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Evaluation of the Provision of Construction Support Through Business Entities (Case Study: Terbanggi Besar Kayu Agung Toll Road)

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ABSTRACT

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 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 affected the decrease in IRR by 1.4%. The NPV indicator also decreased by Rp. 198 billion or 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.

Introduction

The development of toll road infrastructure is one of the priority agendas of the Indonesian government to improve connectivity and competitiveness of the national economy (Ameyaw & PC Chan, 2016). According to data from the Toll Road Regulatory Agency (BPJT), the total length of toll roads in Indonesia at the end of 2022 reached 2,555.4 kilometers. This figure is still far from the government's target of 4,500 km in 2024 (Ude & Eneh, 2024).

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 (Babatunde, Perera, Zhou, & Udeaja, 2016). The government encourages the active role of business entities to cooperate in the operation of toll roads, especially for toll road business locations that are economically and financially feasible, to enable business entities to obtain a reasonable rate of return on investment and profits from the toll road business (Badriansyah, Karsaman, & Lubis, 2024).

On the other hand, under certain conditions, there are toll road projects that are not financially feasible even though they are economically feasible (Ali, Irfan, & Salman, 2020). 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).

The Trans Sumatra Toll Road ("JTTS") project is a government assignment project given to PT Hutama Karya (Persero), a State-Owned Enterprise ("BUMN") whose ownership of all shares is owned by the government of the Republic of Indonesia (Zhang & Leiringer, 2023).

The JTTS project is a 2,775-kilometer toll road construction project that connects cities on the island of Sumatra, from Lampung to Aceh. In general, the amount of Internal Rate of Return ("IRR") of JTTS projects varies from 3% - to 12% with an average of 5.7% (data from Hutama Karya, 2023). The JTTS project can be said to be financially unfeasible because the project's IRR value is still below Bank Indonesia's benchmark interest rate, which is 7.5% (Ochieng, Zuofa, & Badi, 2021).

However, when viewed from an overall economic perspective, the JTTS project can be said to be economically feasible. The results of the study show that there is a positive relationship between infrastructure development and economic growth in the development of JTTS. The JTTS project can improve people's living standards, provide equitable distribution of the national economy, and provide new economic growth points (Syaputra, 2022).

The Terbanggi Besar – Pematang Panggang – Kayu Agung toll road is one of the parts of the 189 km JTTS which is a continuation of the Bakauheni – Terbanggi Besar section (Mahani, Tamin, Pribadi, & Wibowo, 2019) . One of the things that are quite interesting in 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 ("BUJT") on the island of Java which has a high rate of return on investment so that it is 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 (Mahani, Tamin, Pribadi, & Wibowo, 2017).

The Terbanggi Besar – Pematang Panggang – Kayu Agung Toll Road was inaugurated in November 2019. Since its inception, the condition of toll roads has often been severely damaged both in rigid and flexible pavement locations with construction support. The maintenance period of this toll road lasts for 3 years from the first handover or ends in August 2022 (Shrestha, Tamošaitienė, Martek, Hosseini, & Edwards, 2019). Until mid-2021, the condition of the Terbanggi Besar – Pematang Panggang – Kayu Agung Toll Road still leaves hundreds of locations of damage in the construction support area. The Director of Freeways of the Ministry of PUPR then instructed PT HK as the concessionaire to take over the repair of the damage and immediately complete the repair of the damage (Carbonara, Costantino, Gunnigan, & Pellegrino, 2015) .

The takeover of the repair certainly increases the maintenance costs that must be borne by PT HK which should still be the responsibility of the implementing contractor who contracts with BUJT, the related construction support provider. Broadly speaking, the chronology of the Terbanggi Besar – Kayu Agung toll road business can be seen in Figure 1 below.

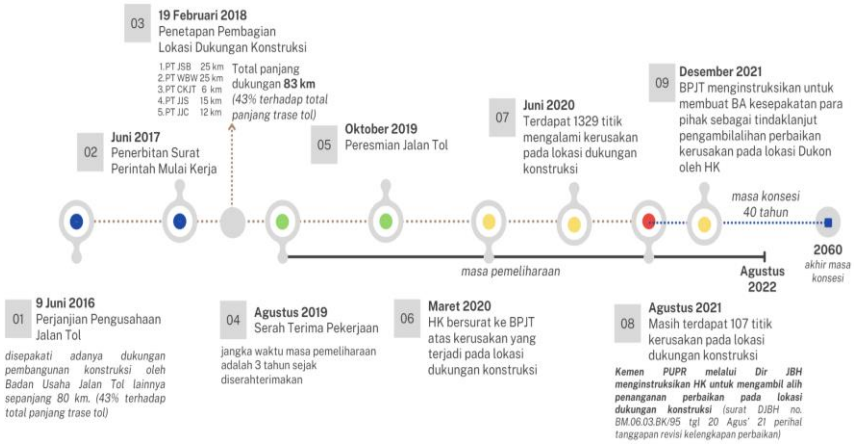


Figure 1
Chronology of Terbanggi Besar Kayu Agung Toll Road Company

The problem of the physical quality of infrastructure at the construction support site has been studied (Mahani, 2018) where the provision of construction support in PPP projects has been identified as having risks, one of which is the difference in the quality of the sections built by the government and BUJT (Wibowo & Putri, 2024).

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. On the other hand, the provision of construction support by the government through cross-subsidies for business entities is the first scheme implemented in Indonesia. 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.

From the background that has been explained earlier, construction support does increase the feasibility of toll road investment projects in general. However, the quality aspect of the infrastructure provided and the authority and responsibility between the government and BUJT need to be further considered. In the implementation of construction support by the government through Toll Road Business Entities, several problems have been identified, including the following:

a. The quality of infrastructure at the construction support location, the condition is not good where massive damage was identified in the first 3 years of the toll road operational period.
b. Repair of damage, which should still be the responsibility of the implementing contractor who contracted with BUJT, the construction supporter, was instructed by the government to take over the settlement by PT HK

The increase in maintenance costs, especially at construction support locations, can affect the financial feasibility of the Terbanggi Besar – Pematang Panggang – Kayu Agung toll road.

Based on the previous description, the purpose of this study is to analyze the impact of the increase in maintenance costs on the financial feasibility of the Terbanggi Besar – Kayu Agung toll road project on the toll road segment that receives construction support.

To achieve these goals, several sub-objectives will be carried out as follows:

a. The impact of providing construction support by the government through BUJT on the financial feasibility of the Terbanggi Besar – Pematang Panggang – Kayu Agung toll road project is identified
b. The preparation of an evaluation of the financial feasibility of the Terbanggi Besar – Pematang Panggang – Kayu Agung toll road after an increase in maintenance costs at construction support locations
c. The preparation of recommendations for projects with the provision of construction support by the government through BUJT on toll road projects in the future.

The expected results of this study are in the form of an overview of the extent of the impact of construction support on the financial feasibility of toll road projects by considering the increase in maintenance costs in the construction support segment.

a. For the concessionaire BUJT, the construction support provider, and the parties involved in the Terbanggi Besar – Pematang Panggang – Kayu Agung Toll Road project, this study can provide recommendations on the implementation of construction support through the cross-subsidy of business entities so that it can optimally provide benefits in the provision of toll road infrastructure;
b. For academics and research in the future, it can be used as a reference in conducting a study on providing construction support by

Method

The research method is a scientific approach carried out in carrying out research by the purpose and usefulness of this research. The methods used in this study are classified as quantitative and qualitative by describing the analysis of the return on investment of the Terbanggi Besar-Pematang Panggang-Kayu Agung Toll Road project and descriptive qualitative, namely by compiling recommendations and alternatives.

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, and 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.

Data Collection Methodology

The data collection in this study aims to collect relevant facts for analysis so that it can answer the problems that are the reason for this research. Secondary data is data obtained through agencies, and parties involved in toll road projects, as well as through existing sources such as journals, literature, and other sources that have been published previously.

Secondary Data

Secondary data collection is from written data obtained from other sources that can support primary data obtained from literature studies, and other sources related to the study being studied. The secondary data needed in the study is as follows: obtained from the study of BPJT, PT HK, and parties involved in toll road investment projects, literature studies, and internet and print media. The data needed includes: investment cost data, operational and maintenance costs, and estimated data on the increase in maintenance costs charged to the concessionaire BUJT.

Investment Feasibility Analysis

The analysis of investment criteria is the result of the calculation of investment criteria which is an indicator of the invested capital, namely a comparison between the total benefits received and the total costs incurred in the form of present value during the economic life. Decisions arising from the results of the analysis: accept or reject, select one or more projects, or establish an analysis scale of the rate of return on investment. The investment criteria that can be used are as follows:

Net Present Value

Net Present Value commonly known as NPV is the difference between expenses and income that has been discounted using the social *opportunity cost of capital* as a

discount factor, or in other words is the estimated cash flow in the future that is discounted at this time. The formula used to get the NPV value is as follows:

$$NPV = \sum_{t=0}^{n} \frac{CFt}{(1+k)^t} - CF_0 \quad \textbf{(Equation 2.1)}$$

Dimana:

CF_t = Arus kas secara bersih pada periode tertentu

FF_0 = nilai awal investasi

K dan n = mempersentasikan tingkat diskonto dan periode investasi

Dengan Kriteria

NPV : NPV>0 (nol) → proyek layak (*feasible*) untuk dilaksanakan. NPV

NPV : NPV<0 (nol) → proyek tidak layak (*non feasible*) untuk dilaksanakan. NPV

NPV = 0 (nol) → proyek berada dalam BEP dimana TR=TC dalam bentuk present value

Internal Rate of Return

Feasibility analysis using IRR (*Internal Rate of Return*) parameters is one of the commonly used methods to evaluate investment projects.

Nilai *internal rate of return* dapat dihitung dengan persamaan berikut:

$$IRR = i_1 + \frac{NPV_1}{(NPV_1 - NPV_2)}(i_1 - i_2) \quad \textbf{(Equation 2.2)}$$

Dimana:

i_1 = Tingkat suku bunga yang menghasilkan NPV+

I_2 = Tingkat suku bunga yang menghasilkan NPV-

NPV_1 = *Net Present Value* bernilai positif (dengan i1)

NPV_2 = *Net Present Value* bernilai negative (dengan i2)

The following are the steps that can be followed in conducting a feasibility analysis using IRR parameters:

1. Cash Flow identification: Identify and estimate cash flows associated with an investment project. Cash flow consists of inflows (revenue) and outflows (costs) during the project period

2. Determination of Discount Rate: Determine the discount rate that will be used to calculate the present value of cash flow. This discount rate reflects the cost of capital or the expected rate of return on investment.
3. Net *Present Value* (NPV) Calculation: Calculate NPV using a predetermined discount rate. NPV is the difference between the present value of cash inflows and cash outflows. If the NPV is positive, it indicates that the project is making enough profits to meet the expected rate of return.
4. Internal *Rate of Return* (IRR) Calculation: Calculate the IRR by looking for the discount rate that makes the NPV zero. IRR is the rate of return generated by an investment project. IRR is used to determine if the project's rate of return is higher than the discount rate used.
5. IRR Analysis: Compare the IRR to the discount rate used. If the IRR is higher than the discount rate, the project is considered feasible because it generates a rate of return that exceeds expectations.
6. Outcome Evaluation: Evaluate the results of an IRR analysis by considering other factors such as risk, consistency with company objectives, and non-financial aspects of the project. In addition, conduct sensitivity analysis to parameter changes to understand their impact on project outcomes.

Results and Discussion

Toll Revenue Estimate

On the Terbanggi Besar – Pematang Panggang – Kayu Agung Toll Road, the assumption of the initial toll tariff is determined by several approaches, namely:

1. Ability To Pay (ATP) and Willingness To Pay (WTP)
2. BKBOK Savings (Large Vehicle Operating Cost Advantage)
3. Analysis of Tariff Sensitivity to Revenue and Traffic Volume

The estimated toll revenue is obtained from the amount of traffic of each group of vehicles passing through the toll road, multiplied by the distance traveled by the vehicle, and multiplied by the toll tariff/km of each vehicle group. For the Terbanggi Besar – Pematang Panggang – Kayu Agung Toll Road, a closed system is used so that the toll revenue for each section depends on the length of the road for each section. Other income is obtained from the business of advertising/billboards and rest places with a large revenue of +1.5% of toll revenue.

The increase in toll rates is assumed to occur every 2 years, by Law Number 38 of 2004 and Government Regulation Number 15 of 2005 concerning Toll Roads and their amendments. The proposed tariff adjustment is to follow the biennial inflation applied for the entire calculation year. Furthermore, assuming the initial toll tariff is determined as follows:

Group I: Rp. 900/km

Group II: Rp. 1,350/km

Group III: Rp. 1,800/km

Group IV: Rp. 2,250/km

Group V: Rp. 2,700/km

Other income is assumed to be worth 1.5% of the total toll tariff revenue obtained every year, whereas other income comes from the use of assets in the toll road, including rental in the Rest Area, advertising rental, fiber optic utilization, etc.

Construction support for project feasibility.

The assignment of the Trans Sumatra Toll Road by the Government to PT Hutama Karya (Persero) can be carried out through a construction support scheme or partial construction support with funding and construction implementation carried out by the Government (Indonesia, Presidential Decree Number 131, 2022 page 9).

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.

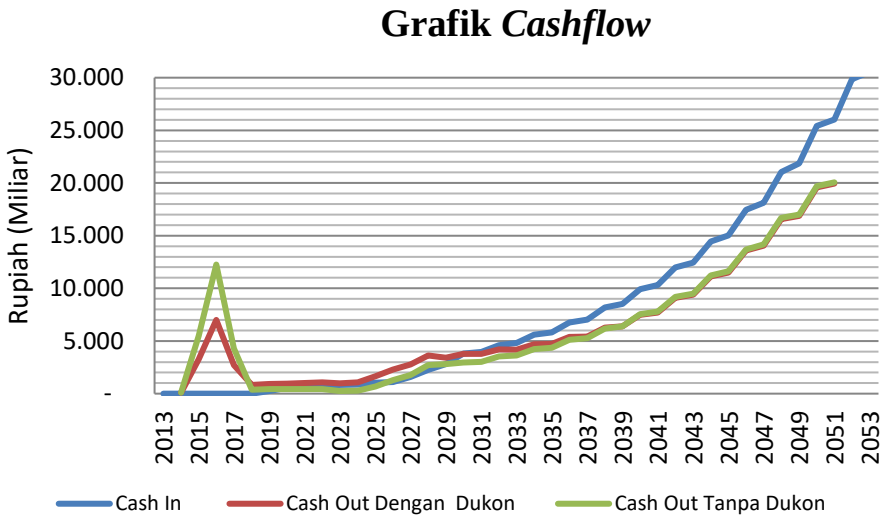


Figure 1
Cash Flow Chart With/Without Ducon

Cash flow in a Toll Road Project is an increase or decrease in the amount of money owned by a business. In the financial sector, the term serves to describe the amount of cash generated and consumed in a certain period of time used to pay for construction, operational, loan, and tax costs (Badriansyah, 2021).

The construction period of the Terbanggi Besar – Pematang Panggang – Kayu Agung Toll Road Project is until 2019 for all sections to be ready to operate. Figure 4.3 above shows the *cash-in* and cash-out flows 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 construction support because it is influenced by larger 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, O/M fees, etc.

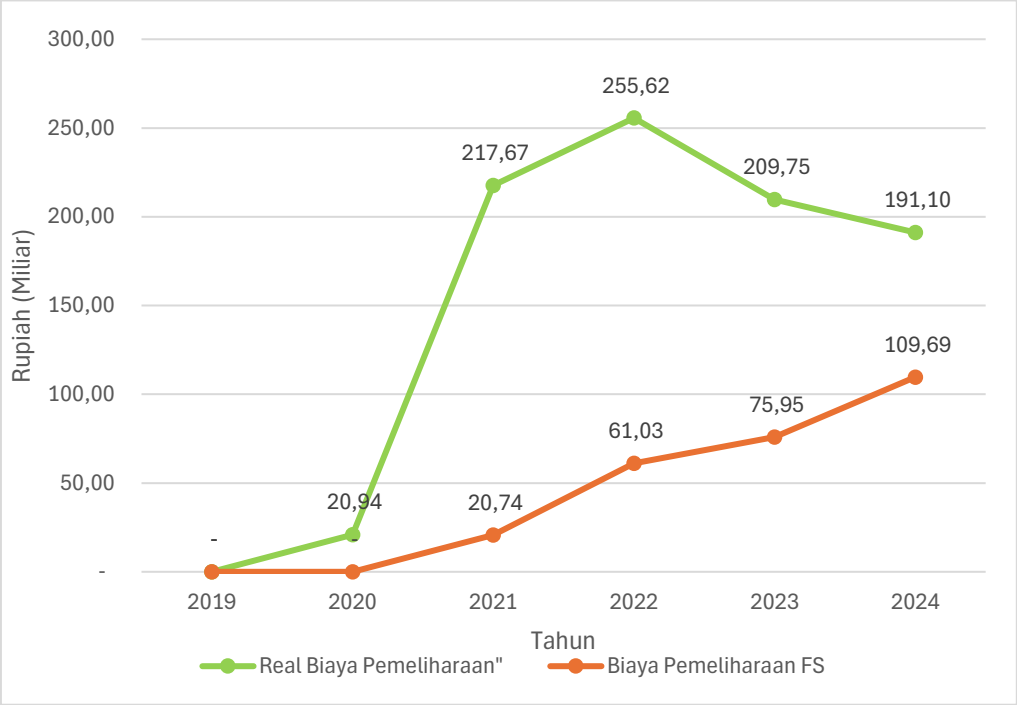
Financial Analysis After Maintenance Cost Increase

The implementation of cross-construction support applied to the Terbanggi Besar – Pematang Panggang – Kayu Agung Toll Road is an innovative scheme launched by the government to accelerate the construction of toll roads in Trans Sumatra. This scheme allows funding for the financially disadvantaged Terbanggi Besar – Pematang Panggang – Kayu Agung toll road by taking advantage of the Trans Java Toll Road project which

has higher financial feasibility. Construction support is provided by the government through toll road business entities by providing subsidies to the Terbanggi Besar – Pematang Panggang – Kayu Agung project which is part of the investment cost of the Trans Java toll road project.

In the scheme of providing cross-construction support, there is a risk of differences in the physical quality of infrastructure between those built by the government and business entities. Poor infrastructure quality can increase 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)

In the Terbanggi Besar – Pematang Panggang – Kayu Agung Toll Road project, PT Hutama Karya (Persero) as BUJT has identified the potential for an increase in maintenance costs since the beginning of the toll road operation. In this study, because the study will focus on the impact of providing construction support, the estimated increase in maintenance costs 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 **the following Graph 2**.



Graph 2
Estimated Increase in Maintenance Costs

In 2019 - 2020, when the Terbanggi Besar – Pematang Panggang – Kayu Agung toll road began operating, there were 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 PUPR through BPJT and the Directorate General 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.

Sensitivity Analysis

Based on the analysis of financial feasibility that has been carried out previously, it can be known that the provision of construction support can improve financial feasibility indicators. However, with the increase in maintenance costs, it is necessary to review the indicators of financial feasibility after the increase in maintenance costs. A sensitivity analysis will be carried out to test how the increase and decrease in maintenance costs affect the financial feasibility indicators of the Terbanggi Besar – Pematang Panggang – Kayu Agung Toll Road by considering the provision of construction support.

In the scenario of changing maintenance costs, *the discount rate* used is 10.09% according to the assumption in the *Business Plan* with a large increase and decrease in maintenance costs of 10% - 50%. To test the sensitivity of the financial feasibility of the Terbanggi Besar – Pematang Panggang – Kayu Agung Toll Road project, the scenarios presented in the following Table 1 are carried out:

Table 1
Scenarios in Sensitivity Analysis

Scenarios Against Changes in Maintenance Costs		
Iteration	Increased Maintenance Costs	Maintenance Costs (Rp. Trillion)
1	5%	26
2	10%	27
3	15%	28
4	20%	30
5	30%	32
Iteration	Reduced Maintenance Costs	Maintenance Costs (Rp. Trillion)
6	5%	23
7	10%	22
8	15%	21
9	20%	20
10	30%	17

The following are the results of the sensitivity analysis in Table 2 as follows.

Table 2
Results of Sensitivity Analysis

Scenarios Against Changes in Maintenance Costs

Iteration	Maintenance Costs (Rp Trillion)	NPV (Rp. Billion)	IRR (%)	*Payback Period*
1	26	2102	11,07	20 years 7 months
2	27	172	10,18	21 years 8 months
3	28	-1759	9,45	22 years 7 months
4	30	-3689	8,82	23 years 5 months
5	32	-7550	7,79	24 years 12 months
6	23	5396	14,24	18 years 6 months
7	22	6843	14,38	17 years 6 months
8	21	8291	16,03	16 years 4 months
9	20	9739	18,34	14 years 3 months
10	17	12634	27,55	5 years 10 months

Based on the results of the analysis presented in Table 4.12, it shows that the scenario for changes in maintenance costs begins to achieve changes in one of the financial indicators to negative when the scenario increases maintenance costs to 115% or equivalent to maintenance costs of Rp 28 T.

Toll Road Business Flow According to Regulations

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.

The stage of toll road assignment by the government to State-Owned Enterprises (SOEs), in general, consists of the planning stage, the assignment stage, the implementation and supervision stage, and the termination stage.

Based on a study conducted by Badrinasyah, 2021, the FIRR of the South Japek II toll road project resulted in a value of 13.90% that did not meet the financial feasibility criteria based on the Minister of Public Works Regulation 06/2010 because the results showed that it was less than 4% of the applicable loan interest rate (i = 11%). However, BUJT Japek II Selatan as the subsidy provider BUJT has other parameters that are used as the basis for calculating the feasibility of the project so that the project is still feasible.

The Krian – Legundi – Bunder – Manyar (KLBM) toll road project is a toll road in the province of East Java whose business entity auction process also uses the parameters of providing construction support on other toll roads. PT Waskita Bumi Wira is a business entity that won its concession by providing construction support along 25 km on the Terbanggi Besar – Kayu Agung toll road. This construction support is equivalent to Rp 3T and is estimated to reduce the project's IRR value from the original 18.09% to 14.59%. The assumption of the IRR reduction with the assumption of traffic and revenue expected

to occur on the KLBM toll road is quite high. Further analysis is needed on the impact of the granting of Yukon on the condition of the KLBM toll road project with the current existing conditions.

BUJT, another construction support provider, PT Citra Karya Jabar Tol which has a concession on the Cileunyi – Sumedang – Dawuan (Cisumdawu) Toll Road, has a unique condition. Cisumdawu is a project that is considered economically feasible but requires government support to be financially feasible for investors. The government's support for the Cisumdawu Toll Road project is to build section 1 (Cileunyi – Rancakalong (12,025 Km)) to section 2 (Rancakalong – Sumedang (17,150 Km)) from a total of 6 existing sections. The provision of government support makes the financial feasibility of the Cisumdawu project reach a fairly high financial feasibility. If the government only builds one of the two sections, the Cisumdawu project has not yet achieved adequate financial feasibility. Because the government's task in providing support must be functional, it cannot only build section 2 in full but section 1 only partially or vice versa. Because the two sections built by the government make the Cisumdawu project achieve fairly high financial feasibility, the government uses the auction method to provide support for the construction of Other Toll Roads. PT Citra Karya Jabar Tol, which won the Cisumdawu project, provided a subsidy in the form of construction costs for the construction of the 6 Km Terbanggi Besar – Pematang Panggang Toll Road amounting to 530 billion (Badrianasyah, 2021).

Conclusion

The conclusions that can be drawn from the research 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 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 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 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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