The Cost of Moving Goods
Road Transportation, Regulations and Charges in Indonesia

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The Asia Foundation is a private, non-profit, non-governmental organization committed to the development of a peaceful, prosperous, just, and open Asia-Pacific region. In Indonesia, the Foundation's Economic Program works with local governments and small business associations to improve local-level governance and the regulatory environment.

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Unreliable and expensive road transportation is a growing constraint to Indonesia's development. In comparison with other countries in Asia and world-wide, the Indonesian trucking industry is high-cost and inefficient. Indonesia also scores badly relative to other countries in terms of domestic logistics and transportation (World Bank, 2007a). A combination of regulatory red-tape and high domestic transportation costs hampers Indonesia's trade competitiveness. In some export sectors, such as cocoa, rubber and coffee, more than 40% of total logistics and transport costs come from pre-shipment and inland transportation expenses in Indonesia before international shipment (Carana, p.37, 2004).

To assess the size and nature of domestic road transportation costs, The Asia Foundation, in partnership with the University of Indonesia's Institute for Economic and Social Research (LPEM-FEUI) implemented a comprehensive survey of domestic trucking costs along nine routes in Indonesia. The survey explicitly examined licensing costs, road charges and the costs associated with poor infrastructure. Through GPS tracking and interviews with firm managers and truck drivers, the survey identifies exactly who is charging drivers, where they are being charged and how much.

Results from this survey indicate that although the trucking sector is quite open in Indonesia, the regulatory framework for road transportation still creates unnecessary costs and is far simpler in other countries. A key characteristic of the Indonesian legal environment is the discrepancy between national and local regulatory practices. In particular, local governments often issue permits and licenses and impose user charges that act as barriers to the transportation of goods throughout the country.

Vehicle operating costs in Indonesia are higher than in other Asian countries, due in part to poor road infrastructure and mountainous terrain. But the cost of illegal and legal charges is also significant. On the road, drivers are liable for various kinds of payments, including: local user charges; legal and illegal payments at weigh bridges; and

payments to police or *preman* (criminal organizations). User charges are fees set by local governments for transporting goods along surveyed routes and make up almost 50% of total payments along some routes. Many user charges are in fact illegal and redundant.

While user charges are often only intended to raise revenue for local governments, weight limits in principle serve the public interest by ensuring that trucks do not damage the roads and endanger other road users. However, our survey shows that weight limits are routinely ignored and weigh stations are frequently used to extract illegal payments. The trucks along the nine routes surveyed are typically overloaded by 45%, or 4 metric tons over the maximum legal load, because regulations on weigh stations are not enforced. This failure to effectively enforce weight limits endangers public safety and damages the roads.

Truck drivers and transportation firms also make payments to the police and to local *preman*, criminal organizations which often have army and police connections. On-the-road payments to police and *preman* are more common in Sulawesi relative to non-Sulawesi routes. For example, a typical truck going from Mamuju to Pare-Pare would be stopped 10 times by the police or by *preman*. These stops generally serve no useful function – rather they are merely another means of extracting bribes from transportation firms, further raising the costs of domestic trade.

As an alternative to on-the-road payments, some trucking firms make regular payments to the police, or to *preman* organizations, so they will not be charged on the road. This was particularly common in Sumatra and, to some extent, in East Java. Firms in Sulawesi make fewer routine payments, but when they do these are usually made to the police. Payments to police, the army, and *preman* organizations are generally illegal, damaging perceptions of the rule of law and the overall business climate.

1. Introduction

Indonesia's business climate overall is improving. According to the World Bank's Doing Business Report 2008 (World Bank, 2007b), business perceptions of Indonesia's investment climate are improving in most areas. Indonesia's overall "ease of doing business" ranking has improved from 135 in 2007 to 123 in 2008. Macroeconomic indicators have stabilized and Indonesia's GDP growth rate in the second quarter of 2007 reached 6.3%.

Although perceptions of the business climate are improving on most fronts, perceptions of infrastructure and transportation have worsened. In some export sectors, more than 40% of the total pre-shipment and inland transportation costs are incurred within Indonesia before international shipment (Carana, 2004).[1] This greatly harms Indonesia's international trade competitiveness and contributes to a high-cost economy.

Inland transportation costs are high in comparison to other countries. For example, delivering goods from Warsaw to Hamburg, a distance of 750 kilometers, costs half the amount it costs to move freight 240 kilometers from Makassar to Enrekang in Sulawesi (Carana, 2004). Infrastructure costs, licensing costs and road charges all contribute to overall operating costs and harm domestic trade and the investment climate in Indonesia.

Indonesia's poor infrastructure is impeding the domestic trucking industry and limiting the ability of small business owners to access profitable markets. The poor quality of district roads is an impediment to trading across districts and to integrating poor and remote areas with larger markets. At the district level, only 49% of district roads are in reasonable condition (World Bank, 2007c). The costs and time required for small-

[1] The USAID/Carana team separated total costs into pre-shipment, inland, and international freight costs for the commodities. The pre-shipment cost category included all costs prior to the shipment starting its journey to an international buyer. These included bringing the goods from producer to a warehouse, preparing the goods for shipment, packaging, labeling, preparing documentation, obtaining necessary certifications and licenses, etc. Inland costs included transportation costs to the port of origin, and finally for international freight, all costs from the port of origin to the port of destination were included.

and medium-sized enterprises or small farmers to reach markets significantly reduces their profits. Approximately 70% of freight in Indonesia is transported by trucks, and therefore the road system is critical. Unfortunately, the majority of the trucks on the road in Indonesia are old and poorly maintained. Poor infrastructure increases maintenance and fuel consumption costs, narrowing the profit margins of Indonesian business owners.

Dangerous and costly practices such as overloading are common throughout Indonesia. Although weigh stations are required by law, truck drivers simply bypass them by paying a non-compliance fee to the local officials manning the weigh stations. This results in widespread overloading, endangering safety and damaging the roads even further.

In addition to infrastructure costs, business owners and truck drivers must pay for licenses, permits and on-the-road charges. These costs, both legal and illegal, impose significant constraints on local producers' ability to trade. Corruption in the form of illegal bribes and fees is endemic in the road transportation sector in Indonesia. These fees result in increased prices for consumers. A recent report on Aceh (Olken and Barron, 2007) found that trucks traveling the route from Banda Aceh to Medan spent about USD 40 per trip, or about 13% of the total cost of a trip, on bribes, extortion, and protection payments. The study also discovered that price setting is decentralized along the roads, and corrupt officials practice several types of price-discrimination, acting like monopolistic firms. This study took a similar approach to the study by Olken and Barron, but examined nine trucking routes throughout the country. Using this larger sample size we confirm that their findings are not unique to Aceh, with the same costly and corrupt practices seen along roads throughout Indonesia.

This domestic transportation survey, carried out in partnership between The Asia Foundation and the University of Indonesia's Economic Research Center (LPEM-FEUI) examined transportation costs along nine routes in Indonesia. The survey uses a combination of GPS tracking and interviews with truck drivers and trucking firm owners to examine charge-related and infrastructure-related costs in detail.

Transportation costs were captured through two surveys: a survey of truck drivers to capture on-the-road costs, and a survey of trucking firm managers or owners to capture costs paid at the firm level. In addition, a study on the regulatory framework of the trucking industry was also conducted for each district through which the routes passed and at the national level.

Six of the nine routes selected were in Sulawesi, with three others, selected for comparison purposes, located in North Sumatra, East Java, and West Nusa Tenggara. The Sulawesi focus allows for a more in-depth analysis of major transport routes within the island, crossing different districts. The district-level analysis is important because district and city governments have the authority to reduce local permits and charges on transported goods.

The next section describes the key characteristics of the trucking industry in Indonesia. Section 3 then describes the methodology of our survey in detail. Section 4 provides an explanation of the legal context for transportation charges which is necessary to understand the nature of charges faced by transportation firms. Section 5 then provides our main findings, broken down by the different types of costs while Section 6 concludes with recommendations for policy.

2. The Trucking Industry in Indonesia

The transportation sector in Indonesia is an important and growing sector. Between 2004 and 2006, the transport and communications sector made up an average of 6% of Indonesia's Gross Domestic Product. The growth of the sector also exceeded the growth of all other sectors.[2] The three-year average annual growth rate, between 2004 and 2006, of 13%, was more than double the non-oil and gas average annual growth rate of 6%. Road transport, as part of the transportation sector, is growing steadily, although it is surpassed by the growth in air and sea transport.

Table 1 – GDP Structure and Growth by Industry, 2004-2006 average

	3-year average (2004-2006)	
INDUSTRIAL ORIGIN	Share of total GDP	Annual growth
1. Agriculture, Livestock, Forestry & Fishery	15%	3%
2. Mining & Quarrying	9%	0%
3. Manufacturing Industry	28%	5%
4. Electricity, Gas & Water Supply	1%	6%
5. Construction	6%	8%
6. Trade, Hotel & Restaurant	17%	7%
7. Transport & Communication	6%	13%
a. Transport		7%
1) Railways Transport		1%
2) Road Transport		5%
3) Sea Transport		7%
4) River, Lake & Ferry Transports		4%
5) Air Transport		17%
6) Services Allied to Transport		7%
b. Communication		24%
8. Finance, Real Estate & Business Services	9%	7%
9. Services	9%	6%
GROSS DOMESTIC PRODUCT		5%
GDP WITHOUT OIL & GAS		6%

Source: BPS-Statistics Indonesia (www.bps.go.id)

Looking just at trucking, in 2005, there were 47.6 million vehicles on the road in Indonesia, and approximately 4.6 million were trucks, amounting to about 10% of all vehicles (Government of Indonesia, 2007).

[2] Although driven primarily by air transport and communications.

The trucking sector in Indonesia has few barriers to entry. The trucking industry appears to be highly competitive, with a large number of independent trucking companies. There is a low barrier to entry and multiple providers exist. There are no entry regulations for trucking firms transporting goods or for specific routes. The operational area of trucks (and other goods-carrying vehicles) is not limited by administrative jurisdictions.[3] Because of high competition, trucking firms face thin profit margins. Current market prices are reported to be 30% below the tariffs recommended by *Organda*, the national land transport association.

Table 2 – Profile of a Typical Trucking Firm and Truck on Surveyed Routes

Firm Profile	
Ownership	Single Owner- Operated
Company Status	Sole Proprietorship
Fleet Size	Average of 4 Trucks
Truck Profile	
Average Age of Trucks	10 years
Type	Open-Box, allows overloading
Make	Mitsubishi
Commodities	Various

Source: primary data, processed

Transportation company structures range from a few regional truck fleets to numerous owner-operated trucks. *Ekspedisi* companies are truck operators which rent out their trucks to other firms. These firms are also called 'general' trucking companies as their trucks carry different mixes of general goods. There are also trucks that are owned and operated by freight forwarder companies, or transportation and delivery companies, which tend to transport high volumes. Many businesses, both small and large, prefer to operate their own trucks. The typical trucking firm surveyed in this report, profiled in Table 2, is an owner-operator with four relatively old open-box trucks transporting a wide variety of goods. Thus, the market structure is very varied, with small firms constituting the vast majority and few or no barriers to entry.

[3] The decree specifically states that the "operational area of transportation of goods, as stipulated in article 2 paragraph 2 (goods-carrying vehicles), begins from loading (origin) to unloading (destination), and is not limited by administrative jurisdictions and or national boundaries." (Ministry of Transportation Decree No. 69 Year 1993 on Transportation of Goods on Roads - *Keputusan Menteri Perhubungan No. KM 69 Tahun 1993 tentang Penyelenggaraan Angkutan Barang di Jalan*)

Trucks in Indonesia are old and in poor condition, and are further damaged by the practice of overloading. The age of trucks on routes surveyed averaged 10-11 years old, with an average service life of 13 years, far higher than the US median truck age of 6.9. Used truck fleets are often imported wholesale and are in poor condition (Carana, 2004). These trucks are further damaged by the practice of overloading. They are often modified so that they can carry excess loads in order to bring in greater profits. The only part of the truck that cannot be easily expanded and modified is the axle, leading to a great number of broken axles.[4]

Trucks are under-utilized and overloaded. Because most trucks are overloaded and the roads are damaged, trucks tend to make fewer trips at a slower pace. Trucks surveyed in this study traveled an average of 21,800 kilometers per year, less than half of the Asian average of 57,000 kilometers per year.[5] This is because trucks experience a number of delays and therefore do not complete as many trips as they do in other countries.[6] Some of these delays are due to poor roads, while others are due to bureaucracy. For instance, a truck making a round-trip from Bandung to Jakarta may spend up to 75% of its time parked due to customs processes, warehouse delays, and lift-on and lift-off queues (Carana, 2004, p.47).

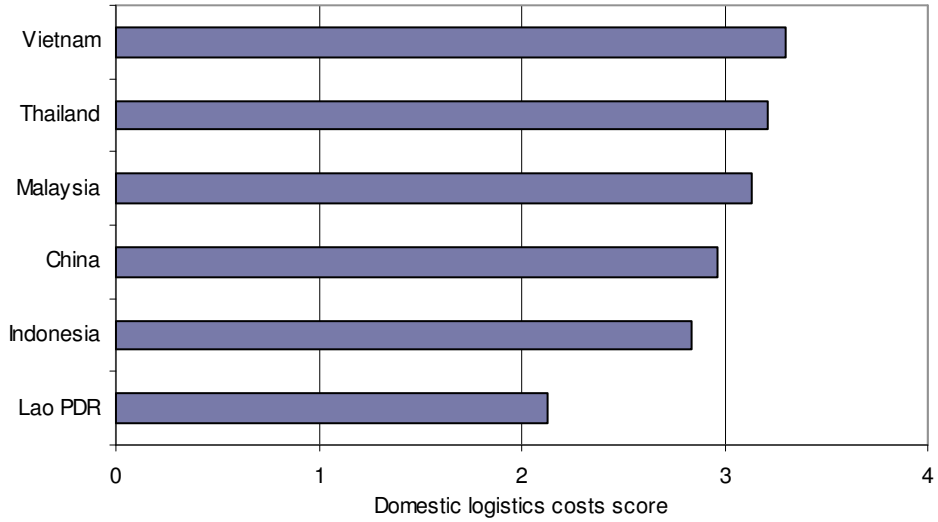
Illegal road charges pose a significant barrier to the trucking industry. According to Murphy Hutagalung, the head of the Indonesian road transport association *Organda*, illegal charges represent a significant cost to the trucking industry. "If only the funds that are lost to illegal charges were invested in our truck fleets and improving the transportation system, I believe the quality of our transportation system would be far better than that of our neighboring countries."(Suara Karya, 22 September, 2007). Because trucks generally run overloaded and truck drivers often do not understand all of the charges required, drivers are particularly vulnerable to illegal charges from policemen and *preman* organizations. These fees are often viewed as security payments by truck

[4] Personal interview with the Head of Research and Development Department, *Dewan Pimpinan Pusat* (*DPP*) Organda (the land transportation association), 7 November 2007.
[5] *Road User Costs Study Results*, World Bank (2006a).
[6] Personal interview with the Head of Research and Development Department, *Dewan Pimpinan Pusat* (*DPP*) Organda (the land transportation association), 7 November 2007.

drivers. However, truck owners still argue that it is cheaper to pay non-compliance fees or routine payments than to comply with rational regulations, such as weight limits.

Compared with other countries in Asia and world-wide, the Indonesian trucking industry is high-cost and inefficient. Infrastructure costs, licensing costs and road charges are all higher in Indonesia than in other countries. Indonesia was ranked number 43 out of 150 countries in The World Bank's Logistics Performance Index (LPI) (World Bank, 2007a). The LPI is a benchmarking tool that measures performance along the logistics supply chain within a country. The index places Indonesia below many of its neighbors in Asia, including Singapore, Malaysia and Thailand. One factor measured by the LPI is domestic logistics costs, which includes domestic transportation and warehousing costs. On this scale (see Figure 1), Indonesia scores below Vietnam, Thailand, Malaysia, and China, despite similar labor costs. Thus, domestic logistics costs significantly hinder Indonesia's trade competitiveness worldwide.

Figure 1 – Domestic Logistics Costs



Notes: scale between 1 (lowest/worst score) and 5 (highest/best score).
Source: World Bank (2007), http://go.worldbank.org/XQMBHIUUR0

High logistics costs are a result of poor regulatory performance, high road charges and infrastructure-related costs. Infrastructure costs in Indonesia are high in part due to the condition of secondary, arterial roads. A survey conducted by the World Economic Forum ranked Indonesia 91 out of 131 countries in the transportation infrastructure area

(The Jakarta Post, 27 February, 2008). Only 58% of the total road length in Indonesia is paved, leading to higher maintenance costs for vehicles traveling secondary roads, particularly trucks bearing high loads. By comparison, 98.5% of Thai roads are paved, and 80.8% of Malaysian roads are paved (*The IRF World Road Statistics*, 2006).

Although it is recovering now, Indonesia has suffered from a decade of underinvestment in roads. After the Asian financial crisis, public infrastructure expenditure fell to about 1% of the GDP in 2000. By 2007 it had risen to 3.4%, which is still below pre-crisis levels of 5% to 6% of GDP (World Bank, 2007c). In general, Indonesia's national and provincial roads are financed and maintained through the Special Allocation Fund (*Dana Alokasi Khusus* or *DAK*), while the General Allocation Fund (*Dana Alokasi Umum, DAU*) transfers funds from the central to the district/city governments. According to a World Bank study on road conditions and SMEs in Manggarai, East Nusa Tenggara,[7] lack of *DAU* is one of the biggest limitations to the government's ability to maintain district/city roads, since allocations are based on population, rather than land area. In this study, we focus on major trade and distribution routes, which are primarily national roads. Our study indicates that hilly topography, rather than road quality, is the major challenge along these routes.

The World Bank study also shows that poor infrastructure, whether due to road quality or topographical reasons, also has secondary effects. For example, infrastructure affects the reliability of commercial deliveries. Damage and spoilage due to unpredictable travel times and conditions can mean that small businesses cannot access large markets, such as supermarket chains. Poor road quality also increases the costs and sometimes reduces the availability of production inputs, such as fertilizer. Overall, the poor quality of roads in more isolated areas of Indonesia significantly raises the costs faced by small businesses, transport firms and consumers.

[7] World Bank (2006b). *Roads in Manggarai District, East Nusa Tenggara: Infrastructure Decline and Impacts on Business and Communities*. Rural Investment Climate Assessment Case Study 5. World Bank Office, Jakarta.

3. Methodology

This study aims to compile direct and indirect costs of transporting goods across districts, in particular those relating to road infrastructure, regulatory and licensing costs and illegal charges. In particular, the study aims to: a) analyze and review the regulatory framework governing the road transportation sector at the national, provincial, and district/city levels; b) estimate the quality and key characteristics of road infrastructure along the selected routes; and c) disaggregate total transportation costs along selected routes.

In order to obtain data on infrastructure and regulatory costs, two types of surveys were used. The first is the truck survey, which was used to interview truck drivers. The second is the firm survey, which was used to interview truck owners or trucking firm managers.

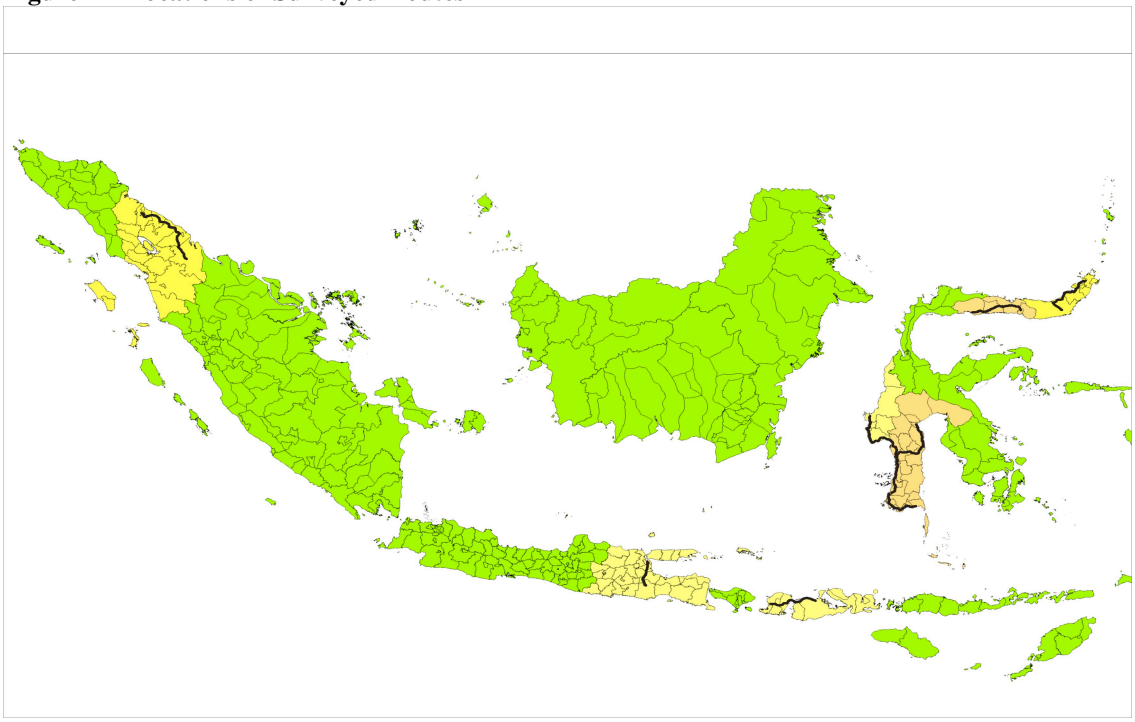
3.1 Routes chosen

The study focuses on six routes in Sulawesi with three other routes in Java, Nusa Tenggara Barat and North Sumatra serving as comparisons. The sample routes were all roads that connect large cities or towns in their respective provinces. The nine routes chosen for this study are:

- South Sulawesi: Bulukumba to Makassar
- South Sulawesi: Parepare to Makassar
- South Sulawesi: Palopo to Parepare
- South/West Sulawesi: Mamuju to Parepare
- Gorontalo: Marisa to Gorontalo
- North Sulawesi: Kotamobagu to Manado
- West Nusa Tenggara: Sumbawa Besar to Mataram
- East Java: Malang to Surabaya
- North Sumatra: Rantau Parapat to Medan

Figure 2 shows the locations of the nine surveyed routes in Indonesia. Detailed maps of routes and districts are available in Appendix 1.[8]

Figure 2 – Locations of Surveyed Routes



3.2 Listing and sampling

Before the survey was conducted, for each selected route the survey team had to list the population of trucks and draw a sample. The main concern was finding the best way to accurately inventory the population of trucks serving the selected routes. The population was defined as "all the trucks serving the selected routes". Trucks refer to vehicles with a minimum of six tires. The ownership types of the trucks were not limited and included trucks managed by large firms and owner-operators.

The survey team attempted to construct an inventory of the truck population serving each route from all the truck parking lots, both public and company owned, in the starting city of the selected routes. From this list the surveyors were supposed to

[8] The three routes outside Sulawesi were chosen to complement the World Bank's Rural Investment Climate Survey (RICS), which was conducted in six districts, including Sumbawa, Labuhan Batu, Barru, and Malang.

choose three public parking lots randomly and two company-owned lots. They would then determine the sample size from each lot proportional to the total number of trucks parked in the sampled parking lots, for a total number of sampled trucks of 35 on each route. Listing was conducted between two to three days in each location.

However, during the listing and sampling, a number of difficulties arose. First, some trucks were not parked at the designated parking lots as owners preferred to park their trucks closer to their shops or homes. In some of the cities, there was no public truck parking. Second, some of the selected routes were part of longer routes and trucks would only pass the start cities of the survey without stopping. Therefore, it was difficult to list truck population based on trucks parked at parking lots. In practice therefore, enumerators attempted to construct the best list that they could of trucks serving the route using whatever sources of information that were available. In cases where listing yielded more than the sample size of 35 trucks, the sample was chosen randomly out of the list. In cases where the initial listing provided less than 35 trucks, surveyors would enlarge the listing area to include nearby districts or sub-districts where drivers also park their trucks.[9]

3.3 Truck survey

The aim of the truck survey was to obtain information on the direct costs paid by truck drivers during a trip. During the trip, a surveyor rode with each truck and obtained information on truck specifications, drivers' payment mechanisms, goods transported, expenses during the trip, legal and illegal payments, the quality of the roads, weigh stations along the route, traffic violations and payments to police officers. Data was collected through direct observations along the selected routes, in which the surveyors filled our forms to record all payments made during the trip. These observations were complemented with driver and trucking firm interviews to obtain information on costs not paid on the road.[10]

[9] For further details of the listing procedures for each route see Appendix 2.
[10] The full questionnaire for the truck survey is available on request.

In 27% of the trucks surveyed, surveyors were also equipped with a global positioning system (GPS) device to record the trip (Table 3). The GPS units recorded information related to the topography of the route, the speed of the truck and the locations of legal and illegal payments. This data included distance traveled, travel time, altitude, bends, and slope, and the precise location of all stops and charges. This information was then used to calculate transportation costs related to infrastructure and to map the locations where charges occurred.

Table 3 – Number of Observations, by Route

No	**Routes**	Number of trips	GPS-equipped trips	Firm interviews
1	Bulukumba - Makassar	35	10	22
2	Pare Pare - Makassar	35	12	15
3	Palopo - Pare Pare	35	17	8
4	Mamuju - Pare Pare	35	15	17
5	Marisa - Gorontalo	36	6	25
6	Kotamobagu - Manado	34	4	13
7	Sumbawa Besar - Mataram	35	17	9
8	Malang - Surabaya	35	12	35
9	Rantau Parapat - Medan	35	12	35
		315	105	179

Source: primary data, processed

3.4 HDM-4 Model

The GPS data on road topography, such as the number of rises, falls and turns, was entered into a World Bank-developed infrastructure model, the Road User Costs Knowledge system, a part of the Highway Development and Management Model (HDM-4).[11] This study uses a subset of HDM-4 Version 1.10[12] called the Road User

[11] The HDM-4 model is used to "combine technical and economic appraisals of road projects, to prepare road investment programmes and to analyse road network strategies." (Kerali, Henry G.R., *Highway Development and Management-4 – Volume One – Overview of HDM-4*, p. 1, The World Road Association (PIARC) and The World Bank, 2000)

[12] The HDM-4 model has been developed since 1968 by the World Bank, the Transport and Road Research Laboratory (TRRL) and the Laboratoire Central des Ponts et Chaussées (LCPC). Thereafter, the World Bank commissioned the Massachusetts Institute of Technology (MIT) to carry out a literature survey and to construct a model based on information available. See *Road User Costs Knowledge System* (World Bank, 2006a).

Costs Knowledge System (RUCKS*),* which models road user costs based on data on road characteristics, vehicle fleet data, and financial unit costs.[13]

The RUCKS model estimates nine components of vehicle operating cost. These are: 1) fuel consumption, 2) lubricant consumption, 3) tire wear consumption, 4) crew time, 5) maintenance parts, 6) maintenance labor requirements, 7) depreciation, 8) interest, and 9) overhead costs.

The RUCKS input variables that affect the cost of operating a vehicle on a given route can be divided into three broad groups:

1. *Road characteristics:* the relevant topographic and road surface characteristics of the route, e.g., vertical and horizontal alignments, road width, and surface profile irregularity or 'roughness';
2. *Vehicle characteristics:* the physical and operating characteristics of the vehicle, e.g., the weight, and number of hours and kilometers operated per year;
3. *Regional financial unit costs:* the financial or economic unit costs of a truck's operation in the region, e.g., the region-wide fuel prices, relative prices of new vehicles, parts and labor.[14]

Data from the truck and the firm surveys were used as inputs for the RUCKS model. In addition, some information, especially regarding the quality of the road, was obtained from a 1999 survey conducted by the Ministry of Public Works and BPS-Statistics Indonesia. For a complete list of the data sources used for this exercise, please see Appendix 3.

3.5 Firm survey

[13] For more details on RUCKS model's parameters, please see Appendix 3 – Data Definition and Sources for HDM-4 Model

[14] The difference between the unit costs in this group with those in the output, mentioned in the previous paragraph, is in the unit of measurement. For example, for fuel, the input is in rupiah per liter, while the output is in rupiah per kilometer. The same holds for lubricant, tire, crew, maintenance labor, interest, and overhead costs.

In addition to the truck survey, another survey was conducted with trucking firm managers or owners. The aim was to collect information on indirect costs and overheads, including regular payments for protection, the competitive environment, and costs relating to business regulations and licensing. They were asked for information relating to the company's finances, labor costs, maintenance costs, costs related to permits and taxes, illegal payments, and competition.[15]

To ensure information from firm managers/owners corresponded to information provided by truck drivers, the sample of firms was drawn from the trucks that were already surveyed. The final number of firms surveyed is less than that of the trucks because most firms owned more than one truck.

In addition to this standard firm survey, an in-depth interview questionnaire with a smaller set of trucking firms was also conducted to capture an overview of legal and illegal payments, as well as local competition in the trucking sector. The interviews were conducted with three firms in the starting cities of each of the surveyed routes.

3.6 Regulatory mapping

A mapping of the regulatory environment was also conducted at both the national and local levels. This was to understand the main regulations governing the trucking sector and to understand the impediments that these regulations may create for the sector.

A research team in Jakarta collected national level laws and regulations, while field surveyors collected local regulations that affect the trucking business, directly or indirectly. The areas of regulation covered include general business regulations, technical regulations, entry regulations, and license tariffs regulations. The levels of regulations collected include national laws, government regulations, ministerial decrees, and local regulations. Interviews were conducted with officials from the Ministry of Transportation to clarify the policy position of the government towards the trucking

[15] The full questionnaire for the firm survey is available on request.

industry. Additionally, interviews with the National Road Transport Association (*Organda*) and the Indonesian Forwarders Association (*Gafeksi*/INFA) were conducted in Jakarta to obtain a picture of the national-level issues faced by the sector.

4. Legal Context for Transportation Charges

Regulations governing road transportation can be divided into two types: regulations related to the operations of trucking firms, vehicles, and road use and physical infrastructure-related regulations. The two sets of regulations are linked at the national level through safety and technical standards, which aim to maintain road safety and the quality of public roads. Key regulations and actors are described in Table 4.

Table 4 – Key Regulations on Overland Transportation of Goods in Indonesia

Laws and Regulations	Ministry responsible	Relevant content
Road transport		
Law no. 14 Year 1992 on Road Traffic and Transportation	Transportation	Definition of motorized vehicle for public use; definition of road networks for use by public transportation vehicles
Government Regulation no. 41 Year 1993 on Road Transportation	Transportation	Road transportation management, including permits; types of trucks and goods
Government Regulation no. 44 Year 1993 on Vehicles and Drivers	Transportation	Vehicle registration
Minister of Transportation Decree no. 69 Year 1993 on Road Transportation of Goods	Transportation	Transportation company permit; operational area of trucks
Infrastructure		
Law no. 38 Year 2004 on Roads	Public Works	Road operation (regulation, maintenance, development and supervision of roads) and its authority
Government Regulation no. 34 Year 2006 on Roads	Public Works	Road maintenance and supervision
Minister of Transportation Decree no. 65 Year 1993 on Road Facilities	Transportation	The operation of weigh stations
Minister of Transportation Decree no. 13 Year 2001 on Road Classifications in Sulawesi	Transportation	Maximum axle load and dimensions of trucks allowed on different classes of roads; available classes of roads in Sulawesi

4.1 The legal framework of the road transport sector

All aspects of the construction and classification of road infrastructure fall under the jurisdiction of the Ministry of Public Works. This includes regulations and standards related to road construction, upgrading, and maintenance. The most important infrastructure-related laws are the 2004 Law on Roads[16] and the 2006 implementing

[16] Law No.38/2004 on Roads (*Undang-Undang Nomor 38 Tahun 2004 tentang Jalan*) is an update of an earlier Law No.13/1980.

regulation.[17] The 2004 law classifies roads by their road network systems, functions, class, and levels of authority.[18]

Traffic codes, road access, and safety standards are set and monitored by the Ministry of Transportation. These include not only road management, but also permitting and licensing requirements related to transportation (see Box 1 for an example from North Sulawesi). The key regulations are the 1992 national law on road traffic and transportation and its 1993 implementing regulation.[19] Road transportation of goods is also specifically governed by the Ministry of Transportation.[20]

Box 1 – Case Study: North Sulawesi

Company A owns a trucking operation in North Sulawesi. In order to operate, the business must first obtain all necessary general business licenses, including the trade license (*SIUP*), firm registration (*TDP*), the nuisance permit (*HO*), the business location permit (*SITU*), taxpayer identity number (*NPWP*), the advertising license, parking permit, and city operations permit.

Company A must also obtain vehicle safety inspection certificate. In order to operate on North Sulawesi roads, the company must also have two other major permits: 1) the route permit *(Retribusi Ijin Trayek)*, governed by the Provincial Regulation number 3/2000, and 2) the cross-border permit for districts in North Sulawesi (*Retribusi Ijin Pengoperasian Mobil Barang Lintas Kabupaten/Kota Sulawesi Utara*), and governed by Provincial Regulation number 2/2003). This means that for every district border crossed, a truck driver must pay a fee. The revenues from these permits are shared between the province and the district/city with 60%:40% allocation, respectively.

Source: in-depth firm interviews

Although the national regulatory framework on road transportation is complex, there are no regulatory barriers to entry into the sector. Apart from technical and traffic regulations, the general trucking industry is not directly regulated by the national

[17] Government Regulation No. 34/2006 (*Peraturan Pemerintah Nomor 34 Tahun 2006 tentang Jalan*) is an update of an earlier Government Regulation No. 26/1985.
[18] *Road network systems* are grouped into primary (national level) and secondary (urban) road networks. *Functions* of roads include their functions as arterial, collector, local, and community roads. In addition, the four types of road functions are also categorized into five classes: Class I, II, IIIA, IIIB, and IIIC. These are based on the different infrastructure specifications of the roads. However, these are not to be confused with the groupings of *road class*. *Road class* is based on its role, ie. highways, main roads, medium roads, and streets. *Levels of authority* (or road status) relate to the levels of governments: national, provincial, and district/city, and village.
[19] Law No. 14/1992 on Road Traffic and Transportation (*Undang-Undang Nomor 14 Tahun 1992 tentang Lalu Lintas dan Angkutan Jalan*); Government Regulation No. 41/1993 on Road Transportation (*Peraturan Pemerintah Nomor 41 Tahun 1993 tentang Angkutan Jalan*).
[20] Minister of Transportation Decree No. 69/1993 on Transportation of Goods on Road (*Keputusan Menteri Perhubungan Nomor KM 69 Tahun 1993 tentang Penyelenggaraan Angkutan Barang di Jalan*).

government.[21] There is no entry regulation for trucking firms or for specific routes. The only permit that a general trucking firm needs to obtain is the transportation business permit (*izin usaha angkutan*), issued by district/city governments.[22] This permit itself does not serve as an entry barrier into the sector, but rather as a registration of the company. Other types of companies that operate trucks to support their core business do not even need to obtain this permit.[23]

Areas of operation for trucks and trucking firms are not restricted by the national government. The national government specifically states that the "operational area for the transportation of goods … is not limited by administrative jurisdictions and/or national boundaries."[24] Route permits, which act as an entry regulation for specific routes, by law should only be issued for passenger transportation, though some districts and provinces still require them of trucking companies.

4.2 Local interpretation of national regulations

A key characteristic of the Indonesian legal environment is the discrepancy between national and local regulatory practices. Despite the nationally set standards on road transportation and road quality, local governments in Indonesia pass regulations that contradict or disregard national regulations. A decade ago, in response to high local permitting costs, the Government of Indonesia issued a law that limited many local taxes and user charges at the provincial and district/city levels.[25] Although this law was proven to have a positive impact on business climate by reducing prices and regulatory burden

[21] The Ministry of Transportation classifies trucks into the following categories: 1) those that carry general goods (and available for hire); 2) those carrying special goods or materials; 3) those that carry dangerous goods; 4) those that carry heavy equipments; and 5) container trucks (Government Regulation number 41 of 1993, Art. 13; Minister of Transportation Decree number 69 of 1993, Art. 2). For the purposes of this study, we are concerned only with the first category, trucks carrying general goods available for hire.
[22] Government Regulation number 41 of 1993, Art. 18; Minister of Transportation Decree number 69 of 1993, Chapter III.
[23] There is also a truck-related regulatory distinction between trucks owned by transportation companies and those owned by other types of companies. Transportation companies register their trucks as 'public' (for hire) transport vehicle, while non-transportation companies register their trucks as 'private' trucks.
[24] Minister of Transportation Decree number 69 of 1993, Art. 3.
[25] Law No. 18/1997 on Local Taxes and Local User-Charges (*Undang-Undang Nomor 18 Tahun 1997 tentang Pajak Daerah dan Retribusi Daerah*).

(Usman et al., 1999), it was overturned in 2000[26] when local governments succeeded in reaffirming their authority to manage taxes and permits at the local level.[27]

Despite the negative impact on the free flow of goods, some local governments still issue permits and licenses and impose user charges on the movement of goods. As mentioned earlier, trucking firms have few permitting obligations according to national law. They only need to obtain the transportation business permit (*izin usaha angkutan*), issued by district/city governments, and the vehicle safety inspection certificate (*KIR*). However, in practice, local governments may impose a number of types of permits, which are described in Box 2.

Box 2 – Types of Permits that May Be Required by Local Governments

1. Truck-related permits

a. Loading and Unloading Permit (*Ijin Bongkar Muat*)
Trucking firms/owners may need to get this permit from district/city governments in order to be able to load and unload goods.

b. Parking user charge (*Retribusi parkir*)
This permit may also be required by some district/city governments, based on the parking location, whether at a specific truck parking lot or on a public street.

2. Road-related permits

a. Route Permit (*Ijin Trayek)*
Route permits for trucks, although not specified by the national government, are sometimes issued by the district/city and provincial governments. This type of permit also goes by some other names. In Makassar, South Sulawesi, the city government issues an operational permit; in Pohuwato and Gorontalo, it is called a goods-transporting vehicle permission or letter. The validity of the permits varies for every 3, 6, or 12 months. Provincial governments in Sulawesi also issue the route permit or some variant of it.

b. Road Use Permit (*Ijin Penggunaan Ruas Jalan)*
Road use permits are issued at the district/city level. The idea of this permit is that all trucks which pass through a district/city must pay the local government to use their roads.

c. Border Crossing Permit *(Ijin Lintas or Retribusi Ijin Pengoperasian Mobil Barang Lintas)*
This permit may be required to cross district or provincial borders. Similar to the road use permit, this permit is not common and is rarely used by the local government.

3. Commodity permits

[26] Law No. 34/2000 on Changes to the Law No. 18/1997 on Local Taxes and Local User-Charges (*Undang-Undang Nomor 34 Tahun 2000 tentang Perubahan Atas Undang-Undang Republik Indonesia Nomor 18 Tahun 1997 tentang Pajak Daerah dan Retribusi Daerah*).

[27] The Law adopts a principle of positive list and specifies that local taxes can be applied on the following objects: restaurants, hotels, entertainment, advertising, electricity use, sand and rocks mining, and parking. User charges can be applied on public services, public services with private good characteristics, and licenses and permits. The Law also sets a number of criteria for local taxes and user charges, one of which is that tax objects should be located in the particular district/city and have low mobility across district boundaries (Law No. 34/2000).

Commodity permits are sometimes required for transporting some commodities, especially natural resource based products, such as forestry products. These permits are governed by specific sectoral ministries, such as the Ministry of Agriculture or the Ministry of Forestry. Commodity permits vary across regions and across commodities. Among the districts and cities passed by the selected routes of this study, the city of Palopo stands out as one district that enforces the inspection of commodities, and imposes a high fee for this inspection.

4. Business permits

In addition to the above operational permits, trucking firms also have to obtain general business permits, which are issued by the district/city governments.

a. Trade permit (*Surat Ijin Usaha Perdagangan*)
This is one of the most common permits in use across Indonesia. Originally the permit was supposed to serve as an entry permit into the trading sector. However, its issuance has lost its original purpose as ministerial decrees governing its administration have been vague on whether it is the trade sector or trading activities that it is supposed to control.

b. Business registration (*Tanda Daftar Perusahaan*)
Business registration is required of all companies, after they have received the trading permit.

c. Other permits
Depending on the type of company, trucking firms, especially the bigger ones, may need to get other business permits, such as the nuisance permit or warehouse registration.

Source: firm and truck surveys

Route permits are inconsistently applied and legally unnecessary for trucks.

Although national regulations on road transportation already specify that route permits are only required for passenger transportation vehicles, approximately 37% of districts/cities on the surveyed routes required a route permit for trucks. Table 5 below lists the names of districts/cities and provinces, from whom trucking firms obtain the route permits. Some firms also obtain route permits for districts outside of the surveyed routes. Most of the districts/cities that issue route permits are in Sulawesi and all Sulawesi provinces also issue route permits. In the three routes outside Sulawesi, only a few districts issue route permits and no provincial governments issue provincial route permits. The number of trucking firms, within each route, that bothered to obtain the permits is not particularly high, an average of 19% for district permits and 54% for provincial permits. However, the issuance of the route permits violates government regulations on road transport since they restrict the movement of goods across the country.

Table 5 – Districts/Cities and Provinces that Issue Route Permits

Routes	District/city permit	number of firms having route permit (for each district)	% of firms having route permit (for each district)	Provincial permit	number of firms having route permit (for each prov)	% of firms having route permit (for each prov)	number of respondents (firm survey)
1 Bulukumba - Makassar	Bulukumba	1	5%	South Sulawesi	14	64%	22
2 Pare Pare - Makassar	Barru	2	13%	South Sulawesi	8	53%	15
	Pare-Pare	2	13%				
	Pinrang	1	7%				
	Pangkajene Kep.	2	13%				
	Maros	2	13%				
	Makassar	2	13%				
3 Palopo - Pare Pare	*Unspecified districts*	2	25%	South Sulawesi	3	38%	8
4 Mamuju - Pare Pare	Mamuju	15	88%	West Sulawesi	17	100%	17
				South Sulawesi	17	100%	
5 Marisa - Gorontalo	Boalemo	9	36%	Gorontalo	2	8%	25
	Bone Bolango	1	4%	Central Sulawesi	4	16%	
	Gorontalo, district	12	48%	North Sulawesi	1	4%	
	Gorontalo, city	1	4%				
	Pohuwato	9	36%				
	Kota Wanya	1	4%				
6 Kotamobagu - Manado	Bitung	1	8%	North Sulawesi	13	100%	13
	Minahasa	4	31%				
	South Minahasa	5	38%				
	North Minahasa	2	15%				
	Kotamobagu	1	8%				
7 Sumbawa Besar - Mataram							9
8 Malang - Surabaya	*City entry permit, unspecif.*	4	11%				35
9 Rantau Parapat - Medan	Labuhan Batu	1	3%				35
	Tapanuli Tengah	1	3%				
Total/Avg	23 districts	81	19%	5 provinces	79	54%	179

Source: primary data, processed

4.3 Weigh station regulations

The standards and operations of weigh stations are governed by the Ministry of Transportation. The Ministry of Transportation is responsible for maintaining road quality by ensuring that trucks are not overweight and tests the specifications of new vehicles, including their maximum weight. This serves as the basis for the weight limits of each type of vehicles (Box 3). The trucks' weight limitation is checked at weigh stations.[28]

Box 3 – Determining Weight Standards of Vehicles

The Ministry of Transportation conducts a Type Test (*Uji Tipe*) to check the specifications of new vehicles, including their maximum axle load. The results of the Type Test are posted on the side of trucks and buses and in a Test Book accompanying each vehicle. The district/city governments have the responsibility to conduct regular vehicle safety inspections, which test that all of the vehicles' parts function and are not safety hazards. The Ministry of Transportation also issues a ministerial decree that stipulates the different

[28] However, in practice, trucks are hardly ever weighed – see Section 5.

classes, functions, and administrative levels of roads on specific islands, and the maximum size and weight of vehicles allowed on those roads.[29]

Source: Interviews with official at the Sub-directorate for Road Transportation, Ministry of Transportation, 13 November, 2007, and the Head of Research and Development Department, Organda*, 7 November, 2007.*

Weigh stations are operated by provincial governments. Prior to decentralization in 2000, the weigh stations were operated by the provincial branches of the central Ministry of Transportation. Decentralization transferred this authority to the provincial governments. Under the current decentralized administration, provincial governments have the authority to determine the location of weigh bridges and operate them, whilst the national government sets guidelines on technical standards and the standards for the location of weigh bridges.

Only half of all weigh stations are operational and few are effectively enforced. According to a Ministry of Transportation study (Government of Indonesia, 2001), 83 of 175 weigh bridges in the country are not working. Equipment frequently malfunctions and is not replaced and the interaction between truck drivers and local departments of transportation officials at these stations provides an opportunity for corruption and bribery. The central government is currently attempting to address these problems by gradually reducing the tolerance limit for overweight vehicles (see Box 4).

Box 4 – New Initiative to Enforce Weigh Limits: Independent Oversight

The government is aware of the operational and bribery problems at weigh stations. Past initiatives, such as eliminating weigh stations altogether, only led to more serious deterioration of roads. Currently, however, the Ministry of Transportation is experimenting with a new way of managing weigh bridges. Together with the local authorities and private sector trucking associations in eight provinces, Lampung, Banten, Jakarta, West Java, Central Java, Yogyakarta, East Java, and Bali, the Ministry is gradually reducing the tolerance limit of overweight trucks. Staff from the trucking associations act, therefore, as an independent oversight. At the participating weight stations, two teams, one composed of local transportation department officials and the other of staff from the trucking associations, undertake independent checking of trucks and the results are compared to make sure that they are accurate.

As of February 2008, trucks that are 50% overweight above the maximum axle load are not permitted to continue their journey. This limit was reduced from a 60% threshold set in March 2006 and will be further lowered in the coming years. The Ministry of Transportation maintains that gradual reduction of the tolerance limit is necessary to accustomize firms to more stringent implementation of weight limits by local officials and independent observers from the private sector.

[29] For example, for Sulawesi, the Ministry of Transportation issued the Ministerial Decree number 13 of 2001 on Road Classifications in Sulawesi. The decree also specifies the maximum vehicle axle load for each road.

Source: Interview with official at the Sub-directorate for Road Transportation, Ministry of Transportation, 13 November, 2007.

4.4 International comparisons

The regulatory framework for road transportation is far simpler in other countries. In Indonesia, local regulations differ from national regulations, leading to confusion and excess charges for route permits and internal border crossings. This is counter to the direction the rest of the world is heading. Many countries and federations are moving towards a free-trade zone in terms of trade and transport, reducing regulatory burdens on industries and the flow of goods. For example, the European Union (EU) has made great strides in creating free movement across borders and unifying trade regulations. Transport policy was one of the first European Community policies incorporated in the Treaty of Rome in 1957, which formed the basis for the European Union.[30] Since then, constant efforts have been aimed at facilitating the free movement of persons and goods across member states.

The transport market for goods and passengers was liberalized in Europe in 1998. Since then, operators that are recognized and hold what is known as a 'Community license' can supply international transport services throughout the European Union. One of the key directives adopted shortly after transport liberalization was the 'Eurovignette' model of road charges, described in Box 5. The EU is also working on a harmonization of road transport taxes and charges. Currently a common rule exists for annual taxes for heavy goods vehicles over 12 metric tons and there is a minimum rate for fuel taxes, aimed at reducing differences between EU countries.

Box 5 – The Eurovignette Model of Road Charges

A "Eurovignette" directive adopted in 1999 and recently modified in 2006, establishes common rules regarding distance-based tolls and time-based user charges. This directive specifies the following:

[30] The European Union (EU) is a political and economic community which originated as the European Economic Community (EEC,) formed in 1957 by the Treaty of Rome between six European countries. The EEC expanded to become the European Community (EC) in 1967. In 1993, the Maastricht Treaty established the current legal framework, which makes the Community a full European Union, with a Single Market policy and freedom of transportation.

- Tolls are only applied for distance traveled and type of vehicle. Charges for time spent vary by congestion and emission class
- Tolls and charges shall not be applied on the same stretch of road
- Tolls and charges should be non-discriminatory, easy to understand and avoid mandatory checks and internal borders

Source: European Commission (2006), Road Transport Policy: Open Roads Across Europe

Other countries in Asia are making steps toward a harmonized system with clear regulations related to permits and road charges. For example, in China there are generally no checkpoints at provincial boundaries, and national law prohibits the stopping of vehicles by any institution other than traffic police. In Pakistan, route permits are issued by provinces, but there are no cross-border permit fees. Indonesia could also move towards a simpler regulatory system, thereby reducing the burden of licenses and illegal charges that falls on the trucking industry and local firms.

5. Main Findings

The main findings of this study can be organized into four separate areas. First, we discuss the overall operating costs of trucks in Indonesia and how these costs depend on road topography and infrastructure quality. Second we look at two specific types of payments on the road: local user-charges and weigh bridge charges. The third sub-section describes security payments made to the police and to *preman*, both on the road and routinely by truck owners. Finally, we detail the licensing costs paid by truck owners.

5.1 Operating costs and infrastructure-related costs

Vehicle operating costs were estimated using data from three different sources: the RUCKS model, the results of the firm survey, and the results of the truck survey.

The vehicle operating costs in Indonesia are higher than the average for other Asian countries. Table 6 below shows the vehicle operating costs on all the routes surveyed. This calculation assumes a standardized truck across all routes so that the differences in costs across different routes result only from differences in the topography and quality of the road. The average vehicle operating cost is IDR 3,093 per kilometer, or approximately USD 34 cents per kilometer. This is higher than the Asian average, which is about USD 22 cents per kilometer.[31]

Table 6 – Vehicle Operating Costs

	Bulukumba - Makassar	Pare Pare - Makassar	Palopo - Pare Pare	Mamuju - Pare Pare	Marisa - Gorontalo	Kotamobagu - Manado	Sumbawa - Mataram	Malang - Surabaya	Rantau Parapat - Medan	Average
Vehicle Operating Costs (IDR/km)	3,084	3,117	3,121	3,083	2,958	2,950	3,467	2,823	3,236	3,093

Source: primary data, processed by RUCKS

[31] The figure for Asia results from a combination of Asian vehicle fleet data and economic unit costs, taken from *Road User Costs Study Results*, World Bank (2006b), and by using the averages for road characteristics from the truck survey. This data estimates that a medium-sized truck in another Asian country, driving on a route with similar road characteristics as our surveyed routes, would have an average vehicle operating cost of USD 22 cents per kilometer.

Vehicle operating costs vary around the country. Operating costs vary by route and were highest along the Rantau Parapat – Medan route, in Sumatra, and along the Sumbawa-Mataram route, in West Nusa Tenggara. Operating costs were lowest along the East Java route from Malang to Surabaya. In the Sumbawa route the higher costs seem to be driven by geography, especially the degree of rise and fall in the road (in meter per kilometer; see Table 8).

The main costs faced by trucking firms are fuel, depreciation, and interest payments. The RUCKS model shows that the major cost items for firms serving the surveyed routes are fuel (28% of total cost), depreciation (27%), and maintenance parts (18%) (see Table 7). The results from the firm survey confirm the findings on fuel (39%), but the survey also indicates that a significant portion of costs go to labor, for a total of 14% for both driver's and mechanic's wages.[32]

Table 7 – Breakdown of Vehicle Operating Costs, RUCKS and Firm Survey Results

RUCKS, avg of all routes		Firm survey, avg of all routes	
Vehicle Operating Costs (IDR/truck/km)	3,093	3,514	Operating Costs (IDR/truck/km)
Fuel (% of total)	28%	39%	Fuel (% of total)
Lubricants (% of total)	2%	13%	Lubricants* (% of total)
Tire (% of total)	1%	13%	Tire* (% of total)
Maintenance parts (% of total)	18%	4%	Maintenance costs (% of total)
Maintenance labor (% of total)	1%	3%	Mechanics' wage (% of total)
Crew time (% of total)	10%	11%	Driver's wage (% of total)
Depreciation (% of total)	27%	5%	Depreciation (% of total)
Interest (% of total)	10%	10%	Interest (% of total)
Overhead (% of total)	2%		

Source: primary data, processed by using RUCKS; firm survey

Notes:

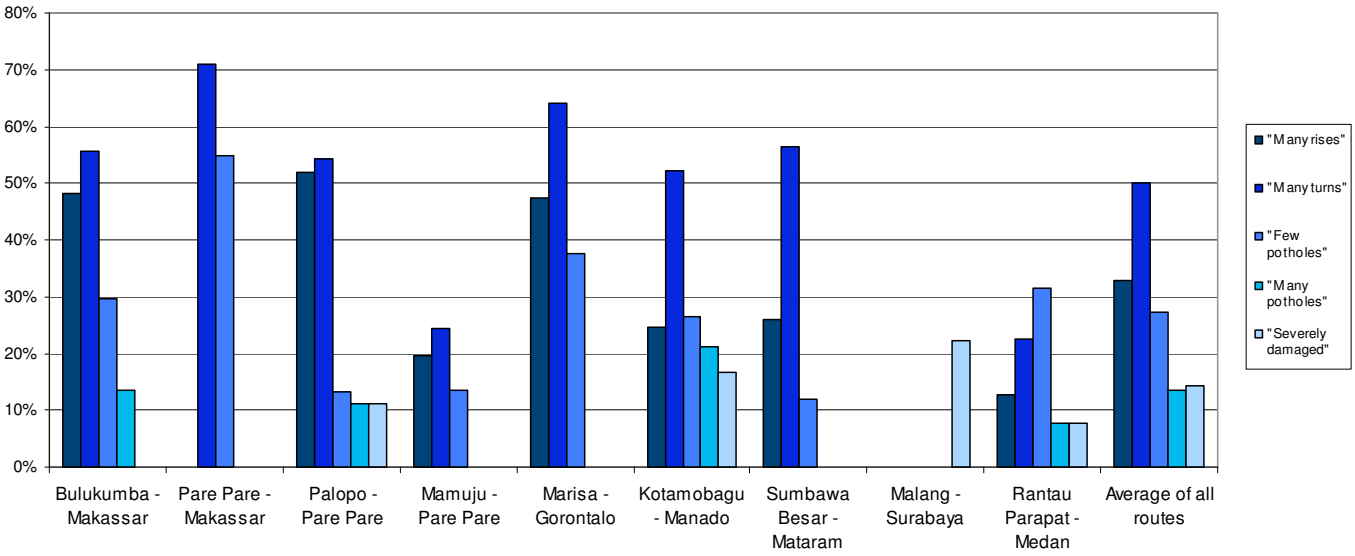
*Lubricants and tire (and toll charges) are treated as one item in the firm survey

The surveyed routes were mostly winding and undulating with relatively few portions of the national roads in bad condition. The routes were divided into segments, taking into account major natural breaks along the road. Drivers were then asked whether they think each segment had "many turns," "many climbs," "few potholes," "many potholes," or "severely damaged." Drivers indicated that more

[32] The results from the RUCKS model should be taken as estimated costs based on a set of entry parameters (see Appendix 4 – HDM-4 Entry Parameters), while the survey results were based on actual costs reported by firm managers.

segments were hilly, with many turns and climbs, than were characterized by frequent pot holes or severe road damage (Figure 3). This suggests that on the surveyed routes it is difficult topography, as opposed to road quality, that is the primary obstacle for the transportation of goods.[33]

Figure 3 – Quality of Infrastructure



Source: primary data, processed

Vehicle operating costs, including maintenance costs and fuel costs, are affected by topography. The rise and fall of the road appears to have a strong effect on vehicle operating costs. As seen in the table below, the highest rise and fall rates (vertical meter per kilometer distance) were found on the Sumbawa-Mataram route, which is also the most costly route (Table 8). A simulation that reduces the rise and fall on this route to the average of other routes would lower operating cost by 13%. These results imply that the most important road improvement is leveling, although this is also the most expensive type of improvement (Burningham and Stankevich, 2005).

[33] Road quality is still a general problem in Indonesia. The surveyed routes were on national roads, which are better maintained than district roads, but represent only a minor portion of all roads in the country.

Table 8 – Operating Costs and Road Attributes

	Bulukumba - Makassar	Parepare - Makassar	Palopo - Parepare	Mamuju - Parepare	Marisa - Gorontolo	Kotamobagu Manado	Sumbawa - Mataram	Malang - Surabaya	Rantau Parapat - Medan	Average
Vehicle Operating Costs (IDR/km)	**3,084**	**3,117**	**3,121**	**3,083**	**2,958**	**2,950**	**3,467**	**2,823**	**3,236**	**3,093**
Road attributes										
Rise & Fall (m/km)	10	5	8	9	12	11	32	15	3	12
Number of Rise & Fall per Km (#)	2	1	2	2	2	2	1	1	1	2
Horizontal Curvature (deg/km)	315	292	303	393	435	313	322	217	210	311
Altitude (m)	22	12	28	40	67	68	32	196	27	55
Roughness (IRI, m/km)	6	7	7	6	5	5	6	3	7	6

Source: primary data, processed by RUCKS

Roughness also has a clear impact on operating costs. The roughest roads on the surveyed routes were found along the Rantau Parapat-Medan route in Sumatra, which also demonstrates high overall operating costs.[34] Keeping all other factors constant and reducing the roughness index for this route to the average of all other routes reduces overall operating costs by 8%. Sealing or lightly grading paved roads is one of the most cost-effective actions the government can take. The World Bank estimates that light sealing and grading of a highway is relatively inexpensive compared to resurfacing or reconstruction. Investing in routine maintenance at a mean of USD 989/kilometer per year could significantly decrease costs for trucking firms, increasing their efficiency and profits (Burningham and Stankevich, 2005, Table 1).

5.2 User charges and weigh station payments

Drivers are liable to different kinds of payments on the road, which include legal and illegal local user charges,[35] payments at weigh stations, and payments to police or *preman*[36] (Figure 4)**.** The typical total cost of these charges is around IDR 80,100 per trip for the surveyed routes, which is about 12% of the drivers' lump sum payment. The

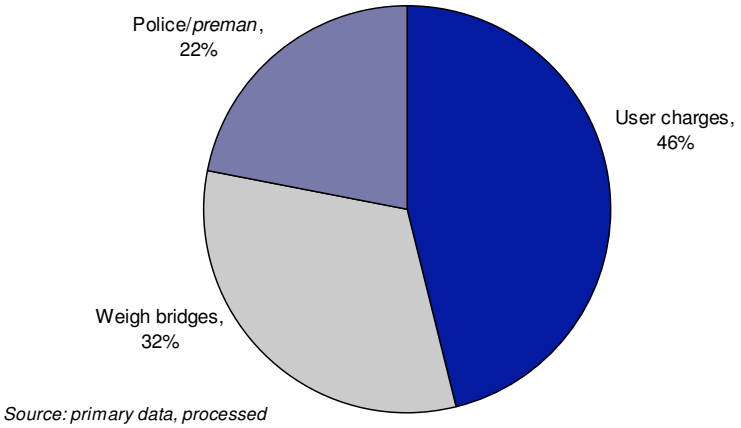
[34] The source of the roughness measure is the 1999 road survey conducted by the Ministry of Public Works and BPS-Statistics Indonesia.

[35] Technically, user-charges are local government-issued charges for the provision of public services or the use of public assets. For the transport of goods, some local governments issue user charges for the use of roads. In some cases, user charges are charges for the inspection of the goods transported.

[36] *Preman* are criminal organizations, similar to the mafia, which conduct a variety of under-the-table business operations in Indonesia. The term also includes neighborhood gangs that conduct petty illegal activities around their neighborhoods.

typical time spent in paying these charges is 19 minutes for each truck. This represents about 6% of the overall trip duration. These charges are important to drivers because 84% of the drivers on the surveyed routes make these payments out of a cash advance provided by their employers; on-the-road charges therefore reduce their take-home wage. In fact, the overall amount of road charges is nearly equivalent to the driver's and his assistant's wages. This section will discuss the payments drivers have to make at weigh stations and to local government staff in the form of user charges.

Figure 4 – Components of On-the-Road Payments



Source: primary data, processed

There is substantial variation across routes in the amount of on-road payments. The highest overall charges occur along the Palopo-Pare Pare route. This is due to a very high commodity inspection user charge near Palopo. The Sumbawa Besar-Mataram route also reports a high user charge caused by the ferry crossing between the islands of Sumbawa and Lombok.[37] Payments at weigh bridges are highest on two of the non-Sulawesi routes, the Sumbawa Besar-Mataram and the Rantau Parapat-Medan routes. Table 9 shows the number of stops for each type of charges, as well as the total time spent and total payments made along all of the routes.

[37] The ferry crossing charge between Sumbawa and Lombok varies according to the types of vehicles, but typically costs about IDR 123,000 for trucks surveyed in this study.

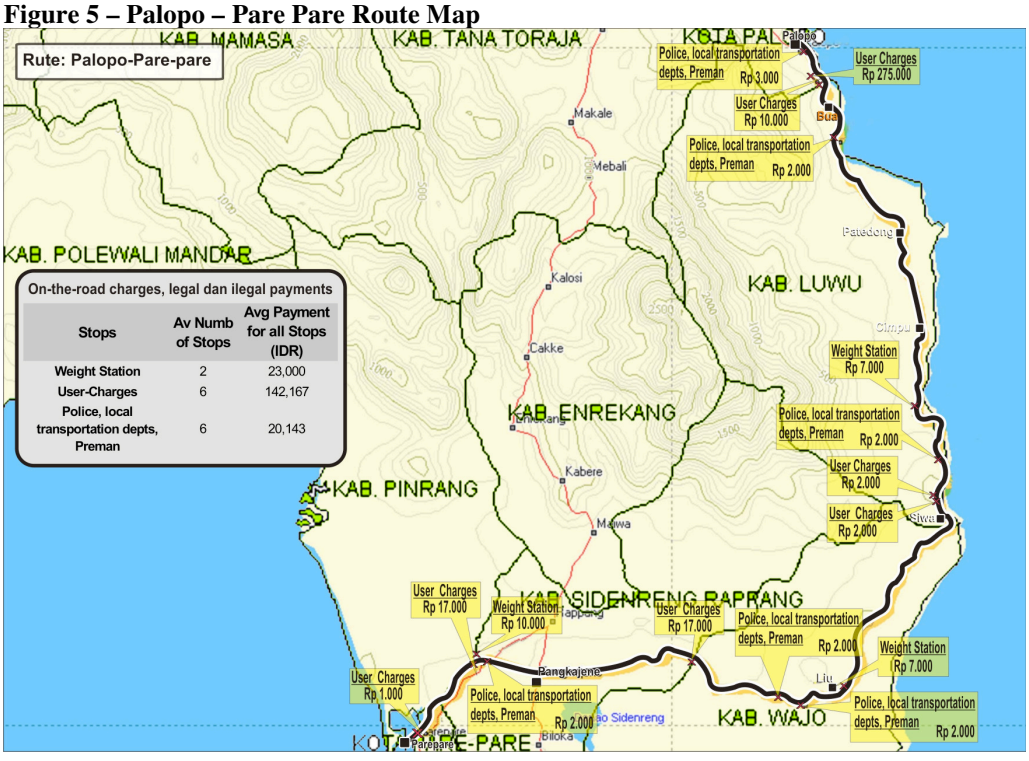
Table 9 – Weigh Stations and Local User Charges

		WEIGH STATIONS			LOCAL USER CHARGES		
No	**Routes**	Avg number of stops	Avg time for all weigh bridges (in min)	Avg payment for all weigh bridges (IDR)	Avg number of stops	Avg time for all user-charge stops (in min)	Avg payment for all user charges (IDR)
1	Bulukumba - Makassar	2	2	11,857	6	6	34,265
2	Pare Pare - Makassar	2	3	26,529	2	1	3,222
3	Palopo - Pare Pare	2	8	23,000	6	15	142,167
4	Mamuju - Pare Pare	1	3	13,543	3	4	6,909
5	Marisa - Gorontalo	2	6	14,056	1	3	5,000
6	Kotamobagu - Manado	3	4	14,176	2	4	5,455
7	Sumbawa Besar - Mataram	2	7	70,029	3	6	122,970
8	Malang - Surabaya	1	2	8,943	1	2	6,000
9	Rantau Parapat - Medan	3	16	47,857	2	10	7,000
	Average	2	6	25,554	3	6	36,999

Source: primary data, processed

Because some of the trips along each route were equipped with GPS devices, it was possible to map precisely where different types of charges typically took place. Figure 5 shows an example of the location of charges on the Palopo-Pare Pare route. Maps of other routes are available in Appendix 1.

Figure 5 – Palopo – Pare Pare Route Map

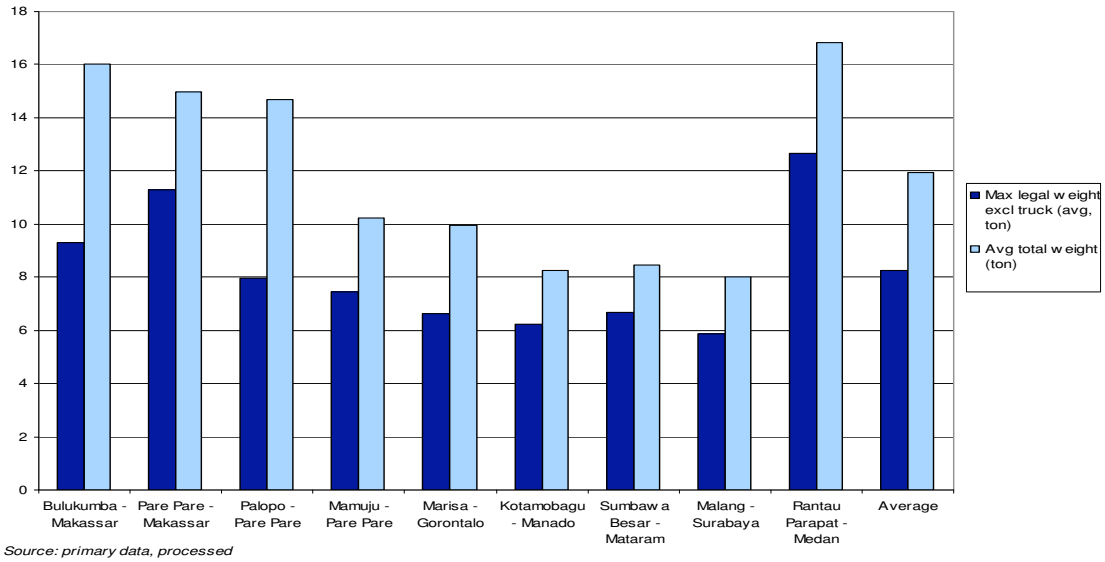


User charges make up 46% of on-the-road payments. User charges are charges issued by local governments for transporting goods along the surveyed routes. They may be collected by different government departments based on commodity. For example, the local forestry department may ask any truck driver carrying forest products to pay a fee. In other cases, user charges are collected for road use. The implementation and collection of user charges is problematic because the majority of respondents in the truck survey did not fully understand which ones were legal and which were not. They often accepted the need to pay user charges without questioning whether or not the charge was legitimate.

Some local governments have begun to eliminate user charges, but most continue to enforce them. For example, in Gorontalo, there was a requirement for truck companies to pay a natural resource user charge (*retribusi hasil bumi*). This fee was eliminated by the new governor of Gorontalo in 2004. However, in Palopo, like many districts in Indonesia, user charges add significantly to road charges. If these types of charges could be reduced or eliminated, it would significantly mitigate corruption and help increase trade.

Trucks along most routes in Indonesia are typically overloaded because regulations on weigh stations are not enforced. In the long run, this situation endangers safety and damages the roads, causing further infrastructure damage. Current policies fail to stop this and simply extract a small fee for non-compliance.

Figure 6 – Legal and Actual Truck Weights, by Routes



Source: primary data, processed

Most trucks in Indonesia are overweight, some severely overweight. This survey reveals that on the surveyed routes, on average 52% of trucks are overweight by an average of 45% over the payload weight limit (Table 10). The average load weight was about 4 metric tons over the maximum legal load (see Figure 6). Most trucks are the open-box type because this allows the owner or driver to increase payload beyond the maximum capacity, which both owners and drivers claim is necessary in order to make a profit.

Table 10 – Weight and Overloading of Trucks

No	Routes	Max legal weight excl truck (avg, ton)	Amount overweight, excl truck (avg, ton)	% overweight (avg)	Number of trips	Number of trucks overweight	% of trucks overweight (avg)
1	Bulukumba - Makassar	9	7	72%	26	12	46%
2	Pare Pare - Makassar	11	4	33%	33	13	39%
3	Palopo - Pare Pare	8	7	84%	35	30	86%
4	Mamuju - Pare Pare	7	3	37%	30	12	40%
5	Marisa - Gorontalo	7	3	50%	36	7	19%
6	Kotamobagu - Manado	6	2	32%	30	16	53%
7	Sumbawa Besar - Mataram	7	2	26%	35	18	51%
8	Malang - Surabaya	6	2	37%	35	28	80%
9	Rantau Parapat - Medan	13	4	33%	33	17	52%
		8	4	45%	293	153	52%

Source: primary data, processed

Overweight trucks do substantial damage to roads. Studies on the correlation between truck weight and road damage show that effects are exponential. “An increase in axle weight generally causes a more than proportional increase in pavement damage. The relationship appears to approximate an exponential function, and various studies have assumed the power of the exponent to be about 4 as a rule. Estimates of the exponent’s power vary substantially, however.” (Luskin and Walton 2001: 12) Thus, the failure to enforce weight limits in Indonesia may cost more in terms of road damage than the benefits gained by truck companies and corrupt weigh station officials.

Overweight trucks increase the potential for accidents. According to a study by the University of Michigan Transportation Research Institute, higher truck loads clearly increase the risk of traffic accidents.

“Among all vehicle characteristics reviewed…weight shows the strongest association with fatal accident rates (accidents per mile traveled)...Gross combination weight (GCW) is the only vehicle characteristic showing a clear association with the *overall* fatal accident rate.” (Fancher and Campbell 1995: 35)

One of the major reasons that overloaded trucks lead to more accidents is because brake reaction times are slower. In Indonesia, this danger is exacerbated because trucks tend to be at least 8 years old and not well-maintained. Thus, lack of weight enforcement leads to a highly dangerous situation on the roads.

Safety risks and road damage are further exacerbated because trucks are modified after the vehicle specification process is completed. All trucks must go through the vehicle safety inspection (*Uji KIR*), administered by the local departments of transportation, which tests the proper functioning of such items as the brakes, lights, and tires. However, after the truck inspection process is complete, many truck owners modify the trucks so they can carry goods above and beyond the weight limits. They accomplish this by extending the railings and the chassis, and using stronger, non-standard tires, without necessarily adding new parts. The one part that is not easily modifiable is the

axle. This means that the axles are under severe pressure and often break. Axle weight directly corresponds to road damage and the risk of breakage further increases the accident rate.

In Indonesia only a handful of trucks are weighed and fined at weigh stations. Only 53% of 175 weigh bridges in the country are actually functioning (Government of Indonesia, 2001). Furthermore, as Table 11 indicates, enforcement at weigh stations is a significant problem. Although trucks enter weigh stations, they are not likely to be properly weighed, fined, or asked to reduce their loads. Most of the trucks simply pass through the weigh stations and make unofficial payments to the officials. In general, only 53% of trucks are weighed. Half of these are overweight, but only one in five are fined. Fines are also quite low, amounting to only IDR 12,829 on average, or about USD 1.50.

Although only half of the trucks were weighed, a higher proportion made "extra payments" to avoid compliance. Even though only half of all trucks were weighed, a higher percentage, 84%, of them made extra payments anyway. This may explain the brevity of stops at weigh bridges, an average of 6 minutes, which are too short for the trucks to be weighed properly. Most trucks simply passed through the weigh stations and make an average payment of about IDR 9,600 to the officials, whether or not the weigh bridges were working or the trucks were weighed.

Weigh stations appear to work in a small number of locations. Table 11 also shows that at some weigh stations, such as Paku and Badas, a high proportion of trucks were weighed and fined. This suggests that in these locations the equipment is working and that officials are actually implementing the weight regulations. However, even in these locations, the number of trucks that made extra payments is still high. Thus, the existence of weigh stations seems to offer an interface for bribery, while failing to protect road transportation standards.

Table 11 – Weigh Stations and Payments at Weigh Stations

ROUTES	Weigh bridge name/location	Number of trucks stopping at weigh station	Number of trucks weighed	% of trucks weighed	Number of trucks overweight	% of trucks overweight (out of those weighed)	Number of trucks that pay fine	% of trucks that pay fine (out of those overweight)	Amount of fine (avg per truck, IDR)	Number of trucks that make extra payment	% of trucks that make extra payments (of all those that stopped)	Amount of extra payment (avg per truck, IDR)
Bulukumba - Makassar	Jeneponto	32	3	9%	1	33%				32	100%	5,438
	Gowa	34	8	24%	4	50%				34	100%	6,912
Pare Pare - Makassar	Lumpue	34	8	24%	2	25%	2	100%	20,000	30	88%	9,150
	Maccopa	32	30	94%	17	57%	10	59%	11,100	27	84%	13,481
Palopo - Pare Pare	Larompong	33	14	42%	6	43%				32	97%	8,281
	Salabulo/Sajoangin	35	35	100%	21	60%				33	94%	9,303
	Dattae	19	16	84%	10	63%				19	100%	8,737
Mamuju - Pare Pare	Paku	29	25	86%	20	80%	17	85%	11,588	20	69%	11,350
Marisa - Gorontalo	Marisa	34	3	9%	1	33%				33	97%	3,909
	Isimu	36	6	17%	1	17%				34	94%	3,059
Kotamobagu - Manado	Inobonto	33	1	3%	1	100%				32	97%	6,344
	Amurang	33	4	12%	1	25%				30	91%	5,000
	Pineleng	25	2	8%						24	96%	5,375
Sumbawa Besar - Mataram	Sumbawa	9								3	33%	3,667
	Badas	17	16	94%	3	19%	2	67%	32,000	14	82%	8,929
	Tano	17	13	76%	1	8%				17	100%	9,118
	Lobar	15	1	7%						14	93%	4,500
Malang - Surabaya	Singosari	34	34	100%	28	82%	4	14%	9,250	26	76%	10,615
Rantau Parapat - Medan	Aek Kanopan	35	34	97%	16	47%				19	54%	26,053
	Lima Puluh	35	35	100%	16	46%				16	46%	27,188
	Tanjung Morawa	35	35	100%	16	46%				18	51%	31,389
Total/average	21 Weigh bridges	606	323	53%	165	51%	35	21%	12,829	507	84%	9,571

Source: primary data, processed

Even where the weigh stations are working, the penalty for overweight trucks does not deter overloading. The average fine and extra payments paid are relatively small. This points to a larger problem of enforcing penalties for overloading. Fines commensurate with the likely road damage and the threat to public safety caused, would be extremely high, further encouraging bribery and evasion. However, simply prohibiting passage for trucks not in compliance of the weight limits is also difficult to enforce. Unloading extra goods is nearly impossible since most weigh stations are not equipped with storage facilities for unloaded cargo and there is no assurance of security. The government is, however, trying a new mechanism of forcing overloaded trucks return to their points of origin (see Box 4).

5.3 Payments to police and *preman*

Drivers and firms also make payments to the police and to local *preman* for security reasons. Some *preman* organizations were originally set up by military officers in the Indonesian army (*TNI*). Fees paid to police and *preman* organizations are either paid as road charges (see Box 6), or they are paid up-front as routine payments. However, routine security payments made by trucking firms tend to occur more often in Sumatra and Java.

On-the-road payments to police and *preman* are more common in Sulawesi relative to non-Sulawesi routes. Although there are reports of police and *preman* payments along all routes, the incidence of bribery is quite low outside Sulawesi (see Table 12). Within Sulawesi, payments are more frequent in South Sulawesi than in Gorontalo and North Sulawesi.

Table 12 – Road Payments to Police and *Preman*

No	ROUTES	Avg number of stops	Avg time for all police, *preman,* and other stops (in min)	Avg payment for all police, *preman,* and other stops (IDR)
1	Bulukumba - Makassar	4	3	12,364
2	Pare Pare - Makassar	8	17	55,581
3	Palopo - Pare Pare	6	8	20,143
4	Mamuju - Pare Pare	10	22	33,171
5	Marisa - Gorontalo	1	3	5,818
6	Kotamobagu - Manado	3	5	15,074
7	Sumbawa Besar - Mataram	1	1	2,333
8	Malang - Surabaya	1	1	5,000
9	Rantau Parapat - Medan	1	6	8,750
	Average per route	4	7	17,582

Source: primary data, processed

In Sulawesi, illegal payments are largely made to the police, and charges vary by route. In most cases, the illegal payments in Sulawesi are made to the local police officers rather than to *preman*. The highest amount of total payment is on the Pare Pare-Makassar route, followed by the Mamuju-Pare Pare route. In a few cases, such as near a bridge construction site in North Sulawesi, a group of local *preman* would also demand payments from passing trucks.

Box 6 – How are Payments Made on the Road?

Implicit requests for payment are made by police officers under a variety of guises. Police officers sometimes conduct checks on the documentation of all vehicles passing the local police station or the district border. While it is difficult to extort bribes from private cars and motorcycles with complete paperwork, truck drivers do not hesitate to hand over IDR 3,000 to 5,000, even if they have their papers in order and the truck is not overweight. However, since half of the trucks surveyed were overweight, drivers are aware that they need to provide a cash bribe. In some cases, police officers also check the cargo or vehicle equipment for possible violations. For truck drivers, these payments have become the norm rather than the exception.

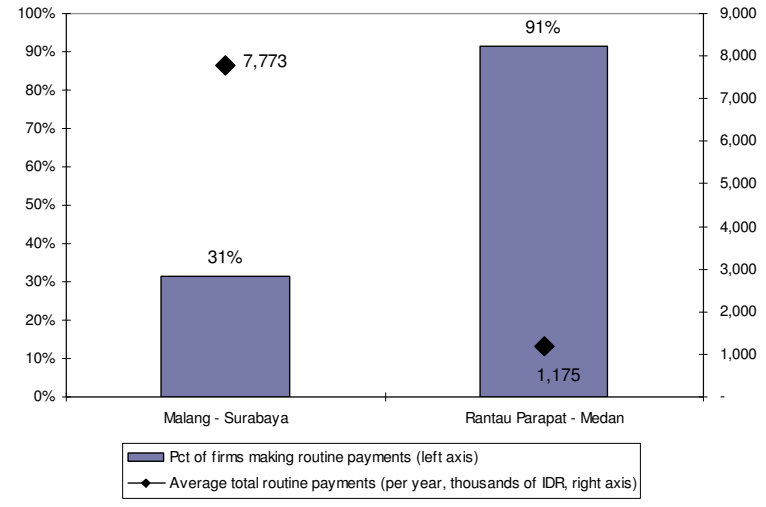
Source: firm interviews

As an alternative to on-the-road payments, trucking firms sometimes make regular payments to the police (or a proxy organization), the army, or to a *preman* organization. In North Sumatra and East Java it is more common for firms to make monthly up-front payments to avoid operational problems, rather have drivers pay on the road. In East Java, these payments are made particularly to the army, while in North

Sumatra they are made to police organizations or to *preman* organizations who work with the police. These police and army organizations often extort trucking firms in exchange for security and the assurance that drivers from firms that have paid will not be regularly charged on the road by the police. Trucking firms also make regular payments not only to avoid being stopped, but also to avoid heavy fines. One respondent mentioned that by paying these fees on a regular basis, he was promised that every time his truck was pulled over by the police, his truckers' driver's license and/or vehicle registration would be returned quickly without facing any court procedures or fines.

The total amount of these illegal payments is small. The average total routine illegal payment made by firms serving the surveyed routes is 0.6% of their monthly costs. The total of these payments adds up to an average cost of IDR 3,022,724 per year, or approximately USD 336, for firms serving the surveyed routes. This average, however, hides the large difference between the average amount paid in North Sumatra, about IDR 1.2 million, and the average amount paid in East Java of almost IDR 8 million per year (see Figure 7). Although the average amount of payment is higher in East Java, only 31% of firms make routine security payments there. In North Sumatra, over 90% of firms pay routine security payments.

Figure 7 – Frequency and Amount of Security Payments on Non-Sulawesi Routes



Source: primary data, processed

Firms in Sulawesi also make irregular payments to the police. The in-depth interviews revealed that firms in Sulawesi do make occasional payments to the police. Firms interviewed in Makassar, South Sulawesi reported that illegal charges are usually paid to police officers on an irregular basis. Around particular events, such as independence day or religious festivities, firms make unofficial donations to the police and local government officials, ranging from IDR 10,000 to IDR 50,000 per visit. Police officers also might extort payments for alleged violations or simply for personal reasons. A typical example is a firm operating in Pare-Pare. On average, police officers visit the firm a few times per month and ask for approximately IDR 50,000 per visit. In order to ensure that police officers do not fine their truck drivers, this firm also pays IDR 200,000, or over USD 20, to the police on a monthly basis.

Box 7 – The Origin of *Preman* Organizations

Military Links
Preman have a reputation as criminals operating on the seedier side of Indonesian business and profiting from extortion and corruption. Many *preman* organizations were originally set up by military or police generals and served as paramilitary units to the army or police. One such organization is called *Petir* (lightning), a *preman* organization which was associated with the army's special forces. Although *Petir* disappeared after its founding general was discharged, *preman* organizations still rely strongly on patrons in the military or police. The legacy of this connection between criminals, the military and the police damages the reputation of Indonesia as a reform-minded country. This is unfortunate as Indonesia has made significant progress in curtailing the power of the military and in changing the role of the police, which was once subsumed within the armed forces.

Security Organizations or Criminals Gangs?
Some *preman* organizations did not begin life as criminal organizations; instead they began as security ventures. One organization, called *Leskapin*, was established by the police in Sumatra to prevent the high-jacking of trucks. Members of *Leskapin* included retired police officers and unemployed youths who would accompany the trucks. *Leskapin* thus served as a semi-formal security organization. However, as the police themselves loosened their involvement with the organization, it became more and more violent to drivers who didn't pay up, and eventually it turned into a racketeering organization.

Payments to police, the army, and *preman* organizations are mostly illegal, damaging perceptions of the rule of law and the overall business climate. *Preman* organizations are able to operate on the roads and exert a large amount of influence, thus reflecting very poorly on the legal system. Because police officers also extort illegal charges from truck drivers, often in conjunction with *preman*, this damages any sense of trust in the police force. This kind of extortion also harms the overall business climate because corruption leads to uncertainty for firms carrying their goods along Indonesian

roads. As mentioned in the World Bank Logistics Performance Index, predictability and reliability are as important as cost and speed (World Bank, 2007a).

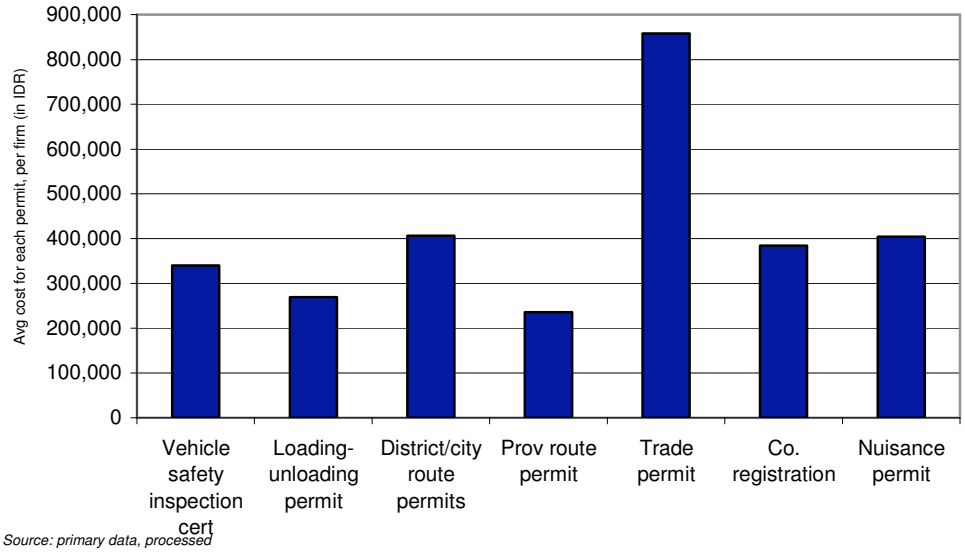
5.4 Licensing costs

Provincial and district governments impose a plethora of regulations which contravene national principles of the free movement of goods and reduce the efficiency of domestic trade. As mentioned in Section 4, according to the national regulations, the only permits that public trucking firms are required to have are the transportation company permit and the vehicle safety inspection certificate. However, local governments still impose a number of other permits, especially those that govern access to, or use of, roads and therefore impede the movement of goods across districts. In addition, trucking firms also must obtain general business permits and vehicle-related permits, such as the vehicle safety inspection and loading and unloading permits.

Regional differences exist in the types of permits obtained by firms and issued by local governments. Not all permits are required by all local governments or obtained by all trucking firms. In some routes in Sulawesi, firm owners did not report having general business permits, although they are required by law. This is because their companies are often small and may not be registered as business entities. On the other hand, the route permits, both district/city and provincial, are not issued by local and provincial governments outside Sulawesi. The only permit that is consistently issued by local governments and obtained by firms is the vehicle safety inspection certificate.

The costs of permits vary according to their types and jurisdictions. Figure 8 shows the average payment for several key licenses. These licenses represent the most common permits that trucking firms are required to have. The most expensive permit for companies serving the surveyed routes is the trade permit, which, together with company registration and the nuisance permit, is considered as a general business permit. The fees for these permits also vary across districts and cities since local governments have the power to set fees for permits.

Figure 8 – Average Licensing Costs, for Each Permit



Source: primary data, processed

However, permits and licenses do not represent a significant cost for firms. Licensing costs do not make up a high percentage of costs or revenue. Business permits are usually valid for as long as five years, while route permits may be valid for as little as six months. On average, company permits and licenses amount to 0.67% of the monthly cost for trucking firms serving the surveyed routes.

The in-depth interviews with businesses also confirm the perception that licensing costs are not a burden to firms. Because general business permits are one-time payments for a period of five years, these are not considered a significant burden. The vehicle safety inspection certification is considered as a 'normal' cost, but the route permits are considered a burden if the validity period is too long. This is because transportation of goods along certain routes/roads is seasonal and so trucks may only use a one-year route permit for a few months. Thus, drivers and firms prefer shorter-duration and less expensive route permits, usable only when there is a demand for trucking services to a particular region.

While licenses do not present a significant financial burden, they still impede domestic trade and are often redundant and unnecessary. Licensing costs remain problematic for two main reasons. First, local permits and user-charges that impede the transport of goods contradict national policy and regulations, which maintain the principle of the free trade of goods within the country. Second, security payments, made by firms, and road payments, made by drivers to police or *preman* organizations, contribute to the diminishing overall perception of Indonesia's business climate. Future efforts to eliminate these payments need to be framed not only around the economic costs, but also around their legality and their impact on the corrupt behavior of local bureaucracies and the trucking industry itself.

5.5 Summary of costs

Table 13 summarizes the different transportation costs covered in this section. In general, on-the-road charges including user charges, weigh bridges and charges by the police, make up more than 10% of vehicle operating costs, while routine and licensing payments are less of a concern for trucking firms.

Table 13 – Summary Table of Road Transportation Costs

No	Routes	Vehicle operating cost (avg, IDR/truck/month)	Legal and illegal road charges (avg, IDR/truck/month)	Regular security payments (avg, IDR/truck/month)	License payments for each route (avg, IDR/truck/month)	Total costs (IDR/truck/month)
1	Bulukumba - Makassar	4,537,824	593,517		35,276	5,166,616
2	Pare Pare - Makassar	4,535,007	705,407		52,630	5,293,044
3	Palopo - Pare Pare	5,042,319	1,207,160		38,315	6,287,795
4	Mamuju - Pare Pare	3,828,752	241,305		44,094	4,114,152
5	Marisa - Gorontalo	4,847,034	259,620	7,862	143,289	5,257,804
6	Kotamobagu - Manado	3,938,183	302,772		21,668	4,262,623
7	Sumbawa Besar - Mataram	2,345,286	733,974		19,136	3,098,396
8	Malang - Surabaya	5,819,368	377,101	151,665	70,058	6,418,193
9	Rantau Parapat - Medan	5,563,304	365,741	20,903	125,121	6,075,069
	Average	4,495,231	531,844	60,143	61,065	5,108,188

Source: primary data, processed

6. Summary and Recommendations

The high cost of domestic transportation is a key impediment to growth in Indonesia. Domestic logistics costs are higher in Indonesia than in Vietnam, Thailand, Malaysia and China. This study has found that the overall vehicle operating cost for trucks carrying goods is IDR 3,093 per kilometer, or approximately USD 34 cents per kilometer. This is higher than the Asian average, which is about USD 22 cents per kilometer. The evidence suggests that domestic transportation costs also significantly hinder Indonesia's trade competitiveness worldwide.

Indonesia's topography and the poor quality of road infrastructure significantly increase vehicle operating costs in the trucking sector. Maintenance costs and fuel costs, in particular, are affected by geography and the quality of infrastructure.

Local governments also raise costs by issuing permits and licenses and imposing user charges that act as barriers to the domestic road transportation of goods. These practices are illegal in Indonesia because they are inconsistent with the national regulatory framework. According to national law, route permits (*izin trayek*) are required only for passenger-carrying public transportation, but in practice they are often required of trucks at the district level. In addition, some districts require a permit simply to cross district borders. These illegal and inconsistent licenses force drivers and firms to make additional payments, increasing overall transportation costs.

In many other countries, illegal charges and permit requirements at the local level are banned. The regulatory framework for road transportation is more straightforward and less open to interpretation in other countries, allowing for unimpeded trade across borders and routes. For example, in China, cross-border permits are illegal. In Europe, the European Community adopted a "Eurovignette" directive in 1999 which establishes common rules for tolls and time-based user charges.

Road- and transportation-related local user charges and related permits serve no public welfare function. These charges are not used for maintenance or to limit the trade of protected natural resources, for example. Instead, they are used as a way to boost local government revenue.

Weigh station regulations should serve the public interest but are routinely ignored. Overloading is very common in Indonesia and causes exponential road degradation, further increasing infrastructure-related operating costs. Overweight trucks also pose a major safety hazard, particularly because many truck operators modify their trucks so that they can carry larger loads, making the axle vulnerable to failure.

Police and *preman* exacerbate the problem, increasing insecurity in the road transportation sector. Trucking firms in some areas make routine payments to *preman* and police officers to ensure the secure passage of their vehicles. Payments to police, the army and *preman* organizations are mostly illegal, damaging perceptions of the rule of law and the overall business climate. Police officers, the army, and criminal organizations often work hand in hand. Most *preman* organizations were founded by police or military members. This harms the reputation of the police and causes perceptions of insecurity.

Recommendations

The following policy recommendations emerge from the analysis of this study. These recommendations focus on enforcing good legislation, such as weigh station regulations, while seeking to eliminate unnecessary road charges that hinder the free flow of goods throughout the country.

- **Prohibit *"izin trayek,"* or route permits, for trucks carrying general goods, through regulation at the national level.** Adopt elements of the "Eurovignette" model and the Chinese model, abolishing border charges and checkpoints which limit domestic trade.

- **Work with local governments to eliminate unnecessary user charges.** Use the governor of Gorontalo's measure to eliminate a natural resources user charge as a model for addressing a wide range of user charges. As part of this initiative to eliminate user charges, clarify exactly what charges local governments may impose.

- **Build capacity at the provincial level to analyze, revise and monitor the elimination of unnecessary licenses and user charges using the Regulatory Impact Assessment method.** Ensure that local regulations are not simply designed to obtain revenue and do not impede movement of goods across districts.

- **Transparency campaign.** Provincial governments should list and advertise legal charges and permits, and their costs, at checkpoints, weigh stations, in newspapers, and at truck stops. These could be combined with Public Service Announcements (PSAs) on local TV station or radio stations.

- **Study the incentive system of the police and develop alternative incentive mechanisms to eliminate reliance on road charges, unnecessary checkpoints, and routine payments.** As part of this study, examine the relationship between the police and local governments and their incentive structures.

- **Support the Ministry of Transportation's efforts to monitor and enforce weight limits.** The national Ministry and local departments of transportation have tried a new approach over the last few years in Java, Sumatra, and Bali, described in Box 4. Under this approach, weigh bridges are manned by two teams: one private firm team and one local government team. Weight measurements are cross-checked. Trucks are measured based on axle load, not overall weight, a more accurate measure for road damage. Punishment is gradually increased—at the beginning, only those over 90% over the limit are forced to turn back, this

year this limit is down to 60%. This system could be expanded, and more private firms could become involved in monitoring weigh stations.

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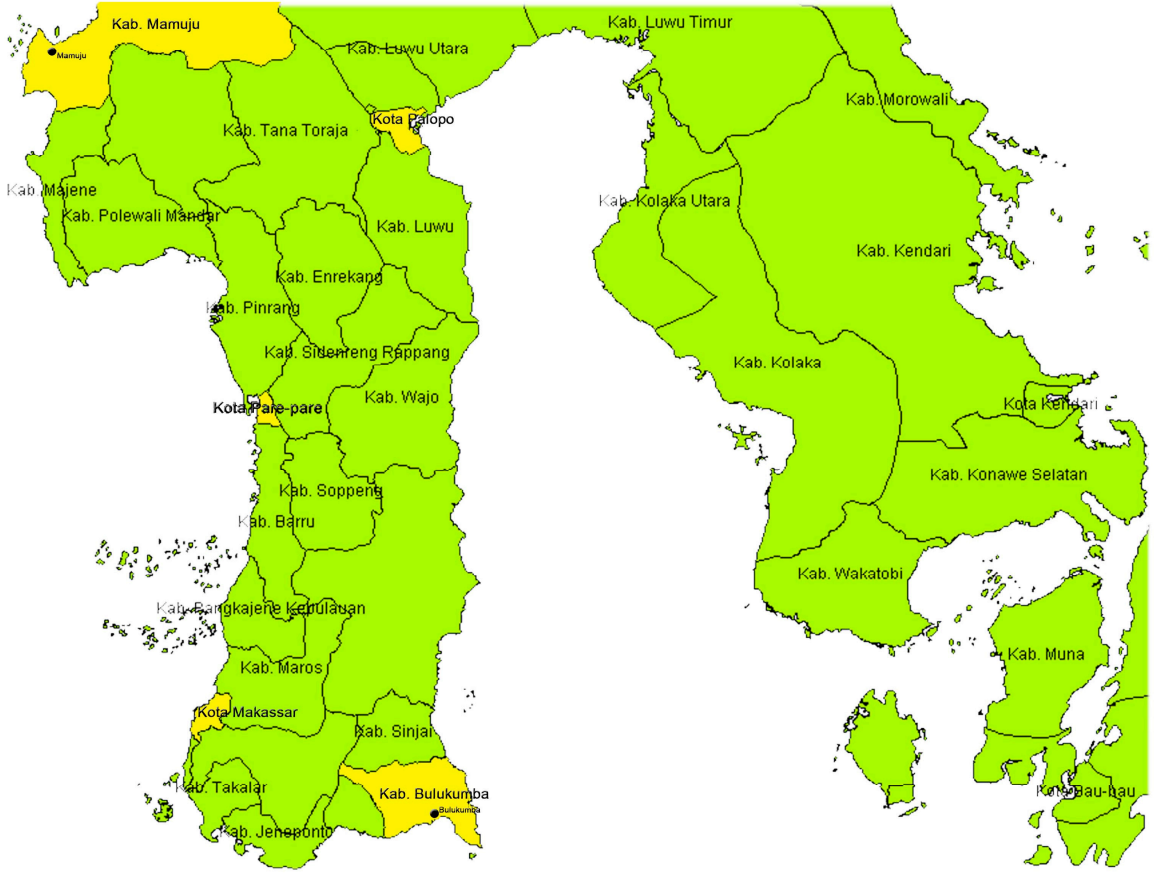
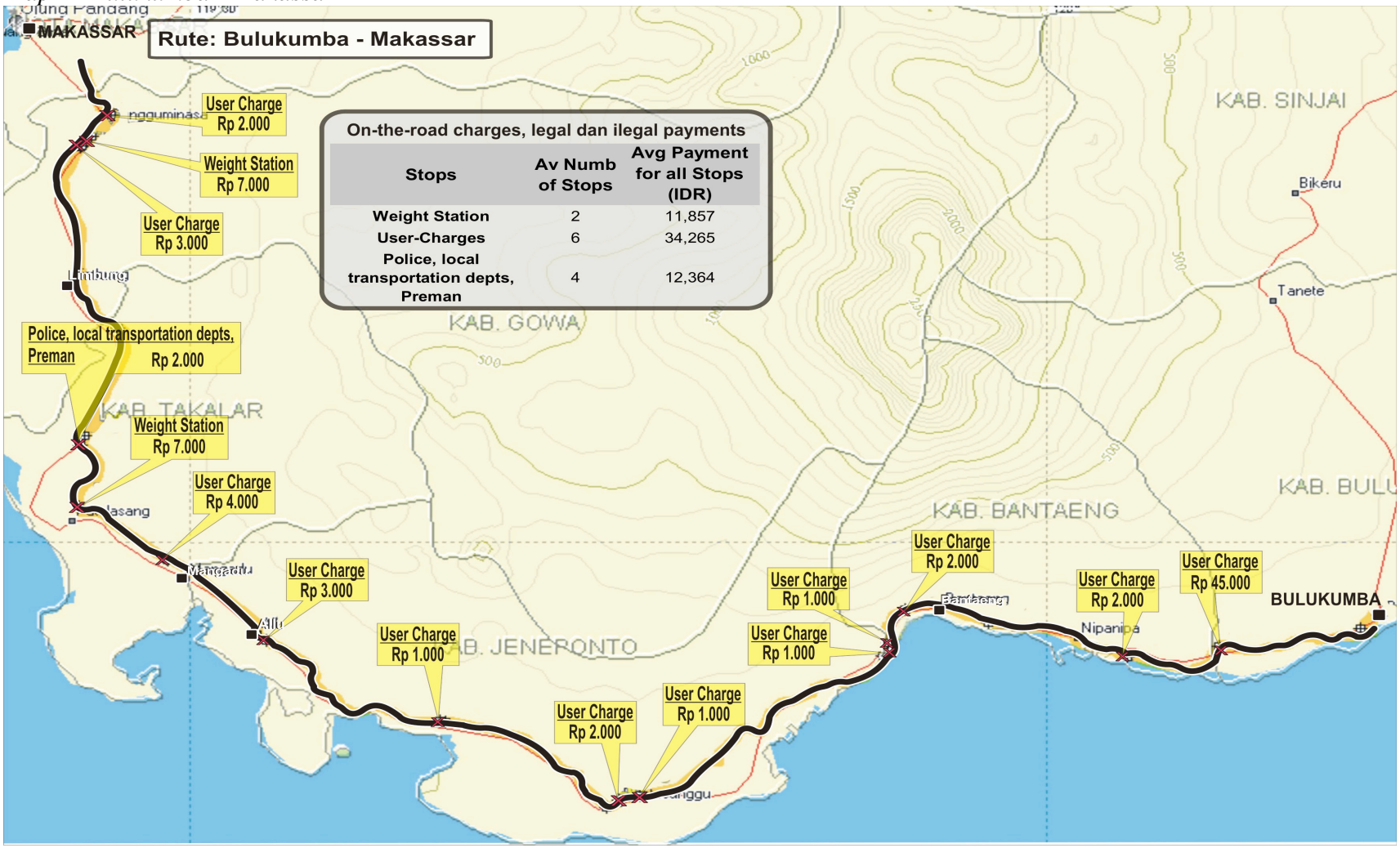
Appendix 1 – Maps of Surveyed Routes and Districts

Map 1 – South and West Sulawesi Districts

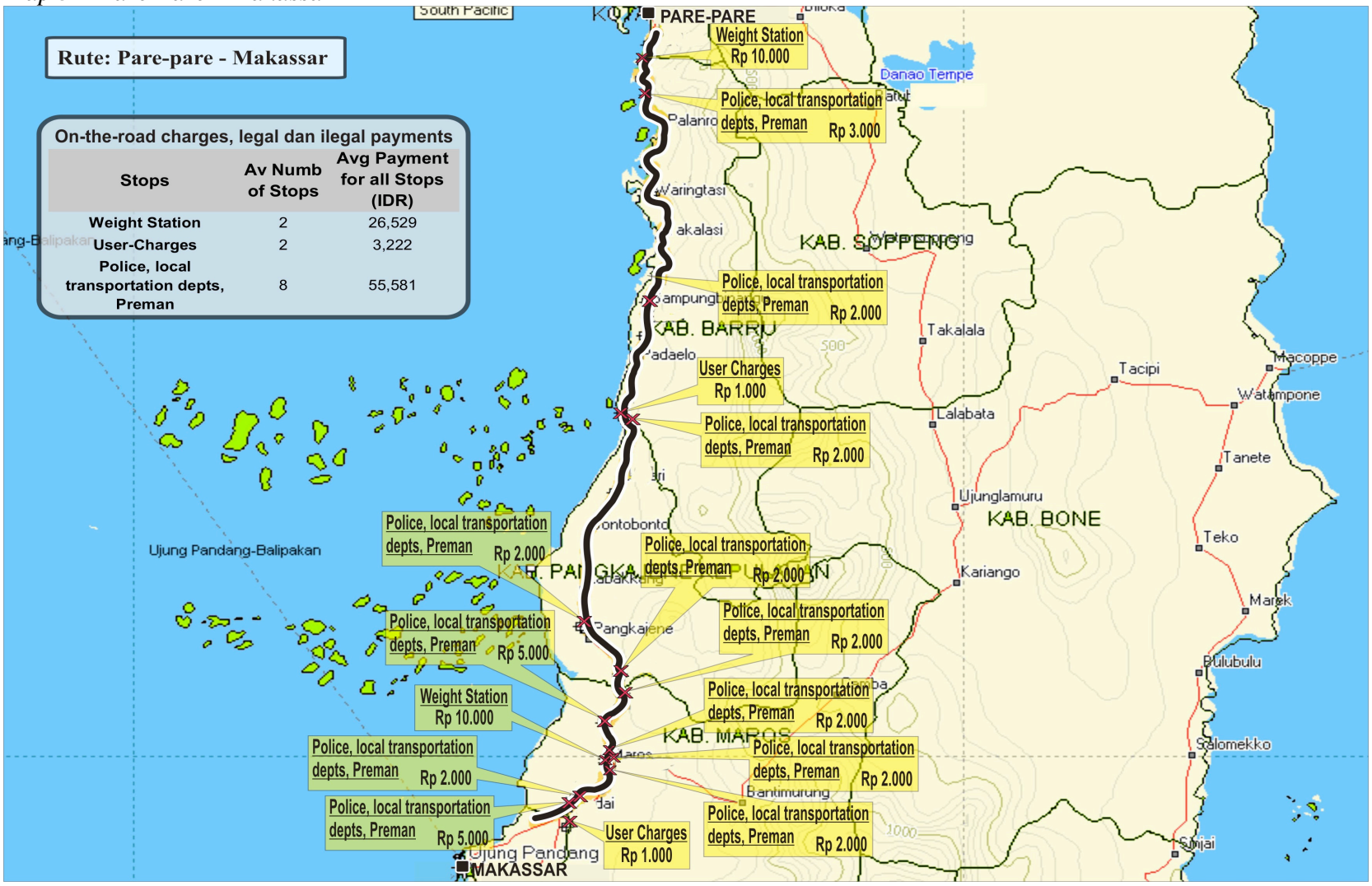


Notes:
Departure and destination cities/districts of surveyed routes are highlighted in yellow.
District boundaries are correct at the time of the survey, in late 2006.

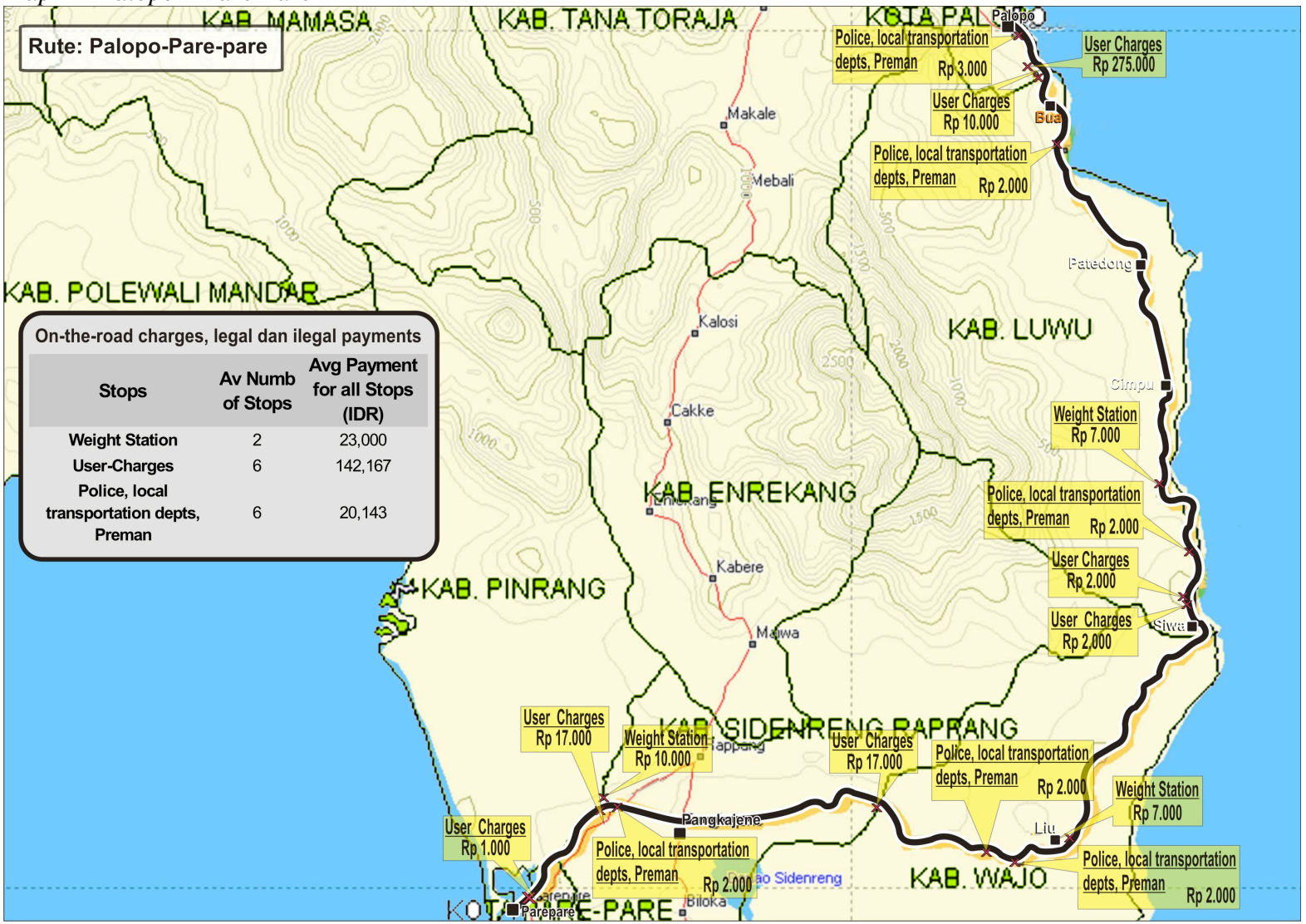
Map2 – Bulukumba - Makassar



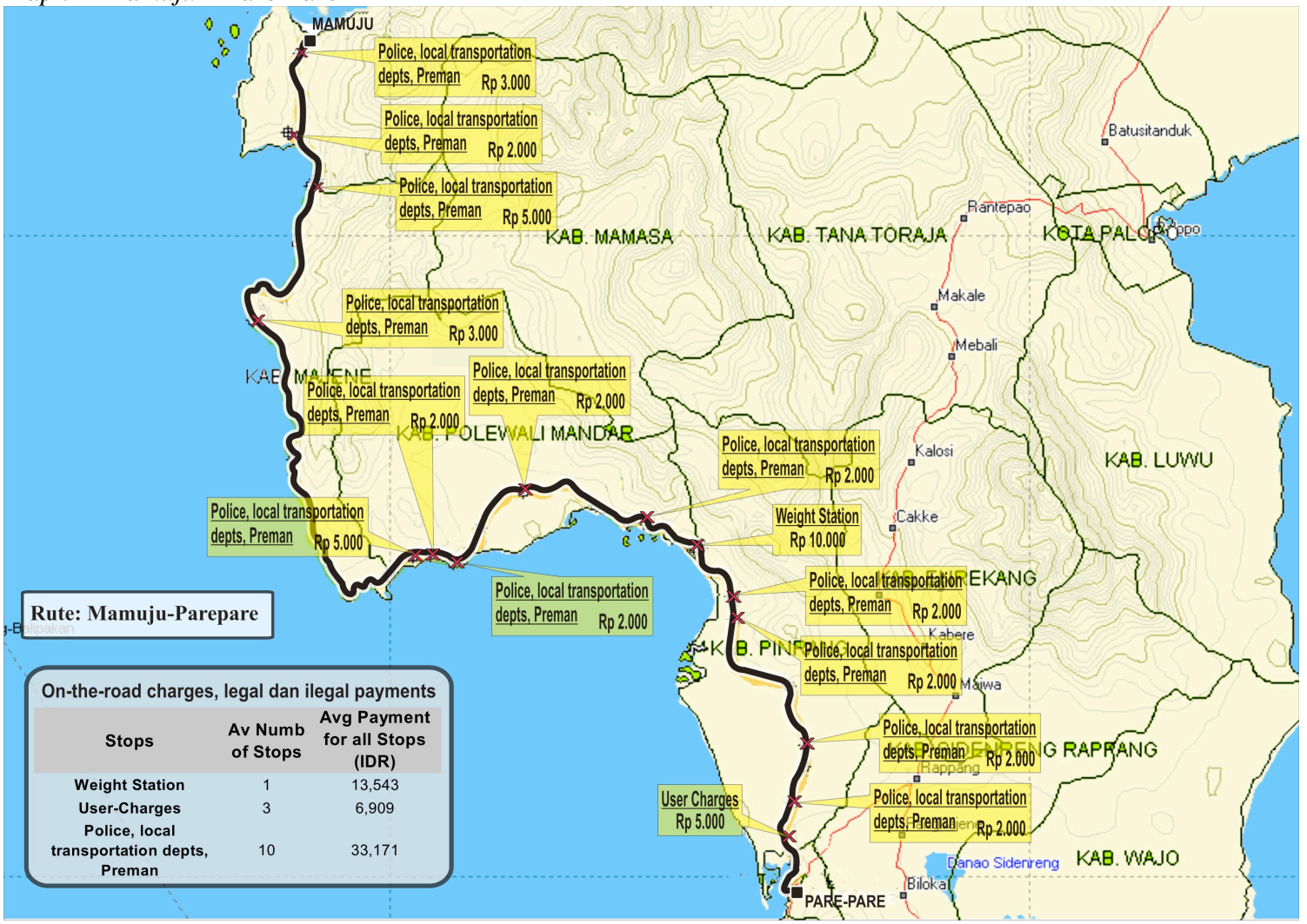
Map 3 – Pare Pare - Makassar



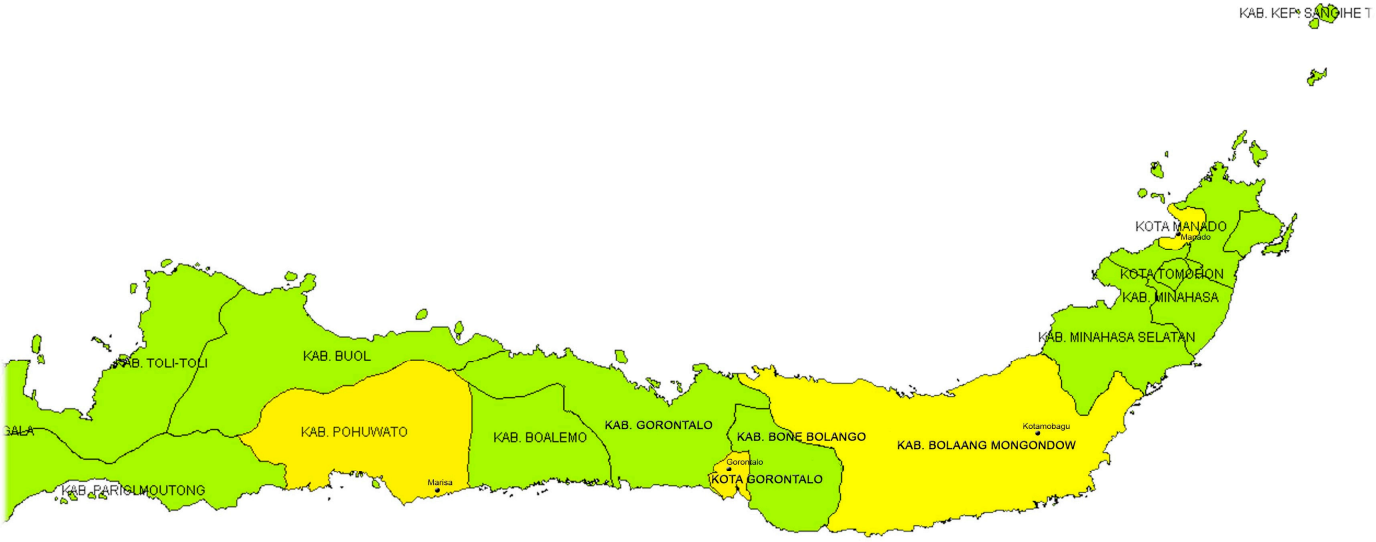
Map 4 – Palopo – Pare Pare



Map 5 – Mamuju – Pare Pare

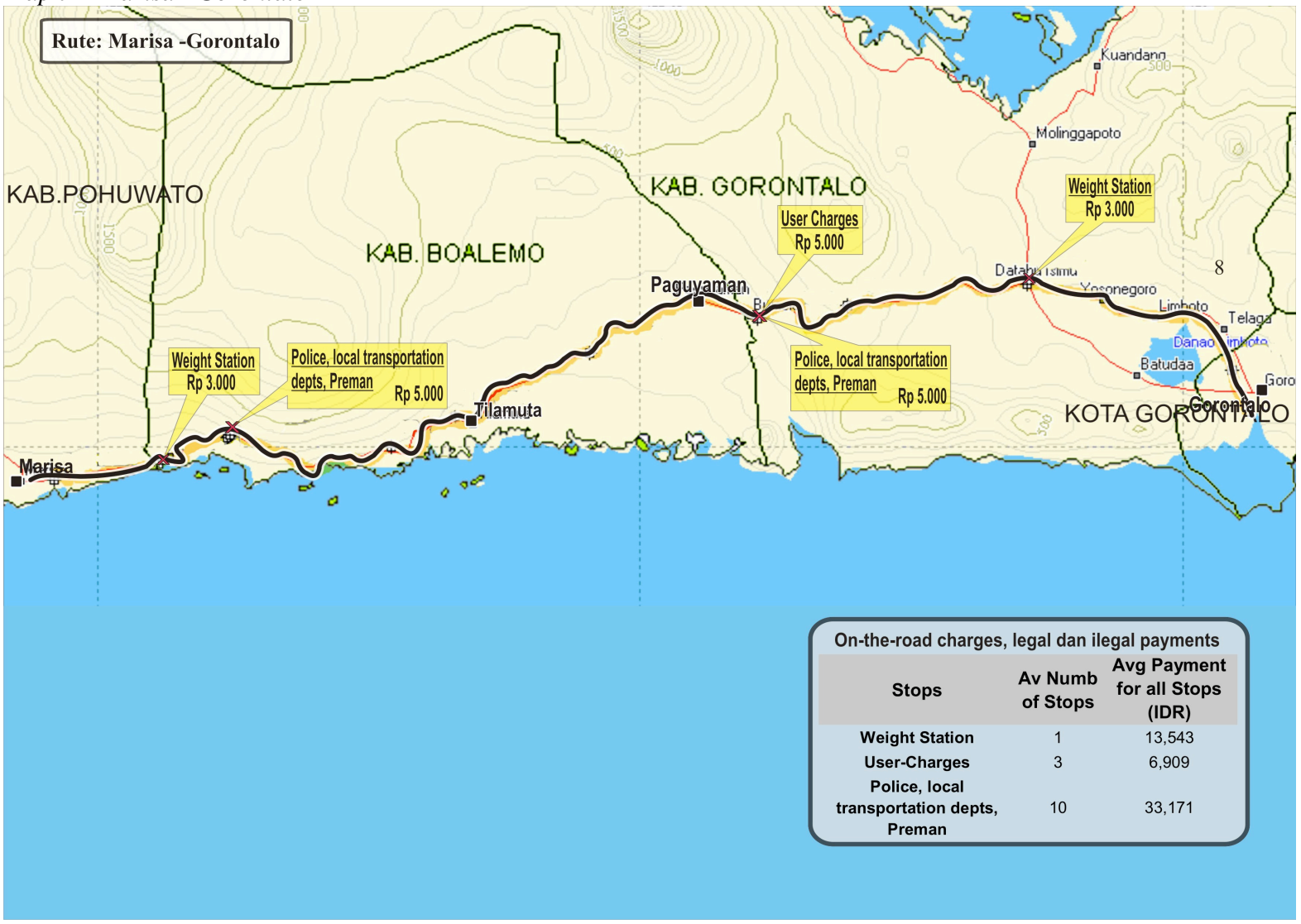


Map 6 – Gorontalo and North Sulawesi Districts



Notes:
Departure and destination cities/districts of surveyed routes are highlighted in yellow.
District boundaries are correct at the time of the survey, in late 2006.

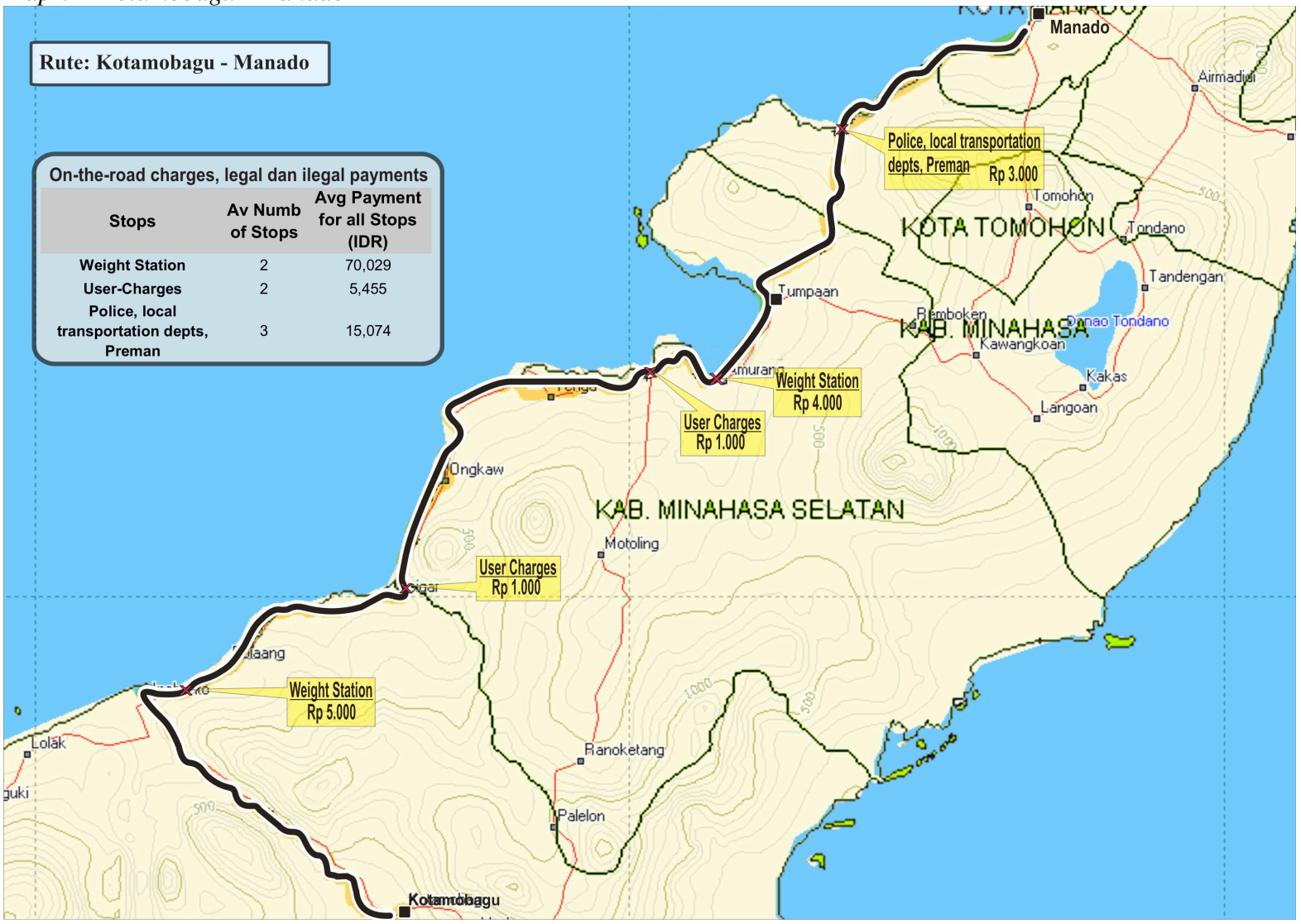
Map 7 – Marisa - Gorontalo



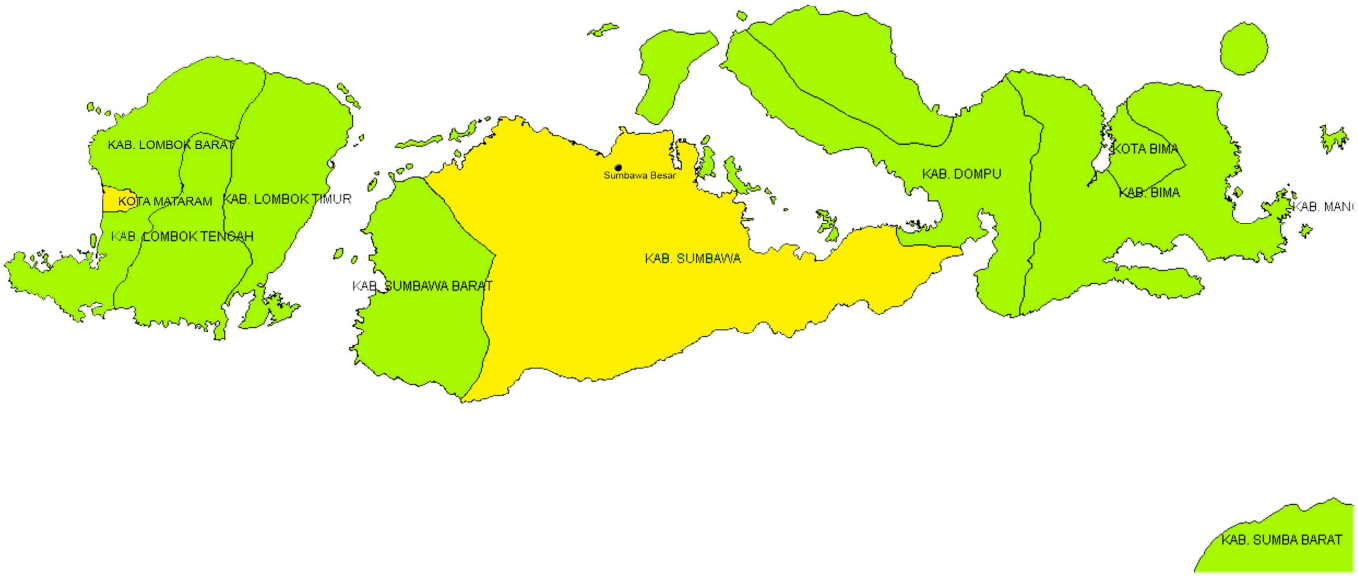
On-the-road charges, legal dan ilegal payments

Stops	Av Numb of Stops	Avg Payment for all Stops (IDR)
Weight Station	1	13,543
User-Charges	3	6,909
Police, local transportation depts, Preman	10	33,171

Map 8 – Kotamobagu - Manado

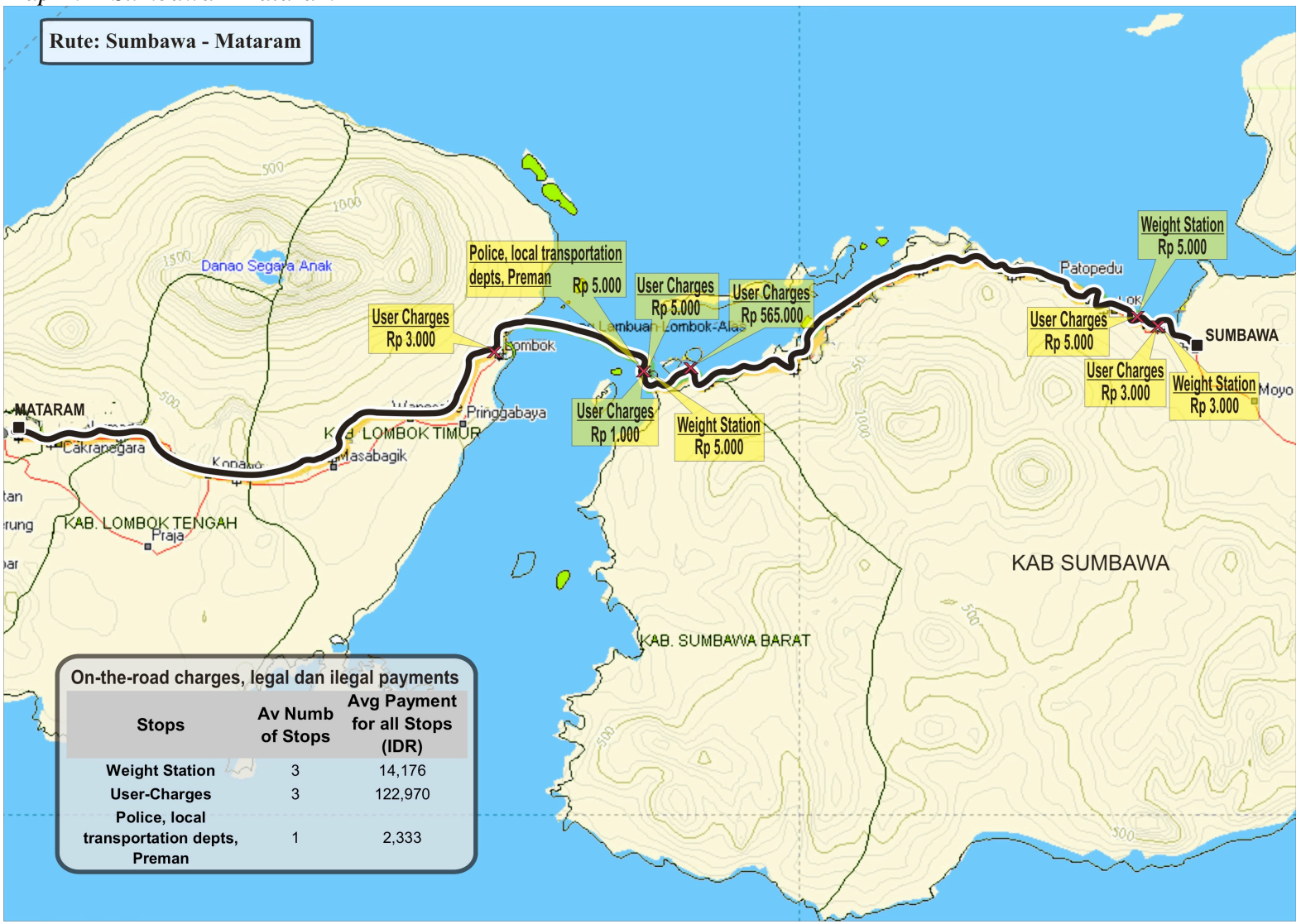


Map 9 – West Nusa Tenggara Districts



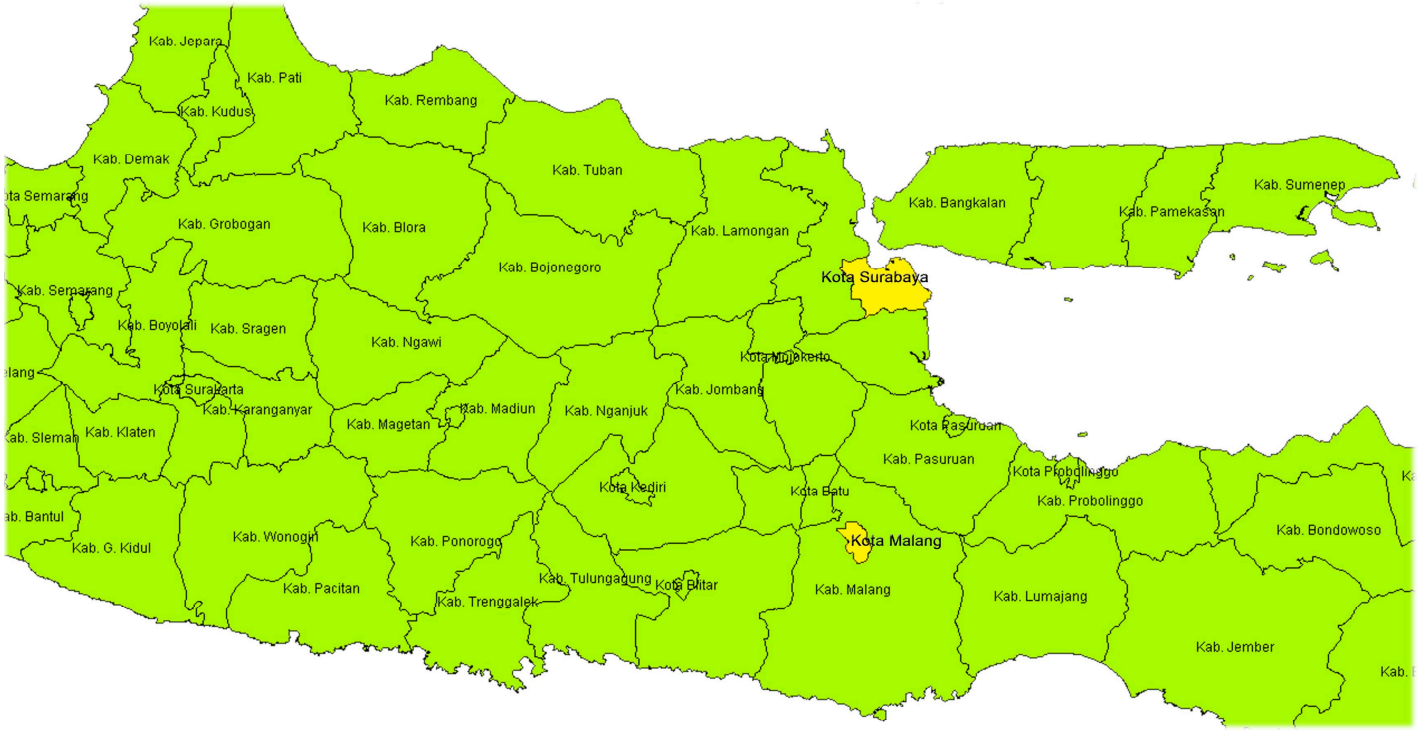
Notes:
Departure and destination cities/districts of surveyed routes are highlighted in yellow.
District boundaries are correct at the time of the survey, in late 2006.

Map 10 – Sumbawa - Mataram



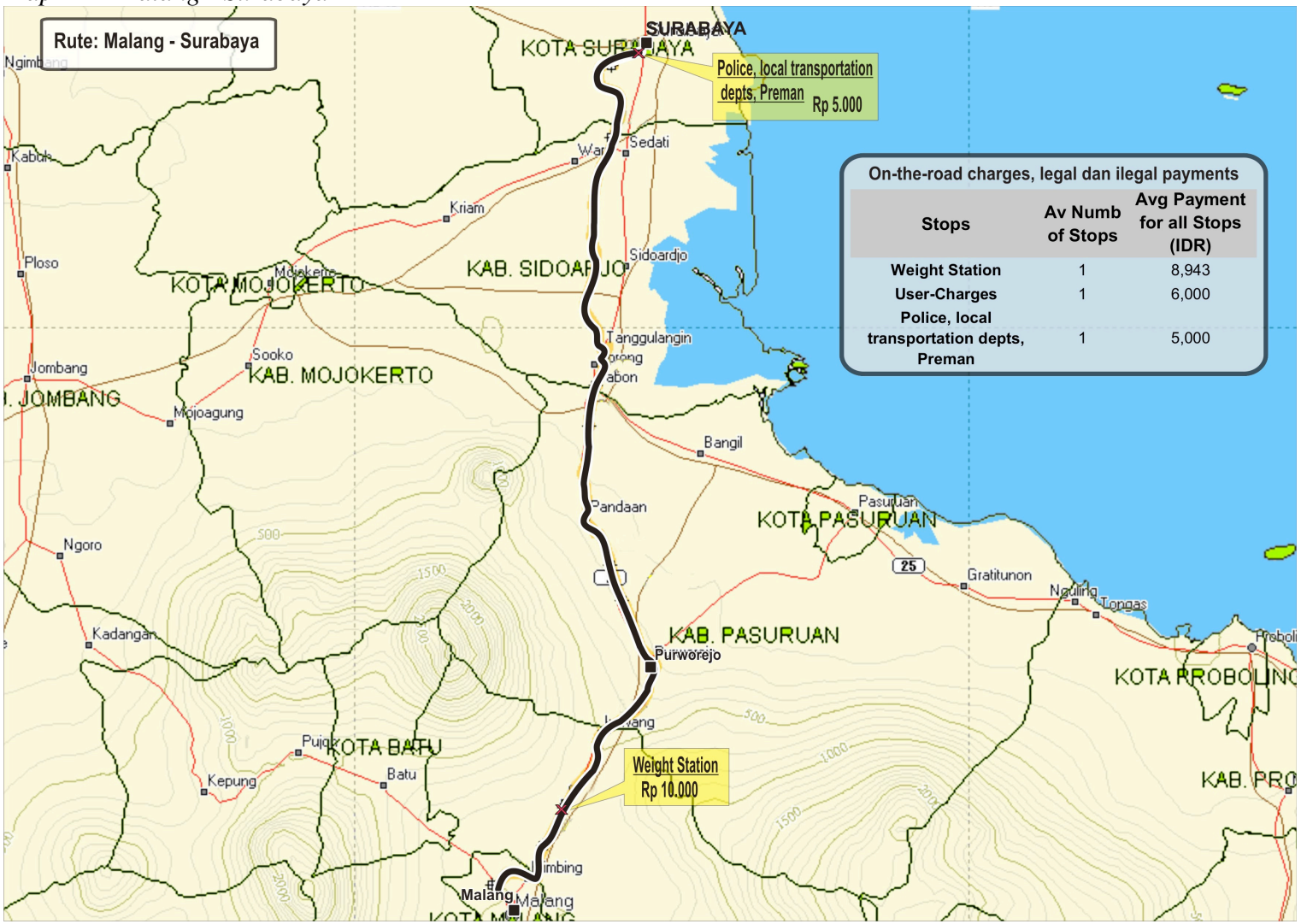
Stops	Av Numb of Stops	Avg Payment for all Stops (IDR)
Weight Station	3	14,176
User-Charges	3	122,970
Police, local transportation depts, Preman	1	2,333

Map 11 – East Java Districts

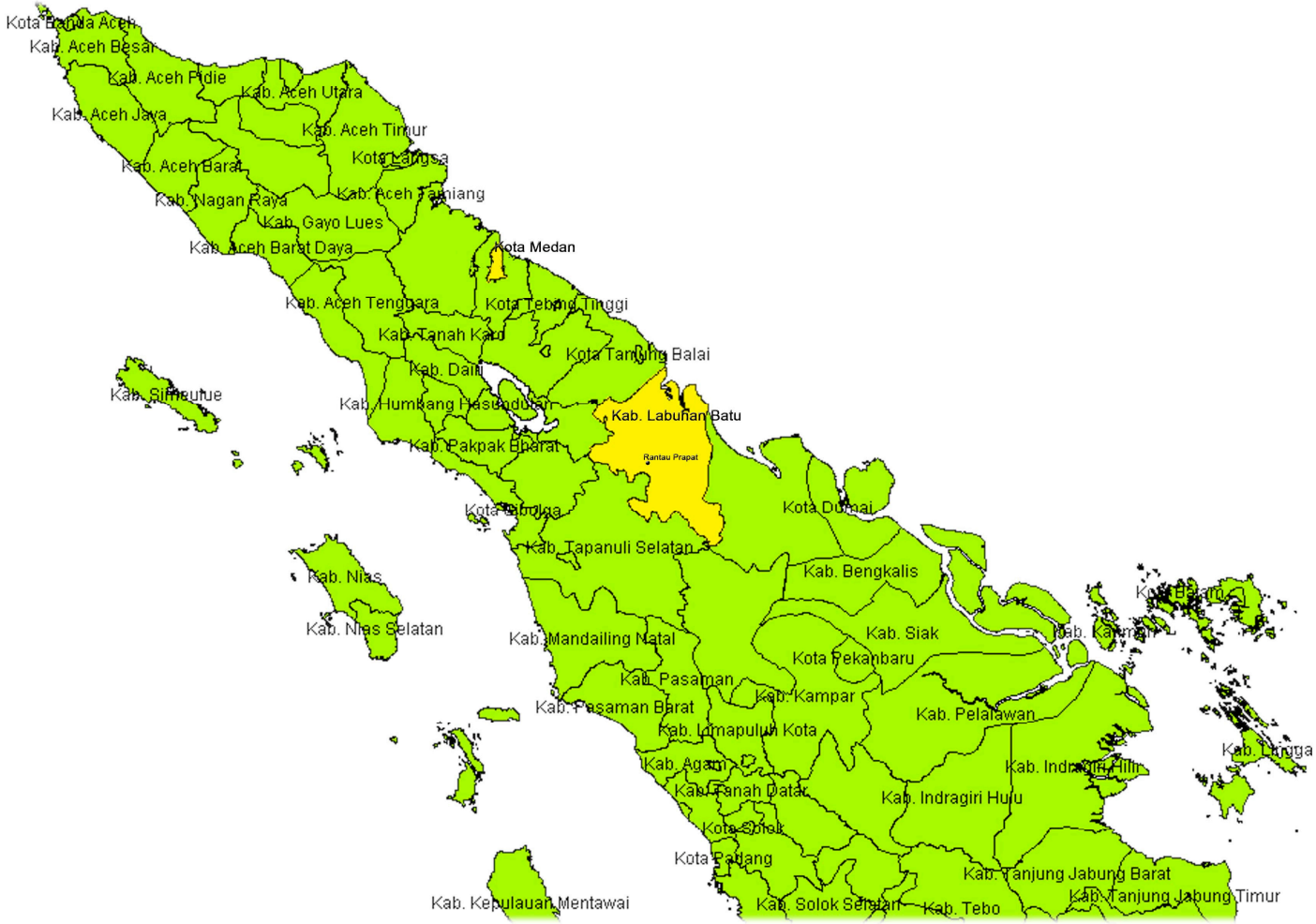


Notes:
Departure and destination cities/districts of surveyed routes are highlighted in yellow.
District boundaries are correct at the time of the survey, in late 2006.

Map 12 – Malang - Surabaya



Map 13 – Sumatra Districts



Notes:
Departure and destination cities/districts of surveyed routes are highlighted in yellow.
District boundaries are correct at the time of the survey, in late 2006.

Map 14 – Rantau Parapat - Medan

Appendix 2 – Listing and Sampling for each Route

1. Bulukumba-Makassar: The surveyor went around Bulukumba to find every single truck being parked at the owner's house, at the marketplace, or on the streets. Eighty-four trucks were listed and 35 were randomly drawn to be interviewed.
2. Pare Pare-Makassar: A brief field survey was conducted prior to listing to identify trucks and truck owners. Listing was done by visiting all transportation companies, businesses that use their services, and other local merchants. Thirty-six trucks were listed and out of this, one was left out of the sample.
3. Palopo-Pare Pare: Listing was done by visiting transportation firms and grocery stores that own trucks. Most trucks only pass through Pare Pare on the way to Makassar and, therefore, the population was redefined as trucks that pass the route without necessarily loading or unloading in these two cities. Forty-four trucks were listed and out of this, 35 were randomly drawn for the survey.
4. Mamuju-Pare Pare: Listing was done by visiting trucks and grocery stores. Most trucks were owned by grocery stores and there was only one trucking firm. Only 23 trucks were initially listed. To increase population size, the listing area was expanded to include an area 150 kilometers north of Mamuju which had a substantial number of trucks. This added another 20 trucks to the list.
5. Marisa-Gorontalo: Snowballing was done by meeting drivers of parked trucks on public streets. Forty-two trucks were listed and 35 were then selected for the survey.
6. Kotamobagu-Manado: Only one truck parking lot was found and listing was continued by visiting individual truck owners. Forty-six trucks were listed.
7. Sumbawa-Mataram: There were no public parking lots for trucks in either of the two cities. Firms on this route tend to be big and, therefore, listing was done by visiting individual firm's truck pool. Fifty-six trucks were listed this way and 35 were then sampled at random.
8. Malang-Surabaya: This route is served by a large number of trucks. The team identified 18 firms that own 533 trucks and six public truck parking lots with 127 trucks. The survey team then conducted stratified sampling to select the 35 sample trucks. Eighteen trucks were chosen in Malang. Nine of these were selected from nine firms and nine other trucks from the public parking lots. The firms were sampled

from the list of 18 firms. Another 17 trucks were selected randomly from the Tanjung Perak port in Surabaya.

9. Rantau Parapat-Medan: The survey team listed the trucks that are parked on the three largest public parking lots. For sampling, due to incomplete information given by truck drivers, the team returned to the parking lots and approached truck drivers that were parking at the time of the visit.

Appendix 3 – Data Definition and Sources for HDM-4 Model

No	Variable	Definition of variable	Source of data
1	**Road Characteristics**		
1.1	**Road geometry (natural breaks)**		
1.1.1	Rise & Fall (m/km)	The sum of the absolute values of total vertical rise and total vertical fall of the original ground	Calculated from GPS data of the truck survey (World Bank, Asia Foundation, and LPEM FEUI, 2006)
1.1.2	Horizontal Curvature (deg/km)	The weighted average of the curvatures of the curvy sections of the road, the weights being the proportion of the lengths of curvy sections	Calculated from GPS data of the truck survey (World Bank, Asia Foundation, and LPEM FEUI, 2006)
1.1.3	Number of Rise & Fall per Km (#)	The number of rises plus the number of falls, as defined on the computation of the rise & fall of a road section	Calculated from GPS data of the truck survey (World Bank, Asia Foundation, and LPEM FEUI, 2006)
1.1.4	Superelevation (%)	The vertical distance between the heights of the inner and outer edges of the road divided by the road width.	Best judgment of surveyor based on the HDM-4 "recommendation"
1.1.5	Altitude (m)	The average elevation of the road above the mean sea level	Calculated from GPS data of the truck survey (World Bank, Asia Foundation, and LPEM FEUI, 2006)
1.2	**Road conditions**		
1.2.1	Roughness (IRI, m/km)	Deviations of a surface from a true planar surface	Based on "National and Province Road Indicators" surveyed by BPS,1999
1.2.2	Carriageway Width (m)	Width of the carriageway in meters	Based on "National and Province Road Indicators" surveyed by BPS,1999
1.2.3	Surface Type (1-paved / 2 –unpaved)	The surface type: 1 for paved roads or 2 for unpaved roads.	Based on Pre Survey by Surveyor
1.3	**Speed adjustment factors**		
1.3.1	Speed Limit (km/hour)	Posted speed limit defined by law based on safety and economic consideration.	Based on the Surveyor information of each route
1.3.2	Speed Limit Enforcement (#)	The speed limit enforcement factor is the speed by which traffic travels above the posted speed limit under ideal conditions.	Based on the Surveyor information of each route
1.3.3	Roadside Friction (#)	Speed reduction factor of the desired speed due to roadside activities	Best judgment of surveyor based on the HDM-4 "recommendation"
1.3.4	NMT Friction (#)	The speed reduction factor of the desired speed due to the presence of non-motorized transport	Best judgment of surveyor based on the HDM-4 "recommendation"
1.4	**Rolling resistance factors**		
1.4.1	Percent Time Driven on Water (%)	Percent of time traveled on water covered roads	Best judgment of surveyor based on the HDM-4 "recommendation"
1.4.2	Percent Time Driven on Snow (%)	Percent of time traveled on snow covered roads. This value is used to compute the rolling resistance of a road.	No data on snow covered road. This is irrelevant.
1.4.3	Paved Roads Texture Depth (mm)	Average depth of the surface of a road	Best judgment of surveyor based on the HDM-4 "recommendation"
2	**Vehicle Characteristics**		
2.1	Annual Km Driven (km)	The number of kilometers driven per vehicle per year	Calculated from the firm survey (World Bank, Asia Foundation, and LPEM FEUI, 2006)
2.2	Annual Working Hours (hours)	The number of working hours per vehicle per year.	Calculated from the firm survey (World Bank, Asia Foundation, and LPEM FEUI, 2006)
2.3	Service Life (years)	Average service life of the vehicle in years.	It is assumed that average service life of the vehicle is about 13 years.
2.4	Private Use (%)	The percent of the time a vehicle is driven for private use	Best judgment of surveyor based on the HDM-4 "recommendation", assumed to be 0.
2.5	Number of Passengers (#)	The average number of passenger per vehicle.	Calculated from the firm survey (World Bank, Asia Foundation, and LPEM FEUI, 2006)
2.6	Work Related Passenger Trips (%)	The percent of the time passengers use the vehicle for work related trips.	Best judgment of surveyor based on the HDM-4 "recommendation", assumed to be 0.
2.7	Gross Vehicle Weight (tons)	The sum of the tare weight plus the average payload of the vehicle in tons.	Calculated from the firm survey (World Bank, Asia Foundation, and LPEM FEUI, 2006)
2.8	Average Annual Daily Traffic (AADT)	The average annual daily traffic	Based on "National and Province Road Indicators" surveyed by BPS,1999
2.9	Traffic Levels Data	The daily traffic for each traffic level and the corresponding traffic composition.	Based on "National and Province Road Indicators" surveyed by BPS,1999
3	**Economic or Financial Unit Costs**		
3.1	New Vehicle Cost (Rp/vehicle)	The new vehicle price	Based on surveyor's information on each route
3.2	New Tire Cost (Rp/tire)	The gasoline or diesel cost	The government-adminstered price of IDR 4,300/liter
3.3	Fuel Cost (Rp/liter)	The new tire cost	Based on surveyor's information on each route
3.4	Lubricant Cost (Rp/liter)	The lubricant cost	Based on surveyor's information on each route
3.5	Maintenance Labor Cost (Rp/hour)	The maintenance labor cost	Calculated from the firm survey (World Bank, Asia Foundation, and LPEM FEUI, 2006)
3.6	Crew Cost (Rp/hour)	The crew time cost	Calculated from the truck survey (World Bank, Asia Foundation, and LPEM FEUI, 2006)
3.7	Overhead Cost (Rp/year)	The overhead cost per vehicle-year	Calculated from the firm survey (World Bank, Asia Foundation, and LPEM FEUI, 2006)
3.8	Interest Rate (%)	Annual interest charge on purchase of new vehicle	Assumed to be 12% per annum
3.9	Working Passenger Time (Rp/hour)	The cost per passenger-hour delayed	Best judgment of surveyor based on the HDM-4 "recommendation"
3.1	Non-Working Passenger Time (Rp/hour)	The passenger delay cost doing non-work activities	Best judgment of surveyor based on the HDM-4 "recommendation"
3.11	Cargo Delay (Rp/hour)	The cost per vehicle-hour delayed	Best judgment of surveyor based on the HDM-4 "recommendation"
4	**Parameter**	**All parameters in this study is based on the specific technical calibration**	**Based on HDM-4 model,2007**

Appendix 4 – HDM-4 Entry Parameters

Variable	Bulukumba-Makassar	Parepare-Makassar	Palopo-Parepare	Mamuju-Parepare	Marisa-Gorontolo	Kotamobagu-Manado	Sumbawa-Mataram	Malang-Surabaya	Pantauprapat-Medan
Road Characteristics									
Road geometry (natural breaks)									
Rise & Fall (m/km)	10	5	8	9	12	11	32	15	3
Number of Rise & Fall per Km (#)	2	1	2	2	2	2	1	1	1
Horizontal Curvature (deg/km)	315	292	303	393	435	313	322	217	210
Superelevation (%)	5	5	5	5	5	5	5	5	5
Altitude (m)	22	12	28	40	67	68	32	196	27
Road conditions									
Roughness (IRI, m/km)	6	7	7	6	5	5	6	3	7
Carriageway Width (m)	5	5	5	5	5	5	5	6	5
Surface Type (1-paved / 2–unpaved)	1	1	1	1	1	1	1	1	1
Speed adjustment factors									
Speed Limit (km/hour)	30	30	30	30	30	30	30	30	30
Speed Limit Enforcement (#)	1	1	1	1	1	1	1	1	1
Roadside Friction (#)	1	1	1	1	1	1	1	1	1
NMT Friction (#)	1	1	1	1	1	1	1	1	1
Rolling resistance factors									
Percent Time Driven on Water (%)	20	20	20	20	20	20	20	20	20
Percent Time Driven on Snow (%)	0	0	0	0	0	0	0	0	0
Paved Roads Texture Depth (mm)	1	1	1	1	1	1	1	1	1
Vehicle Characteristics									
Annual Km Driven (km)	21,802	21,802	21,802	21,802	21,802	21,802	21,802	21,802	21,802
Annual Working Hours (hours)	1,434	1,434	1,434	1,434	1,434	1,434	1,434	1,434	1,434
Service Life (years)	13	13	13	13	13	13	13	13	13
Private Use (%)	0	0	0	0	0	0	0	0	0
Number of Passengers (#)	3	3	3	3	3	3	3	3	3
Work Related Passenger Trips (%)	0	0	0	0	0	0	0	0	0
Gross Vehicle Weight (tons)	15	15	15	15	15	15	15	15	15
Average Annual Daily Traffic (AADT)	2,238	2,238	2,238	2,238	2,238	2,238	2,238	2,238	2,238
Economic or Financial Unit Costs									
New Vehicle Cost (Rp/vehicle)	250,000,000	250,000,000	250,000,000	250,000,000	250,000,000	250,000,000	250,000,000	250,000,000	250,000,000
New Tire Cost (Rp/tire)	700,000	700,000	700,000	700,000	700,000	700,000	700,000	700,000	700,000
Fuel Cost (Rp/liter)	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300	4,300
Lubricant Cost (Rp/liter)	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
Maintenance Labor Cost (Rp/hour)	4,131	4,131	4,131	4,131	4,131	4,131	4,131	4,131	4,131
Crew Cost (Rp/hour)	9,934	9,934	9,934	9,934	9,934	9,934	9,934	9,934	9,934
Overhead Cost (Rp/year)	2,691,000	2,691,000	2,691,000	2,691,000	2,691,000	2,691,000	2,691,000	2,691,000	2,691,000
Interest Rate (%)	12	12	12	12	12	12	12	12	12
Working Passenger Time (Rp/hour)	0	0	0	0	0	0	0	0	0
Non-Working Passenger Time (Rp/hour)	0	0	0	0	0	0	0	0	0
Cargo Delay (Rp/hour)	0	0	0	0	0	0	0	0	0
Parameter	Based on HDM-4, 2007	Based on HDM-4, 2007	Based on HDM-4, 2007	Based on HDM-4, 2007	Based on HDM-4, 2007	Based on HDM-4, 2007	Based on HDM-4, 2007	Based on HDM-4, 2007	Based on HDM-4, 2007