

# Evaluation of Construction Support by the Government Through Business Entities on the Trans Sumatra Toll Road (Case Study: Terbanggi Besar – Kayu Agung Toll Road Section)

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## Abstract

Terbanggi Besar – Pematang Panggang – Kayu Agung toll road is part of the Trans Sumatra Toll Road that received 83 km of construction support carried out by the Toll Road Business Entity that won the auction of toll road projects on the island of Java with a high rate of return on investment. Generally, construction support is provided directly by the government, but in this case the government provides construction support through other toll road business entities. The provision of construction support through toll road business entities on the Terbanggi Besar – Pematang Panggang – Kayu Agung Toll Road has financially increased the investment feasibility parameters, including: an increase in the IRR value to 12% from the original 9.36% before the provision of construction support; The NPV value with the provision of construction support has a better NPV value, which is Rp. 3,875 T compared to the NPV value without construction support of - Rp. 2,044 T; The value of the payback period without the provision of construction support is for 22 years and 3 months and with the provision of construction support for 19 years and 5 months. However, in the implementation process, the quality of toll road infrastructure at construction support locations is not met, resulting in business entities still having to participate in bearing quality risks to construction work carried out by the government. Business entities receiving construction support must bear maintenance costs due to repairs to damage to the construction support site. However, the increase in maintenance costs in general did not have a significant effect on the investment feasibility parameters of the Terbanggi Besar – Pematang Panggang – Kayu Agung toll road project. The increase in maintenance costs had an effect on the decrease in IRR by 1.4%. The NPV indicator also decreased by Rp. 198 billion or worth 5.1%. The payback period has also increased from 19 years and 5 months to 19 years and 8 months. However, the mechanism for providing construction support through business entities needs to be considered to ensure that the benefits of providing construction support can be felt to the maximum.

**Keywords:** Toll Roads, Construction Support, Financial Feasibility

## 1. Introduction

The development of toll road infrastructure is one of the priority agendas of the Indonesia government in order to improve connectivity and competitiveness of the national economy. The construction of toll road infrastructure requires relatively large funds. Therefore, the government encourages the involvement of the private sector in helping to accelerate the provision of toll road infrastructure in the country's limited financial situation. On the other hand, under certain conditions, there are toll road projects that are not financially feasible even though they are economically feasible. This causes no business entities or investors to be interested, so the government delegates its authority to other agencies in the form of assignments to State-Owned Enterprises (Indonesia, Law, 2014). PT Hutama Karya (Persero) is a business entity assigned by the Indonesia government to operate the Trans Sumatra Toll Road which has low financial feasibility even though on the other hand it has high economic feasibility.

The Terbanggi Besar – Pematang Panggang – Kayu Agung toll road is part of the 189 km Trans Sumatra Toll Road. One of the things that is quite interesting on this section is the financing innovation where there is an 83 km long toll road segment supported by the construction of the Toll Road Business Entity on the island of Java which has a high rate of return on investment, so that it becomes a cross-subsidy to this toll road section. Generally, construction support is provided directly by the government, but in this case the government provides construction support through other toll road business entities.

In the implementation process, problems were encountered related to the lack of quality of toll road infrastructure, so the government then instructed business entities receiving construction support to make repairs that had an impact on the increase in toll road maintenance costs. The lack of quality of toll road infrastructure results in business entities still having to bear quality risks to construction work carried out by the government. The increase in maintenance and repair costs for damage to the construction support site will affect the level of financial feasibility of the Terbanggi Besar – Pematang Panggang – Kayu Agung toll road. Lack of quality control of work, and unclear risk-sharing mechanisms may be the reason why feasibility support with this scheme cannot optimally provide benefits in improving the feasibility of toll roads. Therefore, it is necessary to study further for the implementation of a scheme to provide construction support by the government through business entities in the future.

## 2. Review of Literature

Toll roads are freeways that are part of the road network system and as national roads whose users are required to pay tolls (Indonesia Law No. 2 of 2022 concerning Roads). The implementation of toll roads is one of the government's efforts to support increased economic growth in a region, as well as ease the burden of government funds through the participation of road users (Riyanto, 2020). The development of toll road infrastructure in Indonesia has been intensively carried out in the last 1 decade. To accelerate development and increase efficiency, the government uses a toll road assignment scheme. The mechanism for assigning toll roads is regulated in Presidential Regulation Number 10 of 2014 concerning the Acceleration of the Implementation of Toll Road Infrastructure and Regulation of the Minister of Public Works and Public Housing Number 17 of 2021 concerning Mandatory Assignment of Toll Roads. Assignments are generally given to SOEs with a larger development role.

Badriansyah, 2021 in his research entitled "Study on Toll Road Development with Cross-Subsidy VGF Scheme (Case Study: Jakarta – Cikampek II South Toll Road and Terbanggi Besar – Pematang Panggang Toll Road)" said that construction support through cross-subsidization of toll road business entities is an innovative scheme that allows disadvantaged toll road projects to get financial support from other toll road

projects that are more financially feasible. The scheme could help build toll roads in areas that are financially less attractive to private investors, thereby expanding connectivity and boosting economic growth in the region. If the source of funds from the construction support scheme in general is through the contribution of the State Budget, in the cross-subsidy construction support scheme, the source of funds is obtained from part of the financial feasibility of other PPP Infrastructure projects that have excess financial feasibility with the maximum construction cost support that can be provided is still adjusted so that the subsidized PPP project still meets the financial feasibility with reasonable profits as agreed in the Agreement Toll Road Business (PPJT) between BUJT that provides subsidies and the government.

While cross-subsidy schemes offer many benefits, there are several challenges to consider, including: strict monitoring is needed to ensure that the subsidy support is used effectively and efficiently and that it is necessary to ensure that the toll road projects that provide subsidies are not financially harmed. (Mahani, 2018) said in his research that in this scheme, business entities participate in bearing quality risks to construction work carried out by the government, so it is necessary to socialize to BUJT that the government will carry out quality control of the work that has been carried out strictly so that the results are in accordance with the specifications that have been set. Poor infrastructure quality can result in an increase in maintenance costs that must be borne by the BUJT concessionaire. An increase in toll road maintenance costs can reduce the financial feasibility of toll roads (Karsaman, 2007)

### 3. Objectives

1. To identify the impact of construction support by the government through toll road business entities on the financial feasibility of the Terbanggi Besar – Pematang Panggang – Kayu Agung toll road project
2. To evaluate the financial feasibility of the Terbanggi Besar – Pematang Panggang – Kayu Agung toll road after an increase in maintenance costs at construction support locations
3. To obtain the recommendations for projects with the provision of construction support by the government through toll road business entities on toll road projects in the future.

### 4. Methodology

The methods used in this study are classified as quantitative and qualitative by describing the analysis of the rate of return on investment of the Terbanggi Besar – Pematang Panggang – Kayu Agung Toll Road project before and after being given construction support and after there is an increase in maintenance costs. The descriptive qualitative method is then used to compile recommendations for a better scheme for providing construction support through business entities in the future.

The data was obtained in this qualitative and quantitative research by analyzing investment criteria based on data obtained from parties involved in the Terbanggi Besar – Pematang Panggang – Kayu Agung Toll Road project. The data obtained will then be processed, analyzed, and the results will be presented in the form of a descriptive narrative to answer the questions asked as a formulation of the research problem.

### 5. Analysis

#### 5.1. Financial Feasibility before and after the provision of construction support

On the Terbanggi Besar – Pematang Panggang – Kayu Agung Toll Road, the Government provides construction support along 80 km or worth with a construction cost of Rp. 7,200,000,000,000 (Rp. 7.2 T) or 32.8% of the total investment cost.

Furthermore, the feasibility of the Terbanggi Besar – Pematang Panggang – Kayu Agung Toll Road project will be calculated to find out how the financial feasibility of the project compares before and after the provision of construction support.

Financial analysis aims to determine the financial feasibility of the construction, operation and maintenance of toll roads. In this study, the financial feasibility was evaluated using Cash Flow Analysis, Net Present Value (NPV), Internal Rate of Return (IRR), and Payback Period. The construction of the project is said to be feasible if the  $NPV > 0$  value,  $IRR >$  applicable factual interest rate, and payback return  $<$  the toll road concession period.

The period used in this analysis is during the concession period, which is for 40 years. The Debt Equity Ratio (DER) capital structure used is 30:70 (30% Equity and 70% Debt) with a discount rate of 10.09% (Business Plan PT HK, 2016).

The following is a cash flow graph of the Terbanggi Besar – Pematang Panggang – Kayu Agung Toll Road with and without construction support shown in Figure 1 below.

**Figure 1: Cashflow Graph With and Without Construction Support**

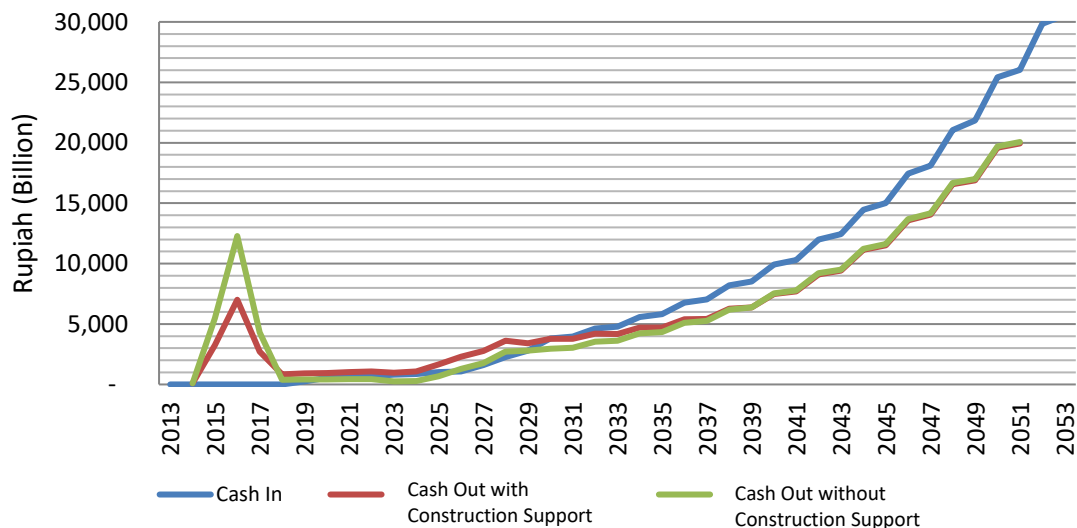


Figure 1 above shows the cash in and cash out in the Terbanggi Besar – Pematang Panggang – Kayu Agung Toll Road Project with/without construction support which has a fairly visible difference in cash out between the two schemes due to the influence of subsidies in the form of construction costs along 80 Km. Cash out without construction support has an average increase every year relatively higher than Cash out with The provision of construction support is due to the influence of greater initial investment costs and has an impact on cash out in the following years due to larger loan payments every year. On the graph, it can be seen that the increase in cash out is higher in the early years of the construction period, especially in cash out without the provision of construction support because the amount of investment costs is calculated as the movement of money out from equity and loans for the construction needs of the Terbanggi Besar – Pematang Panggang – Kayu Agung Toll Road. The components that become Cash Out are investment costs per year, bank installment payments (principal and interest) per year, and O/M fees, etc.

Meanwhile, Cash in with/without a scheme to provide construction support, has the same amount of cash inflow because there is no difference in the source of income, namely only from toll revenue (toll levies). The component that becomes Cash In, namely annual toll revenue.

Furthermore, the results of the analysis of investment parameters including IRR, NPV and Payback Period for and without construction support are presented as follows

**Table 1 Results of Financial Feasibility Analysis with/without Construction Support**

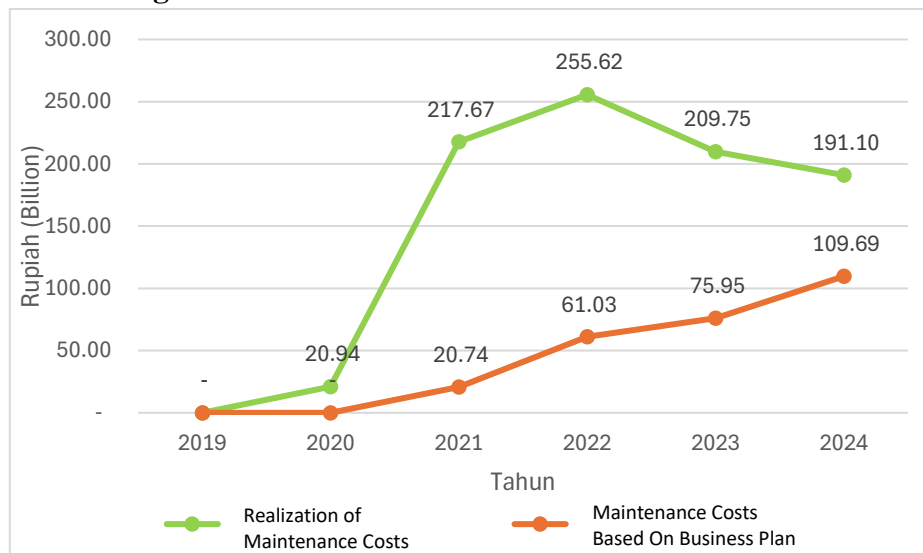
No.	Financial Indicators	Investment Feasibility parameters	With Construction Support	Without Construction Support
1.	IRR (%)	>10,09% (<Discounted interest rates)	9,36	12
2.	NPV (Rp. Billion)	>0 (positive)	-2.044	3.875
3.	Payback Period (Th)	> 40 years (<consession period)	22 years 3 months	19 years 5 months

Based on the results of the analysis of the financial feasibility of the Terbanggi Besar – Pematang Panggang – Kayu Agung Toll Road project with and without the provision of construction support, it can be concluded that the provision of construction support increases the financial feasibility indicators, especially in the IRR and NPV indicators.

**5.2. Financial Analysis After an Increase in Maintenance Costs**

In the Terbanggi Besar – Pematang Panggang – Kayu Agung Toll Road project, PT Hutama Karya (Persero) as toll road business entities has identified the potential for an increase in maintenance costs since the beginning of the toll road operation. In this study, the impact of providing construction support will be limited to the location of the construction support. To see the increase in maintenance costs on the Terbanggi Besar – Pematang Panggang – Kayu Agung Toll Road, you can see in Figure 2 below.

**Figure 2: Estimated Increase in Maintenance Costs**



In 2019 - 2020, when the Terbanggi Besar – Pematang Panggang – Kayu Agung toll road began operating, there were actually indications of an increase in maintenance costs with structural improvements such as rigid pavement reconstruction and flexible pavement which are generally carried out at five-year periodic maintenance. At that time, maintenance costs were still the responsibility of the implementing contractor for the maintenance period of 3 years.

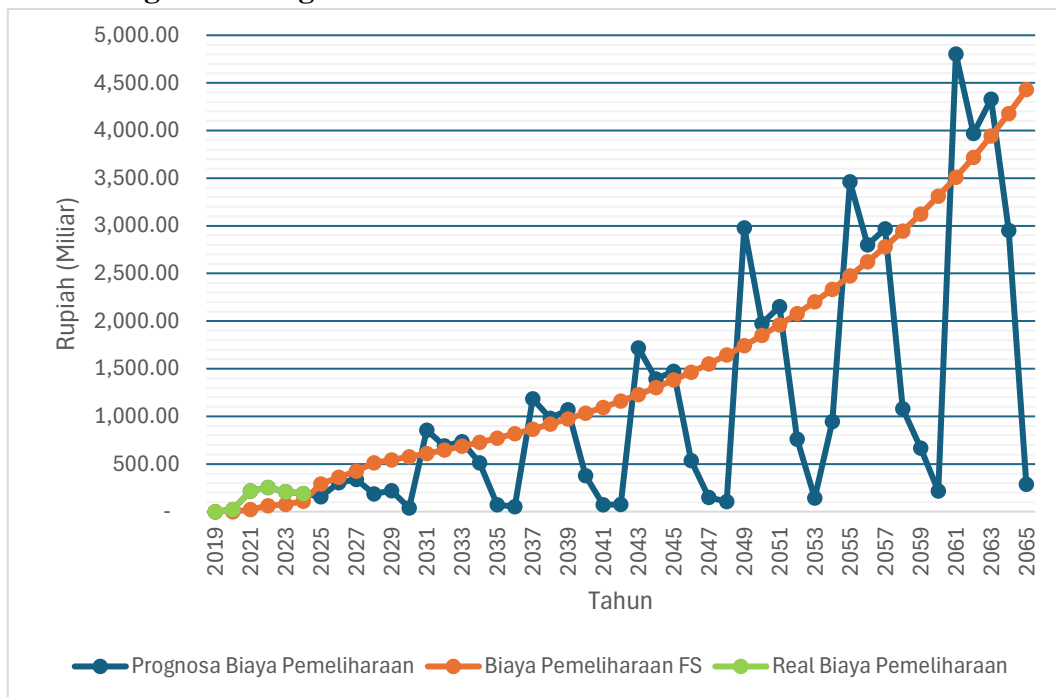
In 2021, the Ministry of Public Works and Housing through BPJT and the Directorate General Bina Marga instructed PT Hutama Karya (Persero) to take over the handling of toll road repairs at construction support locations, so that the estimated increase in maintenance costs began to be seen in 2021.

This occurred outside of the estimate of the previously prepared Business Plan study because it did not consider a significant increase in maintenance costs at the beginning of the toll road operational period with a period of 2021 – 2023, which was 75% of the initial estimate.

Furthermore, the calculation of the projected maintenance cost is carried out considering the increase in maintenance costs. In projecting maintenance costs, the author uses an approach based on the Minister of Public Works and Housing Number: 02/PRT/M/2007 concerning Technical Instructions for Toll Road Maintenance where maintenance is classified based on 3 categories according to the time of implementation, including: routine maintenance, periodic maintenance carried out every 2 and 3 years, and improvements carried out every 5 years. So that the prognosis of maintenance costs each year tends to be not fixed, but conditional in accordance with the scheme of maintenance activities that take place. Meanwhile, in the Business Plan, maintenance activities are assumed to be carried out almost every year with an increase in maintenance costs that tend to be constant every year.

Furthermore, the estimated maintenance cost is compared to the maintenance cost contained in PT HK's Business Plan. The following is presented with a prognosis of maintenance cost estimates based on the approach of maintenance cost increase data in the 2021 – 2023 period against the maintenance cost estimates contained in PT HK's 2016 Business Plan.

**Figure 3: Prognosis of Maintenance Costs After Cost Increase**





Based on the results of the analysis of the financial feasibility of the Terbanggi Besar – Pematang Panggang – Kayu Agung Toll Road project with the provision of construction support that has been carried out in the previous sub-chapter, then in the same way, the financial feasibility indicators are analyzed after the increase in maintenance costs, especially in the IRR and NPV indicators presented in Table 2 below.

**Table 2 Results of Financial Feasibility Analysis After the Increase in Maintenance Costs**

No.	Financial Indicators	Investment Feasibility parameters	Without Construction Support	Before the Increase in Maintenance Costs	After the Increase in Maintenance Costs
1.	IRR (%)	>10,09% (<Discounted interest rates)	9,36	12,11	11,94
2.	NPV (Rp. Milyar)	>0 (positive)	-2.044	3.875	3.677
3.	Payback Period (Th)	>40 years (<consession period)	22 years 3 months	19 years 5 months	19 years 8 months

Based on the financial feasibility analysis, it can be found that the Terbanggi Besar – Pematang Panggang – Kayu Agung Toll Road project before and after the increase in maintenance costs is still feasible to be implemented because all financial indicators produce value in accordance with the set financial feasibility criteria. The increase in maintenance costs did affect the decrease in IRR by 1.4%. The NPV indicator also decreased by Rp. 198 billion or worth 5.1%. The payback period has also increased from 19 years and 5 months to 19 years and 8 months.

It can be noted that the provision of cross-construction support through other business entities can pose a risk of not achieving the previously planned financial feasibility indicators if there is an increase in maintenance costs. An increase in maintenance costs can have an effect on a reduction in reasonable profits for the implementing business entity as well as a longer payback period / return on investment time than previously planned. However, it can be concluded that the increase in maintenance costs does not have a significant effect on investment feasibility parameters compared to the effect on construction costs.

### 5.3. Evaluation of the Business Flow of the Terbanggi Besar – Kayu Agung Toll Road

The author tries to evaluate the toll road business mechanism in accordance with applicable regulations compared to the existing conditions that occur on the Terbanggi Besar – Kayu Agung toll road. Based on the analysis carried out, it is known that there are several different activities from the business flow in accordance with existing regulations, including the following:

**Table 3 Comparison of the Business Flow of the Terbanggi Besar – Pematang Panggang – Kayu Agung Toll Road to Applicable Regulations**

No.	Toll Road Business Flow According to Regulations	Business Flow of Terbanggi Besar – Pematang Panggang – Kayu Agung Toll Road
1	The concept of providing construction support through business entities is carried out with the principle of PPP where the determination of BUJT that provides dukon is sure to have reasonable financial feasibility on the section that is the scope of the concession.	PT Citra Karya Jabar Tol, BUJT Cileunyi – Sumedang – Dawuan section received partial construction support by the government, although on the other hand it was chosen as the winner of the auction for providing construction support on the Terbanggi Besar – Pematang Panggang – Kayu Agung Toll Road
2	Certainty on the scope and mechanism of providing construction support is determined before the Toll Road Business Agreement is agreed upon	The scope and mechanism of providing construction support is determined in stages from before the Toll Road Business Agreement is agreed until the implementation of construction has taken place. This results in an overlap in scope and responsibility between the Dukon Implementing BUJT and the Concession Owner BUJT
3	BUJT is required to appoint an Independent Quality Control (PMI) consultant who is responsible to BPJT to ensure that the quality of infrastructure runs well The procurement of PMI consultants is carried out before the construction period begins	BUJT holds a construction management consultant 6 months after construction starts and the upper scope of PMI consultants is only included in the scope of construction management consultants 1 year after construction takes place. PMI Consultants and Construction Management Consultants cannot work optimally in ensuring the quality of infrastructure carried out by implementing contractors
4	If there is damage to assets during the maintenance period which is the responsibility of BUJT Dukon and the implementing contractor, it must be fulfilled in accordance with its obligations	Damage to assets that occurred during the maintenance period, which is the responsibility of BUJT Dukon and the implementing contractor, was carried out by BUJT Concessionaire

**5.4. Recommendations for the Implementation of Providing Construction Support Through Business Entities**

Based on the literature study that has been carried out, the author then tries to compile recommendations for the implementation of construction support through business entities in the future with the following considerations:

1. In accordance with the Regulation of the Minister of Public Works and Public Housing of the Republic of Indonesia Number 06/PRT/M/2018 concerning the authority and duties of the Directorate General of Highways, Toll Road Regulatory Agencies, and Toll Road Business Entities in the Implementation of Toll Roads, BPJT is responsible for the implementation of toll road investment procurement. Meanwhile, the physical implementation of construction carried out by business entities is supervised



by the Directorate General of Highways. The Directorate General of Highways acts as the government's representative in the ownership of toll road assets. This is different from what happened in the Terbanggi Besar – Pematang Panggang – Kayu Agung toll road project, where the role of supervision in ensuring the quality of infrastructure by the Directorate General of Highways has not been seen. The delay in the procurement of independent quality control consultants and construction management consultants was not followed up by the Directorate General of Highways so that it has the potential to reduce the quality of toll road infrastructure, especially construction support locations. Therefore, it is recommended to increase the role of BPJT, the Director General of Highways and the Concessionaire BUJT in supervising the process and quality of the toll road infrastructure built

2. BPJT basically plays a role as a regulator in the implementation of toll road business. On the Terbanggi Besar – Pematang Panggang – Kayu Agung Toll Road, the scope and mechanism of providing construction support is determined in stages from before the Toll Road Business Agreement is agreed until the implementation of construction has taken place. This resulted in an overlap in scope and responsibility between the Dukon Implementing BUJT and the Concession Owner BUJT. Therefore, the author recommends the need for implementation guidelines that clearly regulate the implementation of construction support through Business Entities
3. One of the BUJTs that provides construction support, the Cileunyi – Sumedang – Dawuan section BUJT received partial construction support by the government, although on the other hand it was chosen as the winner of the auction for providing construction support on the Terbanggi Besar – Pematang Panggang – Kayu Agung Toll Road. This is not in accordance with the PPP principle. Therefore, it is recommended that there is a need to increase the alignment of PPP principles where the determination of BUJT that provides construction support can be ensured to have reasonable financial feasibility on the section that is the scope of the concession before being able to provide construction support for other sections

## 6. Conclusions

The conclusions that can be drawn from the study are as follows:

1. The provision of construction support through BUJT on the Terbanggi Besar – Pematang Panggang – Kayu Agung Toll Road has financially increased the investment feasibility parameters, including: an increase in the IRR value to 12% from the original 9.36% before the provision of construction support; The NPV value with the provision of construction support has a better NPV value, which is Rp. 3,875 T compared to the NPV value without construction support of - Rp. 2,044 T; The value of the payback period without the provision of construction support is for 22 years and 3 months and with the provision of construction support for 19 years and 5 months.
2. The increase in maintenance costs in general does not have a significant effect on the investment feasibility parameters of the Terbanggi Besar – Pematang Panggang – Kayu Agung toll road project. The increase in maintenance costs had an effect on the decrease in IRR by 1.4%. The NPV indicator also decreased by Rp. 198 billion or worth 5.1%. The payback period has also increased from 19 years and 5 months to 19 years and 8 months.
3. Recommendations for the implementation of construction support through business entities in the future include: (1) Increasing the role of BPJT, the Director General of Highways and BUJT Concessionaires in supervising the process and quality of the toll road infrastructure being built; (2) There needs to be an implementation guideline that clearly regulates the implementation of

construction support through Business Entities; (3) Increasing the alignment of PPP principles where the determination of BUJT to provide construction support can be ensured to have reasonable financial feasibility on the section that is the scope of the concession before being able to provide construction support for other sections

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