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Service-Based Periodic Payment Provided/PBBL by the Government of Indonesia to Bayung Lencir – Tempino - Simpang Ness Toll Road

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ABSTRACT: In 2020, PT Hutama Karya (Persero), a state-owned enterprise mandated by the government to build the Trans Sumatra Toll Road, appointed a private consultant to conduct a feasibility study and for the proposed construction of the Betung – Tempino – Jambi Toll Road. However, due to the low traffic volume in the Jambi Province, the toll road was deemed financially not feasible to be developed. Given the substantial costs required for the development of the Betung – Tempino – Jambi Toll Road, this toll road segment was divided into several sections. Betung – Tempino – Jambi Toll Road is a segment of the primary route of the Trans Sumatra Toll Road, Phase 2, which spans 171 kilometers across the provinces of South Sumatra and Jambi. Bayung Lencir – Tempino – Simpang Ness Toll Road, which stretches 52 kilometers, is a part of the Betung – Tempino – Jambi Toll Road prioritized for construction and operation. According to Presidential Regulation of the Republic of Indonesia Number 131 of 2022, a funding scheme known as Service-Based Periodic Payments/Pembayaran Berkala Berbasis Layanan (PBBL) shall be provided to PT Hutama Karya (Persero) to enhance the financial feasibility and to ensure the funding, technical planning, construction execution, operation, and maintenance of the toll road.

This study will analyze and evaluate the financial feasibility of the Bayung Lencir – Tempino – Simpang Ness Toll Road before and after the implementation of PBBL provided to PT Hutama Karya (Persero) during the estimated duration of toll road concession for 50 years. The duration of the PBBL granted by the Government of Indonesia to PT Hutama Karya (Persero) is 15 years, with an annual payment of 880 billion Rupiah.

Based on the financial feasibility analysis without PBBL, the results indicate a negative NPV, an IRR lower than the Weighted Average Cost of Capital (WACC), a Discounted Payback Period exceeding the toll road concession period, and a Profitability Index below 1, indicating that the project is not yet financially viable. On the other hand, the financial feasibility analysis after PBBL implementation shows a positive NPV, an IRR greater than WACC, a Discounted Payback Period within the toll road concession period, and a Profitability Index above 1, indicating that the project is financially feasible. Therefore, PT Hutama Karya (Persero) shall develop the Bayung Lencir – Tempino – Simpang Ness Toll Road with PBBL scheme that contributed by the Government.

KEYWORDS: Service-Based Periodic Payments, *Pembayaran Berkala Berbasis Layanan (PBBL)*, Financial Feasibility, Net Present Value (NPV), Internal Rate of Return (IRR), Payback Period (PP), Discounted Payback Period, Profitability Index.

INTRODUCTION

PT Hutama Karya (Persero) is one of the state-owned enterprises established in 1961 specialized in construction and services that is not yet went to public and 100% owned by the Government. Its core business has always been to developed infrastructures and buildings. On 2014, through Presidential Regulation that mandates PT Hutama Karya (Persero) to build and operate Trans Sumatera Toll Road, transform its core business into toll road investors and operators. Trans Sumatera Toll Road itself stretches for 2700 Kilometres between Lampung Province to Aceh Province requires large amount of capital and resources. From 2014 until 2024, PT Hutama Karya (Persero) has successfully developed and operating 882 kilometres of Trans Sumatera Toll Roads from Lampung Province to Aceh. The construction of Trans Sumatera Toll Road has been able to enhance economy, opened plenty of job vacancies for the people of Sumatera and increasing mobility.

Jambi is the last province within the Trans Sumatera's backbone route to have the Toll Road infrastructures and is crucial to connect between Toll Road in South Sumatera Province and Riau Province. Prior to develop the first Toll Road in Jambi Province, PT Hutama Karya (Persero) must conduct a financial feasibility study thoroughly. PT Hutama Karya (Persero) as an enterprise should be able to

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find the appropriate ways to develop and connect the Trans Sumatera Toll Road and, in the meantime, still able to maintain its profit and sustainability.

Betung – Tempino – Jambi Toll Road is part of the phase 2 of Trans Sumatera Toll Road Development planning spread across 171 Kilometres and located in South Sumatera Province and Jambi Province. Within Betung – Tempino – Jambi Toll Road, there are 52 Kilometres of Toll Road from Bayung Lencir through Simpang Ness that has been prioritized to be constructed and should be open for traffic in 2025. On 2020, PT Hutama Karya has appointed a consultant to conduct feasibility studies on Betung – Tempino – Jambi Toll Road. The results of feasibility studies showed that this project is not financially viable. However, the President of Indonesia has released a decree that stated the funding, technical planning, construction phase, operation and maintenance of Betung – Tempino – Jambi Toll Road shall apply a Pembayaran Berkala Berbasis Layanan financing scheme to support its investment.

This study will analyze and evaluate the financial feasibility of the Bayung Lencir – Tempino – Simpang Ness Toll Road Development if PT Hutama Karya (Persero) continue to conduct conventional investment and if PT Hutama Karya (Persero) receives PBBL funding from the Government for 15 years. During the PBBL period, The Government of Indonesia through Ministry of Finance and Ministry of Public Works and Housing shall give PT Hutama Karya 880 billion Rupiah annually. The impact of PBBL funding to the project's NPV, IRR, Payback Period, Discounted Payback Period, and Profitability Index (PI) will be analyzed thoroughly.

RESEARCH METHODOLOGY

The research of financial feasibility study begins with gap analysis between the Trans Sumatera Toll Road connectivity and Bayung Lencir – Tempino and Tempino – Simpang Ness Toll Road financial feasibility study. Following the financial feasibility analysis for conventional Toll Road financial scheme, the research will conduct another form of financial scheme that the Government had offered and state in Presidential Decree. The selected method for data analysis upon this research is through quantitative method rather than qualitative method. The data analysis would be using secondary data to define its operating cashflow starting from the 2-years construction phase until the end of concession period which assumed will be given to PT Hutama Karya (Persero) for 50-years period.

RESEARCH RESULTS

A. Toll Road Revenue Analysis

The main revenue stream of Toll Road generally comes from the Tariff that applies to every Toll Road user. The amount of Tariff is projected based on the Ability to Pay (ATP) – Willingness to Pay (WTP) analysis, Cost of Operation and Maintenance, and the Investment of Toll Road Development. Therefore, based on the Ministry of Public Works and Housing Decree Number 507/KPTS/M/2015, and the Consultant's report, the assumption Tariff for each Group in 2025 are as follows:

- Group I (Passenger Car, Smal Truck and Bus) : Rp 1,700
- Group II (2-Axle Truck) : Rp 2,805 (1.65x of Group I)
- Group III (3-Axle Truck) : Rp 3,400 (2.00x of Group I)
- Group IV (4-Axle Truck) : Rp 4,250 (2.50x of Group I)
- Group V (5-Axle Truck or more) : Rp 5,100 (3.00x of Group I)

Furthermore, the Toll Road Tariff is expected to increase 12% for every 2 years

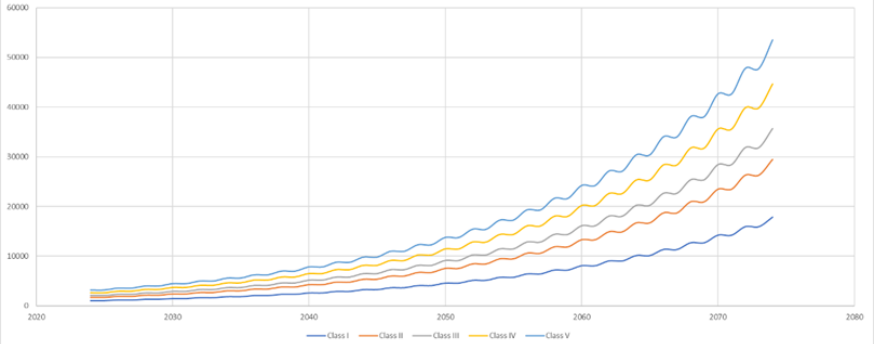

Figure 1. Tariff growth for Betung – Tempino – Jambi toll road

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Following the tariff projection for 50 years, the revenues projection for 50 years shall be calculated with the value of Annual Average Daily Traffic (AADT).

Table I. Annual Average Daily Traffic for Bayung Lencir –Tempino – Simpang Ness Toll Road

Bayung Lencir - Simpang Ness	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Group I	1,551	1,608	1,675	1,840	2,061	2,332	2,657	3,036	3,400	3,692
Group II	17	17	18	20	22	25	29	33	37	40
Group III	559	580	604	664	743	841	958	1,095	1,226	1,332
Group IV	21	22	23	25	29	32	37	42	47	51
Group V	1	1	1	1	1	1	1	1	1	2
TOTAL	**2,149**	**2,228**	**2,321**	**2,549**	**2,856**	**3,231**	**3,682**	**4,207**	**4,711**	**5,116**
Bayung Lencir - Simpang Ness	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**	**2041**	**2042**	**2043**	**2044**
Group I	4,058	4,279	4,509	4,730	4,959	5,194	5,433	5,661	5,893	6,130
Group II	44	46	48	51	53	56	58	61	63	66
Group III	1,464	1,544	1,626	1,706	1,789	1,873	1,960	2,042	2,126	2,211
Group IV	56	59	62	65	69	72	75	78	82	85
Group V	2	2	2	2	2	2	2	2	2	3
TOTAL	**5,624**	**5,930**	**6,248**	**6,555**	**6,872**	**7,197**	**7,528**	**7,844**	**8,166**	**8,495**
Bayung Lencir - Simpang Ness	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**	**2051**	**2052**	**2053**	**2054**
Group I	6,371	6,621	6,882	7,152	7,433	7,725	8,026	8,338	8,662	8,999
Group II	68	71	74	77	80	83	86	90	93	97
Group III	2,298	2,388	2,482	2,580	2,681	2,787	2,895	3,008	3,125	3,246
Group IV	88	92	95	99	103	107	111	115	120	124
Group V	3	3	3	3	3	3	3	4	4	4
TOTAL	**8,829**	**9,175**	**9,536**	**9,911**	**10,300**	**10,705**	**11,122**	**11,555**	**12,004**	**12,470**
Bayung Lencir - Simpang Ness	**2055**	**2056**	**2057**	**2058**	**2059**	**2060**	**2061**	**2062**	**2063**	**2064**
Group I	9,349	9,713	10,090	10,483	10,884	11,300	11,732	12,180	12,628	13,093
Group II	100	104	108	113	117	121	126	131	136	141
Group III	3,372	3,504	3,640	3,781	3,926	4,076	4,232	4,394	4,555	4,723
Group IV	129	134	140	145	151	156	162	168	175	181
Group V	4	4	4	4	5	5	5	5	5	6
TOTAL	**12,955**	**13,459**	**13,983**	**14,527**	**15,082**	**15,658**	**16,257**	**16,879**	**17,499**	**18,143**
Bayung Lencir - Simpang Ness	**2065**	**2066**	**2067**	**2068**	**2069**	**2070**	**2071**	**2072**	**2073**	**2074**
Group I	13,575	14,074	14,592	15,129	15,686	16,264	16,862	17,483	18,127	18,795
Group II	146	151	157	163	169	175	181	188	195	202
Group III	4,897	5,077	5,264	5,458	5,658	5,867	6,083	6,307	6,539	6,780
Group IV	188	195	202	209	217	225	233	242	251	260
Group V	6	6	6	6	7	7	7	7	8	8
TOTAL	**18,811**	**19,503**	**20,221**	**20,965**	**21,737**	**22,537**	**23,367**	**24,227**	**25,119**	**26,045**

The Revenue projection is crucial for Capital Budgeting analysis that would determine whether the development of the Toll Road feasible or not. The revenue projection is determined by calculating each group of vehicle classification using following formula.

$$Revenues = Tariff \times AADT \times Number\ of\ Operational\ Days \times Length\ of\ Toll\ Road$$

B. Initial Investment Cost

The estimated investment cost of Bayung Lencir – Tempino toll road which consist of design cost, construction cost, supervision cost, toll road equipment cost, overhead cost and interest during construction cost (IDC) is Rp 7,037,948,687,496.15. While the investment of Tempino – Simpang Ness Rp 4,039,633,482,656.64. The construction of Bayung Lencir – Tempino section has been started on June 2023 while Tempino – Simpang Ness section is scheduled to start its construction phase on 2024 and to finish its construction by the second Quarter of 2025.

C. Operation and Maintenance Cost

Although the traffic of Trans Sumatera Toll Road is not as attractive as another toll road located in Java Island, the Cost of Operation and Maintenance remains the same since the Ministry of Public Works and Housing has a Minimum Service Standard for all

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operating toll road. The projection of Operation and Maintenance Cost per Kilometres for this project is acquired from Toll Road and Operation Maintenance Division of PT Hutama Karya (Persero) which refering to the nearest Trans Sumatera toll road that has been operated. The assumption of growth rate for Operation and Maintenance Cost starting from 2025 is at 6% per year.

Table II. Operation and Maintenance Projection for Bayung Lencir –Tempino – Simpang Ness Toll Road (2025-2034)

(In Billion Rupiah)

	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
1. Toll Road Tariff Collection										
Personnel Cost	9,509	10,080	10,684	11,325	12,005	12,725	13,489	14,298	15,156	16,065
Non-Personnel Cost	2,515	2,666	2,826	2,995	3,175	3,365	3,567	3,781	4,008	4,249
Annual Maintenance Cost	2,412	2,557	2,710	2,873	3,045	3,228	3,422	3,627	3,845	4,075
Sub Total (1) :	**14,436**	**15,302**	**16,220**	**17,193**	**18,225**	**19,318**	**20,477**	**21,706**	**23,008**	**24,389**
2. Toll Road Users Services										
Personnel Cost	13,367	14,169	15,019	15,921	16,876	17,888	18,962	20,099	21,305	22,584
Cost of Traffic Management	12	13	14	15	15	16	17	18	20	21
Cost of Traffic Services	10,485	11,114	11,780	12,487	13,237	14,031	14,873	15,765	16,711	17,713
Annual Maintenance Cost	3,080	3,264	3,460	3,668	3,888	4,121	4,369	4,631	4,908	5,203
Sub Total (2) :	**26,944**	**28,560**	**30,274**	**32,090**	**34,016**	**36,057**	**38,220**	**40,513**	**42,944**	**45,521**
3. Cost of Rest Area Services										
Personnel Cost	5,195	5,506	5,837	6,187	6,558	6,952	7,369	7,811	8,280	8,776
Non-Personnel Cost	3,755	3,980	4,219	4,472	4,740	5,024	5,326	5,645	5,984	6,343
Sub Total (3) :	**8,949**	**9,486**	**10,055**	**10,659**	**11,298**	**11,976**	**12,695**	**13,456**	**14,264**	**15,120**
4. Cost of Maintenance										
A. Routine Costs (Cleanliness & Mild Maintenance)										
Personnel Cost	6,379	6,762	7,167	7,597	8,053	8,536	9,049	9,592	10,167	10,777
Non-Personnel Cost	953	1,010	1,071	1,135	1,203	1,276	1,352	1,433	1,519	1,610
B. Rutin (Konstruksi)		-	-	-	-	-	-	-	-	-
Routine Maintenance	9,152	9,701	10,283	10,900	11,554	12,247	12,982	13,761	14,586	15,462
Sub Total (4) :	**16,484**	**17,473**	**18,521**	**19,632**	**20,810**	**22,059**	**23,382**	**24,785**	**26,273**	**27,849**
5. Administration and Overhead Costs										
PBB	19,858	21,050	22,313	23,652	25,071	26,575	28,169	29,860	31,651	33,550
Administration and Overhead Costs	46,366	49,148	52,096	55,222	58,536	62,048	65,771	69,717	73,900	78,334
Sub Total (5) :	**66,224**	**70,197**	**74,409**	**78,874**	**83,606**	**88,623**	**93,940**	**99,576**	**105,551**	**111,884**
T o t a l	**133,036**	**141,019**	**149,480**	**158,448**	**167,955**	**178,033**	**188,715**	**200,038**	**212,040**	**224,762**

D. Weighted Average Cost of Capital

The definition of Weighted Average Cost of Capital (WACC) reflects "*The expected average future cost of capital over the long run. It is found by weighting the cost of each specific type of capital by its proportion in the firm's capital structure*", (Gitman & Zutter, 2015). The formula to define the value of WACC is as follows:

$$WACC = (Re \times WoE) + Rd \times (1 - T) \times WoD$$

a. E = The Firm's Equity
b. D = The Firm's Debt
c. V = Investment Costs
d. WoD = Weight of Debt
e. WoE = Weight of Equity
f. Re = Cost of Equity
g. Rd = Cost of Debt
h. T = Corporate Tax Rate

According to preceding formula, the WACC of this project using 10.46% market return, 6.69% risk-free rate and 22% corporate tax rate is as follows:

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Table III. WACC Analysis for Bayung Lencir –Tempino – Simpang Ness Toll Road (2025-2034)

No	Description	Symbol	Formula	Value
1	Investment Cost	V		11,077,582,170,152.80
2	Equity	E	$E = 30\% \times V$	3,323,274,651,045.84
3	Debt	D	$D = 70\% \times V$	7,754,307,519,106.95
4	Weight of Debt	WoD		0.70
5	Weight of Equity	WoE		0.30
6	Risk Free Rate	Rf		6.69%
7	Beta	β	$\beta = Unleverage\ Beta \times (1 + (1 - Tax) \times Leverage)$	0.825
8	Market Return	RM		10.46%
9	Cost of Equity (CAPM)	RE	$RE = Rf + \beta(RM - Rf)$	9.80%
10	Cost of Debt Before Tax	RD		11%
11	Corporate Tax Rate	T		22%
12	Cost of Debt After Tax			8.58%
13	Weighted Cost of Capital	WACC	$WACC = RE \times WoE + RD \times (1 - T\_ \times WoD$	8.95%

E. Financial Feasibility Analysis

1) ***Net Present Value (NPV)**: The theoretical foundation of NPV is "The Net Present Value (NPV) is found by subtracting a project's initial investment (CF_0) from the present value of its cash inflows (CF_t) discount at a rate equal to the firm's cost of capital (r)" (Gitman & Zutter, 2015).* Using Net Present Value as one of the decision-making tools in investment the criteria for the project to be deemed feasible is when the NPV greater than 0. The formula for NPV is as follows:

$$NPV = \sum_{t=1}^{n} \frac{CF_t}{(1+r)^2} - CF_0$$

2) ***Internal Rate of Return (IRR)**:* Whereas the theoretical foundation for the internal rate of return (IRR) is "*The discount rate that equates the NPV of an investment opportunity with 0 (because the present value of cash inflows equals the initial investment. It is the rate of return that the firm will earn if it invests in the project and receives the given cash inflows.*" (Gitman & Zutter, 2015). When using IRR as one of the decision-making tools in investment, the criteria for the project to be classified as feasible is when the IRR is greater than the cost of capital. The formula for NPV is as follows:

$$CF_0 = \sum_{t=1}^{n} \frac{CF_t}{(1+IRR)^t}$$

3) ***Profitability Index (PI)***: Profitability Index is another variation of NPV that measures the cash inflows to the cash outflow. "*A profitability index greater than 1.0 implies that the present value of cash inflows is greater than the cash outflow, so a PI corresponds to a net present value greater than 0*", (Gitman & Zutter, 2015). The value of PI shall be define by dividing the present value of cash inflows to the initial cash outflow. The formula for NPV is as follows:

$$PI = \frac{\sum_{t=1}^{n} \frac{CF_t}{(1+IRR)^t}}{CF_0}$$

According to the analysis conducted in this research, the following Internal Rate of Return (IRR), Net Present Value (NPV), Payback Period, the Discounted Payback Period, and Profitability Index for this project without PBBL namely:

a. Net Present Value (NPV) is Rp. – 4,123,196,493.
b. Internal Rate of Return is 7.20%.
c. Profitability Index (PI) is 0.5787.

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While the Internal Rate of Return (IRR), the Net Present Value (NPV), Payback Period, the Discounted Payback Period, and Profitability Index for this project with PBBL namely:
a. Net Present Value (NPV) is Rp. – 609,688,031,798.
b. Internal Rate of Return is 9.28%.
c. Profitability Index (PI) is 1.0668.

CONCLUSIONS

After conducting thorough analysis of financial feasibility for Bayung Lencir – Tempino - Simpang Ness Toll Road. The project without PBBL and relies solely on toll road revenue with 12% tariff growth for every 2 deemed not viable while the project provided by the Government with PBBL deemed viable. Therefore, PT Hutama Karya (Persero) shall continue to develop the Bayung Lencir – Tempino – Simpang Ness toll road project if the PBBL applies. However, it is recommended that PT Hutama Karya (Persero) ensure that there is a clause in the agreement that the amount of PBBL may change due to the change of design since the project is classified as Nation Strategic Project and the duration of Toll Road construction is accelerated.

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