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EVALUATION OF THE PERFORMANCE OF THE CONSTRUCTION OF THE INFRASTRUCTURE OF THE ABC ROAD THROUGH PUBLIC FUNDS

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ABSTRACT

Purpose: The objective of this research is to assess the viability of the construction of toll road infrastructure through public funds in the case of the construction of ABC street toll road, as well as to analyze the development of ABC road toll road, whether it is favorable or unfavorable to the community.

Design/Methodology/Approach:The research was conducted using a mixed approach of qualitative and quantitative methods with concurrent or simultaneous designs. In this method, researchers combine quantitative and qualitative data at a time and then integrate information into the interpretation of results to provide a comprehensive analysis of research at the PT. ABC.

Findings: The results of this study show that the calculation of the NPV of the construction of ABC street toll roads yields a value > 0, thus the development of this toll road infrastructure is worthy of a net present value (NPV). The Internal Rate of Return (IRR) of the construction of ABC street toll roads is 10% > the Social Discount Rate (SDR), thus building the ABC road toll is worthy, which in this study uses a discount rate of 9%. The value of the benefit-cost ratio (BCR) of the construction of this toll road is > 1, so the construction is worthwhile.

Practicalimplications: Government support in the use of public funds for the development of marginal toll roads is needed so that the viability of an investment can be preserved, which will encourage further involvement of investors in the infrastructure development of roads, especially toll roads, in Indonesia, eventually becoming an accelerator of economic and regional growth.

Authenticity/Value: The association is committed to creating a sense of safety, comfort, and smoothness for road users by making efforts to comply with the Minimum Service Standards (SPM) continuously established by the Government in this regard through the Directorate of JBH-DJBM Ministry of PUPR, as well as striving to meet the level of customer satisfaction through surveys carried out on a regular basis, inter alia by adding guidance lamps, building weighing bridges, improving rest area facilities, and traffic management activities in conjunction with the police and other relevant parties.

ÉVALUATION DE LA PERFORMANCE DE LA CONSTRUCTION DE L'INFRASTRUCTURE DE LA ROUTE ABC POR LE BIAIS DE FONDS PÚBLICOS

RESUMO

Objectif : L'objectif de cetteétudeestd'évaluer la viabilité de la construction d'infrastructuresroutières à péage par le biais de fonds publics dans le cas de construction de la route ABC, ainsiqued'analyser le développement de la voie ABC, qu'ellesoit favorable oudéfavorable à la Communauté.

Conception/Méthodologie/Approche : La recherche a étémenée en utilisantuneapprochemixte de méthodesqualitatives et quantitatives avec des conceptions concomitantesousimultanées. Danscetteméthode, les chercheurscombinent des

donnéesquantitativesetqualitatives à la fois et intégrentensuitel'informationdansl'interprétation des résultats pour fourniruneanalysecomplète de la recherche au PT. ABC.
Résultats : Les résultats de cetteétudemontrentque le calcul du NPV de la construction des routes routières ABC donneunevaleur> 0, donc le développement de cette infrastructure routièreestdigned'unevaleuractuellenette (NPV). Le taux de rendement interne (IRR) de la construction de routes de péage ABC est de 10 % > le taux de réductionsociale (SDR), donc la construction du tarif de la route ABC estdigne, qui danscetteétudeutilise un taux de remboursement de 9 %. La valeur du rapport bénéfice-coût (BCR) de la construction de cette route est> 1, donc la construction vaut la peine.
ConséquencesPratiques : Le soutien du gouvernement à l'utilisation des fonds publics pour le développement de routes à péage marginal estnécessaire pour préserver la viabilité d'un investissement, ce qui encouragera la participation des investisseurs à la mise en place d'infrastructuresroutières, en particulier de roues à péages, en Indonésie, qui deviendrontfinalement un accélérateur de la croissanceéconomique et régionale.
Authenticité/Valeur:L'associations'engage à créer un sentiment de sécurité, de confort et de simplicité pour les usagers de la route en s'efforçant de respecter les Normesminimales de service (SPM) établies en permanence par le Gouvernement à cetégardparl'intermédiaire de la Direction du Ministère du JBH-DJBM de la PUPR, ainsiqued'atteindre le niveau de satisfaction des clients par le biaisd'enquêtesmenéesrégulièrement, notamment en ajoutant des lampesd'orientation, en construisant des ponts de pesage, en améliorant les installations des zones de repos et en menant des activités de gestion du trafic en collaboration avec la police et d'autres parties concernées.

EVALUACIÓN DEL DESEMPEÑO DE LA CONSTRUCCIÓN DE L'INFRAESTRUCTURA DE LA CARRETERA ABC A TRAVÉS DE FONDOS PÚBLICOS

Objetivos: El objetivo de estainvestigaciónesevaluar la viabilidad de la construcción de la infraestructura de carreterasaduaneras a través de fondospúblicos en el caso de construcción de carreteraaduanera ABC, asícomoanalizar el desarrollo de la carretera ABC, sies favorable o desfavorablepara la comunidad.
Diseño/Metodología/Enfoque: La investigación se llevó a caboutilizandounenfoquemixto de métodoscualitativos y cuantitativos con diseñossimultáneos o concurrentes. En estemétodo, los investigadorescombinandatoscuantitativos y cualitativos a la vez e integran la información en la interpretación de los resultadosparaproporcionar un análisisamplio de la investigación en el PT ABC.
Resultados: Los resultados de esteestudiodemuestranque el cálculo del NPV de la construcción de carreteras de pagoporcarretera ABC da un valor > 0, por lo que el desarrollo de estainfraestructuraporcarreteraesdigno de un valor actual neto (NPV). La tasainterna de retorno (IRR) de la construcción de carreteras de pago de la calle ABC es 10 % másque la tasa de descuento social (SDR), por lo tanto la construcción del precio de la carretera ABC esdigna, que en esteestudioutilizaunatasa de descuento del 9 %. El valor de la relaciónbeneficio-coste (BCR) de la construcción de estacarreteraes> 1, por lo que la construcción vale la pena.
ImplicacionesPrácticas: Se necesitaapoyogubernamental en la utilización de fondospúblicospara el desarrollo de carreteras de peaje marginal a fin de preservar la viabilidad de unainversión, lo quealentará la participación de los inversores en la construcción de infraestructuras de lascarreteras, en particular lasautopistas, en Indonesia, queeventualmente se convertirán en un acelerador del crecimientoeconómico y regional.
Autenticidad/Valor: La asociación se compromete a crearunasensación de seguridad, comodidad y suavidadpara los usuarios de la carreterahaciendoesfuerzosparacumplir con lasNormas de ServicioMínimo (SPM) establecidascontinuamentepor el Gobierno a esterespecto a través de la Dirección de JBH-DJBM Ministerio de PUPR, asícomoprocurandoalcanzar el nivel de satisfacción del clientemedianteencuestasrealizadasregularmente, entre otrascosasañadiendolámparas de guía, construcción de puentespesados.

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INTRODUCTION

The rapid economic growth of the last few decades has been accompanied by a significant increase in the movement of people and goods, so with this increase, the most important issue is regulating the flow of traffic. These issues continue to affect the provinces and/or major cities of Indonesia, especially as a developing country. Transport plays a crucial role in the smoothness of economic activity. In other words, the region's economic growth must be directly proportional to its development, especially the construction of transportation infrastructure.

A region developed to improve the well-being of the entire layer of society and prevent social degradation. Therefore, development requires the right approach to generate growth. Infrastructure plays an important role in increasing investment and public participation, as well as in decentralizing development results. (Atmadja and Mahalli, 2014).

Infrastructure is a very necessary and vital aspect of accelerating the development of the Republic. Infrastructure also plays an important role as a motor of the country's economic growth, as the pace of development and economic growth of a country are not independent of the availability of infrastructure such as transport, telecommunications, health, and energy.

Therefore, the development of this industry is the basis for boosting regional development. Infrastructure is a public system that provides public facilities such as transport, irrigation, drainage, and buildings to meet the basic needs of society in the economic and social spheres. (Ema, 2017).

The development of toll roads is part of the government's efforts to streamline the orderly and rapid economic and social mobility of Indonesians. A toll road is a public road that is part of a national road system and network and whose use requires toll payment. The purpose of toll roads is to streamline traffic in a particular region so that it can grow. As part of the Trans Java toll road, the ABC toll road has strategic significance in the development of the road network in East Java in particular and also in developing the network of roads on a regional scale. The traffic flow that passes the roads from Solo to Surabaya is one of the connections between the center and the east through the center of the island of Java.

As a significant part of the Trans Java toll road network, this project needs to be accelerated and completed on time. This mega-trans-java toll project is a line that connects Anyer on the western end with Banyuwangi on the eastern part of the island of Java. The total value of this project is estimated at Rs. 47 Trillion, a project that had begun during the New Order's reign and was only beginning to be realized in its entirety significantly by the end of the second period of President JokoWidodo's rule.

Among the efforts made to accelerate the construction process, the Government issued regulations such as Presidential Decree (Perpres) No. 71 of 2012, updated with Perpres No. 40 of 2014, No. 99 of 2014, No. 148 of 2015, and No. 30 of 2015, and the last issued Government Unity (PP) No. 39 of 2023, which abolished the entire Perpres earlier. This regulation regulates the arrangements for the acquisition of land for development in the public interest, including the involvement of public funds in the development phase of toll roads that fall into the category of National Strategic Projects (PSN), as part of the eligibility of the investment of the Toll Enterprise Agency (BUJT).

This situation presents an opportunity for all developers, both State-owned enterprise agencies (BUMN) and domestic and foreign private investors, who want to invest in this sector. When developers make investment decisions, their initial steps consider future profits. The Payback period, of course, is the surplus of the income derived from the established rate multiplied by the amount of each vehicle class passing. The more vehicles pass the toll road, the faster the return time, and vice versa.

To avoid losses, eligibility studies should be carried out before proceeding with project development. A business eligibility study is a comprehensive study of a business plan or business plan to be operated to determine whether this investment is worthwhile. (Kasmir&Jakfar, 2012). These include marketing, operational/technical, legal, managerial and organizational, economic/social, financial/financial, and environmental impact (AMDAL) aspects. Kasmir&Jakfar (2012)

The study focuses on the evaluation of the feasibility of the construction of marginal toll road infrastructure that follows the inclusion of public funds so that these investments can be judged financially worthy or not. The question to the financial sector, by reference to available data, is to calculate the Net Present Value (NPV), Internal Rate of Return (IRR), Social Discontent Rate (SDR), and Benefit-Cost Ratio (BCR).

THEORITICALFRAMEWORK

Public Funds

Soetrisno (1981), public finance or state finance, is the science that studies government and state expenditures and receipts. Public finance is the branch of the economy that studies state activities such as taxation and government spending. Important issues in public funding research are not fiscal issues; although they are related to fiscal aspects, the main issues are related to the source of truth.

Development

Development is a process of social change that involves widespread participation in achieving social and material progress, including greater destruction, freedom, and other qualities valued by most people through greater control over their environment. (Handayani, 2014)

Infrastructure

Infrastructure is a system that supports social and economic systems and environmental interconnections and can be used as a basis for policy formulation. (Kodoatie, 2005).Infrastructure is the physical facility developed or needed by a public body to perform governmental functions, including the supply of electricity, waste treatment, road construction, and other services for further economic and social purposes.

Previous Research

Maciulyte-Sniukiene and Butkus (2022) The objective of this study is to study whether developments in different types of infrastructure (transport, information and communication technologies (ICT), energy, water, and sanitation) contribute to economic growth and to assess whether the quality of government affects the outcomes of infrastructure growth. The empirical estimates are based on neoclassical specifications and cover 28 EU countries from 2000 to 2019. Estimates reveal that all kinds of positive infrastructure correlate with growth, but not all correlations are significant. Only cellular, which represents ICT infrastructure, electricity production, energy infrastructure, and infrastructure pipeline transportation, has a major impact on economic growth. The development of water and sanitation infrastructure has not significantly contributed to the economic growth of the European Union's MS. The institutional environment, i.e., decreasing corruption, has a considerable positive effect on the output of electricity production growth and pipeline transportation infrastructure.

Hudani and Sulistagatanrum (2021). The results of the test showed a significant impact on the districts and cities that passed the toll road in the Central Java Province and the district or city that followed the construction of toll roads, and the average economic growth was higher than that of the Districts and cities in the Central Java Province that did not pass the toll route. The average economic growth rate of the district or city in Central Java Province that opened a toll road was 0.015% higher than the districts or cities in the province that did not open a toll road and built a toll street.

Fay et al. (2021) This research develops a model for rationalizing facts that explains the structure of contracts and regulations of financial infrastructure, access to public and private funds, and side-by-side conditions. It requires a combination of price regulation and public subsidies to attract external investors, which shows a fundamental balance between financial viability and social inclusion. While improving the efficiency of the insolvency process facilitates access to private financing, institutional changes reduce the cost of public financing and allow for more attractive public finances.

Kintan. (2020). The results of the study show that the social mobility of the people affected by the construction of these toll roads is manifested as changes in employment,

changes in income, changes in land ownership, and changes in living conditions. The house they have right now Social mobility in terms of employment increased by 9,09% from domestic servants (PRTs) to traders, then rose by 51% in terms of income, 2 to 3 times more than before, then increased in terms of land ownership than before, plus 0.7%, and was more respectable in terms of changing the condition of home ownership with new furniture and vehicles. Changes that occur so that respondents in this study experience vertical social mobility

RESULTANDDISCUSSION

A. Cost Analysis

The geometric data of the ABC street toll road is as follows:

1) Road type: 2 columns, 2 directions without a median (2/2TT)
2) Width of the street: 1.3 m
3) Directional separation: 50%–50%
4) Side Barrier Class: Low

AB street toll road that starts from AAA district to BBB district With a large intersection at the western end bordered by the XYZ toll road, the road continued with AAA, LLL, OOO, UUU, and BBB. The east end borders the ZYX toll road. Cities passed: Cities FFF, GGG, and HHH Fees issued by the company, with details:

Tabel 1
Operating Costs PT. ABC

Year	2022	2021	2020	2019
Construction Load	-	-	-	110.645.444.970
Toll Load	180.056.559.892	168.213.938.500	162.987.275.023	135.987.470.532

Source: Processed Data, 2023

Pollution costs in this study are also taken into account because there is pollution from motor vehicles crossing toll roads after toll routes are operational. Estimating the value of economic losses resulting from emissions of public vehicles, the estimated value of emission tax per pollutant produced by public vehicles fueled with gasoline is HC of IDR 1,339/gram or IDR 1.339/kg and CO of IDR 0,209/gr or IDR 209/kg (Hidayat, Nuva, and Syafitri 2017), with the emission of pollutants in vehicle units using emission thresholds in accordance with the Regulations of the Ministry of the State of the Environment (KLH) of the Republic of Indonesia Number 10 year 2012, that is for motor vehicles exhaust gas limit of CO 2 gr/km and HC 0.8 gr/km (MenteriLingkunganHidup 2014).

Tabel 2
Calculation of Pollutant Values Vehicle

Reproduction	Unit	HC	CO
Vehicle Output	gr/km	0,8	2

Emission tax value	IDR/gr	1,339	0,209
Long way.	Km	117	117
Vehicle Value	IDR	125,3304	48,906

Source: Processed Data, 2023

B. Benefit Analysis

Transportation projects, such as the construction or repair of roads, can have benefits or savings for the community that can be quantified by the difference between projects with and without them. The immediate benefits perceived by the community are usually taken from the difference between vehicle operating costs and the difference in time value in which the community earns the vehicle operating cost benefits savings and time value when crossing the toll roads that have been built by the project. The most significant and quantifiable difference is the speed difference between with and without the project, so in this analysis, vehicle operating cost benefits and the time value will be quantified to calculate the value of the benefit in rupees.

1. Direct Benefits

a. Economic Income

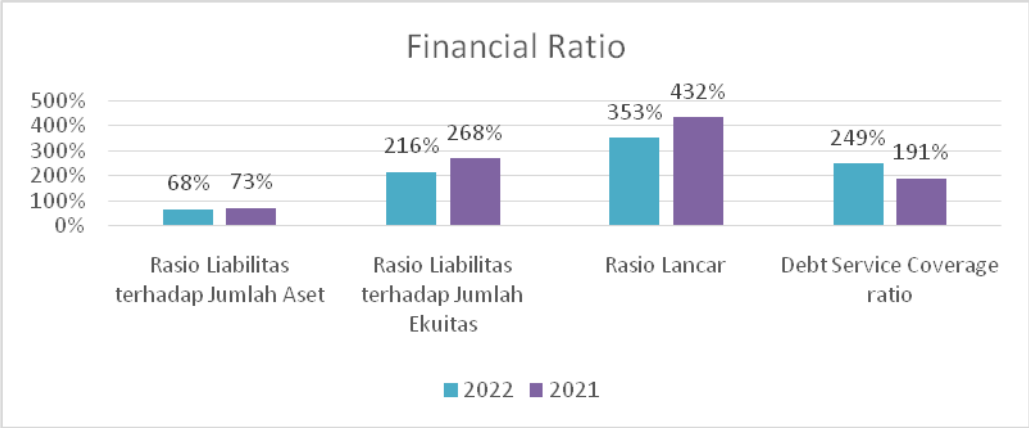
The toll rate applied to the use of toll roads varies according to the vehicle and the distance of the vehicle. The toll rate is determined by the following six considerations: Savings in operating costs: the operating cost of the vehicle is heavily influenced by the travel time. The occurrence of traffic jams has resulted in increased operating costs for vehicles because the fuel used becomes inefficient. The time element is also a matter of consideration because each user of the road understands the value of the time used individually. Traffic failure will prolong the time.

Tabel 3
Total Revenue PT. ABC

	2022	2021	2020	2019
Construction Income	-	-	-	111.799.476.962
Tax Revenue	652.784.582.500	506.721.287.500	409.352.473.000	494.496.208.075
Other Enterprise Revenue	-	10.500.000	3.661.273	683.959.406

Source: PT. ABC

Tabel 4
Financial RatioPT. ABC



Source: PT. ABC

Toll revenue for PT. ABC reached IDR. 652.784.582.500, up 29% compared to 2021, amounting to IDR. 506.721.287.500. This toll revenue increased due to the tariff adjustment on April 29, 2021, by 3.36% and will continue to increase in the years to come as the territory develops through the toll road. With the total length of the toll route being 88 km. It is also in line with the interview with the source, the Chief Director of P.T. ABC:

> "Based on the data, our financial performance from year to year tends to experience an improvement, which is fortunately very good compared with the realization above the plan. In 2019, from 494,496,208,075 in 2019 to 409,352,473,000 in 2020, in 2021 to 506,721,287,500, and in 2022 to 652,784,582,500, up 29% from 2021. The company is committed to creating a sense of safety, comfort, and smoothness for road users by carrying out compliance with the Minimum Service Standards and striving to meet the Customer Satisfaction Level, among other things, by adding guidelines, building weighing bridges, and participating in traffic management activities together with the police." (Male/51/Chief Director)

b. Time-saving

Based on the conditions before the existence of ABC street toll roads, the national road network serving the same area can be reached within a time range of 2 hours, 54 minutes (with a length of approximately 107 km). On such lines, there are some areas that are frequently affected by traffic density, namely the AAA highway, Setting average LLL, OOO, UUU, BBB, and larger cities: FFF, GGG, and HHH. However, with the street toll road, ABC travel can be reduced from 2 hours to 1 hour, 54 minutes, and 29 minutes, for an 85 percent savings.

Tabel 5
Time Saving Benefits

Year of Consensus Benefits	**2019**	**2020**	**2021**	**2022**
Traffic Volume/Year	5.319.510	4.375.896	5.255.635	6.756.515
Time Saving	85 Minutes	85 Minutes	85 Minutes	85 Minutes
The amount of time saved	452.158.350	371.951.160	446.728.975	574.303.775
Time-saving Rupiah Value (IDR/Billions)	217,9	179,3	215,3	276,8

Source: Processed Data, 2023

It is also in line with an interview with the source of the Chief Executive Officer of PT. ABC: "Before there was a toll road on this ABC street, the national road had high levels of congestion in the AAA, LLL, OOO, UUU, and BBB big cities: FFF, GGG, and HHH. Four-wheeled vehicles only from the west direction, for example, to the city C in the day can be 3–4 hours at a speed of 50 km/h, not by stopping at the cross-traffic ramp 3 slope 4. From our data, with the availability of this ABC street toll road, people can save up to 85 minutes of travel time from A to C. If we take the A-to-C highway as an example, the intensity of the congestion can double on a normal day. Thus, with the existence of the toll road, ABC Street is expected to be a solution for the community to support activity." (Male/51/Chief Director)

c. **Vehicle Operating Cost Benefits**

The immediate benefits perceived by the community are usually taken from the difference between vehicle operating costs before and after the project. Vehicle operating costsvalue is taken from a vehicle operating cost benefits value in 2019 (when ABC street toll roads started operating). Vehicle operating costsvalue varies depending on the speed of the vehicle, and in this analysis, the vehicle operating costs value used is the vehicle operating costs value for passenger cars. Vehicle operating costs values are shown in the following table:

Tabel 6
Vehicle Operating Cost Benefits

Speed **(km/h)**	Vehicle Operating Costs2022 **(IDR/Volume/km)**
10	7.364
20	7.364
30	3.546
40	3.014
50	2.717
60	2.570
70	2.534
80	2.534
90	2.737
100	2.959

Source: PUPR, 2023

Assuming the vehicle runs on the toll roads ABC street at 80 km/h to vehicle operating cost benefits value IDR. 2.534,- a distance of 88 km, and when there is not yet a toll road project, this alternative is through the national road 107 km away with the assumption of a speed of 50 km/hh to vehicle operating cost benefits valueIDR. 2.717,-. Obtained the calculation of vehicle operating costs savings as in the following table:

Tabel 7
Calculation of the Benefits of Vehicle Operating Cost

Year	**2019**	**2020**	**2021**	**2022**
Traffic Volume	5.319.510	4.375.896	5.255.635	6.756.515

Benefits of Vehicle Operating Cost	37.804.956	31.013.864	37.351.006	48.017.534

Source: Processed Data, 2023

2. Non-Direct Benefits

The time value in rupiah/person/hour units is obtained from the UMR of communities in 4 (four) districts, namely: AAA, RRR, FFF, and HHH in 2023, i.e., around FFF: 2.154.251, AAA: 2.158.844, HH: 2.167.007, and RR: 2,153.062, or a monthly average of the four counties amounting to 2.153,062 per month and around IDR 25.851.012 per year. The average working hours in a year are 8 hours per day multiplied by 22 days of work in a month and multiplied by 12 months to produce 2.112 hours of year. From the previous calculation, the value of time per person per hour at the time of work is income per month divided by working time per year, so that the value is about IDR. 12.240/hour. This is in line with the statement of G.M. Finance PT. ABC:

"The greatest benefit of this ABC street toll road is that we can absorb the labor force from each region that passes through this toll road. Some who used to not work now can work, some who have already worked but apologize for the lower compensation now become better, and so on. We also consider priority the people who passed the toll road ABC in absorbing labor. The minimum we give in accordance with applicable laws is the local kompensasionIf calculated per day, we can get an average compensation of IDR. 100,000 with 22 working days per person, and what we absorb is not just one or two people. Of course the benefits of this tax on Ngawi-Kertosono-Kediri are enormous, not even added to other benefits like BPJS, THR, and others." (Male/36/GM. Finance).

Another important assumption is to assume an average speed of 80 km/h on toll roads, as the speed on toll roads ranges from 60 km/h to 100 km/h. Traffic projections are based on historical traffic data in the last 4 years since the toll street has been operational, so the LHR is set at 157.5% of the projected LHR in the PPJT.

Tabel 8
Calculation of Average Daily TrafficBetween Plan And Current

Description	2019	2020	2021	2022
Average Daily Traffic/Plan	4.577	12.103	14.736	16.078
Current Average Daily Trafficand Projections	14.574	11.956	14.399	18.511
Percentage	318,4%	98,8%	97,7%	115,1%
Average		157,5%		

Source: Processed Data, 2023

From the above table, it is known that the historical traffic in 2019 is favorable. The difference between the plan and the actual is The increase of 318.4% in 2019 is due to the euphoria of the community to justify the integrated trans-Java toll roads ranging from the northwestern edge of the island of Java to the city of Surabaya in the eastern province of Java. In 2020 and 2021, the gap was

unfavorable due to the spread of the COVID-19 pandemic, which forced the government to restrict the mobility of the population.

By 2022, the traffic gap was favorable due to the decline in the spread rate of COVID-19, and the government gradually began to loosen the restrictions on mobility, which triggered the desire of the public to travel long distances in the region after the last 2 years of limited mobility.

The conclusion of the thick profitability index above is that traffic growth for the ABC toll road over the four years in the period 2019–2022, or the average growth per annum, is 14.25% of the growth of traffic for the ABC toll road from the plan. So in the construction of the ABC toll road, this is favorable.

Tabel 9
Asusmsi Economic Calculation Benefits of Toll Roads

Economic Assumptions	
Number of days in a year	365
The number of hours in a day	24
Average Daily Trafficof PPJT Projections	157,5%
Social Discount Rate	9%
Inflation Rate In East Java	4,24%
Average Passengers In One Vehicle	3
Average Minimum Wage From 4 Districts	2.153.062
Long Road Non-Toll Ab	88 KM
Time Values	
Capita Income (Million IDR/person/year)	IDR. 25.851.012
Number of Working Hours In The Year (Hours)	2112
Working Hours Person/Hour (IDR/People/Hour)	IDR12.240

Source: Processed Data, 2023

A government investment project usually has costs and benefits at different times. Therefore, in order to determine whether a government project provides social net benefits or not, the entire cost and benefit must be valued at present value using the social discount rate. There are significant variations in public discount rate policies in practice worldwide, with developed countries applying lower rates (3–7%) than the surveyed developing countries (8–15%) (Zhuang et al. 2007).

C. Calculation

1. Net Present Value (NPV)

Net present value analysis takes into account the difference between the value of cost and benefit and the size of interest rates. The known interest rate at the time of the study was 7%.

$$NPV = \frac{C1}{(1+r)} + \frac{C2}{(1+r)^2} + \frac{C3}{(1+r)^3} + \frac{C4}{(1+r)^4}$$

$$NPV = \frac{509.895.385.695}{(1+0{,}7)} + \frac{416.471.578.863}{(1+0{,}7)^2} + \frac{279.400.539.837}{(1+0{,}7)^3} + \frac{328.312.755.525}{(1+0{,}7)^4}$$

$$NPV = 476.537.743.640{,}186 + 363.762.406.204{,}035$$

$$228.074.067.471{,}101 + 250.468.229.244{,}152$$

NPV = 1.318.842.446.559.47

The calculation of the NPV value of the construction of ABC street toll roads yields a value above 0, or NPV > 0. According to the calculation, the NPV of ABC road toll construction is considered appropriate.

2. Internal Rate of Return (IRR)

An eligibility assessment that calculates the rate of interest that equals the cost value with the value of the benefit received in which an activity is declared eligible when the cost rate is greater than the relevant interest rate, i.e., the required profit rate (HusnandanSuwarsono, 1994). With the IRR method, we have to find a discount rate (r) that equals the entire cost (which is calculated at the present value) and benefits (which is calculated at the present value).

$$IRR = \sum_{t=0}^{T} \frac{Bt - Ct}{(1 - IRR)t} = 0$$

$$\text{(Initial Charges (2019) + Revenue (2019)} = \frac{\text{Charges} - \text{Revenue}}{(1+r)^n} = 0$$

$$(246.632.915.502 + 495.180.167.481 = \frac{757.890.688.916 - 2.175.154.028.037}{(1+r)^n} = 0$$

$$741.813.082.983 = 1417263339121(1+r)$$

$$r = 0{,}999.999.999.436$$

r = 10%

The internal rate of return on the construction of ABC street toll roads is 10%. Then the ABC road toll road construction project is rated eligible because of the value of IRR > Social Discount Rate (SDR), in this study using a discount rate of 9%.

Choosing the right level of social discount is crucial and has implications for resource allocation. When the discount rate is set too high, many government projects that provide social net benefits can be prevented from being implemented, whereas when the rate of discount is set too low, it risks creating economically inefficient investments.

3. Cost-Benefit Ratio (CBR)

The benefit-cost ratio (BCR) analysis takes into account the comparison between the value of the cost and the benefit of the size of the interest rate.

$$BCR = \frac{\sum Bt/(1+i)t}{\sum Ct/(1+i)t}$$

$$NPV = \frac{2.175.154.028.037/(1+0{,}07)^4}{757.890.688.916/(1+0{,}007)^4}$$

$$NPV = \frac{2.175.154.028.037/1{,}1449}{757.890.688.916/1{,}0283}$$

$$= \frac{1.899.863.768.046{,}991}{737.032.664.510{,}3569}$$

= 2,577719902426786

The value of the benefit-cost ratio of the construction of the ABC toll road has a BCR value > 1. It is in accordance with the rules for the assessment of eligibility using the BCR.

CONCLUSION

Based on the results of research and data analysis, some conclusions are drawn as follows:

Based on the analysis carried out based on project projections after operation, the conclusion is as follows:

1. The calculation of the net present value (NPV) of the construction of ABC street toll roads yields a value of NPV > 0, so based on the NPV of ABC road toll construction, it is deemed appropriate.
2. The Internal Rate of Return (IRR) of the construction of ABC street toll roads is 10%. Then the ABC road toll road construction project is considered eligible because it has a value of IRR > Social Discount Rate (SDR) of 9%.
3. The value of the benefit-cost ratio (BCR) of the construction of the toll road ABC > 1. It is in accordance with the rules for the assessment of eligibility using the BCR.
4. The revenue of PT. ABC from year to year continued to increase in 2022 to Rs. 652.784.582.500, up 29% compared to 2021's Rs. 506.721.287.500.
5. The association is committed to creating a sense of safety, comfort, and smoothness for road users by complying with the Minimum Service Standards and striving to meet the Customer Satisfaction Level, among other things, by adding guidance beams, building weighing bridges, and conducting traffic management activities in conjunction with the Police.
6. Without the involvement of public funds in the implementation of the construction of marginal toll roads such as ABC toll streets, both on the support of road construction and land acquisition, it can be assured that the value of NPV, IRR, and BCR will decrease, which will affect the decision of the Toll Road Enterprise Agency (BUJT) to make an investment or not.

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