Available online at www.sciencedirect.com

ScienceDirect

Procedia Engineering 125 (2015) 541 – 546

Procedia Engineering

www.elsevier.com/locate/procedia

The 5th International Conference of Euro Asia Civil Engineering Forum (EACEF-5)

The effective strategy in the management of "Pantura" lane road, Java - Indonesia

Hary Agus Rahardjo[a,*], Dwi Dinariana[a], Fitri Suryani[a]

[a]*Civil Engineering Department, Universitas Persada Indonesia Y.A.I, Jakarta, Indonesia*

Abstract

Pantura lane road, which is located in north coast path of Java - Indonesia, with a length of 1300 km is a major transportation route used for the movement of goods and passengers. This road connects the westernmost side to the easternmost side region of the islands. From year to year, the condition of the road is always damaged, partly because of unstable base layer, which is consisted of clay with elastic properties, rain puddles, vehicle load which exceeds the capacity, and the volume of vehicles that reach 45,000 vehicles per day. For maintenance purpose, it is always incurred costs to repair the roads which are constantly increasing in number every year. In 2013, the budget for repairs reached 1.28 trillion (IDR), in 2014 increased to approximately 1.8 trillion (IDR), an increase of approximately 38%. In practice, performance-based contract method had been tried for road maintenance in addition to the traditional method of a contract, beside of the technical aspects approach. It was taken to ensure that such damage will not happen again. But until now, the damage is still going on and returned. Therefore, it is necessary to study on the implementation of the contract method of repair work that has been done so far, and it also needs to study the alternative solutions with a strategic approach, in addition to pay attention to the technical and juridical aspects. The purpose of writing this paper is to examine the factors causing damage to roads; the effective method of road maintenance contracts that could be implemented, i.e. between traditional contract method and the method of performance-based contracts; and to produce an alternative strategic decision that is an effective way of managing Pantura lane road in order to minimize the damage which usually happens every years. The conclusion is that a holistic view is needed to make sure all necessary, interrelated aspects are covered and dealt with. It must be much more than just an action plan to reach a single goal.

Peer-review under responsibility of organizing committee of The 5th International Conference of Euro Asia Civil Engineering Forum (EACEF-5)

Keywords: Management; method of contract; road maintenance.

* Corresponding author. Tel.: +62-21-3926000; fax: +62-21-3147910.
E-mail address: rahardjo30@yahoo.com

Peer-review under responsibility of organizing committee of The 5th International Conference of Euro Asia Civil Engineering Forum (EACEF-5)
doi:10.1016/j.proeng.2015.11.058

1. Introduction

1.1. Background

Road infrastructure is one of the most strategic transport infrastructure facilities. To maintain performance, the road infrastructure needs to be managed in such a way, so that the condition can be maximum maintained as closely as possible to the optimum funding. Based on data released by the Construction and Investment Development Agency (Bepekin) - Kimpraswil, early damage to the road infrastructure is very common, and the average period of service was only about 50% of the planned life [1]. Pantura lane road, which is located in north coast path of Java islands - Indonesia, with a length of 1300 km is a major transportation route used for the movement of goods and passengers. This road connects the westernmost side to the easternmost side region of the islands. From year to year, the condition of the road is always damaged. [2]. The cause of the damage was partly because of unstable base layer, which is consisted of clay with elastic properties. Other causes are due to rain puddles, vehicle load which exceeds the capacity, and the volume of vehicles that reach 45,000 vehicles per day. This large amount of vehicles passing frequency is related to its functions as a main road in the north side of Java islands. For maintenance purpose, it is always incurred costs to repair the roads which are constantly increasing in number every year. In 2013, the budget for repairs reached 1.28 trillion (IDR), in 2014 increased to approximately 1.8 trillion (IDR), an increase of approximately 38%. In practice, performance-based contract method had been tried for road maintenance in addition to the traditional method of a contract. This action, beside of the technical aspects approach, was taken to ensure that such damage will not happen again. But until now, the damage is still going on and returned require corrective measures annually. Therefore, it is necessary to study on the implementation of the contract method of repair work that has been done so far, and it also needs to study the alternative solutions with a strategic approach, in addition to pay attention to the technical and juridical aspects. Fig. 1 below shows the location of the Pantura lane road (north coast path) which stretches from the west end to the east end of the island of Java, Indonesia. Java island is one of the major island among islands in Indonesia. The inhabitant of this island is the most populated, with a population reaching 40% of the total population. Indonesian Republic government center is also located on the island of Java.

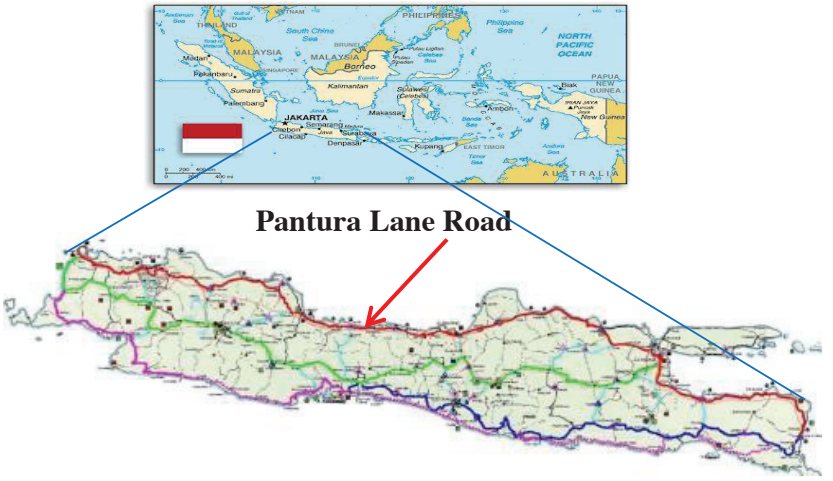

Fig. 1. Pantura Lane Road in Java Island, Indonesia

1.2. Purpose and method of study

The purpose of writing this paper is to examine the factors causing damage to roads; the effective method of road maintenance contract that could be implemented, i.e. between traditional contract method and the method of performance-based contract; and to produce a strategic decision that is the effective way of managing Pantura lane road in order to minimize the damage which usually happens every years. Study conducted in this paper is literature

study and interviews as tools of data collection which is obtained from the experts and stakeholders related to the management of Pantura lane road.

2. Definitions and Principle

2.1. Road Management

One of the fundamental efforts in creating a quality road infrastructure is the improvement of quality control activities or quality control by a team of inspectors and supervision consultant. The design capacity of the road must be established clearly, not only based on load, but also considered traffic count. With this quality control, functions and service levels of roads can be maintained [4]. In addition to the supervision of the work performed, the road managers also have to start reviewing alternatives to help overcome the problem of low quality of roads, one of which is to assess the application of innovative methods, namely contract methods in which a contract also consider aspects of the performance of the work. The contract method is commonly called Performance Base Contract (PBC) [5]. Performance-based contract (PBC) is a contract method, which is different with traditional contract, where the method of payment to the contractor based on the "performance" of work accomplished. Performance-based contract for road work is generally applied to jobs that are “maintenance” (outsourcing maintenance). Most contracts of PBC were implemented within a period of 6 to 8 years. It has been implemented in Argentina and Uruguay, where more than 50% of the national road system use PBC. [6].

2.2. Effective Strategy

Strategy has been studied for years by people and Academician. Yet, there is no definitive answer about what strategy really is. One reason for this is that people think about the strategy in different ways. Strategy applied in business activity may be a little bit different from the strategies applied in government activities. But in general it can be said that the strategy is a method or plan chosen to bring about a desired future, such as achievement of a goal or solution to a problem [7]. In associated with the desire of stakeholders, the Strategy is the direction and scope of an organization over the long-term: which achieves advantage for the organization through its configuration of resources within a challenging environment, to fulfill stakeholder expectations [8]. Effectively implies an impact or meet the expectations of stakeholders. Meanwhile, the strategy set out in the government is influenced by the political and legal aspects. Hence, In contrast to the private sector, where true business strategies are not put out for public consumption, public agencies wear badges proudly, as a way of publicly authenticating their sense of purpose and direction. These strategies enunciated publicly-performed play two roles: 1. they give the agency an identity based on its functions; and 2. they signal the managerial priorities to clients and other stakeholders. [9]. Essentially, in the public sectors, effective strategies need to be: substantively valuable, legitimate and politically sustainable, operationally and administratively feasible [10].

3. Result and Discussion

3.1. Damage cause to roads

The cause of the damage was partly because of unstable base layer, which is consisted of clay with elastic properties. Other causes were due to rain puddles, vehicle load which exceed the capacity, and the volume of vehicles that reach 45,000 vehicles per day. Protracted damage is also caused by the delay in maintenance, lack of funding, and inefficient expenditure allocation [11]. More burdens, as a result of inadequacy of regulatory and law enforcement of traffic of goods vehicles, exacerbate damage to roads and increase maintenance costs from year to year [12]. Fig. 2 below shows the current state of the track pantura with heavy traffic (a); plus a vehicle with excess load (b); which causes damage to the road (c); and ultimately lead to the need for the continuous improvement from year to year (d).

Fig. 2. Condition of Pantura Lane Roads with (a) Heavy Traffic (b) Excess Load (c) Road Damages (d) Routine Maintenance Yearly

In Indonesia, routine maintenance of roads is almost always done by way of self-governance. In most other countries, routine maintenance is done through a contract with another party, as applied to toll road Indonesia. Given the state of the road, in addition to necessary technical maintenance of roads, more importantly, is a road management, where it covers more comprehensive activities including technical maintenance, the contract method used, management strategies relating to the legal aspects, rules and regulations as well as institutional aspects.

3.2. Strategic steps necessary

In order to overcome the damage problem mentioned above, it needs an effective strategy in road management which is related to maintenance cost, rules, regulations, institution, contract, and control of vehicles.

• Increased Maintenance Cost

One alternative solution to overcome this problem is to increase the budget for the cost of repairing the Pantura lane road to fiscal year 2015. Supplementary budget or budget increase is minimal the same as for the realization of the budget that has been running in 2014. So it can be said that the budget repair for pantura lane road in year 2015 is equal to twice of the budget realization in year 2014, as shown in the Fig. 3 below. This is done at once in order to meet the design criteria, which is not only paying attention to the ability to bear the burden, but also the ability to withstand the frequency or the number of road users. With the increased budget for the cost of repairing it then the performance of Pantura lane road will increase, be in accordance with the requirements (according to the existing load), or the level of quality required. When the road construction is in accordance with the requirements, then the damage is only minor damage. Thus, the next road maintenance will be lighter, means reduce repair costs. Meanwhile, road users with loads up to 38 tons can drive safely. Relationship between performances with road maintenance costs are shown in the picture below.

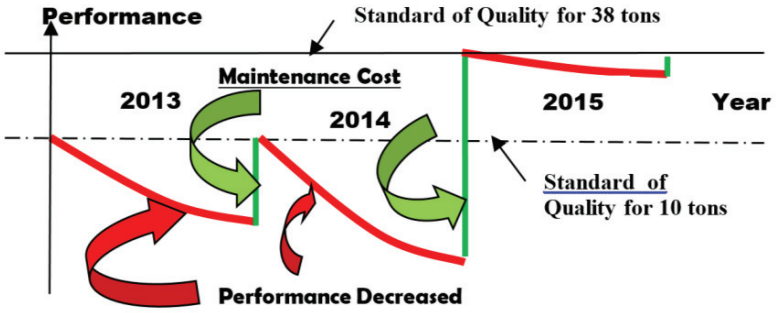

Fig. 3. Strategic Maintenance Cost Allocation in year 2015 to overcome damage problems

• Implementation of PBC with a long period of time

Recent international trends are no longer using the self-management in managing infrastructure facilities. There are changes. Firstly, they choose a contract with another party such as to perform road maintenance projects. The advantages of using contractors are: work performed is paid only if its specification is met; the cost is able to be known, which makes budgeting and planning becomes easier; the risk of work is switched from the public sector to the private sector; and profit motive will increase efficiency and reduce wasted fund. The second change is the shift to a performance-based arrangement or result in the granting of contracts for the maintenance and management of roads. Performance-based contracts are intended to ensure that the road conditions meet the needs of users for a period of several years, by expanding the role of the contractor of the implementation of the work until the road asset management and maintenance. These contracts are usually awarded to the contractor who won the competition. To contractors rewarded a certain cost per kilometer of road to run. In other words, they are not paid based on the input of physical work done, but based on the final results, such as the achievement of the level of quality of service that has been predetermined, as measured by the level of smoothness, speed of travel, the absence of holes, deposition rate of drainage systems, and so on. In addition, this PBC contract is carried out at least within a period of six years, to provide the opportunity for contractors to make some innovation in order to improve their performance during the contract period [13], [14].

• Changes in Rules / Regulations

In addition to enforcement, particularly with respect to load of cargo vehicle passing in the Pantura, regulatory changes are also needed. This change involves the establishment of new institutions that are single, unify, coordinate and organize the five institutions associated with the road, the fields of transportation, public works, the central government, local government and police. With the establishment of this new rule gives assurance to the new institution that serves as a coordinator to be able to work freely and work well.

• Establishment of Single Institution

During this time, the agencies involved in setting national road in Indonesia are the fields of transportation, public works, central government, local government, and police. Each has their respective functions. Public works related to the public works ministry is responsible for the construction and maintenance of roads. The fields of transportation associated with the transportation ministry responsible for public transport route and load weight it carries. The police on duty to control traffic violations, associated with the efforts to keep road safety. While the central government with regard to the issuance of the law after the approval of the legislature. The local government, in this case the provincial governments, set weighbridge in each region in order to avoid overload resulting in damage to the road. From these facts it is deemed necessary for the adoption of a new institution that serves as the coordinator of the five agencies. Thus, the arrangement can be more effective and produce better performance. However, of course this establishment of a new institute requires the legal umbrella of regulations or laws.

• Control of vehicle load more rigorously

During this time, the fine imposed on vehicles with excess load, as shown in the following locations of weighbridge in Fig. 4 below. However, after paying fines, vehicles are allowed to pass, which have resulted in damage to the road. After the enactment of a single institutional structure, management of weighbridge which was originally located under each provinces, can be optimized significantly. Enforcement of regulations covering the implementation of fines for overloading vehicles should be done, followed by unloading, in accordance with a predetermined capacity. However, at each weighbridge location should be provided sufficient space for hoarding goods unloaded from the vehicle with the excess load.

Fig. 4. Control vehicle load by weighbridge

4. Closure

The damage that happened in Pantura lane is influenced by technical and non-technical factors. It needs an effective strategy which is related to maintenance cost, rules, regulations, institution, contract, and control of vehicles. Therefore, the solution is also not just about the technical aspects, such as road construction improvement, but also about other aspects, such as methods of innovative contract (i.e. Performance base contract method), other than the conventional contract method. In its management, necessary strategic steps are include institutional strengthening, adoption of legislation as a legal umbrella for new institutions, and the implementation of budget policies, particularly budget for Pantura maintenance costs. The last is related to law enforcement vehicles with overloaded so that does not happen again and do not damage Pantura Lane which has been fixed by the new budget scheme.

The conclusion according to my observation in implementing government strategies is that a holistic view is needed to make sure all necessary, interrelated aspects are covered and dealt with. It must be much more than just an action plan to reach a single goal. The challenge is very often lack of alignment between or within agencies - probably not a problem unique to government organizations.

References

[1] Badan Pembinaaan Konstruksi dan Investasi. (The Construction and Investment Development Agency). Struktur Spesifikasi Pengendalian Mutu (QC) Yang Baku, Buletin Bapekin No. 03 Year 2001, Kimpraswil.
[2] http://bisniskeuangan.kompas.com/read/2014/11/14/112333526/BPK.Akan Audit.Jalur.Pantura (BPK will audit Pantura Lane)
[3] http://bisniskeuangan.kompas.com/read/2014/07/26/222300726/Proyek.Abadi.Pantura (Long Life Pantura Project)
[4] Hass, R. & Hudson, W. R. Pavement Management Systems, McGraw Hill, New York, N.Y. 1982.
[5] Wirahadikusumah, Reini and Abduh, Muhamad. Metoda Kontrak Inovativ untuk Peningkatan Kualiatas Jalan : Peluang dan Tantangan. Disampaikan pada Lokakarya "Pola Manajemen Proyek untuk Kondisi Berjalan dan Masa Depan", KNTJ-7 Jakarta, 7 – 8 Oktober 2003
[6] Gunter Zietlow. Implementing Performance-based Road Management and Maintenance Contracts in Developing Countries - An Instrument of German Technical Cooperation - German Development Cooperation (GTZ). Eschborn, November 2004
[7] http://www.businessdictionary.com/definition/strategy.html#ixzz3ZzodxLjU, downloaded 20 April 2015.
[8] Whittington, G. Johnson and Scholes, *ExploringStrategy* , 9th edition, Pearson, 2010.
[9] Stewart, Jenny. The meaning of strategy in the public sector. *Australian Journal of Public Administration* • 63(4):16–21. Published by Blackwell Publishing Limited. December 2004.
[10] Petris, Stephen. The nature of strategy in the public sector. Occasional paper no. 7. Department of Sustainability and Environment, The Australia and New Zealand School of Government. April 2010.
[11] Ray, David . Jaringan Jalan Daerah yang Rusak di Indonesia: Tantangan dan Peluang. Journal of Prakarsa Infrastruktur Indonesia, Edisi 14 Juli 2003.pp. 4-9.
[12] Consultant Reports. Menuju Jaringan Jalan Nasional Yang Modern. (Towards Modern National Road Network). Indonesia Infrastructure Initiative. Australian Aid. November 2012.
[13] Stankevich, Natalya and Qureshi, Navaid and Queiroz, Cesar. Performance-based Contracting for Preservation and Improvement of Road Assets. Transport Note No. TN. (updated August 2009). The World Bank Washington DC. 27 September 2005.
[14] Pekka Pakkala. Innovative Project Delivery Methods for Infrastructure. Finnish Road Enterprise Headquarters. Helsinki 2002.