorities.

3. The preliminary model was derived from empirical evidence and other countries' experiences. That means model building was based on the data in the field.

4. The preliminary model was also derived from continuous comparison between other country experiences by taking into account the differences between countries.

5. The model has been validated in Indonesia with subjects who are involved in the road decision making process forming part of the research process.

6. The preliminary models have been refined due to the fact that the parties involved felt that models will only work when the country reaches economic recovery stages.

6.3. Chosen research methodology

The research process was attempting to build a model of the policy framework of financing district road maintenance in Indonesia by combining information from a number of sources. The research strategy has been placed within a time related schematic to represent the sequence of events as they occurred. For each of the research methods used the following section will highlight the objective, the sample choice and a brief resume of the work conducted.

The model development objective was to develop a preliminary model forming the basis of the main research phase. This took the form of a research survey, document analysis and interview. At

the end of the pilot work a preliminary model had been developed and this will mark the start of the main research stage. The objective of the main research stage was to test the research model within the institution concerned in Indonesia. During the main research period, presentations and interviews were conducted within the Indonesian Central Government Agencies. The result of the main research can be seen at Chapter 7.

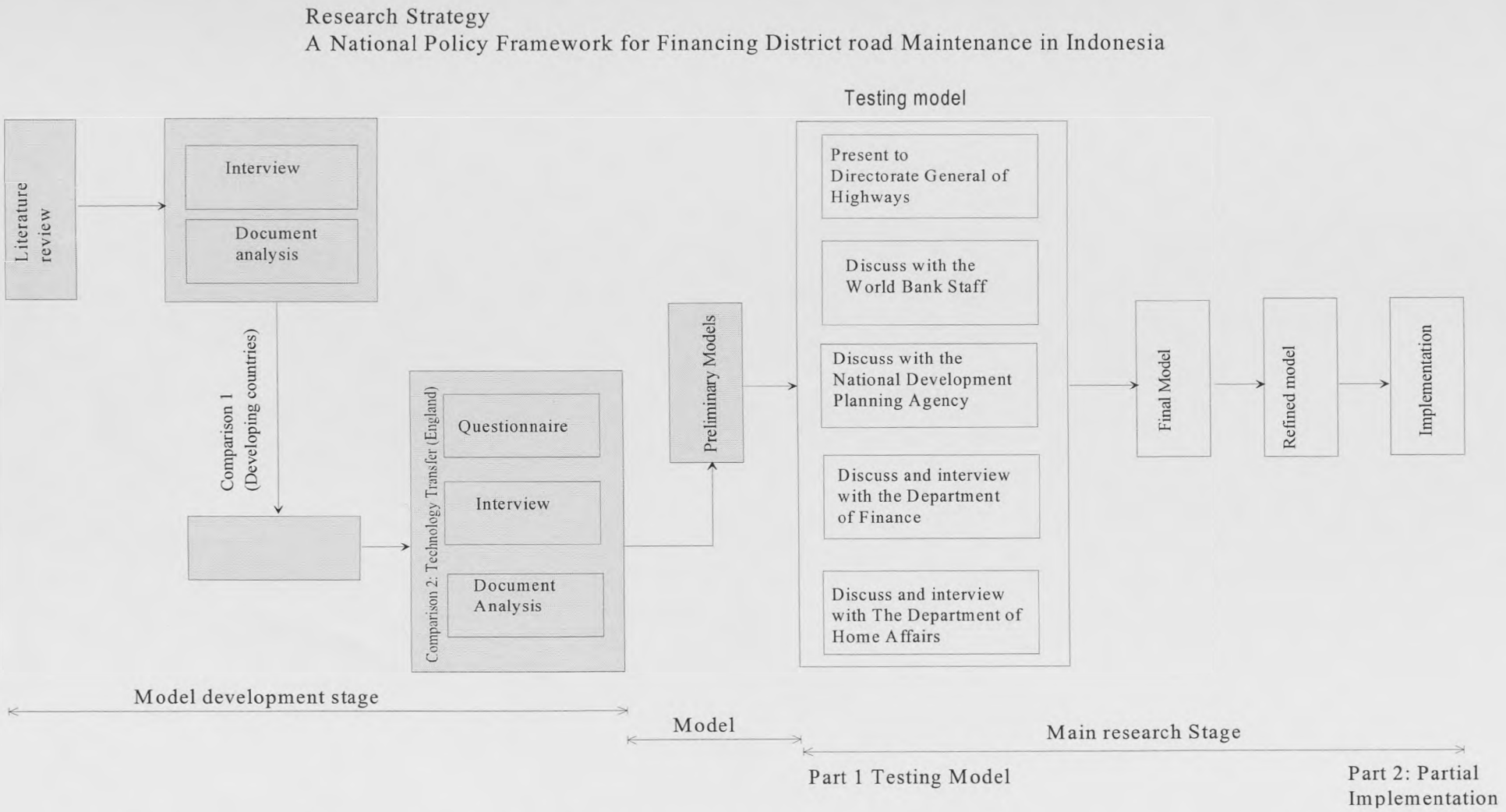


Figure 6-8 Research Methodology Ph.D. A National policy framework for financing district road maintenance in Indonesia. [Source Author 1998]

6.3.1. The field survey in England

The sample consisted of all 35 highway/transport officers in English county councils. Questionnaires had been sent to the county councils and interviews were undertaken based on the respondents' answers to the questionnaires. At the end of the questionnaire the respondents were asked whether they were willing to be interviewed. In each interview case a questionnaire template was drafted as a guide to the researcher and to ensure that all the information was gathered during the interview. Probing and digression from the questionnaire template was conducted where this would add to the quality and depth of the data collected. Where appropriate the interview was tape recorded for transcription after the interview.

6.3.1.1. Pilot survey

The objective of the pilot survey was to test the questionnaire before going to the respondents. A stratified cluster sample was taken from within the local authorities (Leeds and Wakefield). Field survey procedures suggested by Sinclair (1975) were utilized for piloting. Pilot surveys were undertaken through several versions resulting from:

- Preliminary questionnaires and covering letters were given to graduate colleagues for comment. They were PhD students who had undertaken similar types of research strategy. The revised questionnaire was distributed to lecturers with experience of local authorities in England. A request for a critical appraisal of the questionnaire structure, format and content, as well as the possibility of getting initial contacts with local authorities. During these stages, the questionnaire received significant adverse comments, especially the length of the questionnaire since the questionnaire would be sent to officers and would require them to devote a considerable amount of time to deal with it. However, the research evidence indicated that there is no correlation between questionnaire length and lack of response (Kanuk and Berenson 1975). However respondents' fatigue could have proved problematic.

The pilot study, which often had to search for information, especially in sections 2 and 3. The same problem occurred when respondents commented on the length of the time to retrieve information in sections 2 and 3.

- The questionnaire was then given to supervisors for further appraisal before being distributed to a sample of 2 city councils, Leeds and Wakefield.

- The final questionnaire was distributed to local authority officers who had involvement in road maintenance issues in local authority.

6.4. Model Development stage

The model development stage was conducted in order to highlight main areas for input to the preliminary model for testing during the main research. The results of this stage will be documented in this section. These results will be combined with the following activities:

1. District road data collection and interview with relevant district road agencies has been carried out in Indonesia to get officers' views on the management and financing of district roads.

2. International comparison, both to developing countries and England as a developed nation. The objectives of comparison are the following:

- For developing countries, through document analysis from multinational agencies such as: the World Bank and United Nations (document analysis) in order to see how the developing countries solve their problems, and understand the main problems in financing local roads in developing countries.

- For England, for the purpose of technology transfer, to be taken from England and adapted for Indonesia (questionnaire and interview). Advanced technology and management, which

has been done by local authorities in England, will provide Indonesian conditions to compare with England. Technology transfer will be done in stages, depending on conditions in Indonesian.

The model development phase combined the results from three data collection methods (questionnaire, interview and document analysis). The objective and chosen sample of each data collection method is below (Number 1 indicated the activities done in Indonesia, while number 2 in England for the purpose of technology transfer).

Interview Survey (1)	**Objective:** To introduce the research to district authorities (within 2 provinces). To seek out specific issues of district road maintenance for input to the model development
Reason for choice: The information was required at this stage in order to ascertain the real situation of district road maintenance. The question was open-ended and requires explanation.	
Sample: Purposive sampling was used to target personnel who could provide the right level information. Personnel from the district road agency, regional (district and provincial) and National Development Agency together with the regional (district and provincial) financial officers were interviewed.	
Notes: The interviewee was briefly introduced to the area of research prior to the questions being asked. In each case a questionnaire template was drafted as a guide for the researcher and to ensure that all the information was gathered during the interview.	

Figure 6-9 Chosen characteristics of the interview survey in Indonesia

Document analysis (1)	**Objective:** to gain knowledge of the current and past practice of district road maintenance in Indonesia.
Reason for choice: As has been explained in Chapters 3 and 4, taking England as a comparison is an opportunity to take something out of a developed country to adapt to a developing country such as Indonesia. It was necessary to back up the information received from the interviews with direct information gathered from documents that related to policy guidelines, or circulars in district road maintenance. The analysis of documents will enable the researcher to draw specific information regarding changes of the implementation over a period of time.	
Sample: The documents consisted of: A Report on district road conditions; Reports on road conditions in Indonesia; Quarterly report of PBPJK (Project Assistance to the District Road Management) to Directorate General of Highways; Statistical report on district road conditions and budget; Directorate General of Highways report on Rural road loan; World Bank report on Road Conditions on 85 developing countries including Indonesia and Government five year development planning.	
Notes : The documents were discussed with relevant members of the organisation and then reviewed in order to remove any bias from the analysis.	

Figure 6-10 Chosen characteristics of the document analysis

Questionnaire Survey (2)	Objective: to review how English county councils fund their local road maintenance, and the relationship between central-local authorities in terms of a central grant To review the road conditions in local authorities in England to determine the Local Authorities Road Maintenance Management Systems
Reason for choice: Technology transfer from a developed country such as England to developing countries has been done before. There is the possibility of taking suitable technology from England and transferring it to Indonesia.	
Sample: A non-probabilistic sample was taken from 35 county councils in England. The sample consisted of all 35 highway/transport managers across the country.	
Notes: A mix of qualitative and quantitative questions was put within the questionnaire in order to receive both information and specific statistically based answers. In order to increase the return rate a reminder card was sent out two weeks after the questionnaire was forwarded to respondents.	
Results format: The questionnaire is held in Appendix A, while a full analysis of the questionnaire results is in Chapter 4	

Figure 6-11 Chosen characteristics of the questionnaire survey

Interview survey (2)	**Objective:** To introduce the research to the local authority road agency in England. To seek out specific barriers to the achievement of adequate road maintenance for the model development. To respond to gaps in knowledge uncovered from the questionnaire and literature
Reason for choice: The information required at this stage of the research was detailed and required discussion with local authority transport/highway officers. The nature of the questions were open, some requiring explanation.	
Sample: Purposive sampling was used to target personnel who could provide the right level of information. The interviewer has been self-selected by fulfilling one of the questionnaire sections, which asks if they are willing to be interviewed. The full list of those interviewed can be found in Appendix B; it was made up senior officers in the road sector of local authorities in England.	
Notes: The interviewee was briefly introduced to the area of research prior to asking questions without biasing the answers. Probing and digression from the questionnaire template was conducted where it felt necessary to add quality and depth to the data. Where appropriate and when permission was granted, the interview was tape recorded for transcription after the interview.	

Figure 6-12 Chosen characteristics of the document analysis

Document analysis (2)	**Objective:** to gain an appreciation of current and past practices in financing road maintenance in local authorities in England.
Reason for choice: It was necessary to back up the information gathered from the interviews with direct information from documents produced during projects and with reference to projects. The analysis of documents allowed the researcher to draw specific information and recognize changes in practice over time.	
Sample: The documents consisted of Highway Maintenance Code of Good Practice; Local Authorities Highway Maintenance Code of Good Practice; budget book; National Road Maintenance Condition Survey 1990-1996; Local road maintenance expenditures 1990-1996; Newsletter from DETR to Local Government Finance policy and other publications which cover road maintenance contracts and PFI in local government in the UK.	
Notes: The documents were used to get the complete situation in respect of local authority financing of road maintenance and compare it with the results of questionnaires and interviews.	

Figure 6-13 Chosen characteristics of the document analysis

6.4.1. Results from model development stage

The results from exploratory fieldwork in Indonesia have been fully described in Chapter 2. The result of comparisons with other developing countries on how to address road maintenance issues has been explained in detail in Chapter 3, while the results of technology transfer from England has been explained in Chapter 4.

Exploratory fieldwork in Indonesia was analyzed both quantitatively and qualitatively; it was shown that the important role of road maintenance at district level was not understood well by the district local authority. It was shown that while the amount of routine maintenance decreased slightly on one hand, the amounts of rehabilitation increased as well as did the building of new roads.

Data from qualitative information captured from comments, as follows:

Road maintenance is still under-funded; there is no effort to mobilize funding, such as reallocation of funds from other road sectors to road maintenance. The late release of the district road budget led to the road maintenance work being done in the rainy season, which jeopardizes the work. There are at least four budget channels going into the district road agency; each channel having its own rules. Although decentralization has been set-up since 1974, during implementation the budget was highly centralized.

Although lack of qualified staff has been decreasing through the central recruitment, low salary levels encourage engineers to move to the private sector. Low salaries will lead to a lack of qualified staff, which will in turn lead to inadequate planning and subsequent inefficiency. Only recently can the Directorate General of Highways monitor and give guidance to district road agencies.

There is a lack of a qualified construction industry (contractors and consultants) at district level. The duration of routine maintenance contracts is too short and is hampered by the need to privatize through a contract to the private sector.

Figure 6-14 Significant points from document and interview analysis

The result of the comparison with developing countries has been analyzed qualitatively. It was shown that at least 14 countries in Africa (excluding South Africa[3]), 4 countries in Asia (excluding Japan) and 9 countries in Latin American and the Caribbean are adopting the Road Maintenance Fund. Commercialization of roads through road tariffs and separate funds overseen by an independent board has been introduced by the World Bank since the Road Maintenance Initiative in Sub Saharan Africa in 1991. However, the evidence showed that this type of model could only be successful on a case by case basis. There is a minimum requirement for countries to adopt this model. Since Indonesia cannot, for the time being, fulfill the requirements, options other than the Road Maintenance Fund should be proposed.

The results from document analysis and questionnaires conducted in the English field research show that the budget allocations, either from central government or from the county councils' own sources, decreased during the period 1992-1996. The central government grant goes to local authorities through the TPP bid. The Code of Good Practice is a guide for local authorities to deal with road maintenance. Each local authority has its own right to manage its own jurisdiction and organization. Given budget constraints, most of the county councils prioritized the road maintenance budget based on road hierarchy and functional importance. The involvement of citizens in road decision making has been shown through the complaint mechanism systems. Although the local authorities have addressed the issues of under funding local road maintenance the government is still cutting the budget for road maintenance. Local authority road maintenance issues have been accumulating and increasing as time goes on, although there are a few county councils who could keep their road maintenance back-log in a steady phase. The significant point of the document analysis and questionnaire supports the model development, as in the table below:

[3] South Africa and Japan have set-up their road maintenance fund far before the World Bank model was created.

Decentralization of roads in England makes local authorities (county councils) liable for road maintenance. Local authorities can recruit their own engineers.

Since 1992 the amount of work done by the Direct Labor Organisation has decreased, while the amount of work done through the Compulsory Competitive Tender has increased. Most of the DLO has been externalized and competed for through Compulsory Competitive Tendering

There are two types of Code of Good Practice, the National Code of Good Practice and the Local Authorities Code of Good Practice. These give guidance to local authorities on how road maintenance should be undertaken.

Given the budget constraint envelope, local authorities find their way to channeling the budget through road prioritization based on the road hierarchy that has been set-up. A simple local budget process, the virement, can be done either through the highway/transport officer or through the Chief of Finance in local authorities.

Different types of software have been adopted by local authorities in order to manage road maintenance management systems.

The local roads have suffered since local roads have the lowest hierarchy in the road network; the policy of mending and patching is a way to prevent deterioration as an interim measure.

Some of the local authorities exercise the Road Maintenance Strategy for five years in advance; this is good practice for long term planning.

The duration of road maintenance contracts is approximately 3 years. Although this is good enough to encourage contractors to submit bids, the recent study finds that most contractors prefer to extend up to 5 years.

Complaint mechanisms have been setup in local authorities, and the area Road Maintenance Manager is the one to be blame if a road is in a dangerous condition.

Figure 6-15 The main points of the questionnaire, data analysis and interviews with local authorities in England

In summary, the results from the model development stage were a combination of literature review and empirical analysis in England in order to overcome the problems, as mentioned in Chapter 2.

6.5. Field research in Indonesia

Presentation and discussions in Indonesia	**Objective**: To test the research model within the influential actors in the road maintenance decision making process, whether or not it remains applicable to the problems and issues of the financing district road maintenance in Indonesia.
Reason for choice: The road maintenance issues take place within a political and complex environment. It is not the responsibility of the engineer, it is responsibility of stakeholder. The stakeholder should be involved in the reform process to set-up a new policy towards financing district road maintenance. Political and economic factors of a country must be taken into account when setting up an appropriate national policy to finance district road maintenance. In order to implement the models there is a need to involve the decision-makers to get feedback from their own experiences and expertise. By involving all stakeholders to discuss the issues involved in the financing of district road maintenance, the possibilities of the implementation of the refined models will be achieved. This method of data collection would highlight issues and facilitate discussion of ways to overcome problems. In this way those stakeholders would be involved in solving their own problems and the acceptance of the stakeholders as a process of Quasi-action research would filter back into the organizations through the group members.	
Sample: Non probabilistic purposive sampling was used to choose the groups to represent the right population, groups having a stake in district road maintenance policy in Indonesia. The list of the samples for these group discussions may be found in appendix C	
Notes on administration: Prior to the presentation and discussions, a document containing a copy of the slides or hand-out for discussion was sent to the participants in order to familiarize them with the topic for consideration. Each presentation and discussion lasted approximately 1 hour with presentation of the models about 15 minutes.	

Figure 6-16 Chosen characteristics of the presentation within the stakeholders (Part 1)

6.5.1. Partial Implementation through action research

This participant action research methodology of the model were iteratively developed with and communicated to the stakeholders. At the time of completing this study, implementation was only

partially complete, and this forms part of the long time reform. The interaction of the researcher has been: in the exploratory work; during the main research; and during the implementation stages where the researcher was given the opportunity to monitor the process and to conduct the public awareness campaign to persuade stakeholders in the regions of the real problems of road maintenance. The participants actively support the models while they also altered some of the model elements. This research will conclude with the preparation of part of the model and its implementation into the real world.

6.6. Chapter summary

This chapter has identified 4 areas of concern when choosing a research strategy: theory and data, sampling and population, design of data collection and data analysis techniques. Quantitative and qualitative data was introduced by comparing techniques and problems. Since this study is qualitative, the discussion went on to introduce the sampling methods available to represent the population and collect the required data when dealing with qualitative samples. Purposive sampling was adopted whereby the sample is based on expertise.

The chosen research strategy combined the use of the following methods of data collection in an interactive, holistic strategy:

- questionnaire analysis;
- interview surveys;
- document analysis; and
- presentation.

The analysis was achieved by the use of grounded theory. Sampling was achieved according to the requirements of the research methods. Combining and interacting results from each of these methods, models were developed and validated with the sponsoring organization and actors who

are involved in the decision making to comprise a policy framework for use within the sponsoring organization.

Chapter 7. Field research in Indonesia

7.1. Introduction

The purpose of the field research in Indonesia is to gain support from decision-makers who make recommendations for change. Once they understand the current issues and the benefits and costs of the proposed models they will be happy to share their views based on their particular experiences. The validation of the model through the field research with members of the Government of Indonesia will help increase awareness about the problems as well as the recommendation for change. Importantly, it will involve the decision-makers in the study. This will benefit the researcher in ensuring the outcome of the study will move towards being implemented in the near future. This chapter will explore the feedback from Indonesia for the proposed reform model of financing road maintenance in Indonesia. The participants are all senior representatives of Government and the staff of the World Bank. The World Bank's staff has been chosen as it has experience in financing the urban sector. These responses are crucial in determining the shape of any proposed policy reforms to be implemented in Indonesia and the characteristics of the implementation process on the researcher's return. Hence, respondents' questions, answers and also the author's responses are reported to provide policy perspectives for completeness as part of the quasi action research process.

This chapter is divided into 2 sections, corresponding with the proposed model. Section 7.2 presents the discussion stages Section 7.3 reviews Model 1 that proposes improvements to the existing budget process by creating the task force called the Project Management Unit (PMU) at central level and Project Implementation Unit (PIU) at district level. Section 7.4 reviews Model 2, as a continuation of model 1, which is creating a road fund for road maintenance. Sections 7.3 and

7.4 accommodate the questions and comments of the participants in Indonesia. Presentation and discussion were in the Indonesian language. Section 7.5 presents the chapter summary.

7.2. Sample and interview method

The two proposed models presented by the researcher in Indonesia were reviewed by the following parties: Directorate General of Highways staff (where the r esearcher w orks), World Bank Staff, Ministry of Finance Staff, Ministry of Home affairs, and National Development Planning Agency. The presentation of the proposed model was undertaken at the Directorate General of Highways and through discussions with other organisations. The presentation or discussions used the same format. The researcher forwarded the proposals at least two days before the presentation or discussions took place to enable staff who were going to be consulted to be well prepared.

The steps for the presentations were as follows:

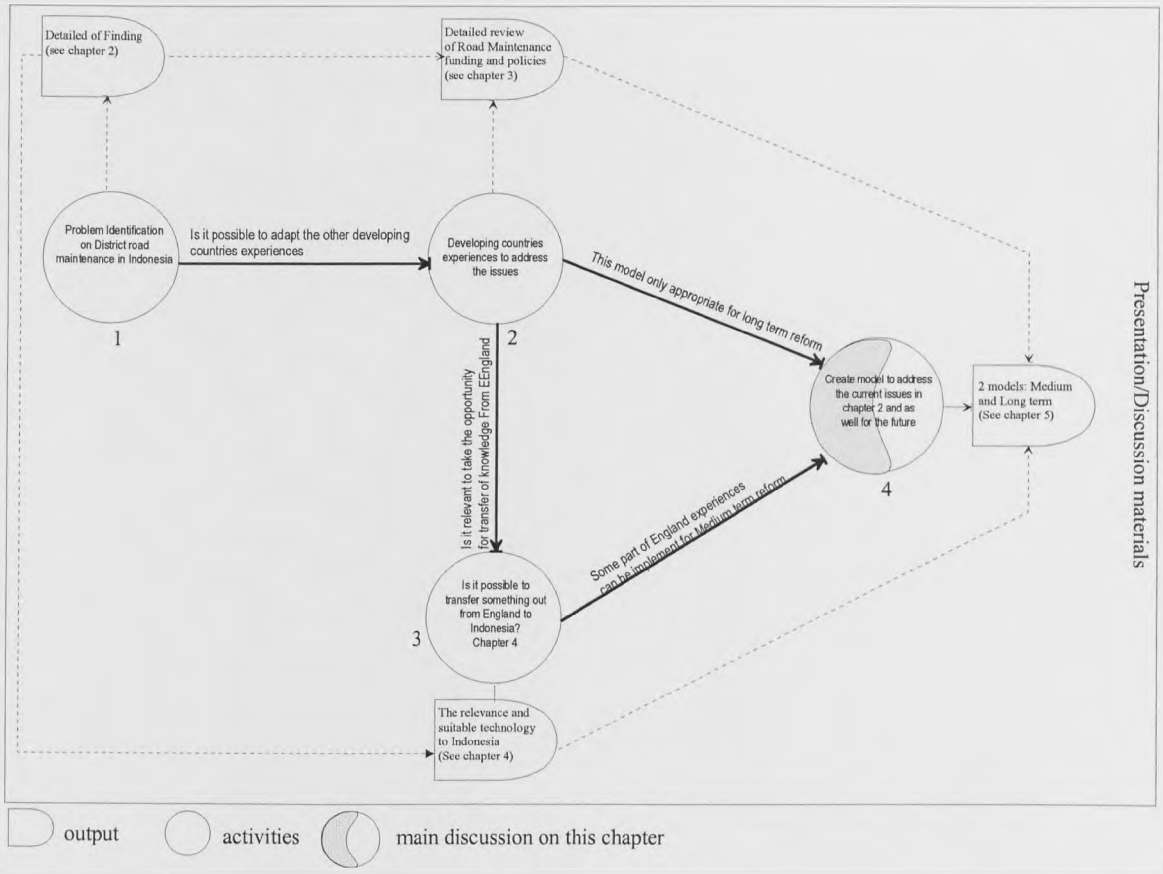


Figure 7-1 Presentation/discussion content and steps in Indonesia. [Source: Author (1998)]

The researcher explained the problem identification for district road maintenance (see Chapter 2). The researcher then explained the consequences of not having adequate maintenance, with empirical analysis of Sub Saharan Africa and Latin American Caribbean (see Chapter 3). Based also on Chapter 3, the option to rationalise existing budget procedures can be undertaken through decentralisation of responsibility to the regions. Decentralisation of work should be followed by fiscal decentralisation. For that purpose, the possibilities of transfer of knowledge from England Local Authorities has been explored in Chapter 4. Next, the main presentation focused on the two research models based on Chapter 5. Model 1 concerned the attachment of task force to Central and district level governments to speed-up decentralisation. The expected results of the decentralisation were presented as in table 5-2, Chapter 5. Model 2, creating a road maintenance fund, was also presented. The advantages and disadvantages of the models as discussed in Chapter

5 were also presented to the audience. A questions and answer' session occurred after the end of the presentation and discussions.

7.2.1. Presentation in Directorate General of Highways

The presentation was attended by a number of senior staff. The purpose of the presentation was twofold:

1. To bring new ideas on the appropriate way to finance road maintenance in Indonesia with particular reference to district roads. The government is aware from the data available that district roads have greatly deteriorated in the current year.

2. As a test case for further discussions with other groups outside this organisation. If the models convince them, they will be more willing to give a recommendation letter for access and further discussions with other organisations. This was seen as crucial.

Comments and questions regarding the presentation were as follows:

Extra cost for the task force

This question was raised immediately after the presentation took place. The participants were concerned about the extra cost in setting up the task force and indicated that the Government would not be willing to cover these costs due to the economic crisis that faces Indonesia. One official expressed the view that he was sure the National Development Planning Agency would object to this idea. The only alternatives suggested were to appeal for a loan from the World Bank to cover this type of cost.

Task force duration

The other interesting question is the duration of the task force. It was established that the task force would exist temporarily. The existence of the task force will be at an end if the problem is solved. Participants were informed that the task force working period would be about five years after its commencement. Further questions included: what is going to be done during the 5-year period? The answer was provided in a similar way to that in Chapter 5 under the heading of Project Management Unit Agenda.

Management of road infrastructure

The participants expect that the first step of the task force should again define the responsibilities of the various agencies involved in district road maintenance. This policy should cover the responsibilities of higher road agencies to district government level.

The co-ordination link between central and district levels

Co-ordination at central and district levels would not be an easy task and this was raised during the presentation. The participants suggested that there should be a periodic meeting between central and district members towards the action plan. The action plan should be set up with an interim objective and adjusted accordingly. Individual correspondents could utilise the PU Net[4], the computer network. The PU Net will help every individual who as a member of the task force has to communicate and share ideas or it can be used for reporting and discussing issues regarding the task force. The participants also questioned whether decentralisation would improve the balance between construction and maintenance spending.

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[4] Internet provider in Public Works Department, that goes to Provinces. So, it is possible to be available in District area.

Reallocation of funds without creating a task force

One question the participants raised was the possibility of funds being reallocated from construction or improvement to road maintenance without creating a task force. Here, the World Bank Study of 1988 was mentioned (see Chapter 3). The researcher commented that the World Bank study in 1988 indicated that the real problems are not only funds or technical issues but also institutional aspects. So, the reallocation of funds without any adjustment/reform in the structural side would be useless. Creating a task force is the way to approach the problems from the institutional side.

Road maintenance back log

The respondent commented that implementation of the road maintenance optimum policy should be implemented by taking into account the road hierarchy. A road hierarchy would distinguish between the core network of the district, continuing to maintain the roads which are in good condition, taking into account their functional importance, and initially allowing deterioration of less important roads. The question raised by the participants was whether Model 1 would eliminate road maintenance backlog at district level. The researcher argued that the model would not eliminate the road maintenance backlog straight away. However, if the Government could shift more funds to road maintenance instead of construction and reduce the institutional aspects of road maintenance then it would be likely that after a long period the backlog would be minimised.

Training in the local highway authority and its components

The participants indicated there is a need for training at district level. This should include some of the following:

- to encourage the use of local consultants and contractors for planning and implementation;

- to provide technical assistance; and
- to provide incentives to encourage high quality engineers to work in district areas.

These above-mentioned factors were included in Chapter 5.

7.2.2. World Bank Staff

The respondent started work as a task manager in Indonesia for Urban Infrastructure in 1989 and regularly visits Indonesia to monitor urban infrastructure in West and East Java provinces. His knowledge of urban infrastructure in Indonesia is substantial. His comments on Model 1 were as follows.

The Implementation of PP (Government regulation) no 45 of 1992

Decentralisation was the focal point of the discussions. The respondent pointed out that the most important steps are now to implement decentralisation based on PP (Government regulation) No. 45 of 1992 and Government regulation No. 8/1995 whereby regional autonomy will be emphasised for second level regions (including district level government). Based on these regulations, a 4-year period is needed to implement this program. The respondent added that the program is establishing a pilot program for transferring functions to one district in each province of the country. He advised that the task force would be attached to some of the districts chosen to be pilot projects for this regulation.

PIUs leader

The respondent commented that the Chief of the District should also be the head of a Project Implementation Unit. He argued that the Chief of the District is the one who sees road maintenance as politically unattractive. There is substantial evidence, already quoted earlier, that

road maintenance funds are often diverted into new road construction, which has a remarkable political value.

How to improve lack of co-ordination?

The respondent is aware that there is a gap between central and district staff in terms of their capabilities and he questioned how the task force would improve the co-ordination between central and district level government. How will this be monitored to see if the new systems will improve existing co-ordination?

The answer to the first two questions has been explained in Chapter 5 that there will be a transfer of knowledge through co-ordination. The answer to the last question is to eliminate the rigidity of the central budget grant to districts and simplify the budget process through the task-force whereby it will provide a good interaction as a form of co-ordination between the actors. Improvement in co-ordination between central and district levels will result in a greater involvement of the district government in terms of the planning and budget process.

Encouraging an innovative approach of district staff

The respondent commented that the impact of devolving more power to districts would be that if the bottom-up approach could be implemented it would provide innovation at district level. The respondent added that for the time being what is needed is the transfer of knowledge to district level in order for them to participate in the planning process. The transfer of knowledge is important so that everyone has the same perception of the problem. A transfer of knowledge can be done both by on the job training, or formal training related to the planning or understanding of the role of road maintenance in the regions. There should be mechanisms to increase the ability of the district staff.

Ring fenced loans

Regarding loan ring fencing, the respondent commented that the purpose of this is to direct the loan to the purpose that has been specified in the loan agreement. The loan agreement itself is a contract between the lender and the recipient countries. Since the loan agreement is standardised, then the format of one loan to another loan agreement will be similar, especially in terms of financing categories. The respondent pointed out and explained that on the "Third Kabupaten Road Development Project" the procurement arrangements are as follows:

Values in million US$.

Project element	Procurement method			
	ICB	LCB	Other	Total cost
Road rehabilitation/improvement	-	199.6	-	199.6
	-	(72.6)	-	(72.6)
Road maintenance	-	192.5	44	236.5
	-	(70.2)	(16)	(86.2)
Workshops, laboratories	-	1.6	-	1.6
	-	(0.6)	-	(0.6)
Equipment, spareparts & supplies	8.4	-	1.5	9.9
for road works, workshops, labs	(7.6)		(1.3)	(1.3)
& training				
Consultancy services	-	-	49.3	49.3
	-		(44.8)	(44.8)
In house training	-	-	1.5	1.5
	-		(1.0)	(1.0)
Professional training	-	-	0.8	0.8
	-			
Total	8.4	393.7	97.1	499.2
	-7.6	(143.4)	(63.8)	(205.9)

Figure 7-2 Procurement method of the World Bank. Source: World Bank (1992)

He again explained that the figures between brackets indicate the loan amount of the individual programs, while the figures on top of the brackets are the total amount of work that is to be done. From the above example, it is shown that road maintenance expenditure would be set up at a constant percentage (40%). This means that the World Bank will pay 40% of the total road maintenance costs of the project. The remaining costs (60 %) will be the responsibility of the

Government of Indonesia. If there still remains a balance of the loan at the end of the fiscal year, the Highway Authority cannot withdraw it. Since the loan agreement is standardised, the ring-fenced budget cannot be avoided. The respondent hoped that by the existence of the task force there would be an integrated road maintenance plan that would build up implementation within of the model.

Accountability

The World Bank respondent questioned the accountability of the government. A question was raised on how the model would improve accountability. The respondent believed that accountability would be improved if there were strong public pressure as well as an understanding of the seriousness of the problems. Accountability and transparency will make local institutions more accountable to the needs of beneficiaries and the task force should bear in mind the accountability and transparency aspects of the program for road maintenance.

7.2.3. National Development Planning Agency (Bappenas)

Discussions with the National Development Planning Agency involved 2 different senior officers in the Transportation and Regional Development Bureau. Their comments on Model 1 are as follows:

The awareness of the present systems

The discussions commenced with the awareness of the present systems in Indonesia. The involvement of the private sector into the road sector has started. Although the government has implemented BOT projects for the road sector, it has up to now only covered approximately 0.16% of the total network. The operation and maintenance of this road network will be undertaken by the private sector during the concession period. This means that the government burden of road expenditure is released by 0.16 % of the total network. However, it is impossible to

privatise district roads due to their low traffic volumes. The respondents believed that the only way to reduce the backlog is through the integrated task force (decentralisation + increased capabilities at district government level), either through development of technology or an increase of efficiency in the management of local roads. Devolving power to districts should, however, result in increasing their capabilities. District capacity building should be the priority of the task force. Staff recruitment should be based on district needs and recruitment should be at that level not at central government level as has happened until now. To increase the capacity of a district government the possibility of attaching central government staff to the district government should be considered, such as Project Assistants to Managing District Roads (PBPJK) or other engineers from central government. This attachment will encourage the district level government to plan and implement road maintenance work. The development of the construction industry is also important in contracting out road maintenance work to the private sector

The Regionalisation based approach

Participants mentioned the regionalisation-based approach towards infrastructure. This approach involves the district 'voice' in terms of final decisions made on district road issues, especially in the district and urban sectors. Although regionalization policy, they believe, can be implemented in the future, the task force should be able to speed up the decentralisation policy. In line with the regionalization policy the task force in central government should be aware that road prioritisation based on a road hierarchy should be similar to that for the national and provincial road systems. The reason for using the existing prioritisation system is that the costs will be low and time to implement the program will be short. The main point during preparation is that the District Public Works, on behalf of the local authorities, should be involved. They are the ones who will use the system and ensure the systems are implemented; the task force should involve them at the preparation stage.

The possibilities of implementation of model 1

According to the participants, more attention should now be given to preventive maintenance e.g. routine and periodic maintenance. The regional auditors should be involved in preparation and implementation since they are the ones who will audit project implementation. The auditors should closely monitor the implementation of road maintenance in line with the road maintenance plan.

There should be a policy of balancing work between road construction and road maintenance by taking road maintenance as a priority. To get this done there should be political decisions to reallocate funds from other road programs to road maintenance. However, this should be followed by improving the district staff 's ability to plan and carry out road maintenance work. In line with this there should be a development of the construction industry at district level to increase the possibilities of contracting out the routine maintenance work.

There will be a training requirement for the highway authority that deals with the District Road Management system. Monitoring should include data inventory and data survey, both of which will have important inputs into the road systems. Initially the local authority could use stand alone PCs to prioritise roads based on traffic volumes. As long as the data inventory and data surveys are accurate, stand-alone PCs will enable districts to produce accurate road condition data.

The only problem with this model is the need for additional funds and at the moment it is hard to find additional funds. Government policy now is to deal with food supplies into the country. An IMF Loan will be used for this purpose and it would be likely that no money will be left for road maintenance. However, in terms of road programs during the economic crisis road maintenance is the only program that is not cut by the Government. Other programs, such as the construction of new roads and road improvements, are cut to a level of 30% of the original budget for 1998/1999. The participants also mentioned that according to the IMF Officers (1998), since the economic turmoil the government's policy would be focused on unemployment rates and labour intensive

projects. This situation will hopefully be eliminated or phased out within four or five years. The idea of creating a task force to speed-up decentralisation of road maintenance should wait until the economic crisis is over. The participants hoped that by delaying this program there would be a possibility that, when the model commences implementation, there would be a good outcome. This will be a good starting point for the task force. The task force will easily be able to choose the districts for pilot projects.

7.2.4. Ministry of Finance

Although the Directorate of Development Budgets does not have a direct relationship with the district road network, this Directorate is involved in reallocating budgets from other road programs to the road maintenance program. Hence, they were chosen as one of the parties to be involved. Participants all received the presentation papers at least two days before the discussions took place in order to give them a framework for discussion with the researcher. In this stage[5], the respondents were both senior officers from each directorate. The procedures adopted for the discussion were similar to previous discussions. Their comments on the proposal of Model 1 are as follows.

The awareness of existing road maintenance problems

The participants commented on budget ring fencing. Their comments are similar to that of the World Bank. In the present system the budgeting process is lengthy and ring fenced. Presidential grants for roads cannot be reallocated for other purposes. Similar to World Bank staff and Bappenas, the participants also mentioned the positive points for the budget being ring fenced,

[5] To recap, the presentation of models by the researcher took five stages as follows: stage one, presentation with Directorate General of Highways (Direktorat Jenderal Bina Marga). Stage two, discussions with the World Bank staff. Stage three, discussions with the National Development Planning agencies (Bappenas). Stages four, discussions with Ministry of Finance and stages five discussions with the Ministry of Home affairs

namely to avoid district officers reallocating funds for purposes other than those stipulated in the contract or on guidance from central government.

Reallocation of funds to Road Maintenance Funds

Reallocation of funds within road sectors, such as reallocating funds from capital works to maintenance, has been undertaken several times since the World Bank report on deterioration (1988) was published[6]. Reallocation or additional funds for road maintenance has been done for national and provincial roads, but not district roads. They suggested that reallocating district road sector funds to road maintenance would be an appropriate way to solve the funding problem, provided the districts have the capability of doing the work. It was hoped that this task would educate the district road staff to enable them to fulfill the standards and to plan and implement road maintenance. The introduction of the task force involving the major decision-makers in the road sectors will support and maximise the reallocation of funds program.

7.2.5. Ministry of Home Affairs

Comments from the Ministry of Home Affairs on Model 1 are as follows:

The awareness of the current systems

District road funds come from many sources of funds. Each fund has its own rules and shifting between these funds will not be possible. The problem of having many sources of funds is that there is little flexibility at local level to use funds efficiently since there are many agencies and officials responsible for each activity. In fact no one has an overall picture of the funding of road maintenance. The other important factors are the implementation of PP No. 8 of 1995 and the

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[6] The importance of road maintenance was made increasingly aware by the government since 1992. At that time, the road maintenance (National and provincial road) has been the priority.

gradual shifting of responsibility from central to district government. Although the pilot project will end in 1999, progress remains slow. One of the reasons is that monitoring systems and co-ordination between local and central government is not working as intended. According to the participants, decentralization is the only way for local authorities to be dependent and innovative in order to find the best solution to their problems.

The real problem at district level mentioned by the participants is capacity building and the lack of staff capacity in the regions. If there were any possibilities of providing the necessary training to local contractors to improve their ability to do the job, this would be a good solution. A good system for training will encourage them to participate in maintenance work in the region. There will be a promising role for the private sector in maintenance. However, training needs additional funds. If the task force also covered this type of training it would be a basis for the districts to develop.

Improve co-ordination via task force

The officers believed that the task force in Model 1 would facilitate the following changes:

1. The possibility of shifting more development expenditure from central government and transferring it for maintenance purposes.

2. The development of similar systems adopted by Directorate General of Highways for District roads would be valuable. Decentralisation is making slow progress. Therefore, another faster and simpler way may consist of allowing local agencies to assume the responsibility and then monitoring their performance.

7.2.6. Summary of model 1

Although there are some changes to Model 1, respondents principally agreed to speed up the decentralisation of road maintenance. The table below is a resume of the comments and questions.

Participants	Questions raised by participants	Comments raised by participants
Directorate General of Highways	• Extra costs for task force • Task force duration • Reallocation of funds only • Task-force vs. backlog	• Utilise PU Net as a tools for co-ordination • Training to capacity Building • PIU's leader
World Bank	• Improve co-ordination • Accountability in district	• Attached to PP No. 8 of 1995 • PIU's leader • Positive point of district involvement • Ring-fenced loan
National Development Planning Agencies		• Increase efficiency through reform • Regionalization based approach • Prioritise road maintenance • Capacity building • Pilot project PP No. 8
Ministry of Finance		• Grant ring-fencing • Reallocation of funds • Improve co-ordination via task force
Ministry of Home Affairs		• Rigidity of funds • Decentralisation • Lack of qualified staff • Ring fencing • Improve co-ordination

Figure 7-3 Summary of questions and comments on Model 1

Table 7-2 shows that most of the respondents questioned the lack of capacity to decentralise road maintenance. Decentralisation will only have a positive effect if there are adequate qualified staff as well as a qualified construction industry. Integrated planning for staff training will be needed in

order to get the right man to the right place for staff improvement. Staff improvement will have to be followed by systematic career planning. Capacity building is not limited to the road sector alone but is crucial also for other sectors. This has a direct relation to the whole decentralisation process and should include the Regional Planning Agency, and financial agencies.

Procurement methods and duration are also the main points in improving road maintenance work. To increase private sector involvement in road maintenance the contract duration should be extended for at least 3 years. Force Account work is still necessary for routine maintenance. There should be a clear definition of work to be done by contractors and the Force Account.

Problems such as ring fencing of central grants or loans should be replaced by one single budget channel at district level. Having done that, there should be a clear accountability for district governments to maintain their roads and diverting funds can be avoided by a good control mechanism through the regional auditor. These problems will not appear if decentralisation takes place; the districts will have responsibility for managing their own regions.

To utilise PU-Net as a tool for sharing information, it can be implemented through the provincial public works or through PBPJK. Circular dissemination or feedback from district to central government will be effective in using the PU-net.

The co-ordination factor is the main reason for setting up a task force, which will increase internal control mechanisms within PMU and PIU or between PMU and PIU. Within the co-ordination function there is a learning process either within central agencies, district agencies, or between central and district agencies. Additional funds to set-up a task force will not be available during the economic crisis. Although some participants are looking at the possibility of getting a loan from the World Bank, it is not seen as the appropriate time. There is, however, the possibility of getting a loan from the World Bank for district authorities in terms of capacity building, while the rest will be the responsibility of the government. Another possibility is the reallocation of the existing loan to this project. The task force in the districts will operate on a pilot project basis,

taken from "Decentralisation Pilot Project (PP No. 8 of 1995)". In this case, the pilot projects will be 27, a district within each province.

Reallocation of funds from other sectors or from other road programs to district road maintenance is not enough. There should be an institutional improvement to increase efficiency in road maintenance planning and implementation. Strategic maintenance planning should be set up at least for a period of 5 years. To do that, there should be a clear distinction between the core network and the rest of the remaining district road network. Within the budget constraint envelope, road prioritisation will be the fair way to assess the need for maintenance with different types of roads at district level.

7.3. Review of model 2

Model 2 is concerned with creating a road maintenance fund to improve the existing issues of sustainable road maintenance policies. A road maintenance board, an independent organisation that can decide on the distribution of road maintenance funds based on certain criteria, would manage the road maintenance fund. During presentation of Model 2 the researcher explained the existing flow of road user charges in most countries, including the United Kingdom. The presentation continued with the proposals for change. The researcher also emphasised in the presentation and discussion that creating road maintenance funds will be subject to the results of Model 1 being implemented. The participants involved in commenting on Model 2 can be divided into two groups as follows:

- First, active participants who were at the presentation and discussion fully able to comment or criticise the model. This group included staff of the World Bank, the National Development Planning Agency and the Directorate General of Highways.

- Second, passive participants, who were only providing initial comments towards Model 2. This group included the Ministry of Finance and Ministry of Home Affairs. This group does not currently have sufficient knowledge about the new features of Model 2.

7.3.1. Presentation in the Directorate General of Highways (Bina Marga)

The presentation for Model 2 in the Directorate General Highways is similar to the presentation model for 1. Their comments are as follows.

The possibility of PT. Jasa Marga acting as a Road Maintenance Board

PT. Jasa Marga, the state owned company who deals with Toll roads in Indonesia, was to go public in the middle of 1998. It was used to arranging the national road network from 1988 until today. At the time, when the road board is implemented, PT. Jasa Marga would be a privately owned profit seeking company and would try to be cost effective in order to compete with other similar types of company. As a private company PT. Jasa Marga would be responsible for managing the road maintenance fund without government interference. It would invite transportation companies as road user representatives, or road user associations, to determine the real needs of road users. It will also invite government highway agencies and other public officers to be board members. However, PT. Jasa Marga would manage the daily activities.

Long term issues for a Road Maintenance Fund

Setting up a Road Maintenance Fund will involve Parliament. The main objection is likely to be from the road maintenance board. In Indonesia it is difficult for the private sector, i.e. the road maintenance board, to increase the price of fuel whenever it felt it was reasonable. Existing mechanisms to increase fuel prices require the approval of Parliament. Also, earmarking road user charges for the road maintenance fund would mean decreasing government revenue. The Ministry of Finance would object to this view with the same reasoning. However, the Directorate General

of Highways would have no objection to creating a road maintenance fund, but the proposal should take into account the regional aspects of road maintenance since the districts usually have low traffic volumes.

7.3.2. World Bank Staff in Jakarta

Why a road fund will not work for the time being?

The first generation of road maintenance fund will not have suitable tools to solve road maintenance problems, especially in developing countries. These have been abolished in Latin American, Caribbean, African and Asian countries. Based on the respondent's views, the principal objections of first generation road funds were due to the following:

1. they hampered effective budgetary control;

2. they led to a misallocation of resources by concentrating too much funds on earmarked activities regardless of other needs; and

3. they tended to make the budget inflexible.

The World Bank has traditionally opposed first generation road funds primarily on macro economic grounds. Road funds are usually associated with earmarking of taxation, particularly fuel taxes, which is seen as infringing the policy making powers of state executives and the legislature.

The second-generation road funds introduced by the World Bank and implemented by many countries in Sub Saharan Africa, Latin American and Caribbean countries are an improvement over the first generation. The World Bank, through its experiences in Sub Saharan Africa, encourages the use of second generation road funds in developing countries. Under this system:

- an independent board will manage the fuel surcharges; and

- Road funds are distributed based on a road hierarchy and formula to be agreed by the board.

However, it was noted that for the time being it is difficult to implement a road fund in Indonesia. The government, the respondent believed, would have no political will to do this. The best thing the government could do for the time being is to improve current institutional policies, as discussed in Model 1. Objections were also expressed concerning the implementation of road funds in Sub Saharan Africa, Latin America and the Caribbean regions. Similar to Gwilliam (1997), the respondent also raised the point that if the government and budgetary systems are functioning well there is no need for 'off-budget' financing or 'earmarking'. If the government lacks "self discipline" the road fund will be raided anyway.

The probability of creating Road Maintenance Funds

The respondent believed that the road fund was not the only way to improve existing district road maintenance. He agreed that improving current budgeting systems will also improve part of the problem provided that districts had the capacity to plan and implement the work. The success of the first research model will support the success of Model 2. He agreed Model 1 and Model 2 are a good strategy in solving the road maintenance issue in Indonesia. Both alternatives would be simultaneously appropriate to Indonesia. Model 2 will speed up privatisation, as experienced by New Zealand. It would not be available for the next 5 to 10 years since it will take that time to improve the budgeting systems while taking into account the economic recovery period of about 5 years. There will be no way for the government to earmark fuel surcharges to road maintenance. Model 1 would work for the time being, while the second model will depend on future conditions in the country.

7.3.3. National Development Planning Agencies (Bappenas)

Bappenas brought up questions on the detailed plan for creating the road maintenance fund. All questions are related to the developing and developed countries that implement the Road Maintenance Fund. Questions raised included:

1. What options would be available for generating revenue?

2. What options would be available for channeling funds to different agencies responsible for roads?

3. Besides New Zealand, had any other developing countries succeeded with Model 2?

4. How can you ensure that additional funds were securely channeled to the road sector?

5. What mechanisms might be used to strengthen management and maintenance of rural roads?

6. What would be the role of road users in winning public support for more road spending?

7. What would be the appropriate management and maintenance of district roads?

8. Were you sure that the second type of model would be the only good solution to the road maintenance issue?

The researcher answered the questions with responses as presented in Chapter 3 and Chapter 5. After answering the above questions, the officers gave some comments on the idea of creating a road maintenance fund, suggesting that the Ministry of Finance should approve these proposals and at the final stages it should go to parliament. The latter would make the political decisions. Comments on the models are as follows.

The possibilities of implementing the Model into districts

Devolving responsibilities to the districts will start next fiscal year and will occur gradually. It is to be hoped that after 10 years district capacities and the ability to accept greater autonomy will increase. Building a district government cannot be done overnight. Important things for the government to do should include setting up a contract-executing agency and increasing the use of local consultants and contractors for planning implementation. Central government should provide technical assistance and incentives to encourage high quality engineers to district areas. An appropriate monitoring mechanism and feedback process should support all of this. In 1995 the government set up a "Regional Private Sector Development" initiative. This program is a "strategic areas" approach to regional development that is currently being implemented as the "Kawasan Andalan program". The Spatial Policy Co-ordinating Group chaired by the National Development Planning Agency published this program in its final form in August 1995. The Plan defines criteria for identifying "Kawasan Andalan on the basis of functional importance". By improving capacity building there will be a possibility of creating road funds, not at central but at district level.

The minimum requirement of creating Road Maintenance Funds

The respondent believes that the minimum requirement for implementing Model 2 depends largely on Model 1. A road maintenance fund should then be accepted politically since it will involve the diversion of budget sources, ring fencing of government revenue and the power of the road maintenance board to increase fuel prices, if it is considered necessary.

Appointing PT. Jasa Marga as a Road Maintenance Board

The other possibility for Model 2 is to appoint PT. Jasa Marga, the existing Highway Agency dealing with toll roads, as the road maintenance board. The rationale behind this is seen as follows:

1. PT. Jasa Marga (A National Highway Co-operation and Government owned company) has a long involvement in the toll roads in Indonesia. This commenced in 1978 (Jagorawi Toll Roads) and up to now they have run at least 378 kms of toll road. Building a toll road is a major long-term investment and the need for more toll roads is increasing. Building them has become even more urgent than ever. Thus the government has offered private companies the opportunity to join in the development of toll roads through joint ventures with PT. Jasa Marga.

2. Since PT. Jasa Marga has experience of managing national roads, it will be relatively easy for it to be appointed as a road maintenance board.

3. The involvement of PT. Jasa Marga in road management will integrate national, provincial and urban/district roads within one company.

7.3.4. Ministry of Finance

After the explanation of Model 2 the officer raised some questions and comments as follows.

Questions raised

1. Why do we have to implement Model 2 and ignore the possibilities of privatising the roads? By privatising the roads, it will reduce the burden on the government for road works. In answering this question, the researcher again showed the economic characteristics of road infrastructure seen in Chapter 3.

2. The respondent also questioned the road users' willingness to pay for road maintenance. The reason is that people will object when the toll companies submit proposals to increase tolls, although they feel that increasing the toll rate is reasonable. The other example quoted, which drove them to ask such a question, was because Parliament disagreed with proposals for

increasing parking fees. In answering this question, the researcher referred to Heggie's (1988) commercialisation stage where the government should first inform road users of the importance of road maintenance and the consequences of lack of road maintenance, as stated in Chapter 3.

3. The other questions asked of the researcher are similar to that of National Development Planning Agencies (Bappenas) - besides New Zealand, were there any developing countries that had experienced success in the implementation of Model 2? The researcher responded that New Zealand is the only country that has fully used a road maintenance fund. For other developing countries, such as the Latin American and sub Saharan regions, since it is relatively new it would be better to wait at least a couple of years to see the outcome of this policy.

Appointed PT. Jasa Marga as a Road Maintenance Board

The other possibility raised for Model 2 is to appoint PT. Jasa Marga to the road maintenance board. This question is similar to that in the World Bank Sections and National Development Planning Agency Sections.

7.3.5. Ministry of Home Affairs

The Ministry of Home Affairs' questions and comments regarding Model 2 are as follows.

Is it possible to provide a seminar/workshop in the near future, even without waiting for the implementation of Model 2?

The researcher responded with comments set out in Chapter 3 and Chapter 5.

Funding different levels of agencies - how does the English Road Maintenance Fund work?

The researcher responded with the formula for distributing funds, as discussed in Chapter 5, and the way that England deals with local roads, as set out in Chapter 4.

Summary of Model 2

The table below summarises comments and questions that arose during the discussions.

Participants	Questions raised by participants	Comments raised by participants
D G Highways		• Jasa Marga to be a road maintenance board • Political willingness to implement
World Bank		• Indonesia not ready for 2nd generation of Road Fund for the moment • Agree to long term solutions, after Model 1
National Development Planning Agency	• Developing countries detailed experiences in implementing road maintenance fund • Example of successful developing countries experiences in this type of reform	• Jasa Marga to be a road maintenance board
Ministry of Home Affairs	• Seminar to be held in the near future without waiting for Model 2 • Formula for distributing funds between different types of road and agencies	•
Ministry of Finance	• Increase privatisation -> decrease government burden which will lead to reallocation of funds to road maintenance • Fuel surcharges means additional tax • Developing countries are successful in implementing this model	• Jasa Marga to be a road maintenance board

Figure 7-4 Summary of questions and comments on Model 2

Reponses to some of the questions have been clearly stated in previous chapters (Chapter 3, 4, 5 and 6). The suggestion by the respondents to execute Pt. Jasa Marga as a road maintenance board would be a problem. A road maintenance board should consist of public and private sectors and its work limited to overseeing the road fund only. To become a road maintenance board many changes in its organisational structure and policy would have to be made. A possibility could be to downsize its staff since the work they would undertake would be decreasing.

Although participants are worried about the political willingness of the government the author is quite certain that the implementation of the road maintenance fund will take place. The experience of the other developing countries reported in Chapter 3 affirmed that most of them received loans and grants from the World Bank as a joint operation with other multinational institutions who try to insist their model is implemented by providing loans to those countries. By introducing ideas and concepts in this study the Government agencies interviewed at least have some idea of what should be done to minimise the problems. They will also be aware that a road maintenance fund is not the only solution for such problems. There are other solutions that are appropriate to Indonesia with relation to the district road network. This study, with supporting evidence for district road maintenance in Indonesia, provides them with the back up to do what they think appropriate to alleviate the problems.

The proposed models also help them to cut down the time and costs for a feasibility study if they accept the World Bank offer, due to uncertainty about the root of the problems in the district road network. However, the success story for the implementation of a road maintenance fund is still not clear and one should wait for the results of the implementation in Sub Saharan Africa, Latin America, the Caribbean and other countries in Asia. During this "waiting time", the Government can improve its existing policies to provide the minimum requirements for a road maintenance fund.

Media dissemination of road sector reforms can be held in the near future to increase road user awareness. The media is capable of reaching a much larger audience. Asking the media to

contribute to the reform process means going beyond key informant interviews, field visits and participatory community appraisals, and this will lead to dissemination seminars. The author is certain that road sector reform is now a subject for both national and regional debate.

7.4. Summary

The participants in Indonesia have accepted the idea of dissemination of a proposed appropriate policy framework for financing district road maintenance following field research in Indonesia. Although road users were not directly involved in the debate, the proposed models developed through the literature survey, systematic analysis of documents of similar studies, and using developed country experience from English local authorities, have taken their views and user benefit and cost into account. The knowledge gained from the study will back up the Indonesian government in making decisions for creating an appropriate type of reform to minimise road maintenance issues at district level. The World Bank is concerned about district level accountability. Accountability will improve the quality of district roads. Ring-fencing central funds should be eliminated and should be followed by strengthening the role of the Regional Auditor[7]. The gradual involvement of road users will also increase the pressure on the district government to be more accountable and transparent to the public.

The field results are presented in diagrammatic form below.

[7] Regional Auditor is based in the province and their jurisdiction area is includes province, district and urban municipalities.

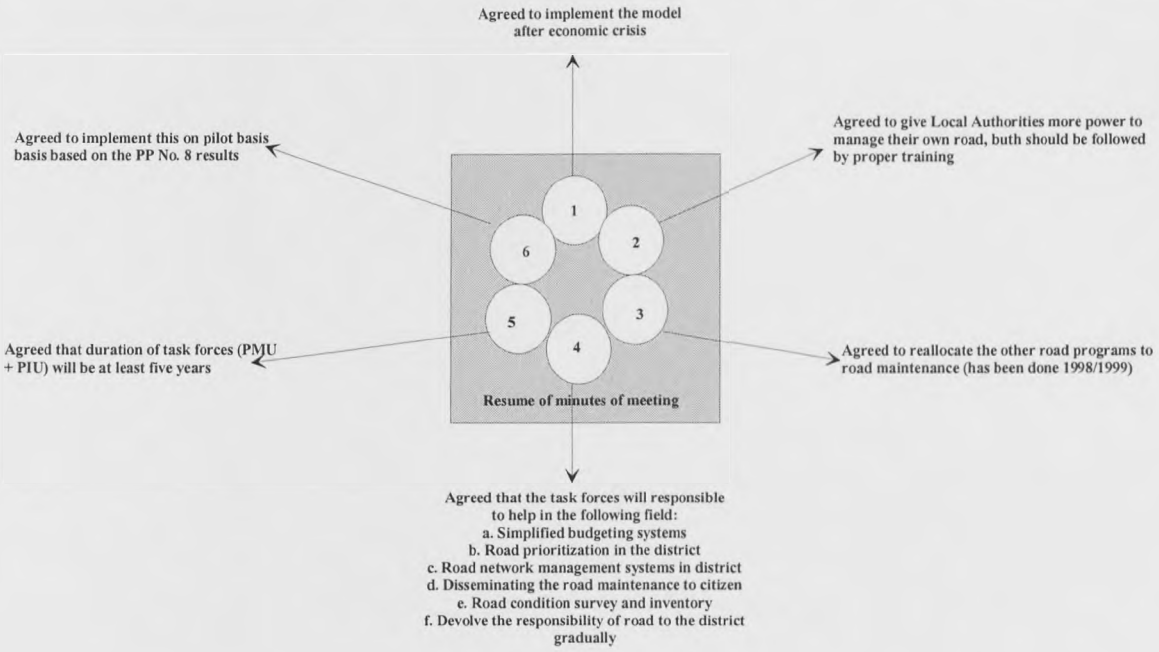


Figure 7-5 Resume of fieldwork interviews Model 1 (Medium term reform).

[Source: Adapted from minutes of field meetings (1997)]

A timetable will be set-up based on the points that have been discussed and agreed by the actors during the field research in Indonesia.

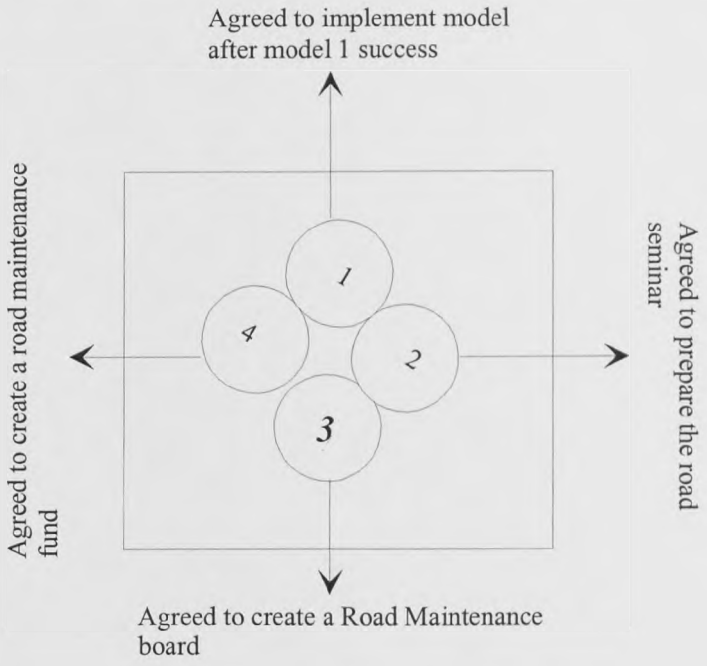


Figure 7-6 Resume of fieldwork interviews Model 2. [Source: Adapted from minutes of field meetings (1997)]

Figure 7-6 summarises the points that have been agreed for Model 2 in field research in Indonesia with the Directorate General of Highways. The implementation of the models relies on the government's ability to provide additional funds for the operation of the task force. The respondents believed that during the economic crisis no funds would be available for that purpose.

Chapter 8. Analysis and discussion

8.1. Introduction

The overall objective of this chapter is to bring the results and emergent ideas of the thesis together and explore the implications for road maintenance. Section 8.2 is a general discussion that draws together the arguments and results into a coherent set of conclusions. Section 8.3 presents a summary of the chapter.

8.2. Resume of research aims, arguments and results

The overall aim of the thesis was to:

1. explore issues of financing district road maintenance in Indonesia;

2. compare any good models of the experiences of developing countries in the financing of district road maintenance; and

3. compare local authorities' road maintenance funding systems in England to see if there is anything of relevance for the Indonesian systems.

With a view to making recommendations, which would:

4. facilitate improvement by adopting or developing or simplifying models from England and other developing countries to be an appropriate model for financing district road maintenance in Indonesia.

Financing district road maintenance in Indonesia has been explored in Chapter 2. District road conditions deteriorated during the previous five year period because of declining road maintenance budgets. District road agency abilities, rigidity of funds from central grants and the late release of budgets are the current situation in Indonesia.

An international review of district road maintenance funding established that similar situations occur in the other parts of the world. Chapter 3 showed that most of the district roads in developing countries in Sub Saharan Africa, Latin America and the Caribbean are under-funded. The main reasons are institutional and financial. England, as a developed country, has a similar situation to other developing countries. As mentioned in Chapter 4, its local road conditions, such as district roads, were in a stage of deterioration due to lack of funds for maintenance. Chapter 5 presented preliminary models built up from international and English experiences. These models have been tested in Indonesia by the active participation of the concerned parties, as documented in Chapter 7. The following section gives a more detailed analysis and discussion of the research that uses specific evidence from fieldwork to address the main aims of the thesis.

8.3. Analysis and Discussion

8.3.1. Closing the gap during transition

As can be seen from previous chapters, road maintenance funding for district roads will be difficult to sustain since there is no adequate funding available to maintain the whole of the district road network. For the time being the best solution is to increase the usefulness of the funding available. Chapter 2 highlighted that district road maintenance funds declined in real terms while the funding needed for road maintenance increased due to increases in the price of raw materials and operational costs, as can be seen from the figure below.

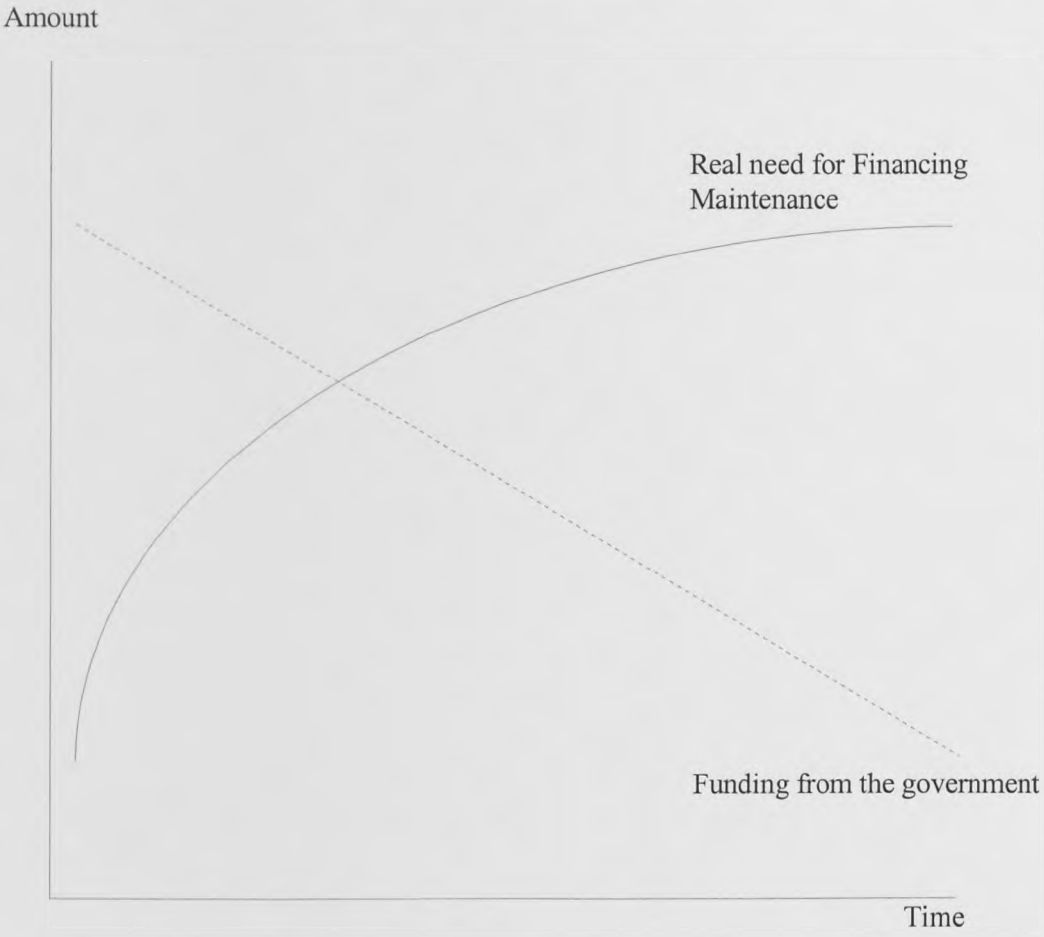


Figure 8-1 Funding trend for road maintenance in developing countries. [Source: Author (1998)]

The difficulty in fulfilling district road maintenance needs is universal, not only in developing countries but also, for example, in England, which has similar problems. Although the sum of money for district road maintenance increases, when taking into account inflation factors the real value of the money is declining. Chapter 3 highlighted that postponing maintenance will increase the amount needed for maintenance. It is clear that prioritisation of district roads in order to distribute the central grant will be a good solution, given the situation that the funds are not adequate. The other solution will be to reduce the number of central budget channels to the district level which will increase efficiency, reduce the rigidity of funds and involve district governments in managing their own jurisdiction.

The objective of the new models is to increase the efficiency of management of the funding of district roads. Increasing efficiency will reduce unnecessary costs occurring in the implementation of road maintenance. Based on the foregoing considerations, and the fact that the Government will have difficulties putting together money for implementing road reforms, the researcher modified the proposed solutions as can be seen in Figure 8.1 below.

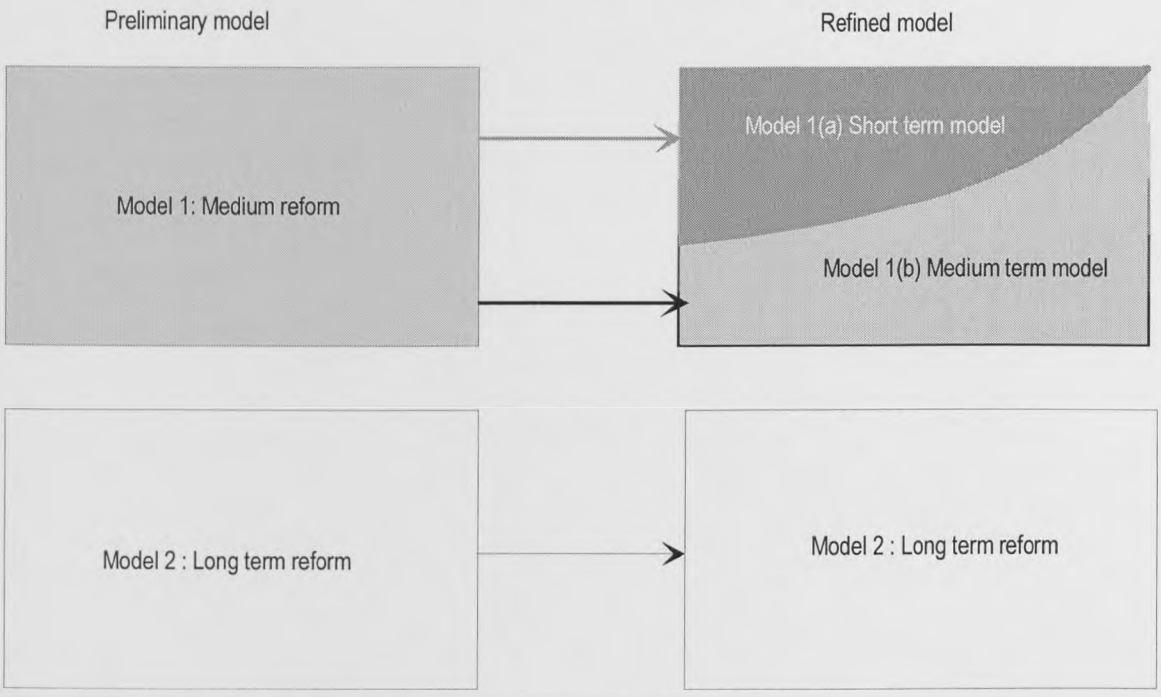


Figure 8-2 The development of the research models. [Source: author (1998)]

As can be seen from Figure 8-1, the preliminary model 1 (medium term model) has now been refined to comprise two component models within it as a medium term solution, namely, Model 1(a) called the short-term model and Model 1(b) now called the medium term model. The short term model can be implemented as soon as the election is in place. The medium term model (Model 1b) will take place after the short term model has been implemented.

Model 2, as originally envisaged, did not have any significant changes following the fieldwork and remains as a continuation of Model 1(b). The discussion will concentrate on exploring research results in more detail for the models, their limitations and the action time.

8.3.2. Model 1(a) short term model

The short-term model was not originally part of the preliminary model. This revised model can be implemented without additional funds for setting up the task force. The revised model can be a bridge for later improvement, which will be implemented by the task force. The main objectives of Model 1(a) are to rationalise the existing budgeting channels to the districts. At the same time there should be an intensive monitoring of the implementation of road maintenance work in the regions by giving local managers responsibility to manage in their own jurisdiction. The short term model would be as follows:

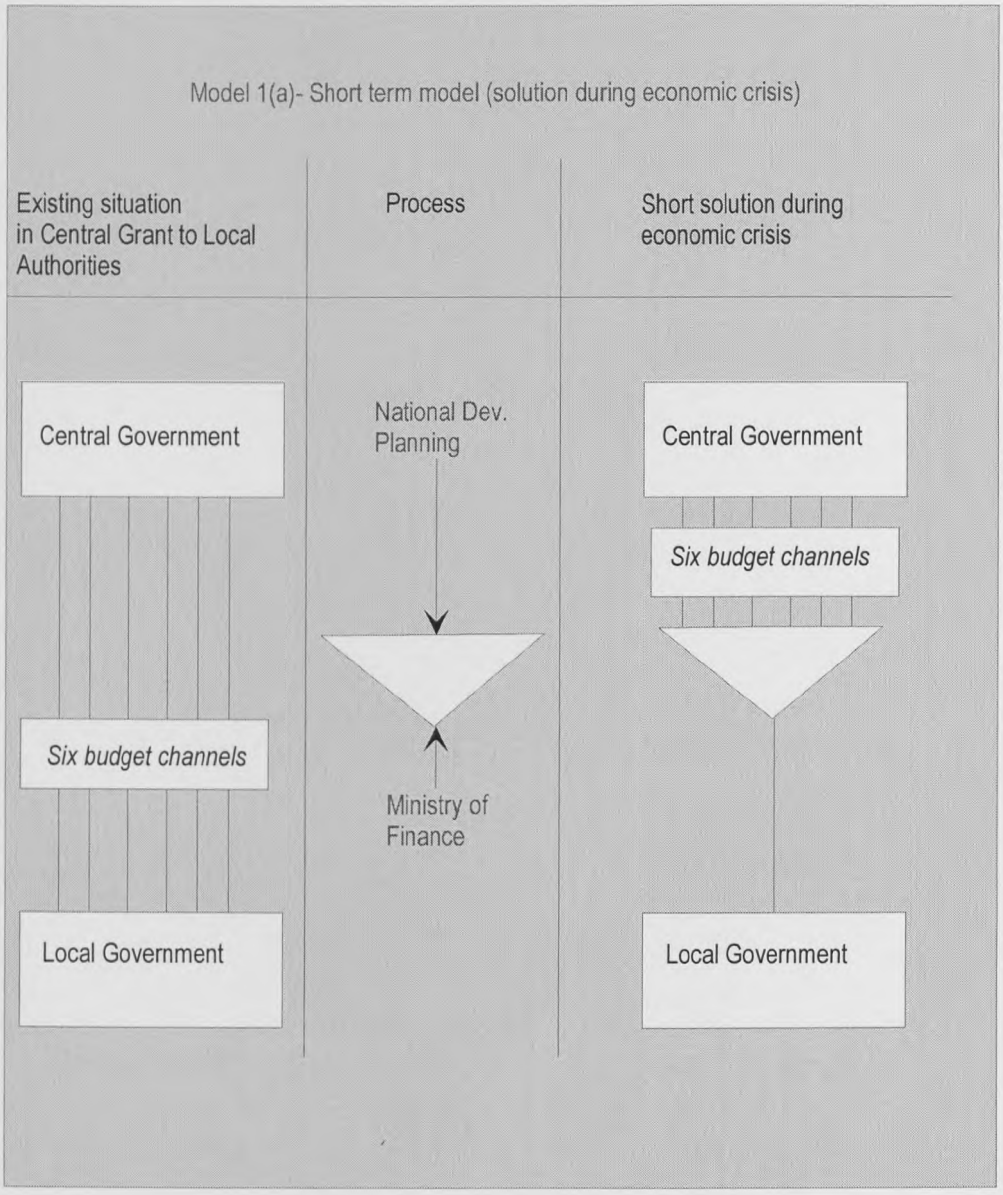


Figure 8-3 Short-term model that can be implemented during an economic crisis.

[Sources: Author (1998)]

From Figure 8.3 it can be seen that the most important actors in the proposed reform that deal with the rationalisation of the budgeting process under this model are:

1. National Development Planning Agency; and

2. Ministry of Finance.

These actors deal directly with all types of budget available for district roads. They can monitor and calculate the likely grant from central to district levels. This is a new approach and co-ordination between these two actors will permit dissemination of information on development and routine budgets including the presidential grant and loans at the district level. The co-ordination between the Ministry of Finance and National Development Planning Agency will avoid overlapping programs for road sectors in the districts. Since the districts have their own revenue they will have to work this out and determine how much they are going to spend on road maintenance. Additionally, local authorities should prepare and implement road maintenance priorities based on their local conditions. These priorities will be in consultation with the Directorate General of Highways. Local conditions can be derived from road surveys. The other additional work to be done by local authorities is to prepare and issue detailed road maintenance plans. Figure 8-4 presents the target timetable for short term reform, as can be seen below:

Figure 8-4: The target timetable for short term reform

No	Activity	taken by	Output	up to May-99	Completion time 2	4	6	8	10	12	14	16	18	20	22	24
1	Analysing the result of the P.P. No. 8 of 1995	Bp+MoF	Rating : Good, Fair and poor performance													
2	Site/district selection based on the result of PP No.8 of 95	MoF	Taking into account condition good, fair and poor													
3	Preparation of short term model	BP+MoF	Bp+MoF decree of simplified budgeting channels to the district level													
4	Identify the road sector central grant to the pilot projects in 2000/2001	Bp+MoF+DGH+ MoH	Publish ceiling for 2000/2001 central grant to district roads													
5	Identify the district own revenue for road maintenance Fy 2000/2001	Bp2+H2+F2	Publish ceiling for 2000/2001 Local own sources (Districts)													
6	Set-up the road maintenance priorities level	DGH+H1+H2	Publish road maintenance priorities to do the work													
7	Consultation of budget mechanisms	Bp+MoF+H2+ F2+Bp2	Guidance on Budget mecha-nisms													
8	Implementation	H2+F2+Bp2	payment													
9	Monitoring progress	Bp+MoF	Receive monthly and quarter-ly progress report													
10	Evaluation for further stage of development	Bp+MoF+DGH+ MoH+H2+F2	Proposal for further stage of development													

Notes : Bp : Bappenas, MoF:Ministry of Finance,DGH: Directorate General of Highways; MoH: Ministry of Home Affairs;

From Figure 8-4, it can be seen that the Ministry of Finance and National Development Planning Agency would undertake the preparation of the short term model only. The outcome of this activity will be a decree rationalising the existing budgeting procedures issued by National Development Planning Agency. A decree from the National Development Planning Agency does not have to go to legislature/parliament. It will need to be signed by Chief of National Development Planning Agency alone. The National Development Planning Agency decree should include:

- the aims and objectives for taking this action;
- the division of work between National Development Planning Agency and Ministry of Finance at central level;
- the division of work that should be done by local authorities in order to support central policy towards financing road maintenance; and
- the control mechanisms for road maintenance work in local authorities.

The existing budget channels from central government are in the hands of the National Development Planning Agency and Ministry of Finance. There is currently no co-ordination between them. The way to recognise the total amount of the central grant to districts can be achieved by involving these two organisations in identifying the likely grant to that road sector. The output of this activity will be the road budget for the district level. At the same time there should be a meeting at regional level between the Regional Development Planning Agency I (Provincial) and Regional Development Planning Agency II (District), and the Provincial and Highway Authority to determine the spending for the road maintenance sub sector at district level.

By putting the total central grant and the district's own revenue for road maintenance together they will be able to determine the total road budget for the district level. The district road inventory will be available after the survey has been done at district road level. Based on the updated road inventory, the local authority will be able to determine the road priority based on District Highway authority advice. Although the priorities are determined by taking into account

the local conditions, traffic volume will be the number one weighting point for road priorities. There should be regional consultation with central government towards a policy on road maintenance. This is not a new thing; it occurs on a regular basis every fiscal year. The main difference is that the focus will be the policy on road maintenance and not on other sectors. This consultation session would discuss the control mechanisms of road maintenance expenditures during the year. It is better to involve the regional auditor to control the implementation of work. The implementation of road maintenance should start on the first day of the fiscal year and there should be no delay in implementation as before.

Every quarter the local authority should report the progress of road maintenance work to central government and one copy of the report should be delivered to the regional auditor. There should be an assessment of the mechanisms done by central government based on the report and field observation. The result of the assessment can be used to prepare the improvement of the system or simplify the local authority budgeting systems.

8.3.2.1. Is this model applicable to Indonesia?

Based on the field visit in April 1999 and further discussions with the parties involved, all parties agreed to the implementation of Model 1(a). As has been stated in the previous section, this model is an intermediate target towards further improvement. The revised model will help to speed up the decentralisation process, which will take place after the economic recovery. The preparation of the model will be in line with budgeting cycles 2000/2001.

8.3.2.2. The limitations of the short term model

Although the short term model will improve the existing road maintenance budgeting systems to districts, it has limitations as set out in the table below:

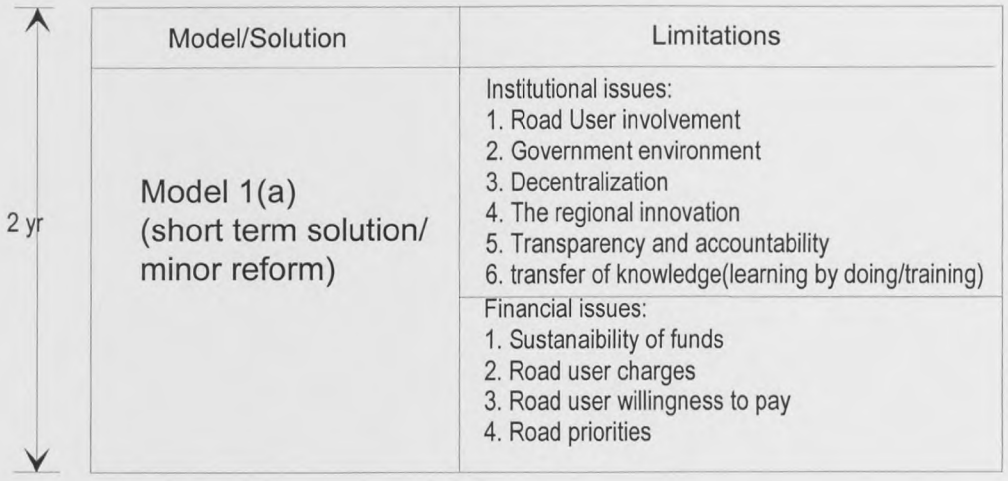


Figure 8-5 The limitations of short-term model/minor reform. [Source: Author 1998]

As can be seen from Figure 8-5, there are a number of limitations to model 1(a). Each will be discussed in turn.

Institutional issues

1. Road user involvement. There is still very small road user involvement in road management systems. The government road maintenance system will only be based on the road condition/road survey and the availability of funds. The road maintenance funds are taken from the government's budget. Road users pay only a small amount for use of the roads. The improvement of road user charges is still in the process of being implemented.

2. Government environment. Model 1(a) still operates within the existing slow bureaucratic framework

3. Decentralisation. The budgeting process in this model is still centralised in the sense that the central government contributes major percentages of funds to the district level. However, the budget channels will be simplified and this will have a positive impact on local governments in terms of managing their road maintenance programs. Besides that, budget implementation

will be tightly monitored against implementation, especially concerning district road maintenance. By using this model, there will be local level involvement both in the preparation of budgets, setting up temporary road priorities and total planning, taking into account local conditions. This aspect makes the difference between the original budget process currently in use and Model 1(a).

4. Regional innovations. Without using this model regional innovations would not exist since the regional staff tend to say yes to central government otherwise they would not be given a grant from the centre. The model also takes into account the development or building of regional innovations by involving the regions in the decision making process. The way to involve regional staff is to let them prepare a road maintenance spending proposal based on local conditions. The road maintenance budget spending will be tested against road priorities. Central government responsibility will be to monitor performance and implementation and local authorities would start to have input into the central decision making process in road maintenance.

5. Transparency and accountability. Transparency and accountability were discussed with World Bank staff in Jakarta. These two difficult aspects are still problematic in Indonesia. However, the new government is now committed to transparency and accountability that should help Model 1(a).

6. Transfer of knowledge (learning by doing/training). There is a need to increase the capabilities of regional staff in road maintenance and in planning and budgeting. Without Model 1(a) the transfer of knowledge will not exist because with every budget cycle the involvement of regional staff decision making is small. Implementation of Model 1(a) allows regional staff to be involved in the planning and budgeting process by taking the local conditions, as well as local recommendations, into the budget decision making process. However, Model 1(a) is only limited to "learning by doing" in planning and budgeting. Technical capabilities will be

taken into account in Model 1(b). Although Model 1(a) has touched on the transfer of knowledge, it does not cover the whole training needs.

Financial issues

1. Sustainability of funds. Road maintenance funds are allocated as part of the annual budgetary process. In this case the Ministry of Public Works or Local Public Works Authority must compete for funds during annual budget negotiations. Moreover the budget allocation is flawed and politicised; politicians will be attracted to allocate funds from the budget to politically attractive projects.

2. Road user charges. Road user charges in Indonesia still have a weakness. The heavy vehicle damaging power on the road is not calculated into the vehicle registration fee. There is no direct link between road users and the damage they cause to the roads, especially for heavy good vehicles.

3. Road user willingness to pay. Since the involvement of road users is small, the road user is unwilling to pay for the use of the road. The implementation of Model 1(a) still does not influence this aspect.

4. Road priorities. Model 1(a) only prioritises roads based on individual district needs. However, the results of prioritised district roads will be analysed and will be developed in Model 1(b).

The next section explores the second revised aspect of preliminary Model 1.

8.3.3. Model 1(b) - Medium term reform

Under Model 1(b), Model 1(a) is already in place and the "Project Management Unit" and the "Project Implementation Units" are now created. The Project Management Unit consists of the main actors in the central government, while the Project Implementation Units consist of the main

actors in the regions. There will only be one Project Management Unit; there will be twenty-seven Project Implementation Units as pilots. The number of Project Implementation Units is derived from the number of pilot projects, based on Government regulation No. 8 of 1995. Model 1(b) will be operational on this basis and will be implemented fully to all districts, i.e.241 districts in the whole country on completion and review of the twenty-seven pilots.

8.3.3.1. Change in Medium term reform

Based on the field research in Indonesia additional advice is needed before appointing the chiefs of districts to be the heads of the Project Implementation Units. The suggestion of attaching this to Government regulation no. 8 of 1995 will not be possible because the working period of this regulation is limited to April 1999. On this date the reforms suggested in this research will not be started. The best way for the continuation of the decentralisation program is to take the result of P.P. No. 8 of 1995 into account when the short term and medium term research implementation starts. The timetable is presented overleaf.

No	Activity	Taken by	Output
1	analyse recommendation from short term resuls	Bp+MoF+MoH+ DGH+LA	Improvement of the central grant budget channels to district level
2	Set up task force	Bp+MoF+MoH+ DGH+LA	Decree of PMU-PIU, objective/ aim, organization chart
3	Prioritized the road maintenance to be number one	PMU+PIU	Ministerial decree to declare road maintenance as a first priorities (reallocation of other road program to maintenance)
4	Recruitment of the systems and supervisory consultant	PMU+PIU	Road Maintenance Management system for district
5	Software development	System consultant	District road program
6	Purchase hardware and setup network	System consultant	District road network
7	Analysis the local budget process	PIU	Recommendation to change on the existing budget process
8	Preparation of road hierarchy systems in the district road	PMU + PIU	Road hierarchy systems
9	Monitoring no. 7 and project audit	Supervisory consultant+Regional auditor	Intensive and monthly report Audit report
10	Follow up funding		
11	Human resources inventory	PIU	Human resources condition
12	Decision of training	PMU + PIU	Training list
13	Survey road conditions	H1+H2	Road conditions data and estimate road maintenance fund
14	Estimation of district road maintenance spending	PMU	Total amount of district road maintenance spending
15	Set-up road priorities and work out the road maintenance link based on road priorities	PMU+PIU+H2	Decision to maintain particular road link

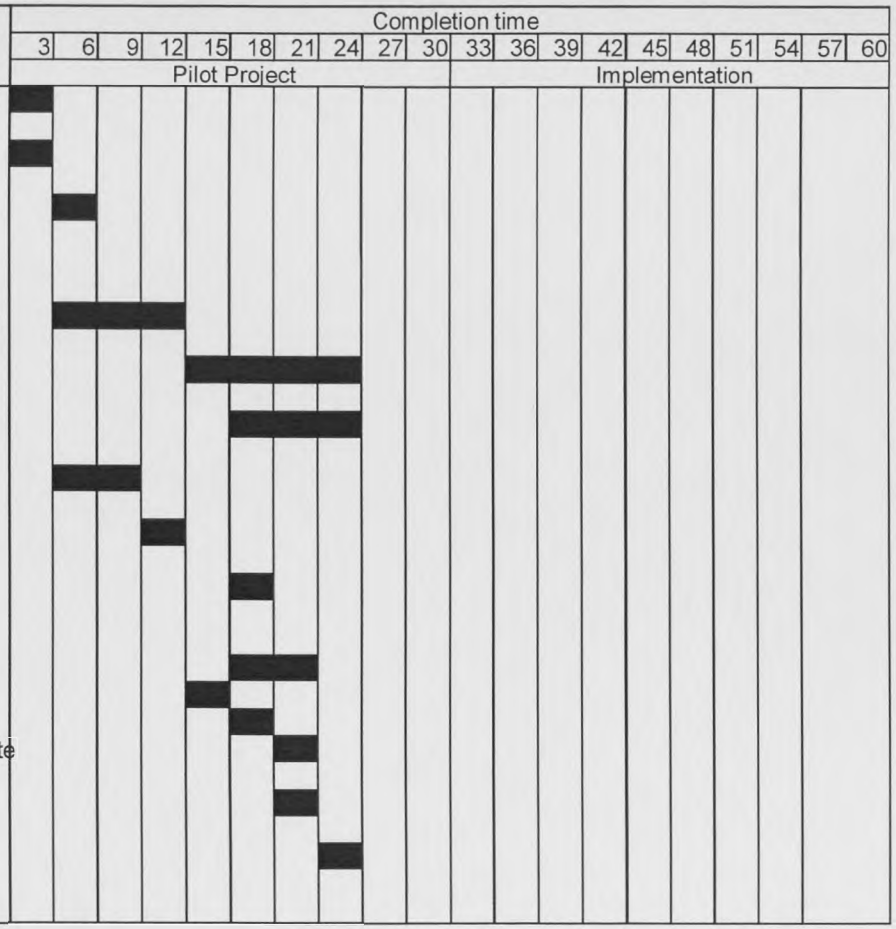


Figure 8-6 The target timetable for medium term reform. [Source: Author (1998)]

Notes: Bp: Bappenas, MoF: Ministry of Finance, DGH: Directorate General of Highways; MoH: Ministry of Home Affairs

H1: Provincial Highway Authority 1; H2: District Highway Authority; F2: District Finance Authority

No	Activity	Taken by	Output	Completion time (3 6 9 12 15 18 21 24 27 30 33 36 39 42 45 48 51 54 57 60) Pilot Project / Implementation
16	Estimation of equipment maintenance		Commercialize equipment maintenance	
17	Road maintenance budget and its implementation		Funding out road maintenance in the district	
18	Monitoring budget implementation	PIU	Report to PMU if the problems exists in the implementation	
19	Improvement of the pilot project and analysis of implementation to the whole network	PMU + PIU	Decision to implement to the whole district network	
20	Implementation of new budgeting systems to the whole district in Indonesia	Central + LA	Implementation	
21	Inform public periodically	PMU	disclosed periodic report to the public	
22	Is model 2 applicable?	PMU	Recommendation for starting model 3	
	Publish report of plan to setup road maintenance fund	PMU	Report to the public	

Notes: Bp: Bappenas, MoF: Ministry of Finance,DGH: Directorate General of Highways;MoH: Ministry of Home Affairs
H1: Provincial Highway Authority 1; H2: District Highway Authority; F2: District Finance Authority

Figure 8-7 The target timetable for medium term reform. [Source: Author (1998)]

After the pilot projects, some adjustment or modifications will be needed before implementation into the whole network. Once the PMU and PIU's are convinced that the adjusted model can be implemented, then full implementation will start. The following are explanations of Figures 8.3 and 8.4.

Recommendation from short term results

By the end of Model 1(a) – short term reform - the National Development Planning Agency should prepare recommendations for any further development of Model 1(a). These recommendations will cover the main points of the strategy and should be included into the Medium term reform (Model 1(b)) in terms of improvement of the budget channels to the district level.

Set-up task force

Setting up the task force will be important in order to implement the division of work for reform. The members will be the National Development Planning Agency, the Ministry of Finance, the Directorate General of Highways and the local authorities. This stage is to introduce the Project Management Unit and Project Implementation Units, and their responsibilities and relationships, in order to achieve the objectives. The result will be the National Development Planning Agency decree to assign PMU and PIUs to be set up based on the agreed schedules and timetable.

Appoint consultant for road maintenance systems and supervision of district road

The appointment of a consultant to help the project set-up the road maintenance system based on the survey data will help district road authorities perform their job. The system will be adapted from the national and provincial road network system. The package should also include training for the use of such systems. This system will help to prioritise the distribution of funds to the

different types of roads in the districts. The network server would be put into the provincial road authority offices, to record road conditions, maintenance and other programs per province.

Prioritise road maintenance as number one

There should be an agreement to implement road maintenance as number one priority. Once this has been achieved funds from other road sectors should be diverted into road maintenance. Reallocation of funds will be useful to prevent roads from further deterioration. This agreement will form part of the joint ministerial decree between the National Development Planning Agency and Ministry of Finance, Ministry of Public Works and Ministry of Home Affairs. The aim of a joint decree is to strengthen the decision or, in other words, it is an agreement between the stakeholders to road maintenance in the district.

Analysis of the local budget process

There should be an improvement in the local budget process to ensure that budget procedures are processed on time. By analysing the problems it will be easy for the task force to find solutions to the problems.

Preparation of road hierarchy

In Model 1(a) the road hierarchy has been set-up temporarily. In Model 1(b), the road hierarchy should be set-up institutionally.

Training

To overcome the lack of staff capabilities to manage road maintenance there is a need to develop capacity building through training local authority staff. With Model 1(b) training will cover technical aspects of road maintenance, including other aspects necessary for capacity building of regions.

Survey road condition

A road condition survey will be an important part of the road maintenance system. Based on the road conditions survey, the scope of the road maintenance will be available and the data should be made accessible to the public.

Estimation of spending for the road maintenance in the district road

The estimation of the central grant and each district's own revenue should be published and made available to the public. Having an estimation of the total amount will be easy for the local authority to calculate what type of work will be done during the fiscal year that will assist future road maintenance planning.

The implementation of road maintenance work

The Project Implementation Units will supervise the implementation of road maintenance work.

Analysis and improvement of the pilot project

Before the implementation of the pilot project to the district network there should be a final analysis to counter any problems after which the model will be ready to be implemented into the 241 districts.

Implementation and reporting to the public

The quarterly or monthly progress report of the road maintenance work should be made available to the public. By providing this information the public will become aware of road maintenance. The awareness of the public as road users will be a starting point in order to involve road users in the management of roads.

Recommendation for Model 2-Long Term reform

The PMU and PIUs would have been working for a period of at least five years. At the end of five years, if there is any possibility of continuing with Model 2 they will have to prepare recommendations based on the field report. If the task force is convinced that Model 2 can be implemented, then it should put into practice.

8.3.3.2. The Limitations of Medium term reform model

Although the results of the fieldwork indicated there are some limitations in the implementation of Model 1(b), this is relatively small compared to Model 1(a). It can be seen from Figure 8.5 that the limitations that exist in Model 1(a) disappear in Model 1(b).

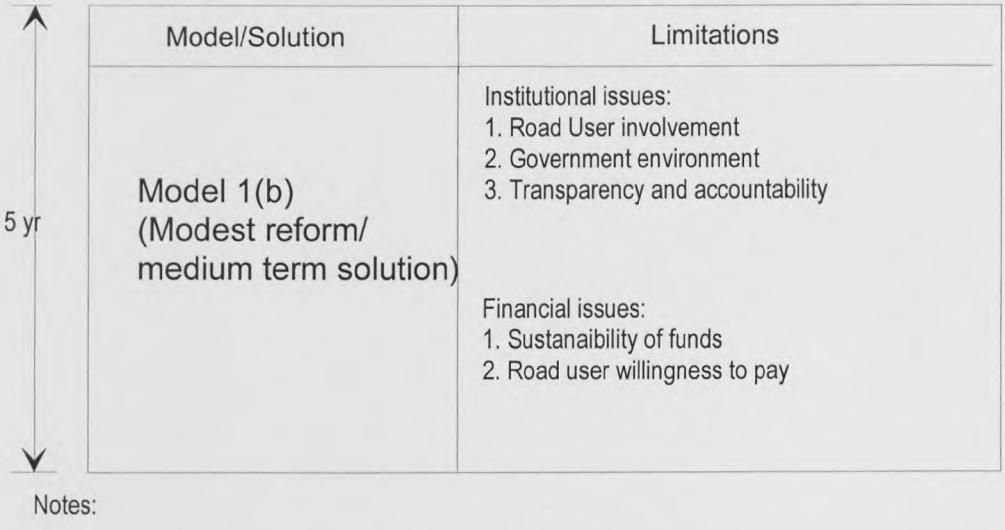


Figure 8-8 The limitations of Model 1(b). [Source: Author (1998)]

The Institutional Issues

The difference between the limitations in Model 1(a) compared with Model 1(b) can be seen in Figure 8.5. There are only two institutional factors, as limitations, that should be considered for the latter. They are:

1. *Road user involvement.* Although road user involvement still does not fully appear in this model, road users will start to gain an understanding of the situation of the government's budget and implementation of road maintenance from information given to them by the government. If in Model 1(a) local government discloses the situation and undertakes road maintenance planning, then in Model 1(b) they should publish the report and spread information to the citizens/road users.

2. *Government environment.* Model 1(b) still operates within the existing government environment and it will not encourage competition.

3. *Transparency and accountability.* Although this still appears in model 1(b) there will be considerable improvement. This model will focus on the planning, implementation and monitoring aspects of road maintenance. There will be a standard measure to allocate funds into district road based on a road hierarchy, set up based on local input.

Decentralisation will be undertaken within a period of between four to five years. The decentralisation of road maintenance and the flexibility of managing road sectors for local authorities will be achieved with this model. Local government will have the right to recruit its own staff. The road decentralisation process is also implemented within the task force framework where the PIU is the main leading actor for implementation, while guidance and monitoring are done by the PMU.

Regional innovation is a consequence of decentralisation by giving local authorities the ability to manage their own jurisdiction. It will encourage local government to be more involved and this will increase regional innovation. Regional innovation will encourage competition between the regions that will create a positive company environment in districts.

Transfer of knowledge through learning by doing, including combining a possible tour of duty for central staff, happens in Model 1(b). Besides training, the "learning by doing" from central

staff who have been moved to the regions will support the transfer of knowledge program. Using this model the training of personnel will take into account their background, performance at work and other criteria which support the sustainable development of human resources in the road maintenance at district level.

Financial issues

Sustainability of funds will not be guaranteed since the road maintenance budget depends largely on the government budget. Road maintenance will still have to compete with other interesting and politically attractive sectors such as education and the social sectors. However, by putting road maintenance as the number one priority politicians will be encouraged to be consistent.

Road user willingness to pay. Since road users do not directly pay for roads they are not forced to choose whether and how to make a journey or to hold the road agency accountable for the way it spends its budget. The involvement of the road user is still small, since there are no mechanisms available for road users to declare what they want in terms of road maintenance. However, Model 1(b) will gradually attract road user awareness of current road maintenance progress.

Road user charges and road priorities no longer appear in Model 1(b) due to the following reasons:

- *Road user charges:* The Government should issue an amendment of the road user charges to cover road expenditure. This will be eliminated by the implementation of Model 1(b).

- *Road priorities:* The Project Management Unit, together with Project Implementation Units, will set up road priorities to allocate the road maintenance budget to different types of road in the districts. There will be a standard of treatment for different conditions of roads, especially for the district roads. The PMU and PIU will setting up a similar model of road programming for the district roads similar to that for national and provincial roads, called the Inter urban Road Management System or IRMS.

The next section discusses the long-term model – Model 2.

8.3.4. Model 2 - Long term reform

This model is a continuation of Model 1(b) and requires the approval of parliament. The detailed results of Model 2 are as follows:

8.3.4.1. Changes in the Model 2

Most of the comments on Model 2 were trying to accommodate PT Jasa Marga, the Toll Company, to be appointed as the road maintenance board. There would be no "road user involvement " if this were accepted. However, the road maintenance board should be an independent organisation drawn from members of both the public and private sectors. Whilst PT Jasa Marga has been established and has its own organisational structure, by including representatives from the private sector into its organisation there will be a change to the company. PT Jasa Marga's experience is focused on the technical side of roads; it does not have any experience in fund distribution channels for road maintenance. To implement Model 2 as proposed here would need a new road maintenance board to be set up. It is a lot easier to create a board than to choose PT Jasa Marga for this role.

World Bank Staff raised objections on setting up road maintenance funding. However, this was solely concerned with trying to set it up now. In fact, the road maintenance fund would not be set up until the budgeting system for roads has improved. Results indicate there are no changes to Model 2 in general, and this would not start for at least the next ten years. The timetable is presented overleaf.

No	Activity	Taken by	Output
1	analysis recommendation of PMU +PIU	Bp+MoF+MoH+ DGH+LA	Input for financing road maintenance seminar
2	Financing Road Maintenance Seminar	Bp+MoF+MoH+ DGH+LA	Preparation of organizing committee for regional seminar public and private sector
3	Financing road maintenance seminar (regional level)	Seminar committee	Prepare organizing committee for road maintenace fund proposals (Public + Private + Road users)
4	Recommendation and conclusion of the seminar	Seminar committee	Proposal for financial and institutional reform of road maintenance
5	Review of the proposal	Min of Finance	Principles approval from government
6	Appointment reform committee	Public + Private	reform committee
7	Preparation of detailed plan	Reform committee	
	a. Management board		
	b. Secretariat		
	c. Sources of funds		
	d. What should the road fund financed		
	e. Cost sharing arrangements		
	f. Daily cash management		Term of Reference and Guidance
	g. Disbursing funds		
	h. Allocating funds to different agencies		
	I. Audit arrangements		
	j. Annual report		

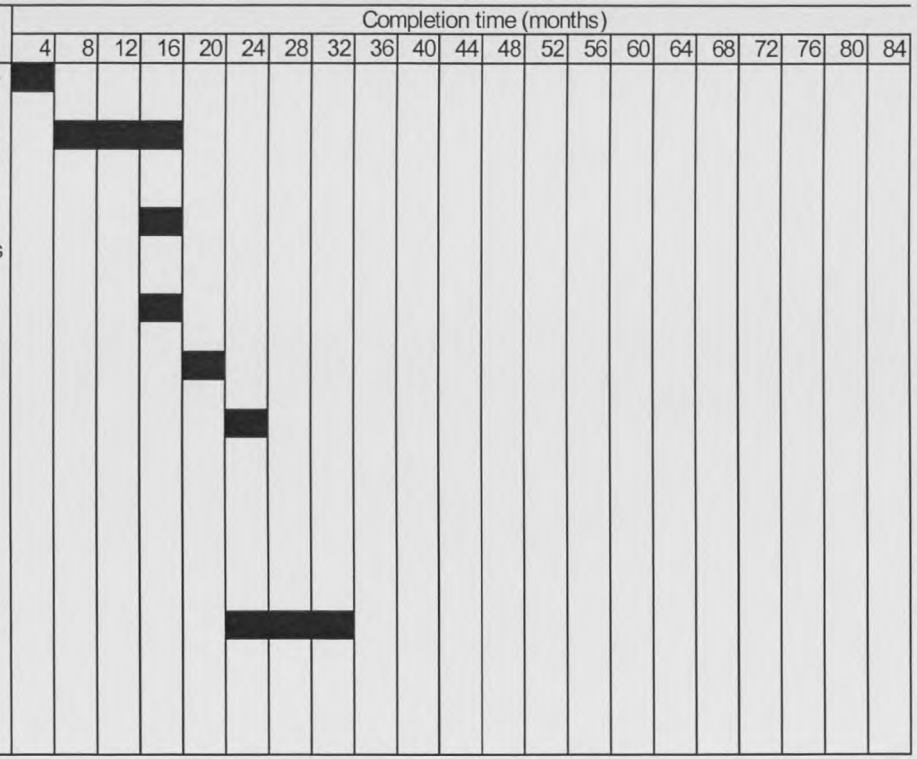
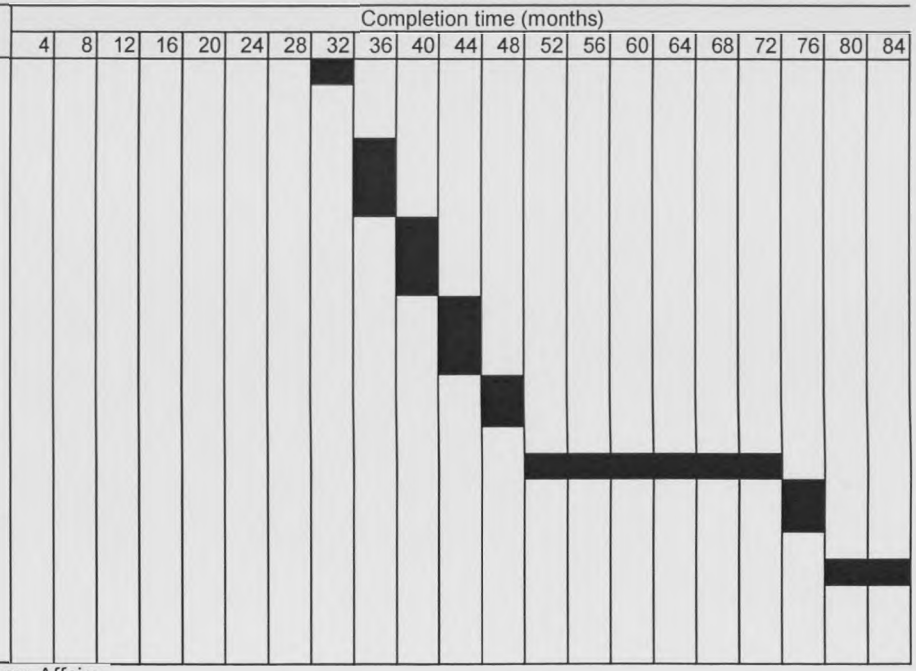


Figure 8-9 The target timetable for long term policy reform. [Source: Author (1998)]

Notes: Bp: Bappenas; MoF: Ministry of Finance, DGH: Directorate General of Highways: MoH: Ministry of Home Affairs

H1: Provincial Highway Authority 1; H2: district Highway Authority; F2: District Finance Authority

No	Activity	Taken by	Output
8	Proposal of agreement of Term of Reference and Guidance	Parliament	Principal Agreement
9	Setting up		
	a. Management board	reform committee	Management board
	b. Secretariat	Management board	Secretariat
	c. Sources of funds	Management board	Sources of funds
	d. What should the road fund financed	Management board	Scope of work to be financed
	e. Cost sharing arrangements	Management board	Cost sharing arrangements
	f. Daily cash management	Management board	daily cash management
	g. Disbursing funds	Management board	Disbursing funds
	h. Allocating funds to different agencies	Management board	Allocation formula
	I. Audit arrangements	Management board	audit guidance
	j. Annual report	Management board	Audit report
10	Set road maintenance fund	Public + Management board	Road Maintenance Fund
11	Piloting Road Maintenance Fund		
12	Evaluation, improvement of the pilot project		
13	Proposal of Implementation	Parliament/ President	New Law of financing road maintenance
14	Implementation of road maintenance fund into the whole network		



Notes: Bp: Bappenas;MoF: Ministry of Finance, DGH: Directorate General of Highways:MoH: Ministry of Home Affairs
H1: Provincial Highway Authority 1; H2: district Highway Authority; F2: District Finance Authority

Figure 8-10 The target timetable for long term policy reform. [Source: Author (1998)]

As can be seen from Figures 8-9 and 8-10, the action timetable will be as follows:

Analysis and recommendation of PMU and PIU

At the end of their working period they would present the analysis and recommendations of Model 1(b). These will be used as input for the Government to decide whether the implementation of Model 2 can be done.

Financing road maintenance seminar (national and regional level)

One of the best ways to get all parties (private and public) to agree to reforms for road financing arrangements is to explore the issues through a well designed country-wide series of workshop.

Recommendations and conclusion of the seminar

The recommendations and conclusion of the seminar, both at national and regional level, will be input into the setting up of a road maintenance board. The recommendations will cover the following subjects: scope of roads to be financed; sources of revenue; level of road user charges; management board; member and board chair nominations; operation of the fund; disbursement mechanisms and prioritisation and audit mechanisms.

Review of the proposal

A reform committee would prepare a proposal concerning the factors in the preceding paragraph. The Ministry of Finance would review and agree the proposal.

Appointment of the reform committee and preparation of a detailed plan

The reform committee would be responsible for preparing the detailed plan of the road maintenance fund. As has been mentioned earlier, the reform committee will consist of the public

and private sectors. This detailed plan, as mentioned in Figure 19, would still have to be approved by parliament or the ministry concerned. The output of this activity will be the terms of reference.

Proposal of agreement of terms of reference and guidance

Parliament would give their approval for the terms of reference and guidance, and once agreed the management board can be set-up.

Setting up management board and its facilities

The management board will be set-up by the reform committee after parliamentary approval has been given to set up a road maintenance board and fund. It will prepare facilities and its organisational structure based on the terms of reference previously set up.

Setting up road maintenance fund

The road maintenance board will oversee the road maintenance fund in line with the terms of reference agreed by parliament.

Piloting Road maintenance fund

Before implementation, nationwide piloting should take place in several provinces.

Proposal for the implementation of road maintenance fund

Before its implementation the Road Maintenance Board, together with the National Development Planning Agency and Ministry of Finance, would make a presentation of the latest results of the pilot project and ask for approval to fully implement the road maintenance fund.

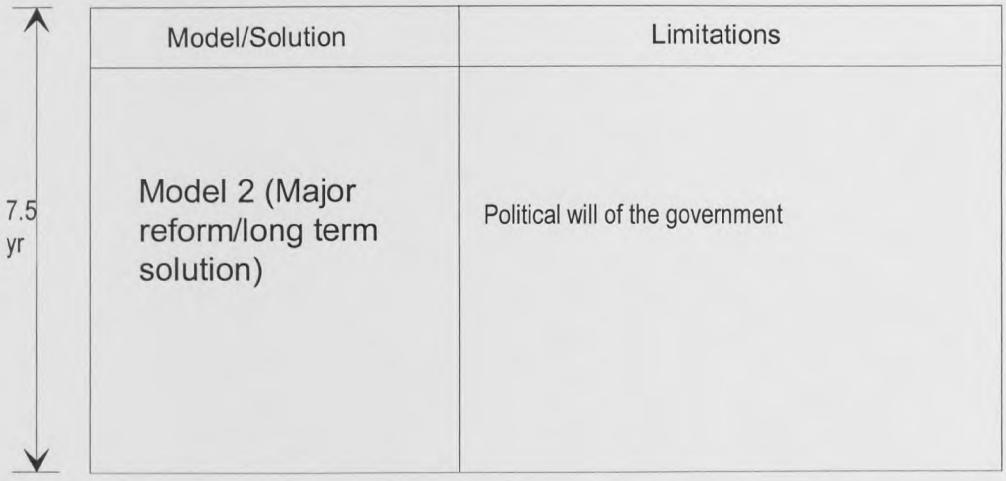


Figure 8-11 Limitations of Model 2. [Source: Author (1998)]

From Figure 8-11 it can be seen that the only limitation for Model 2 is the political will of the government. It depends largely on the results of Model 1(b). The success of Model 1(b) should lead parliament to have no objections for the next stages of reform. The creation of the road maintenance board will change the environment from government bureaucracy to a company environment. A company environment would put services as the number one priority. There would be an active road user involvement because road users were involved in the management board. Since they will be the ones who will pay for road maintenance they will demand accountability and transparency. This, of course, would also create road user willingness to pay. Although it is difficult to convince the Government to change the structure of road user charges such as putting on fuel tariffs as one of the sources of road maintenance, if road users support the idea the government should be willing to change. Earmarking funds would sustain them for road maintenance and this would also be good for planned maintenance.

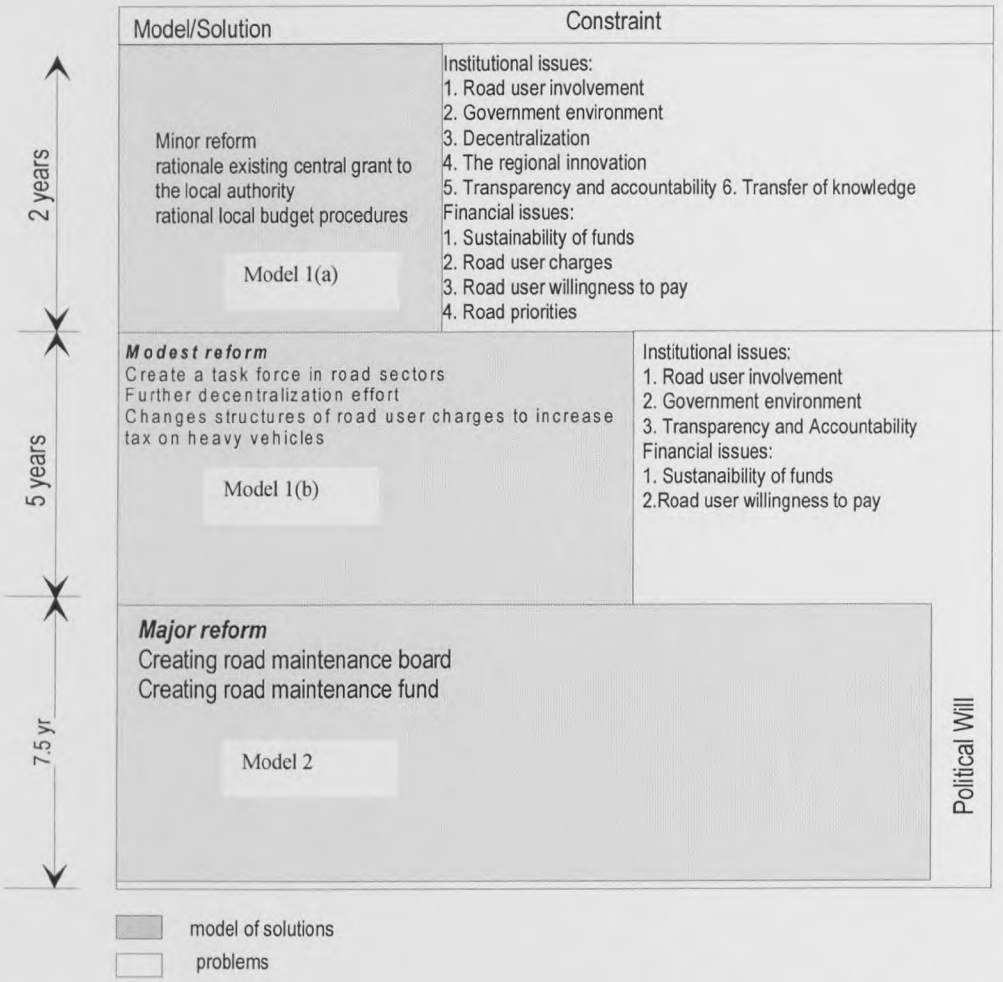


Figure 8-12 Models and their solutions. [Source: Author (1998)]

Consolidating the models and their limitations in Figure 8-12 above demonstrates the difference between the models. There should be an improvement when moving from Model 1(a) to Model 1(b). Some of the limitations in Model 1(a) disappear in Model 1(b). Moving from Model 1(b) to Model 2 again provides an improvement, with no limitations in the former appearing in the latter. The only limitation of Model 2 is the political will to earmark the fuel tariff for road maintenance funds.

8.4. Conclusion

This chapter has presented an analysis of results in Chapter 7. The analysis was based on two main perspectives, namely institutional and financial. The discussion has highlighted the complex relation between Model 1(a), Model 1(b) and Model 2. Model 1(a) called the "Short term model" will implement the simplification of central budgets to district level. Although there are some limitations in Model 1(a), these will gradually disappear with the implementation of Model 1(b). Model 1(a) improves existing conditions with no additional funds needed and can be implemented during the economic crisis.

Model 1(b), called "medium term reform", will create the task force at the central level called "Project Management Unit" and task forces in the regions called "Project Implementation Units". These task forces need additional funds so this model cannot be implemented during the economic crisis. The Project Implementation Units would be in twenty-seven districts as pilot projects. Pilot projects would be chosen based on the pilot projects of Government Regulation no. 8 of 1995. Pilot Projects in Model 1(b) are necessary to counter any problems before full implementation.

Model 2, called "long term reform", creates a road maintenance fund. Fieldwork indicated there is no dramatic change to the models developed in Chapter 5.

The following chapter will present the practical implementation of Model 1(a) and progress on other aspects of the research models.

Chapter 9. Implementation of the research model

9.1. Introduction

This chapter argues there is a need to set-up the implementation of the proposed models in Indonesia and monitor implementation from Model 1(a) up to the preparation of Model 2. This chapter covers the policy changes in the models being proposed up to 9 March 2001 (National Workshop for the appropriateness of road fund in Indonesia). Section 9.2 explores the political and institutional changes due to recent public pressures. Section 9.3 explores the implementation of Model 1(a), which is a simplified budgeting channel for road maintenance in the districts. It commences with the objectives of Model 1(a) as only a partial objective for financing road maintenance. The General Election in May 1999 highlighted the starting date for the model and the subsequent action plan will be discussed in detail. The likely constraints of implementation will also be explored. Section 9.4 explores what should be done in order to implement Model 1(b), which is to create a task force to help to devolve power to the districts. It discusses the possibility, through the co-ordination between involved actors and the transfer of knowledge and other co-ordinating programs, to prepare the districts for decentralised road maintenance. The likely constraints of implementing Model 1(b) will also be discussed. Section 9.5 explores the implementation of Model 2, that is the preparation for setting up a road fund in Indonesia. The likely constraints of implementing Model 2 will also be discussed. Section 9.6 presents the summary of the chapter.

9.2. Political and institutional changes in Indonesia

After 32 years of President Soeharto's era there are considerable changes on the political and institutional levels due to public pressure on the government. The Transition Cabinet (1998-1999) introduced a new decentralisation law known as Laws no. 22 and 25 of 1999. The government's policy of decentralisation is likely to lead to many gains, since it is unusually centralised for its size and diversity. The legal framework (Laws no. 22 and 25 of 1999) will more than double the sub national share of general government spending to well over 40%, up from less than 20% at the present time. This reallocation would make Indonesia one of the most decentralized countries in the world. The district governments have now become fully independent in order to prioritise their own business. The new Government, known as the "United Cabinet", started from October 1999, continued its predecessor's policy towards decentralisation, and prepared immediately an implementation strategy. After extensive discussions with the IMF, World Bank and ADB, Indonesia's new government recently signed a detailed Letter of Intent that included implementation of decentralisation. Laws no. 22 and 25 of 1999 prescribed implementation of the decentralisation framework by June 2001. Decentralisation is believed to increase the role of the regions, local initiatives and diversity. The reformation of the government, which was started from November 1999 onwards, was championed by the President himself and was supported by a clear mandate from the Legislative assembly. In response, there was a People's Advisory Assembly (MPR) instruction to government for the "Achievement of a state apparatus that functions in providing services to the people, professional, efficient, productive, transparent, free of corruption, collusion and nepotism." (People's Advisory Assembly Broad Guidelines of State Policy 1999-2004, Chapter 3, B 7.). Despite the willingness of the government to implement reforms, there are some weaknesses in implementation, as follows:

1. The Unity Cabinet that emerged in November 1999 was supposed to accommodate the downsizing of the central government organisation and accommodate political parties, such that most Ministers come from political parties. For example, the ex Department of Public

Works, from which the author was employed, instead of downsizing expanded into two ministries. These were the State Ministry of Public Works, responsible for preparing strategic plans for the Public Work's sector and providing local authorities with extensive and comprehensive guidelines, and the Department of Settlement and Regional Development, responsible for monitoring central government projects (i.e. inter-provincial projects) and for disseminating guidelines and standards on roads, irrigation, spatial planning and settlements. Although the division between the two ministries is clear, the implementation overlaps. The ex Department of Public Works, which only had 8 deputies under the minister, now has eighteen deputies, with a consequence of affecting the structures below the deputies. After 10 months in operation there was a cabinet reshuffle. The results were not surprising. The Government again decided to reunite both ministries (Ministry of Settlement and Regional Development and State Ministry of Public Works) and form the Ministry of Settlement and Regional Infrastructure.

2. The Cabinet reshuffle occurred during August 2000, with a reduction from 35 departments/state ministries to 25 departments. The existing 2 ministries, the State Ministry of Public Works and the Department of Settlement and Regional Development merged and became the new Department of Settlement and Regional Infrastructure. Up Until 3 October 2000 the proposed draft new organization awaited presidential approval. Under the new organization there will be only 8 deputies to the Ministers. The proposed downsizing plan involves civil servants of more than 50 years old and above receiving early retirement and a "golden handshake". The government will adopt another downsizing model, namely to transfer central civil servants to the regions and strengthen district local authorities. Based on international experiences of the downsizing of governments, this policy has weaknesses such as ignoring the capability of the civil servants themselves, which will cost the government of Indonesia in the longer term.

On the positive side of the reformation, the government is aware that the funding of road maintenance is currently inadequate. The ex State Minister of Public Works and the new Minister of Settlement and Regional Infrastructure have explained the impact of inadequate funding. There should be a new way of funding road maintenance through road user participation paying a levy in return for the use of roads. In addition, at a National Conference on Road Development Associations, the Minister of Settlement and Regional Infrastructure agreed to invite experts from the University of Birmingham to present international experience on road funding. The willingness to change to a fee for services will be a starting point from which to reform road sectors. The road funding system will be discussed in more detailed in section 9.5.

9.3. Implementation of Model 1(a) – Outline methodology for preparation of Simplified budgeting channels

9.3.1. Aims and objectives

Several improvements are needed in the planning and budgeting framework to support more effective road maintenance. This is especially the case in the districts, where budgeting channels come from different sources and are also rigid. Improvements that can be made during the economic crisis are aimed at:

1. Reducing the fragmentation and diffusion of responsibilities for maintenance through consolidating and clarifying roles and improving co-ordination between the relevant central and regional agencies.

2. Facilitating improved budgetary planning of road maintenance through consolidating the multiple channels in the routine and development budgets through a single budget channel. This will allow local authority agencies greater flexibility in shifting funds within expenditure

categories. This should also be supported by post-audit control and road priorities to distribute funds to different types of road.

3. Developing clear guidelines on budget and finance procedures for dissemination among road agencies at district level.

4. Preparing road priorities based on a road hierarchy at local authority level. Based on data available, national and provincial roads have had road priorities implemented based on inter urban Road Management Systems. At the district road level, road authority methods have still not been implemented.

The above mentioned strategy was implemented in the FY 1999/2000 by the Government of Indonesia, and the guidelines were refined during the implementation of Model 1(a).

9.3.2. Actors who are involved in the implementation

Key actors can be divided into two groups as follows:

1. **Main actors.** Those who are mainly responsible for the implementation of Model 1(a). They are the ones who had additional work in simplifying the budgeting channels to local authorities. These are the National Development Planning Agency and the Ministry of Finance.

2. **Normal Actors.** Those who helped the special main actors identified above to perform their jobs and undertook their normal job during implementation of the model. Included in this group are the Ministry of Public Works (Directorate General of Highways), The Ministry of Home Affairs (Directorate General of Regional Development) and the Local Authorities (Provinces, Districts and Municipalities) including local auditors for local authorities.

9.3.3. The starting date

As can be seen from Figure 9-1 below, the implementation of Model 1(a) occurred after the General Election of May 1999. The starting date was June 1999, one month before the Rakorbang (Development Coordination Meeting) took place. Implementation started in fiscal year 2000. The Government changed the fiscal year from 1 January to 31 December. As a transition period, Fiscal Year 2000 starts from April up to December 31 2000, a nine month period. The implementation of Model 1(a) overlapped with the implementation of the annual road maintenance planning process.

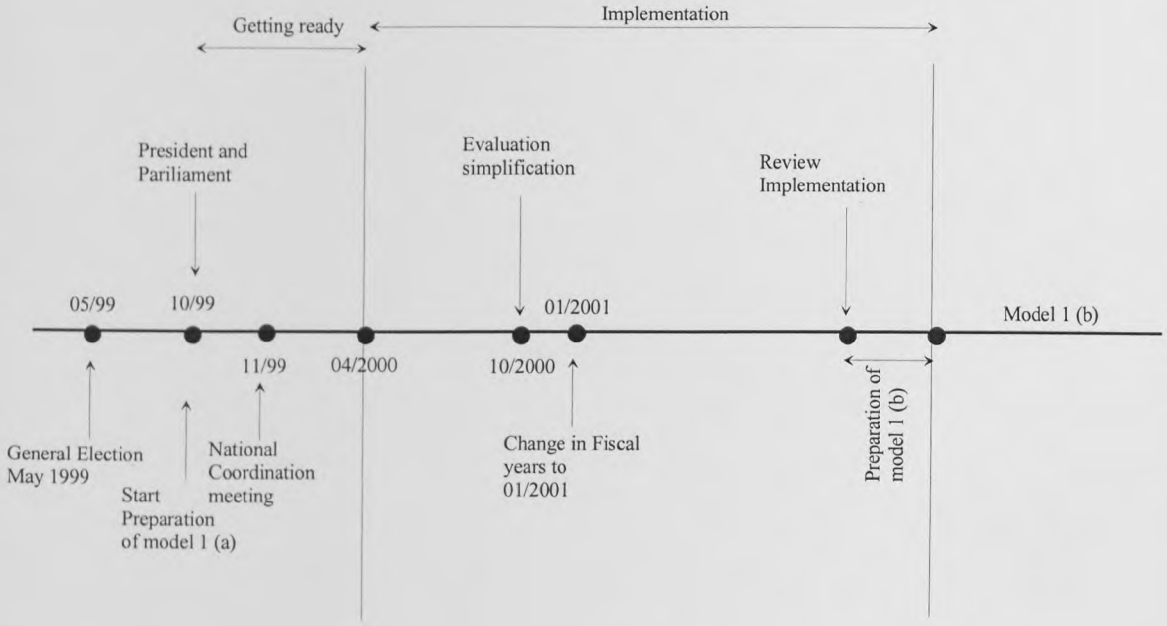


Figure 9-1 Model 1(a) - agenda. [Source: (Author 1999)]

9.3.4. Action plan

The action plan consists of three broad steps as follows:

9.3.4.1. Preparation

Although the preparation for implementation has been done already, starting after the election, the author believes that it should be explained for the purposes of academic study. This is set out below.

Firstly, the preparation for Model 1(a) consisted of explanations as to why this model should be implemented. However, this ignored the fact that the economic situation was worsening and further explanation can be found in Chapter 8. A formal meeting that consisted of the National Development Planning Agency, the Ministry of Public Work and the Ministry of Finance was required in the first place. The output of the meeting was a proposal to simplify budget channels to the districts. This meeting was crucial because the National Development Planning agency needed to be convinced, and they were convinced, that the simplified budgeting procedures would be required and ready after the election without waiting for economic recovery. The National Development Planning Agency, whilst nominally at the same level as the Ministry, in reality is more powerful than the other ministries.

Secondly, inter-ministerial meetings to prepare for implementation. All parties concerned were invited such as: The National Development Planning Agency, the Ministry of Public Works, the Ministry of Finance, the Ministry of Home Affairs and the State Auditor. This meeting discussed the implementation of Model 1(a) to give more autonomy to local authorities to manage their own roads in terms of funding. Budget channels were discussed including the variety of funding channels that are rigid and need to be simplified into one channel. In order to implement this, there is a need for the following:

- **Ministry of Home Affairs.** Local authorities prepared five-year road maintenance programs, in addition to other documents, for the Rakornas (National Co-ordination Meeting). These five years road maintenance programs were based on the road surveys carried out by local authorities.

- **Ministry of Public Works.** The Ministry of Public Works through the PBPJK (District Road Monitoring Project) has responsibility for helping districts with their road maintenance planning. A detailed plan for road maintenance and rehabilitation programs needs to be created, together with preparation of road priorities using the existing road hierarchy. The output of this activity should be a short list of candidate projects for approval during the Rakornas (National Coordination meeting). The road inventory will be strengthened especially at the district level. Road inventories for provincial areas and municipalities have been undertaken satisfactorily through the Inter-urban Road Management Systems (IRMS) and Urban Road Management Systems (URMS). However, at district level a standard program has still not been set up.

- **Ministry of Finance.** The Ministry of Finance and the Regional Budget Office work out the likely amount of revenue to be set aside for road maintenance elements in the routine budget. They are responsible for releasing the budget on schedule.

- **National Development Planning Agency.** The National Development Planning Agency, together with the Ministry of Finance, is responsible for the development budget of districts, to produce an estimate of the likely revenue for the road sector in the regions.

As mentioned in Chapter 2, commencing in 1997/1998 the government gave priority to the road maintenance program. The construction of new roads, including toll roads and the improvement program, has been cut by more than 50%, while the road maintenance program remains the same. For the fiscal year 1999/2000, the President of Indonesia declared that the first priority during the economic crisis would be the maintenance of existing government assets (Suara Pembaharuan, Kompas News Paper 6,1999). There was no new construction and road improvement and the road maintenance program would only maintain existing assets. These political decisions affected the implementation level and involved ministries following up decisions by putting road maintenance as the first and only priority in the country. The other significant political decision, supported by

the IMF through their loan, was to implement labour intensive projects. That means that there was a Force Account and small contractors worked in the road maintenance field. Although in his budget speeach the President commented speech on maintenance policies, his power ended in May 1999. All of these activities were finished by the end of October 1999, when the Rakornas (National Coordination meeting) took place.

Thirdly, The Rakornas (National Coordination meeting) always takes place in Jakarta in October each year. During Rakornas, the central government announced that the road maintenance budget would be simplified and all the involved parties agreed to the proposal they prepared.

Fourthly, the President's speech presented the likely national budget and, based on this, local authorities knew how much the central government grant would be. This grant consists of routine, development and other types of grant channeled to the districts through one "regional government fund", either to provinces, districts or municipalities.

Fifthly, the Ratek or Technical co-ordination meeting. During this phase the regional level presented their plans, including their five-year maintenance plan.

Sixthly, on 1 April 2000, for the fiscal year 2000/2001 a new feature was brought in, one single budget channel for the regions.

9.3.4.2. Implementation and monitoring

Implementation will be the same as the original implementation envisaged for road maintenance work i.e. commencing from the opening of the fiscal year on 1 April 2000. The implementation of road maintenance will be based on both contracting out to regional contractors and using the force account. At the end of the fiscal year there will be an annual review of the financial aspects, undertaken by the regional auditor and/or regional inspectorate (the internal control body within

the local authorities). They will determine if there are any problems on the policy implementation and whether the implementation has been undertaken according to the agreed schedule.

Monitoring results through the midterm and annual review will be a useful input in Rakorbang, that will be take place in July 2000 as a part of the annual budget process. In July 2000, the Rakorbang (Development Coordination meeting) assessed the implementation of results based on the regional auditor report, and if it needed, any problems would be brought to central government to act as an influence to alter the current policies. Three months before the end of the fiscal year 2001/2002 (December 2001) there will be an evaluation of the implementation and a decision to either continue Model 1(b) or postpone it until the economic recovery is over. Evaluation will be on financial management, such as:

- how the financial mechanisms have worked in the districts;
- any late issues in terms of the regional budget;
- whether the road maintenance work been undertaken according to the agreed schedules;
- whether road prioritisations in the districts worked; and
- the economic condition of the country and the predicted growth rate according to the government. If there is still zero growth, then there is a possibility that Model 1(b) will be postponed. Zero growth will mean that the government will still have to concentrate on the social safety net, and it is unlikely Model 1(b) will be implemented unless the World Bank is willing to fund these activities.

9.3.4.3. Audit

The audit covers two purposes. Firstly, to see whether the implementation of road maintenance in the district has been undertaken according to the road maintenance plan set-up and identified in

section 9.2.4.1. Secondly, to see whether there have been problems during implementation. The audit will be carried by three institutions:

(a) a technical audit will be undertaken by the Directorate General of Highways through P3TNAS[8], P3TPROP[9] and PBPJK[10];

(b) a computer audit will be undertaken by the provincial Public Works; and

(c) a financial audit will be undertaken by the Regional Auditor.

Both technical and financial audits will include the following steps. Firstly, a desk audit, which comprises a review and checking of raw survey data, photos and analysis forms, in order to (a) identify obvious omissions or deficiencies in basic survey tabulation and (b) check the judgements made in analysis especially road condition assessment and costing. Secondly, the field audit will be on a sample basis and the scope of audit will be on the utilisation of road maintenance funds as well as road maintenance work.

9.3.5. The Implementation progress on Model 1(a)

The implementation of Model 1(a) has been undertaken much faster than the timetable originally presented in Table 8-3 Chapter 8. The simplified budget process has been implemented into the whole of the regions in Indonesia at the same time due to public pressures. The appointed "United Cabinet" in November 1999, as indicated earlier, continued the previous government policy on decentralisation. Although there have been some weaknesses in the implementation of decentralisation, downsizing of the central government policy on the Civil Service, at local level the development program has been implemented. Changes in the central organization of

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[8] P3Tnas (National Planning and Supervision Project) responsible to monitor and supervise the national road project

[9] P3Tprop (Provincial Planning and Supervision project) responsible to monitor and supervise the Provincial road project

[10] PBPJK (District Road road monitoring Project) responsible to assist the implementation of the District road project

government such as the National Development Planning Agency (Bappenas) has been downgraded from Ministerial level to Deputy Ministerial level and has been attached to the Coordination Minister of Economy and Industry. The role of central ministries (Department of Settlement and Regional Development and State Minister of Public Works) in the Unity Cabinet in connection with the road sector has been only limited to planning the National Road network (inter-provincial roads). Regional road planning and implementation will be undertaken by the respective local authorities (provincial roads will be handled by provincial government and district roads at district level), as can be seen from Figure 9-2 below:

Action to be taken	Progress up to now (3/10/2000)	Problems	Remarks
Simplified budget procedures to district level Government	1. Simplified budgeting system to the districts has been in place since FY 1999/2000 2. District autonomy to decide their own road priorities 3. Grant from central government is a block and specified grant only 4. Preparation and pilot projects of the District Road Maintenance Program 5. Less involvement of the Central Government Agencies in the regional and road priorities at the district level government	1. Focus on short term solution on road maintenance (annual road maintenance program) 2. Road sector organisation in the Central Government has split into two organisations, with no clear distinction between them 3. Merger of two Departments into the Department of Settlement and Regional Infrastructure 4. Road prioritisation on district roads still manually set. The District Road Maintenance System software still operating on the pilot basis.	There is a change in the operation of fiscal years. Initially it will start as from this year - April 2000 and end December 2000. From then onwards, the fiscal year will start from January and run to December. Thus, the fiscal year 2001 will operate from January 2001 to December 2001. In the middle of that fiscal year, decentralisation will be implemented.

Figure 9-2 Progress of Model 1(a): Simplified budgeting procedure to the regions. [Source: Author: (2000)]

1. The simplified budgeting procedure has been in place since fiscal year 2000, and local authorities have their own priorities to set in the road sector, taking road maintenance work as their first priority. Implementation has covered the whole of the district and provincial government sector, without using any district pilot projects, as originally proposed in Chapter 8.

2. There has been an increasing role for local authorities in determining their own road maintenance priorities based on local initiative and needs.

3. The central grant is the only block grant before decentralisation took place. Law No. 25 elaborates the simplification of budget procedures and the implementation framework has been prepared. It was agreed that the grant from central government to the regions would be in two forms - block grants and specified grants.

4. Preparation and pilot projects have only covered the implementation of five year road maintenance programs based on the KRMS (District Road Maintenance Systems) to assist the district government to prioritise its road maintenance program.

5. Based on point 4 above, apart from the central grant, there will be no further involvement of the central government to the district level government.

9.3.6. Problems on the implementation of Model 1(a)

Some problems occurred during the implementation of Model 1(a), apart from political problems that have been addressed in the section 9.2 above.

6. Due to the implementation of Model 1(a), without pilot projects local authorities have conducted no five year maintenance planning. Five year planning will be undertaken when decentralisation starts.

7. No clear distinction of responsibility between two Ministries (State Minister of Public Works and Department of Settlement and Regional Development) caused the local authorities to be confused on strategic policy, especially in terms of guidance on road maintenance.

8. The merger of the two ministries (State Minister of Public Works and Department of Settlement and Regional Development) into the Department of Settlement and Regional Infrastructure, has meant that up until now there has not been a clear responsibility for work to be done, including that of the author. The proposed new organisation is still waiting for Presidential approval (as at 9/10/2000). Hopefully the organisation will be approved within a few weeks.

Road maintenance priority systems have been in place, but still on a pilot project basis.

9.4. Implementation of Model 1 (b) - Creating A Task Force for Decentralisation of Road Maintenance

9.4.1. Objectives

The World Bank (1994), based on its data on 42 developing countries, found that countries with decentralised road maintenance had lower backlogs and the condition of roads is better. Decentralisation should include implementation of maintenance and also financing to ensure that communities are willing to pay for the quality of road services provided. The principal objective of the task force is to improve and speed up the decentralisation process in road maintenance in particular (including road rehabilitation). The task force will be a useful tool to co-ordinate between actors.

The task force will at least provide solutions for the institutional and financial problems of road maintenance. The financial problems, such as inadequacy of funds, have also occurred because of the institutional problems in managing road infrastructures.

9.4.2. The starting date of decentralisation

Based on Law no. 22 and 25/99, the starting date for decentralisation was in January 2001, That means the implementation of Law No. 22/99 on regional autonomy and Law No. 25/99 on Central and local government budget/revenues should be done immediately. The shifting of responsibility from central to local is still not fully implemented.

9.4.3. Progress on implementation of Model 1(b) Decentralisation of road sector through the task force

Law No. 22/99 on regional autonomy and 25/99 on central and local government budget/revenues has been in place since May 1999. This law covers the whole budgetary management process, not only for road maintenance.

The Task Force Manager for decentralisation, who is preparing the national framework, is the State Minister of Regional Autonomy. This ministry has now merged with Department of Internal Affairs and is known as Department of Internal Affairs and Regional Autonomy. The Minister of Regional Autonomy appointed staff from relevant technical ministries to be a decentralisation committee, in order to get relevant and useful feedback from the relevant ministries about what should be done to speed up and provide the framework for decentralisation. It has a similar type of remit as the Task Force-Project Management Unit and Project Implementation Unit of Model 1(b).

The Interaction between PIU and PMU in the model can be seen from national seminar on decentralisation which was sponsored by the IMF and the World Bank as well as regular meetings

conducted by the State Minister of Regional Autonomy. The State Minister of Public Works staff has had to prepare a strategy to devolve the decentralisation of road sector management into the District and includes a new road law to accommodate decentralisation. The new proposed road law will deal with he division of responsibilities among different type of roads to the different levels of government. The responsibility for District roads during the decentralisation era, from planning, implementation, supervision and financing, will fully depend on district government. The draft new road law elaborated role sharing in road management as can be seen from Table 9-3 below.

Division of Responsibility on Road Sector between Central, Province, District/Urban and Village

No	Activities/Description of Work	NSR	N	P	D/Ur	Village	Tol
1	2	3	4	5	6	7	8
A.	**Regulation**						
1	Formulation of policy on planning	CTR	CTR	Pr	D/U	D/U	CTR
2	To arrange policy on general planning and program	CTR	CTR	Pr	D/U	D/U/Vil	CTR
3	To arrange regulation and law	CTR	CTR	Pr	D/U	D/U/Vil	CTR
4	to arrange guidelines and technical standard	CTR	CTR	Pr	D/U	D/U/Vil	CTR
B	**Services**						
1	Licensing	D/U	D/U	D/U	D/U	D/U	CTR/Pr/D/U/Cor
2	Information	CTR	CTR	Pr	D/U	D/U/Vil	CTR/Cor
C	**Capacity building**						
1	Guidance and dissemination	CTR	CTR	CTR/Pr	D/U	D/U/vil	CTR
2	Education and training	CTR	CTR	CTR/Pr	D/U	D/U/vil	CTR
D	**Research and Development**						
1	Research	CTR	CTR	CTR/Pr	Pr/D/U	D/U/vil	CTR
2	Investigation	CTR	CTR	CTR/Pr	Pr/D/U	D/U/vil	CTR
3	Development	CTR	CTR	CTR/Pr	Pr/D/U	D/U/vil	CTR
E	**Reconstruction**						
1	Feasibility study	CTR	Pr	Pr	D/U	D/U/vil	Cor
2	Technical Planning	CTR	Pr	Pr	D/U	D/U/vil	Cor
3	Construction	CTR	Pr	Pr	D/U	D/U/vil	Cor
4	Operation	CTR	Pr	Pr	D/U	D/U/vil	CTR/Cor
5	Maintenance	CTR	Pr	Pr	D/U	D/U/vil	Cor
F	Control	CTR	CTR	Pr	Pr/D/U	D/U	CTR

Notes:

CTR = Central Government
Pr = Provincial Government
D/U = District/Urban Government
Tol = Toll Road
Vil=Village
Cor=Corporation
Others = Special Road (Forestry, Agriculture etc)
NSR = National Strategy Road
N= National Road
P= Provincial Road
D/Ur=District/Urban Road
Ri=Relevant institution

Figure 9-3 Division of responsibility for the road sector between central, provincial, district/urban, village and others

The above table is based on the draft of the new road law which has to wait until the organization of the Department of Settlement and Regional Infrastructure is in place.

The other significant change to accommodate international experience on road maintenance contracts is based on performance. The Minister has accepted the proposals from this study, and they will start from the fiscal year 2001. The study will investigate the appropriateness of implementing a performance based road maintenance contract, as has happened in the Latin American region.

The program on the transfer of civil servants to the regions is still at the discussion stage between the Decentralisation Committee chaired by the State Minister of Regional Autonomy, which has now merged with the Department of Internal Affairs.

Action to be taken	Progress up to 3/10/2000	Problems	Remarks
Decentralised road sector to districts through Task Force	1. Law no. 22/99 on regional autonomy and 25/99 on central and local government budget/revenues has been in place since May 1999. This law covers the whole management not only road maintenance alone. 2. The starting point for both laws is June 2000. 3. Task force, in charge of decentralisation, is under the State Minister of Regional Autonomy and includes the road sector 4. The Government is still in the process of revising Law No. 13/80 on the management of the road sector to accommodate Law No. 22 and 25/99 5. Study on performance based maintenance contract has been underway for some time 6. Transfer of central civil servants to the regions will be done after the government has established a clear framework.	1. The government now has to prepare the framework such as: the exact roles of the regions, the extent of local tax bases, the scope for local borrowing, the standards for financial management and accountability at local level, the equalization formula for the general grant allocation, the size of special allocations 2. Resistance to accept central government staff 3. Stagnation in the programs for preparation due to the Cabinet reshuffle, up to 3/10/2000. 4. The State Minister of Regional Autonomy merged with Department of Internal Affairs and is now known as the Department of Internal Affairs and Regional Autonomy	

Figure 9-4 Progress of Model 1(b): Decentralize road sector to districts through Task Force. [Source: Author (2000)]

9.4.4. Problems on implementation of Model 1(b)- Decentralisation of road sector through task force

The reshuffle of the Cabinet is a major problem for the sustainability of the program. After running approximately 10 months the President reshuffled his cabinet and some of the departments/state ministries have had to merge. Up to 9 March 2001 - when a national seminar on the appropriateness of a road fund was in place - the draft organisational structures were issued by the President for the high ranking echelon and, for the level below that, from the Minister of Settlement and Regional Infrastructure. Political instability will be the real reason for stagnation in the process of decentralisation due to unclear conditions in the central government organization. Most of the staff involved in the process of decentralization were just about to work after at least three months of very slowly progress. They preferred to wait until the President approved the new organization of the Cabinet. Issues to be resolved by the decentralisation committee and the new organization of central government include: the exact role of the region; the extent of local tax bases; the scope for local borrowing; the standards for financial management and accountability at local level; the equalization formula for the general grant allocation; the size of special allocations; the transfer of civil servants and assets; and the establishment of a Regional Autonomy Advisory Council, an important coordinating body with representatives from central and local government. Many of the regions seem ready for more autonomy and show a practical attitude towards issues such as local reorganization and the absorption of central government personnel. In this environment, however, Indonesia's decentralisation is likely to be done by muddling through and a decentralized, ad-hoc resolution of issues as they come up.

9.5. Progress on preparation of the Model 2 – Setting up a road Maintenance Fund

9.5.1. Objectives

The ideal ways for financing road maintenance is through direct charging, which will be installed for the whole network. Although the idea remains a concept to be implemented in Indonesia, there should be proper and comprehensive steps to accommodate this policy.

For the time being the idea to shift the cost burden from government to the road users will be an immediate and necessary step to avoid further deterioration of roads due to inadequate maintenance. Road user charges appear the only answer to those questions. Road user charges will be an additional element on top of a road user tax. The major problem with that policy is the road stakeholders. This group will bear the brunt of road sector financing, and the brunt of poorly maintained roads. They are the most skeptical of any reforms, while also being potentially the most effective public opinion lobby for reform implementation. This group pays fuel taxes, vehicle licences, road tolls, and other tariffs that might comprise the reform. They are the most vocal interest group, and have the most media exposure. They are also the opinion-makers, policy analysts, project officers, professionals, farmers, businesspersons, and policy makers. They are owners, editors and writers in the papers, magazines, radio stations, TV stations, and on the Internet. This group will want to know why they must pay more money in order to keep a "public good" (roads) in good shape. They will want to know what their role, influence and authority will be if they do agree to join administrative bodies such as a Roads Advisory Board or a Road Fund Board. They will need to be convinced that roads can be a "market good" and that "commercializing" roads will provide them with good value for money.

To be accepted by this stakeholder group there should be a continuous effort to disseminate the idea of road financing through systematic seminars, mass media, educating people and

comparative studies of other successful countries that have implemented road user charges and road funds.

9.5.2. The progress of Model 2: setting up a road maintenance fund

The starting point for Model 2 was November 1999, where the State Minister of Public Works at that time conducted a seminar entitled Road Maintenance Reform in Indonesia. Most participants were government officers from the Department of Transport, the Department of Settlement and Regional Development, the Department of Finance, and officers from the legislative bodies, Bappenas etc. The conclusion of the seminar at that time was there should be:

- a continuous and sustainable action to disseminate the idea, especially to road users, since they are the ones who will bear the costs of road conditions; and

- a review of the challenges to implement a road fund in Indonesia such as: Road User Tax, Fuel Subsidy, Law enforcement to overloading vehicles and decentralisation of road sector to the regions.

A press release in Kompas, SuaraPembaruan, Media Indonesia on 7 February 2000, stated the negative impact of inadequate maintenance due to budget constraints. The government proposed in the near future that there would be an earmarking device to ensure that all revenues from the road sector will be returned to the road budget. Based on the Minister's Statement, due to the inadequate funding for roads for 1999/2000, the need was identified as Rp. 5.5 Billion, but the government can only afford Rp. 2.7 billion. As a result of this, over the next 10 years the government will face an economic loss in the order of Rp. 40 Billion.

On May 7, 2000 at a regional meeting attended by the Regional Public Works Officer together with BAPPEDA, there was a presentation by the author on road funding and a two hour discussion with the participants. The conclusions of the meeting were:

- there is a need for central government to disseminate systematically and comprehensively the idea of road funding systems; the advantages of implementing them, and the consequences of not having adequate maintenance for the road user;

- the preparation of a road decentralisation policy in line with dissemination of road funding systems; and

- some of the provinces such as Central Java and East Java stated that the Governor will set up local mechanisms to charge the road users who enter their provinces as a return for using their roads.

The draft of new road law stated that roads can be financed from a road user tax and there will be an earmarking mechanism for road finance. For the time being this clause has been rejected by the Department of Finance since it needs some clarification on road user charges and needs elaboration on the purpose of road funding and its advantages compared with the traditional type of budget.

In July 2000 one of the provinces in Sumatera Barat commenced the dissemination of road funding in its province to the BAPPEDA and other stakeholders. The author was invited to speak on the dissemination of the road funding idea to the ITB students in the form of an Open Lecture and invited West Java Public Works Officers and West Java Bappeda. The conclusions of this lecture were the need to disseminate this idea to road users, not only to government officials. Consideration should be given to take into account the impact of reducing subsidies (although based on the AFTA agreement, commencing in 2002, Indonesia should be putting 0% subsidy on fuel tax especially).

The Directorate of Investment within the DG Settlement and Regional Development, where the author will reside in the near future, has indicated that a study will be put in progress to investigate the appropriateness of implementing the Road Fund in Indonesia. International experts, such as

Ian Heggie or Henry Keraly (depending on their availability), and John Lee, will participate in the study. The author will also be inviting an expert from the World Bank, namely, William Paterson, to review and give comments on the progress. In line with the study, preparation is also underway for an internal seminar within DG Settlement and Regional Development, to invite a number of experts within the Government, together with Sumatera Barat Public Works staff who are working in the similar field. Paterson of the World Bank will be invited to share his experiences on setting up a road fund in the neighbouring country of the Philippines.

A national seminar on the Road Sector was conducted in Jakarta on 2 and 3 October 2000, including one of the seminars on the Road Fund and the possible mechanisms for its implemention in Indonesia. Henry Keraly (Birmingham University) presented international experiences on Road Maintenance Fund.

Also, on 3 October 2000 a National Seminar on Road Financing was chaired by Patana Rantetoding, Max Antameng, Henry Keraly and the Office of State Minister of Public Works. The participants were the Department of Transport, Department of Settlement and Regional Infrastructure, Legislative, Governors (2 provinces: Jakarta and Central Java).

9.5.3. Problems on implementation Model 2 - setting up a Road Maintenance Fund

In the preparation of the new road law there is a clause on earmarking road revenue to be used to finance the road sector. Most of the road law committee, except the author, agreed to earmarking road revenue. The management of the road revenue will be in the Ministry (State Minister of Public Works) account. This model is not the model proposed in the research. It is called a 1st generation road fund, whereby implementation failed to reach the target set. There is the potential for a lot of leakage, and there is inefficient use of the road fund due to government influences on managing the funds. The idea of earmarking road tax has been rejected by the Minister of Finance. The Minister, in his official letter, stated that earmarking tax would cause inflexibility in the

budget process. Based on that letter the State Minister of Public Works prepared a reply, drafted by the author, to explain that commercialisation of roads will not involve earmarking road tax but will involve earmarking a road tariff. This will be added to fuel price and also through a proper review of heavy vehicle licences.

9.5.4. Proposal for the future strategic action to implement road funding

Experiences in Latin America and Sub Sahara show that the results of implementation take on average about 10 to 12 years to come to fruition. Indonesia is still in the early stages and there are some actions that should be taken, such as:

1. A public hearing on the accommodation of decentralisation in the road sector and one of the agenda items will be to disseminate the idea and discuss the possibility of implementing a road fund in Indonesia. The participants should include the Indonesian Transport Society (MTI), Local Authorities, Non Government Organisations, Universities and IBRA (Indonesian Bank Reconstruction Association). The State Minister of Public Works and the Indonesian Transportation Society should conduct this.

2. Training of trainers in Birmingham University (April – May 2001) for 12 people who are in the first line of promoting a road fund. One person from each of the key Ministries, the Ministry of Finance, the Department of Internal Affairs and the Legislature, should attend the training programme.

3. National level training (mainly for road user organisations, the road community and other stakeholders) to be conducted after point (a) above, where the instructors are the ones attending training in Birmingham University. These should include William Paterson, the World Bank expert on road funds, to give guidance and share international experiences in implementing the road fund. The result and conclusions of the national seminar should be carried as sources of further information for dissemination to regional level seminars.

4. Regional seminars to disseminate the idea of road funding and conducted on islands such as Sumatera, Kalimantan, Sulawesi, Papua, Bali, Lombok, NTT, and Maluku. Participants of national level training would provide main instruction.

5. Comparative studies should be conducted to ensure that politicians and the Department of Finance and Department of Kimpraswil gain experience of implementing a road fund in Indonesia. The likely comparator countries to are seen to be New Zealand, USA, Japan, South Africa and England. Comparative studies would include the experiences of those countries in the move to an era of privatisation.

6. A study on the institutional and legal framework to implement the road fund.

9.6. Conclusions

The short-term solution, Model 1(a), a simplified budgeting procedure, has been undertaken within the proposed timescale. The implementation of Model 1(b) – the decentralisation of the road sector - is currently on hold and will not only encompass roads but the whole responsibility of central government. The task force for this model, previously explained in Chapter 8, will not be a PMU or PIU but the State Minister of Regional Autonomy, whose responsibility is to prepare the decentralisation process. One main problem is the political aspects, whereby during the first ten months of the new government there has been a reshuffle at Cabinet level, resulting in a stagnation of the process of decentralisation.

However, many of the regions seem ready for more autonomy. The danger is that in this environment decentralisation is likely to be achieved through muddling through with an ad-hoc resolution of issues as they emerge. Road sector reform through the introduction of road maintenance fund in Indonesia has been accepted by a group of lenders, such the World Bank and ADB. They are now closely watching progress on the preparation for a road maintenance fund.

Chapter 10. Conclusions and recommendations for future work

10.1. Introduction

The World Bank has provided financial support for the research since the thesis comprises part of a policy initiative within the Indonesian government. The research was commissioned by the Directorate General of Highways in Indonesia to seek and develop an appropriate policy framework for financing district road maintenance in the country.

The study has investigated international experience in road maintenance focusing on experience in Indonesia and comparing it with other developing countries and with developed countries. The UK was used as an exemplar of a developed country to enable some elements of technology transfer to take place. Transfer of technology from England to Indonesia can be achieved through: adopting guidelines for road maintenance such as a Local Government Code of Good Practice; prioritizing maintenance using a road hierarchy to finance different types of road at district level; using simplified budget frameworks to improve the existing budget process; enabling public involvement in the road maintenance sector through complaint mechanisms; using routine maintenance contracts of between 3 to 5 years' duration; and the delegation of more power to local authorities.

A series of models has been developed for phased implementation to comprise a policy framework for road maintenance in Indonesia. More specifically, models focusing on short and medium term policy reforms are a direct contribution of this research, commencing initially with a simplified budgetary process and including the fact that, as a direct result of presentations made to senior representatives in Indonesia, the implementation of Project Implementation Units (PIUs) is to form part of a pilot project at regional level within a more comprehensive program of policy implementation. 27 PIUs are to be established as pilot projects across the country. The thesis has

also presented progress on implementing a longer-term policy of road maintenance funds and provided an outline schedule for implementing the short, medium and long-term policy reform initiatives.

More specifically, the chapter will emphasize the main aim of the thesis and detailing the conclusions, recommendations and specific suggestions for further research. Section 10.2 presents the main conclusions under each objective of the study. Section 10.3 lists suggestions for further research.

10.2. Conclusions

Financing road maintenance is rarely given formal or adequate consideration in the strategic planning process in Indonesia. As a result, the following five objectives were set for the study:

1. to explore issues of road maintenance in Indonesia;

2. to learn from advanced countries such as England to enable the possibility of technology transfer; and

3. to compare current practices in Indonesia with international developing countries experiences.

The findings from these objectives identified that there was a specific need to:

4. improve the current practices for Indonesia by adapting or developing an appropriate model; and

5. validate the models in Indonesia in order to make them applicable for developing a policy framework.

The conclusions from the research will be presented under each objective.

Objective 1: Issues and Problem Statements

To achieve this objective a wide range of issues was explored and the conclusions are set out below.

District roads in Indonesia account for approximately 70% (272.219 km) of the total road network, of which 45% are in poor (26%) and very poor condition (19%). This is in comparison to the national roads, accounting for only 7% of the total network, of which 77% are in good condition. The root of the problem for district roads is the institutional and financial framework of the country. Institutionally, there is no clear policy framework for district roads. There is a lack of capabilities; inadequate planning and too great a dependency on central government, the low salaries of civil servants in comparison to colleagues in the private sector is also compounding the problem.

In terms of the financial structure for road maintenance there is inadequate funding, with funding fragmented centrally through the grant process and often with late release of budgets. There is no serious effort to mobilize district revenues. Central funding is under the control of different central government ministries. Six distinct budget channels were identified, with each having its own rules. The central grant is earmarked for particular purposes and reallocation within it is not possible. It is also difficult to get a complete picture of road maintenance due to the institutionalized fragmentation of the budget process. No district road database exists to oversee the condition of the whole local road network. Road users have minimal if any involvement in road management. No complaint mechanisms for triggering road condition improvements exist, which makes road users disinterested in being involved in road related matters. Equally, the centralization of road management creates no incentives and potential for innovation for district road officers. Local prioritization of road maintenance does not exist and is all based on national priorities. It was identified that the differences between road revenues and road expenditures in most districts need to be reviewed. A road hierarchy exists but is not used for road prioritization purposes. The late release of the annual budget, which is sometimes delivered during the rainy

seasons, makes it difficult to undertake maintenance work. Furthermore, incentives do not exist for local contractors to purchase equipment since there is no certainty they will get continuity of work in the next fiscal year.

Objectives 2: Learning from English Experiences in Managing Road Infrastructures

This objective was achieved through exploratory fieldwork undertaken in England to assist the author learn from a developed country. It provided the opportunity for technology transfer to Indonesia.

As a comparator, the total road network in England is 281,882 km, and motorways only account for 4%, while local roads account for 96% of the total network. Road user tax is approximately three to four times higher than road expenditure. However, these additional funds cannot be used directly; instead they go into the general budget.

There are important similarities and differences between England and Indonesia, not least the differential impact of the geography on road maintenance in terms of the latter. In terms of similarities, in England unclassified roads (55.48%) have deteriorated due to inadequate maintenance. Local roads have deteriorated even further since local authorities do not have enough funds to maintain them. DBFO concessions and shadow tolls have been used to improve the road financing in England, especially some motorways and parts of some A roads. However, the rest of the network is still under local government responsibility. The general government grants cover part of highway maintenance. Highway maintenance budgets have declined between 1992 to 1996 and local authorities are looking for another source of funds, such as through Design Build Finance and Operation schemes, with some pathfinder projects already undertaken. Road maintenance in local authorities, especially for local roads as the lowest part of the road hierarchy, has experienced a huge backlog and has deteriorated vastly.

A mechanism has been set up permitting citizens to address complaints to road authorities either via telephone or electronic mail.

A National Code of Good Practice has been set-up, although some of local authorities have implemented their own Local Authority Code of Good Practice. Routine maintenance work is mostly undertaken by contracting out and some county councils have privatized their Direct Labor Organizations, accommodating them within a competitive bidding process. Contracts are let for three-year road maintenance work programs and this is a good way to encourage contractors into maintenance work. Decentralizing the local road network to local government permits capturing the whole picture of their network through an annual survey, undertaken by independent bodies outside local government.

Objectives 3: Compare Current Practices in International Developing Countries

This objective was achieved through the literature review presented in Chapter 3, with international experience of developing countries in road maintenance taken from a series of reports and journal papers.

Internationally, local roads have suffered from lack of capabilities for doing maintenance; inadequate planning and the low salaries of civil servants causes them to opt for work in the private rather than in the public sector. Road maintenance is funded through the general budget instead of through road user charges and, as a consequence, inadequate funding has been highlighted. Most of the roads in developing countries are under funded, with only 30-50% of the amount required being spent on maintenance.

To overcome this, the World Bank and IRF, GTZ and UN ECLAC have pioneered the implementation of road maintenance funds. A road maintenance fund is derived from road tariffs that comes from fuel surcharges and vehicle registration fees. It might also include fines for

overloading vehicles as well as interest from road maintenance funds. In spite of its adoption in two regions, developed economies, like those in Europe, still favour the use of the general budget to finance their roads, although the trend is now declining. Only three countries in Europe, and New Zealand, have implemented road funds.

Implementation of a road maintenance fund should take into account country conditions and whether a set of minimum requirements has been fulfilled. Failing this, it will be better if the country improves the existing budgeting systems through simplifying and improving the institutional aspects of road maintenance. Later, the country can implement a road maintenance fund if they feel it is necessary. Despite differences in conditions between individual countries, a positive aspect for implementing road maintenance funds is the active participation of road stakeholders, including road users, in the management of roads. Active participation by them should enable users to understand the current problems of road maintenance, including the lack of capacity of a government to maintain its own road assets. Participating in the management of roads through the road maintenance board should increase willingness to pay. The board, consisting of all road stakeholders, oversees the road maintenance fund. Road prioritization based on local needs would be accommodated in this approach.

Objectives 4: Improve Current Practices by Adapting or Developing an Appropriate Model for Indonesia

This objective has been achieved.

Each developing country has its own characteristics and individual differences. Chapter 3 indicated that national budgeting frameworks can be separated into three distinct phases, e.g. Low (phase 1), Medium (Phase 2) and High (Phase 3). Countries in Phase 2 will probably be able to implement a road maintenance fund. Indonesia is still in the Low budget phase - Phase 1 – and as a consequence preliminary models for improving road maintenance have been built up. These comprised two models:

Model 1 was developed to speed-up the decentralization process to district governments. Central and regional task forces are to be set up, with the latter operating at district level. Task forces at central and district levels would be responsible for: simplifying budget procedures; increasing local government capacity through training; setting up road priorities based on the existing road hierarchy; introducing road network management to help local authorities manage their roads, analyzing and improving the existing local road budget and increasing the level of coordination between actors who are involved in road maintenance issues. These models are to be piloted before full implementation across the whole country. Model 1 could be implemented within five years. Decentralization law No. 22/99 permits not only the decentralization of the road network but also the whole of government. However, there is still considerable preparation required before the pilot projects can be implemented, such as the development of a Code of Good Practice and Standards.

Model 2 creates an independent road fund, free from government intervention, with an independent board consisting of public and private sectors to oversee it. The World Bank has introduced road funds into developing countries, and it is also working well in New Zealand. Model 2 is to be implemented when Model 1 is running well. The outline program indicates that Model 2 would take at least 7½ years to complete.

These models were subsequently tested and validated in Indonesia to meet objective 5.

Objective 5: Test and Validate the Models in Indonesia in Order to Make Them Applicable

This objective has been achieved.

There was a need to involve the road maintenance decision-makers in Indonesia. Development, testing and validation have been done through presentation, discussion and interview with relevant

actors in central and local government. The results of the validation involved a minor restructuring of the models, with revised models presented below in Figure 10.1.

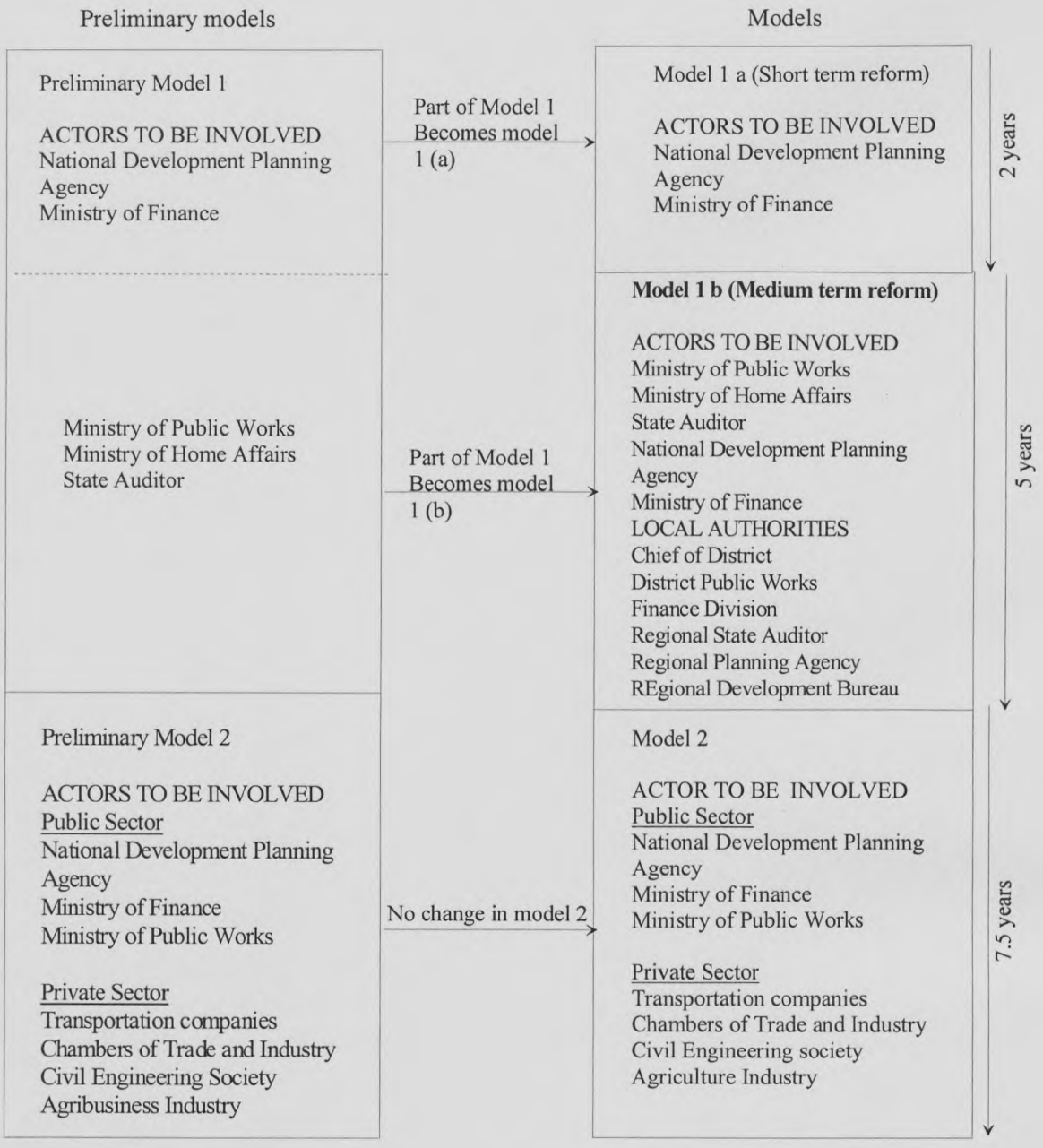

Figure 10-1 Model development. [Source: Author (1998)]

Variations from the original two main models have been due to the economic crisis. It will be difficult for the government to implement Model 1 fully due to lack of funds and full implementation will wait until the economic crisis is over. However, some of the activities in

Model 1 can be undertaken without additional funds. Model 1 now has two components. Model 1(a) involves adopting simplified budgeting channels through two main influential actors in the budget process, i.e. the National Development Planning Agency and the Ministry of Finance. Simplified budget procedures should be followed by setting-up road priorities and starting to review the existing budgeting process in local government, which as indicated earlier also experiences significant delays. The implementation of this model was started after the General Elections in May 1999 and will be completed by 2002.

Model 1(b), building on Model 1(a), creates task forces at central and regional levels. Model 1(b) will start in the fiscal year 2002/2003 and would be completed by 2006/2007. The implementation of Model 2, namely, creating a road maintenance fund, will depend on the implementation of the previous two aspects of Model 1. The suggestions proposed by the National Development Planning Agency to attach road maintenance funds on a provincial basis would not be feasible during this period.

Following this research study, the Indonesian Government has taken on board Models 1(a) and 1(b) and ministerial representatives have agreed to implement the PMU as a central task force, including implementing 27 PIUs. The Districts that will be chosen as PIUs will be previous pilot projects from the Decentralization initiative. While the road decentralization program is being strengthened, the government has also introduced the possibility of implementing a road maintenance fund. Numerous seminars have been undertaken to date, starting in November 1999 and continuing until the present time of writing. A public awareness campaign has been targeted at presenting the importance of road maintenance, the consequences of neglecting it for road users and the introduction of road maintenance fund mechanisms. Up to the present time of writing, five provinces have been the focus of an awareness campaign. There will be a further fifteen provinces in the next public awareness campaign before the final decision is made on the pilot project provinces. Although this will take some five years to implement, at the same time it is important to increase efficiency, either through the use of modified technology or shifting to a new paradigm

of fairness and competition. The public awareness campaign is also about getting as much public support as possible before enabling legislation goes to the Ministry of Finance or the legislature, either at national or local levels.

A number of areas for further research have been identified.

10.3. Recommendations for future research

Through this thesis, several areas of further investigation have been highlighted. Most importantly there is a need to study:

- People participation in financing district roads. Potentially, parts of district roads can be funded from local participation, for example farmers responsible for access from the fields to markets in the rural areas. The other possibility is that farmers will have to pay for part of the financing of rural road projects. The aim of local participation is to develop or create rural road cooperation consisting of all district stakeholders, including farmers.

- Downsizing the public sector. This means a reduction in government expenditure but economic efficiency will be increased only when thoughtfully designed. Dissociating targeting from compensation is the key and to compensate for downsizing the government should try to increase civil servants' salaries so that they are comparable with their counterparts in the private sector.

- Road fund options. There are at least three options within road maintenance fund mechanisms that should be taken into consideration – a national road fund, a provincial road fund, or a district/urban road fund. The national road fund is not an appropriate mechanism at the moment to be introduced after 32 years of centralization. However, during this decentralization era there are two options available, either the provincial or district/urban road

maintenance fund. It is difficult to maintain 360 district/urban road maintenance funds because of the low volume of road and kabupaten capacity. The only possible option is a provincial model since the provincial government is now in charge of road related revenues, such as vehicle licences and fuel taxes. However, this would mean Indonesia would be the only country in the world to use a provincial road fund. All three models have been discussed during the public awareness campaign, and to date all five provinces have stated no objections towards provincial road funds. The preparation of pilot projects should at least cover the following in any further study:

1. The fuel tariff to cover the maintenance of country road networks. The fuel tariff could be reduced accordingly if additional road maintenance tariffs for heavy vehicles are being applied.

2. An appropriate formula for dividing funds between different classes of road or different road authorities should be as fair as possible by taking into account the low volumes of road traffic, especially in the eastern part of Indonesia.

3. The possibility of using two models, such as a combination of a national road maintenance fund as a balancing pot between richer regions/provinces to poor regions/provinces, while at the same time implementing provincial road funds to deal with their own sources of road related revenues.

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APPENDIX A

QUESTIONNAIRE

To:

Ref: Questionnaire on Financing of Road Maintenance
in Local Government in England

Dear Mr/Mrs/Ms .....

Max Antameng is a Doctoral candidate in my Department carrying out research related mainly to the financing of Road Maintenance. The attached questionnaire is collecting data for a research project funded by the World Bank on behalf of the Government of Indonesia.

In order to carry out this research effectively we are investigating the financing of local Road Maintenance in England, in order to examine the possibility of transferring that model in a modified form to Indonesia.

The questionnaire is requesting information on the Road Maintenance budget process in your local government and other aspects of road maintenance related to the budget process.

I wish to assure you that all data supplied will be held in strictest confidence, and will be reported only in the form of statistical summaries. I, however, would be very glad to acknowledge your help in future publications, and provide a summary report of the research when it is completed.

I would be grateful if you could indicate on the back page of Questionnaire if you would be willing to be interviewed for approximately one hour to clarify questions and to analyst further issues related to road maintenance.

I would be grateful if you could return the questionnaire at your earliest convenience.

You may return the completed questionnaire to me, c/o the above address.

Yours sincerely,

Professor Steven Male

Head of Department :
Professor Steven Male
Balfour Beatty Professor of Building Engineering
And Construction Management

FINANCING OF LOCAL GOVERNMENT ROAD MAINTENANCE IN ENGLAND

DEPARTMENT OF CIVIL ENGINEERING
UNIVERSITY OF LEEDS

QUESTIONNAIRE FORMAT AND STRUCTURE

The purpose of this questionnaire is to elicit information about current budget practice in English Local Government Authorities and the effectiveness of these practices. A questionnaire to the Transport/Highway Officer has been sent to County Councils and some city councils in England:

The questionnaire is divided into the following sections:
1. Road Survey
2. Budget Allocation
3. Budget Process
4. Maintenance Management Systems

We would be grateful if you can return the questionnaire within 10 (ten) days of receipt. A pre paid envelope is provided for this purpose.

GUIDELINES FOR COMPLETION OF THE QUESTIONNAIRE

1. The questionnaire is divided into four parts, You can either:

   1.1 Tick one of the possible alternative answers for each question. You are provided with a check list of the possible answers to select form.

   1.2 You may be required to write narrative answers for some questions

Name officer : _____

Job Title : _____

No. of years in current
Local authority : _____

Years in present
Position : _____

Areas of
Responsibility : _____

_____

_____

Name and Address of County Councils

Appendix B

No	Name and Address	Job Title	Areas Responsibility
1	Bedfordshire County Engineers Dept Bedfordshire County Council County Hall, Beds MK42 9AP	Principal Engineer Highway Assessment	All types of highway assessment materials advice, computer systems for highway maintenance scheme
2	Buckingham Head of Transportation Environmental Services Dept		
3	Cambridgeshire Transport Department Cambridgeshire County Council Castle Court, Shire Hall, Castle Hill Cambridgeshire CB3 OAP		
4	Cheshire Dept of Highway & Transportation Cheshire County Council Rivacne Business Centre Mill Lane, Ellesmere Port L66 3TL		
5	Cornwall Social Services Transport Officer Cornwall County Council County Hall, Treyen Road Truro Try 3 AY	Revenue Program Manager	Highway maintenance, dis-used landfill sites, budgetary allocation + control
6	Cumbria Cumbria Dept of High & Transport Cumbria County Council, Citadel Chambers, Citadel Row, Carlisle CA3 8SG	County Road Engineers (area)	Maintenance of County Road Network Excluding Structures
7	Devon Network Management Environment Department Exeter EX2 4QW		
8	Derbyshire County Council Head of Public Transport, Derbyshire County Council Chatsworth Hall		
9	Dorset CC Transport Coordination Centre Engineering and Planning Dept County Hall, Topsham Road Exeter EX2 4QR		

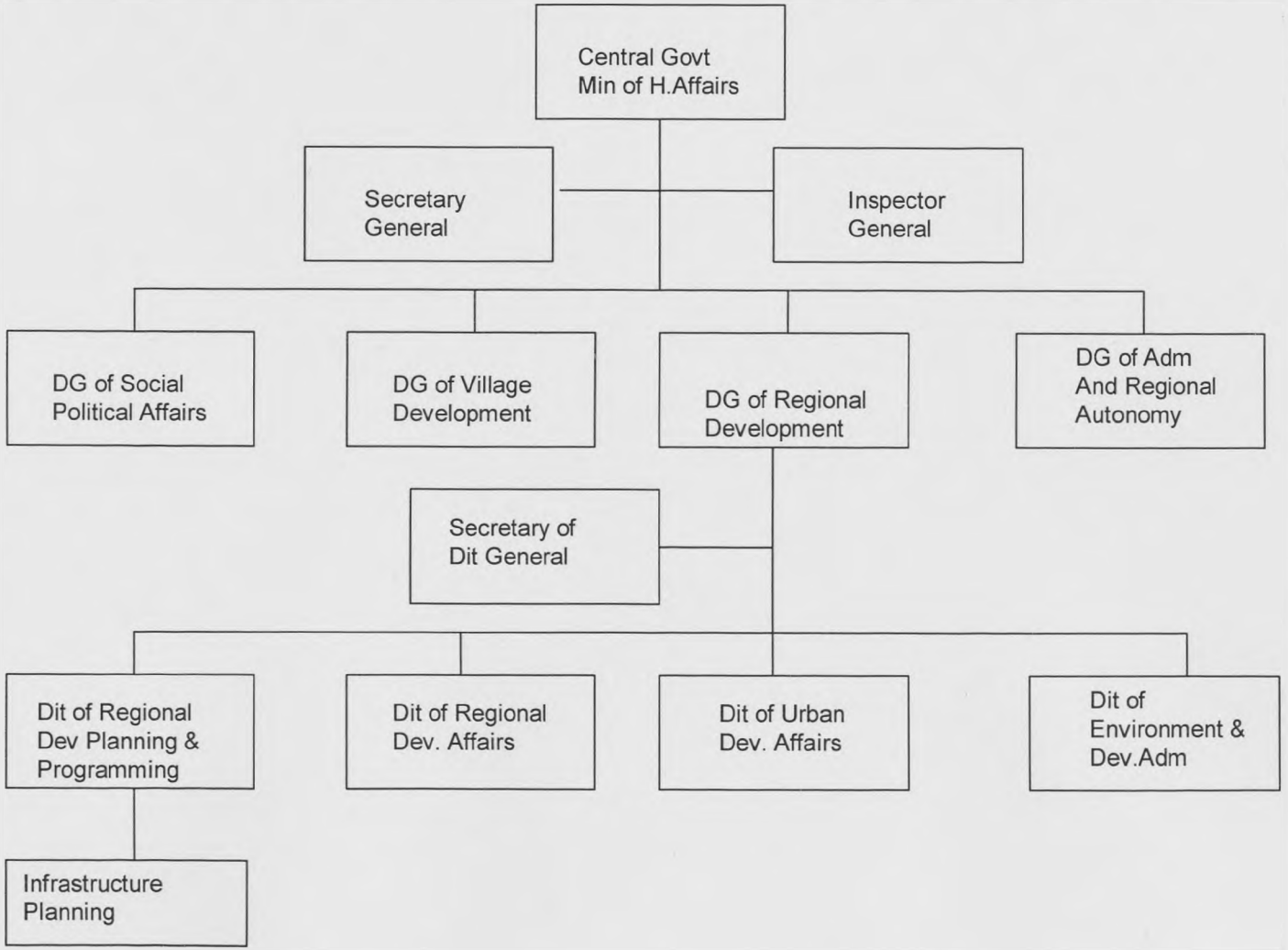
	Name and Address	Job Title	Areas Responsibility
10	Durham County Councils Environment Department County Hall, Durham DH1 5UO		
11	East Sussex County Council Sacville House, Brooks Close East Sussex County Council Lewis, E Sussex BN7 1UE		
12	Essex County Council Public Transport Coordination Officer, Planning Department Essex County Council Chelmsford, Essex CM1 ILF	Principal Engineer	Network Maintenance and Contracts
13	Gloucestershire County Council Public Transport Manager, County Surveyor's Department Gloucestershire County Council Bearland Wing, Shire Hall		
14	Hampshire County Council County Surveyor's Department Hampshire County Council The Castle, Winchester so23 8ud		
15	Hereford & Worcester County Council Dept of Engineering & Planning Hereford & Worcester County Council Spetchley Road, Worcester WR5 2NP		
16	Hertfordshire Transportation Department, PO Box 99, Goldings North Road Herthford SG14 2RE	Assistant Director Network Management	Designated head of Engineering service responsible for all aspects of highway network management
17	Isle of Weight Public Transport Officer County Surveyor's Department County Transport Department Isle of Weight		
18	Kent County Council Kent, Public Transport Planning Manager, Highway & Transportation Dept. Kent County Council		

	Name and Address	**Job Title**	**Areas Responsibility**
19	Lancashire County Council Lancashire, Transport Coordination County Surveyor's Dept, Lancashire County Council, PO Box 9		
20	Leicestershire County Council Leicestershire (0116-2657177) Group Manager Network Management and Road Safety	Group Manager network Management and Road Safety	Client for highway maintenance administration, routine traffic management, lighting & bridges on county road; road safety
21	Lincolnshire Lincolnshire (01524-847701) Principal Engineer (maintenance) Citihall, Bearmont Fee Lincoln LN1 1DN	Principal Engineer	Highway maintenance – policy, processes, budgets TPP Bids, Maintenance Management systems & Surveys
22	Norfolk County Councils Public Transport Officer Dept of Planning and Transportation Norfolk County Council County Hall		
23	North Yorkshire Public Transport Officers Highways & Transportation Dept, North Yorkshire County Council		
24	Northampton Public Transport Coordinator P.O Box 287, 27 Guildhall Road Northampton NN1 1BB	Head of Highway management policy	Policy resources, information+ assessment relating to management & maintenance of county highways
25	Northumberland County Council Public Transport Team County Hall, Morpeth NE61 2 EF		
26	Nottinghamshire County Council Public Transport Group Planning & Economic Development Dept Trent Bridge House, Fosroad, West Bridsford, Nottingham		
27	Oxford County Council Public Transport Officer Dept of Planning & Property Services, Oxfordshire County Council, County Hall, New Road		
28	Shropshire County Council Public Transport Team Leader Shropshire County Council		

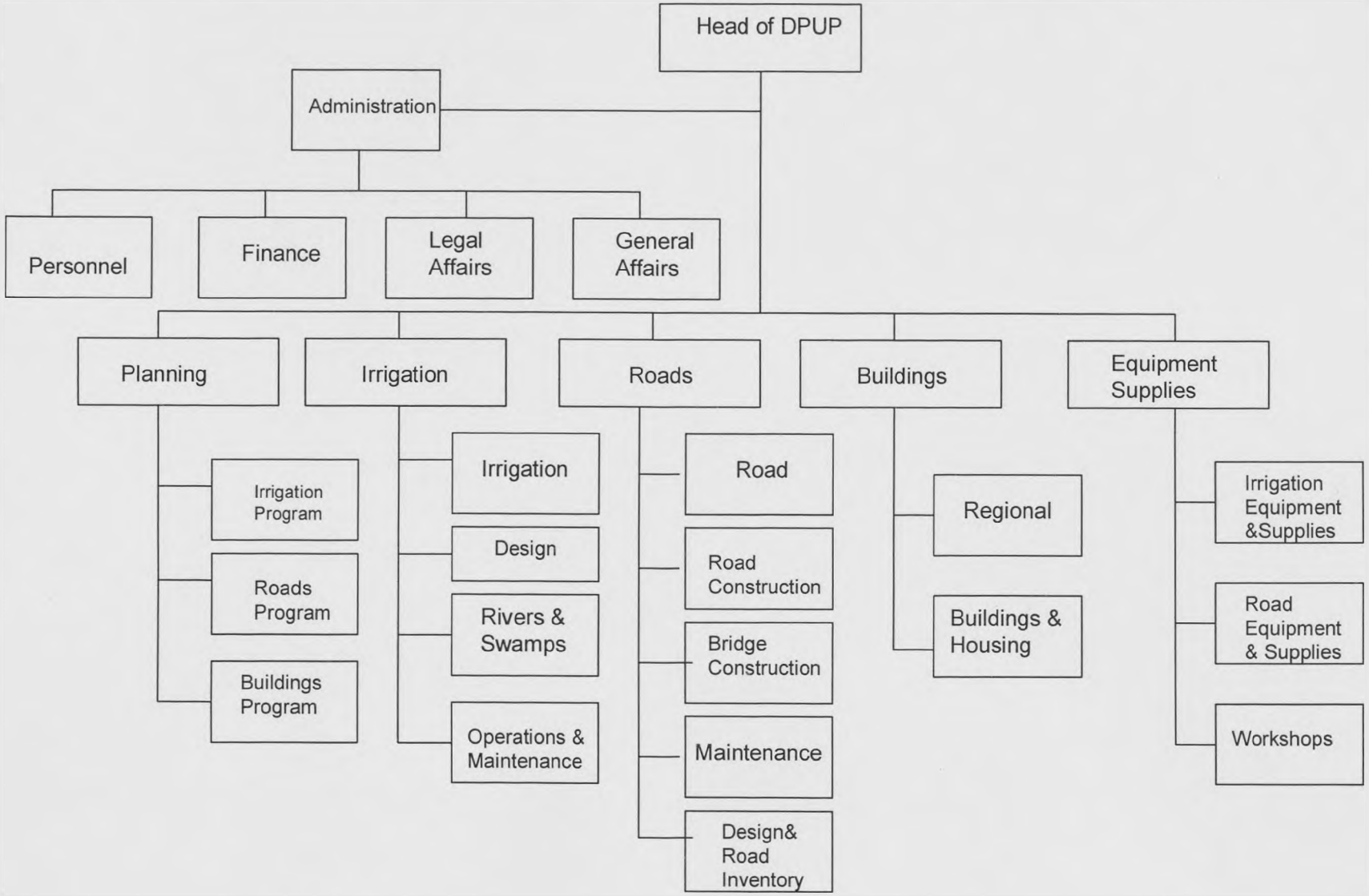
	Shire Hall		
	Name and Address	**Job Title**	**Areas Responsibility**
29	Sommerset County Council Public Transport Department Transport Brooker, County Hall		
30	Staffordshire County Council Public Transport Coordination County Planning Department Staffordshire County Council		
31	Suffolk County Council Public Transport Team, Highway Dept, Suffolk County Council St. Edmum House, County Hall Rope Road		
32	Surrey County Council Principal Public Transport Officer Transportation Planning Unit Surrey County Council County Hall, Penrhyu Road	Head of County Roads	Highway maintenance policies, standard budget contracts, highway lighting, major maintenance, winter maintenance, NRSWA etc
33	Warwickshire Passenger Transport Unit Department of Planning, Transport & Economic Strategy PO Box 43		
34	Wiltshire Public Transport Coordination Dept of Planning & Highways Wiltshire County Council County Hall, Trowbridge BA 14 8JD		
35	Leeds City Council Miss. H. Franklin (0113-2475316) Leeds City Council Chief Engineer Highway Maintenance Leeds City Councils Dept. of Highways and Transport	Chief Engineer Highway Maintenance head quarter	Highway maintenance policy, contract preparation, conditions survey, street lighting design
36	Wakefield Metropolitan Mr. R. Battye Wakefield Metropolitan City Councils	Highway network manager regeneration department policy	Highway Maintenance street lighting, RASWA Winter maintenance

Note:
No. 34;35 involved in pilot project
No. 1;5;11;15;23;31 Questionnaire and Interview respondents
No. 6;7;9;10;13;18;22;25 Questionnaire respondents

Organization Chart of DG Regional Development



Organization of the Provincial Public works Offices (DPUP)



Organization Chart of Directorate General of Highways