

## **CHAPTER 4**

### **FINDING, ANALYSIS AND DISCUSSION**

#### **4.1 Introduction**

This chapter delineates the comprehensive procedures that the company's expert system implements, as well as the data that is gathered during the subsequent interview process. Descriptive analysis is employed to acquire a thorough comprehension of the results of the calculations and procedures. Capital Budgeting and Non-Monetary Assessment are critical components of the analysis that are essential for the evaluation of the investment decision. The Expert System is implemented within the Appreciative Inquiry framework to achieve these outcomes, which is a structured methodology that improves the quality of decision-making. The integration of these methods considerably enhances the accuracy of the analysis, resulting in more precise results and valuable insights for the company in the development of its future strategies. Furthermore, this integrated approach facilitates a more informed planning process, thereby reducing the potential risks associated with business decisions and establishing a more robust foundation for strategic investment considerations.

#### **4.2 Interview with the Top Management to Develop SWOT Analysis**

The project manager of the Harbour Road 2 Toll Road Project from PT Wijaya Karya (Persero), Tbk, was interviewed in-depth by the author as part of an Appreciative Inquiry to better understand the project's goals, the applied approach, and the underlying financial assumptions. The questions and answers are listed in Appendix 1.

The use of a Launcher Gantry (LG) is essential to the Harbour Road 2 project because it entails building bridges with substantial heights and long spans. Figure 4.1 and Table 4.1 show the 47-meter span and up to 22-meter height of one of the main bridges being built for this project. Heavy structural components must be lifted and moved by construction equipment with a high lifting capacity for this

bridge. PT Wijaya Karya (Persero), Tbk. is using a Launcher Gantry with a 1,000-ton lifting capacity to meet these needs, as shown in Table 4.2.

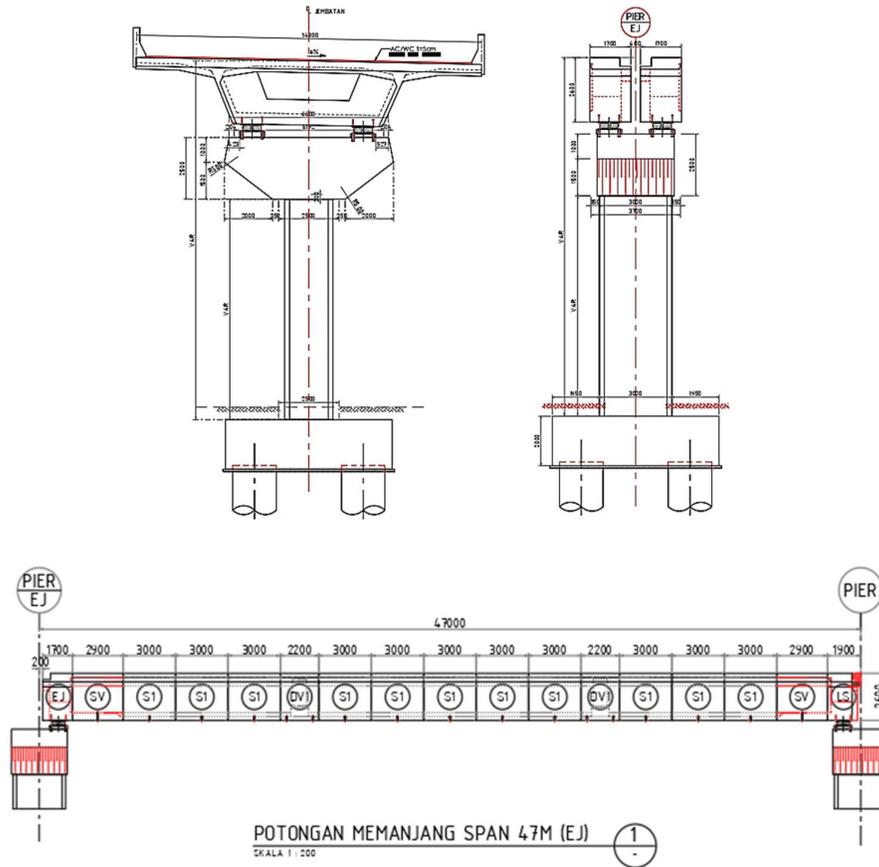


Figure 4.1 Bridge Structure Design Harbour Road 2 Toll Road Project

(Source : PT Wijaya Karya (Persero), Tbk., 2021)

Table 4.1 Structure Design Spesification

No.	Item	Description
1.	Typical Girder Type	Precast Box Girder
2.	Average Span Length	47 m
3.	Erection Equipment	LG 1000 Ton ( W.BOX 950 ton/span)
5.	Lead Rubber Bearing	LRB 6000 kN 4nr/pier
6.	Pier	Pier Dimension 2.5 x 3.0 m
7.	Pile Cap	Pile Cap Dimension 6.9 x 6.9 x 2.0 m
8.	Bored Pile Foundation	Foundation Configuration BP1.8m 2X2 Depth. 42m
9.	Expansion Joint	Expansion Joint 2 nr/7 span

Source : PT Wijaya Karya (Persero), Tbk., 2021

Table 4.2 Launcher Gantry 1,000 Tons Spesification

No.	Item	Description
1.	Equipment Type	Launcher Gantry/ Overhead Launcher
2.	Brand / Type	Comtec TCS
3.	Capacity	1,000 Tons/ 50 m span Climbable slope: 5% longitudinal, 6% transverse slope
4.	Manufacturer Origin	Italy

Source : PT Wijaya Karya (Persero), Tbk., 2021

The lifting capacity of the majority of Launcher Gentries in Indonesia is approximately 850 tons, which is insufficient to satisfy the requirements of the Harbour Road 2 project. Subsequently, the scarcity of appropriate equipment in the domestic market presents a substantial obstacle for PT Wijaya Karya. A Launcher Gantry with a 1,000-ton lifting capacity that is imported from abroad is one of the potential solutions that is being considered. Although the acquisition of this equipment involves additional costs and logistical challenges, it is essential to ensure the project's successful completion.

From an investment standpoint, the preliminary procurement expenses are substantial; however, the long-term advantages of employing this Launcher Gantry

significantly surpass these costs. This equipment will enable the Harbour Road 2 project to be completed with greater efficiency and to a higher standard of quality. This will subsequently improve transportation connectivity in Jakarta and contribute to the acceleration of economic growth in the Greater Jakarta (Jabodetabek) region. A more efficient mobility of goods and people will be facilitated by an improved toll road infrastructure, which will support regional economic development. Several advantages are provided by the utilization of a Launcher Gantry in the Harbour Road 2 project in comparison to traditional construction methods, including:

1. Time and Resource Efficiency

The Launcher Gantry facilitates the installation of bridge girders at a faster pace due to its substantial lifting capacity. This significantly reduces the time necessary to place each structural element, thereby guaranteeing that the project is completed on time. Furthermore, the utilization of Launcher Gantry reduces the necessity for manual labor, which is a more hazardous and time-consuming method of accomplishing comparable tasks.

2. Precision and Installation Quality

The Launcher Gantry is essential for the structural stability and safety of the bridge, as it offers a higher degree of precision in the placement of bridge girders. The bridge's overall lifespan, traffic safety, and long-term durability are contingent upon precise installation.

3. Worker Safety

The Launcher Gantry significantly mitigates the risks that workers encounter on-site by facilitating the installation of girders without necessitating their proximity to hazard areas. In large-scale projects such as Harbour Road 2, the installation of numerous structural elements at significant heights is particularly critical.

#### 4. Increased Project Capacity

With the 1,000-ton Launcher Gantry, the Harbour Road 2 project can lift bridge components that are significantly heavier and larger than those that can be lifted by smaller equipment. This ability improves the project's efficiency, even in the face of intricate structural challenges.

A comprehensive analysis of a wide range of internal and external factors is required before making the decision to purchase a Launcher Gantry with a capacity of 1,000 tons for the Harbour Road 2 Toll Road Project. This analysis is necessary in order to determine whether or not this investment is feasible and whether or not it will be beneficial in the long run. The opportunity, threats, strengths, and weaknesses that are associated with this decision are analyzed in the following SWOT analysis, which provides insights into these vital aspects.

Table 4.3 SWOT Analysis of the 1000 Ton Launcher Gantry Investment for the Harbor Road 2 Toll Road Project of PT Wijaya Karya (Persero), Tbk.

SWOT Category	Description
<b>Strengths</b>	<ul style="list-style-type: none"> <li>- <b>Improved Construction Efficiency:</b> The 1000 Ton Launcher Gantry significantly speeds up the installation of Precast Box Girders, ensuring the timely completion of the Harbour Road 2 Toll Road Project.</li> <li>- <b>Enhanced Safety:</b> The gantry is designed for safe handling of heavy loads, reducing risks of accidents and injuries at the construction site.</li> <li>- <b>Durability:</b> Built to withstand large-scale infrastructure projects, offering long-term value and reusability for future projects.</li> <li>- <b>High Construction Quality:</b> Ensures precise installation of Precast Box Girders, contributing to structural integrity and high-quality construction.</li> </ul>

<p><b>Weaknesses</b></p>	<ul style="list-style-type: none"> <li>- <b>High Initial Cost:</b> The acquisition of the 1000 Ton Launcher Gantry involves a substantial investment, which could strain the company’s finances in the short term.</li> <li>- <b>Repair, Maintenance and Operational Costs:</b> While durable, the equipment requires regular maintenance, adding significant ongoing operational costs.</li> <li>- <b>Limited Utilization for Other Projects:</b> The specialized nature of the Launcher Gantry may limit its use for smaller projects within PT Wijaya Karya’s portfolio, making it harder to justify the initial investment if similar projects aren’t immediately available.</li> </ul>
<p><b>Opportunities</b></p>	<ul style="list-style-type: none"> <li>- <b>Competitive Advantage:</b> The advanced technology of the Launcher Gantry provides PT Wijaya Karya with a competitive edge when bidding for large-scale infrastructure projects.</li> <li>- <b>Long-term Savings:</b> Enhanced construction speed and reduced labor costs can offset the initial investment, leading to better budget management and profitability in future projects.</li> <li>- <b>Reputation Enhancement:</b> Investing in cutting-edge machinery strengthens PT Wijaya Karya’s reputation as a leader in the construction industry, attracting high-value projects and new clients.</li> <li>- <b>National Infrastructure Development Needs:</b> Indonesia is currently undergoing rapid infrastructure development across the country, driven by government initiatives to improve connectivity and economic growth. The demand for high-quality toll roads, bridges, and other transportation infrastructure is increasing, presenting significant opportunities for companies equipped with advanced construction technology. By acquiring the <i>Launcher Gantry</i>, PT Wijaya Karya positions itself as a</li> </ul>

	key player capable of contributing to national infrastructure projects, aligning with Indonesia's long-term development goals.
<b>Threats</b>	<ul style="list-style-type: none"> <li>- <b>Economic Instability:</b> Economic fluctuations, inflation, or rising material costs could affect project profitability, making the initial investment in the Launcher Gantry more challenging.</li> <li>- <b>Operational Risks:</b> Dependence on the performance of the Launcher Gantry presents a risk. Breakdowns or operational failures could cause delays and unanticipated costs.</li> <li>- <b>Regulatory Changes:</b> Potential changes in government policies, machinery regulations, or environmental standards could impact the project's progress and affect the viability of using the 1000 Ton Launcher Gantry.</li> </ul>

Source : PT Wijaya Karya (Persero), Tbk., 2024

### 4.3 Capital Budgeting Analysis

At the Harbour Road 2 Toll Project, PT Wijaya Karya (Persero), Tbk conducted an exhaustive capital budgeting analysis to assess the investment in the Launcher Gantry 1,000 Ton (LG 1,000 Ton). The capital budgeting analysis evaluates the investment feasibility of PT Wijaya Karya (Persero), Tbk in the acquisition of the Launcher Gantry 1,000 Ton (LG 1,000 Ton). The calculation employs the following criteria: the Weighted Average Cost of Capital, Payback Period, Return on Investment, Net Present Value, Profitability Index, Discounted Payback Period, and Internal Rate of Return. Table 4.4 delineates the primary assumptions that underlie the investment evaluation, such as the estimated economic life of the equipment, funding sources, corporate tax rate, and interest rate. These assumptions lay the groundwork for the financial analysis, which allows for an evaluation of the project's financial viability, profitability, and associated risks.

Table 4.4 Capital Budgeting Assumptions

No.	Description	Remarks
1.	Price of the Launcher Gantry 1,000 Ton (CIF)	35,489,000,000
2.	Contractor Engineering Services Fee	4,362,000,000
3.	Cost of Installation and Commissioning	7,720,000,000
4.	Source of fund for Investment	Debt
5.	Economic Life of LG	10 years
6.	Corporate Tax	2.65%
7.	Interest Rate before Tax	12%
8.	Expected Commercial Operation Date	Q2 2025
9.	Long-Term Debt	100%
10.	Equity	0%
11.	WACC	11,68%

Source : PT Wijaya Karya (Persero), Tbk., 2024

Table 4.5 Yearly Income Statement Forecast

Category	Unit	Year					
		Q1 2025	2025	2026	2027	2028	2029
Revenue							
Total Revenue	IDR/ Year		18.744.000.000	18.744.000.000	18.744.000.000	18.744.000.000	18.744.000.000
Operational Expenditure							
Total OPEX			1.047.000.000	1.047.000.000	1.047.000.000	1.047.000.000	1.047.000.000
Earning Before Interest, Taxes, Depreciation, and Amortization (EBITDA)	IDR		17.697.000.000	17.697.000.000	17.697.000.000	17.697.000.000	17.697.000.000
Depreciation and Amortization	IDR		4.757.100.000	4.757.100.000	4.757.100.000	4.757.100.000	4.757.100.000
Earning Before Interest and Taxes (EBIT)	IDR		12.939.900.000	12.939.900.000	12.939.900.000	12.939.900.000	12.939.900.000
Interest before tax	IDR		5.446.879.500	4.876.027.500	4.305.175.500	3.734.323.500	3.163.471.500
Earning Before Taxes (EBT)	IDR		7.493.020.500	8.063.872.500	8.634.724.500	9.205.576.500	9.776.428.500
Tax (2,65%)	IDR		496.716.000	496.716.000	496.716.000	496.716.000	496.716.000
Earning After Taxes (EAT)	IDR		6.996.304.500	7.567.156.500	8.138.008.500	8.708.860.500	9.279.712.500

Category	Unit	Year				
		2030	2031	2032	2033	2034
Revenue						
<b>Total Revenue</b>	<b>IDR/ Year</b>	<b>18.744.000.000</b>	<b>18.744.000.000</b>	<b>18.744.000.000</b>	<b>18.744.000.000</b>	<b>18.744.000.000</b>
Operational Expenditure						
<b>Total OPEX</b>		<b>1.047.000.000</b>	<b>1.047.000.000</b>	<b>1.047.000.000</b>	<b>1.047.000.000</b>	<b>1.047.000.000</b>
Earning Before Interest, Taxes, Depreciation, and Amortization (EBITDA)	<b>IDR</b>	<b>17.697.000.000</b>	<b>17.697.000.000</b>	<b>17.697.000.000</b>	<b>17.697.000.000</b>	<b>17.697.000.000</b>
Depreciation and Amortization	IDR	4.757.100.000	4.757.100.000	4.757.100.000	4.757.100.000	4.757.100.000
<b>Earning Before Interest and Taxes (EBIT)</b>	<b>IDR</b>	<b>12.939.900.000</b>	<b>12.939.900.000</b>	<b>12.939.900.000</b>	<b>12.939.900.000</b>	<b>12.939.900.000</b>
Interest before tax	IDR	2.592.619.500	2.021.767.500	1.450.915.500	880.063.500	309.211.500
<b>Earning Before Taxes (EBT)</b>	<b>IDR</b>	<b>10.347.280.500</b>	<b>10.918.132.500</b>	<b>11.488.984.500</b>	<b>12.059.836.500</b>	<b>12.630.688.500</b>
Tax (2,65%)	IDR	496.716.000	496.716.000	496.716.000	496.716.000	496.716.000
<b>Earning After Taxes (EAT)</b>	<b>IDR</b>	<b>9.850.564.500</b>	<b>10.421.416.500</b>	<b>10.992.268.500</b>	<b>11.563.120.500</b>	<b>12.133.972.500</b>

Source : Researcher, 2025

**\*(1) Revenue Explanation:**

- Revenue is generated based on a monthly production of 4 spans, with each span utilizing the Launcher Gantry 1,000 Ton for the installation of Precast Box Girders.
- With an estimated 12 months of operation per year, the total spans installed annually amount to 48 spans.
- The revenue per span is derived from the contracted agreement between PT Wijaya Karya and the respective project stakeholders.
- The detail calculation is shown in appendix 2
- Revenue is received in cash basis

**\*(2) Cash OPEX Explanation :**

Cash OPEX and non-cash OPEX

**\*(3) Depreciation Explanation:**

- The depreciation of the Launcher Gantry 1,000 Ton is calculated using the straight-line method, which assumes an economic life of 10 years.

Table 4.6 Net Cash Flow Forecasting

Category	Unit	Year					
		Q1 2025	2025	2026	2027	2028	2029
Earning After Taxes (EAT)	IDR		6.996.304.500	7.567.156.500	8.138.008.500	8.708.860.500	9.279.712.500
Depreciation and Amortization			4.757.100.000	4.757.100.000	4.757.100.000	4.757.100.000	4.757.100.000
<b>Net Cash Inflows from operating Activity</b>	IDR		11.753.404.500	12.324.256.500	12.895.108.500	13.465.960.500	14.036.812.500
Net Cash Outflows for financing activity	IDR		- 2.743.188.284	- 3.314.040.284	- 3.884.892.284	- 4.455.744.284	- 5.026.596.284
Cash Outflows for investing activity	IDR	- 47.571.000.000	-	-	-	-	-
<b>Net Cash Flow</b>	IDR	- 47.571.000.000	14.496.592.784	15.638.296.784	16.780.000.784	17.921.704.784	19.063.408.784
<b>Balance</b>	IDR		- 33.074.407.216	- 17.436.110.432	- 656.109.649	17.265.595.135	36.329.003.919

Category	Unit	Year				
		2030	2031	2032	2033	2034
Earning After Taxes (EAT)	IDR	9.850.564.500	10.421.416.500	10.992.268.500	11.563.120.500	12.133.972.500
Depreciation and Amortization		4.757.100.000	4.757.100.000	4.757.100.000	4.757.100.000	4.757.100.000
<b>Net Cash Inflows from operating Activity</b>	IDR	14.607.664.500	15.178.516.500	15.749.368.500	16.320.220.500	16.891.072.500
Net Cash Outflows for financing activity	IDR	- 5.597.448.284	- 6.168.300.284	- 6.739.152.284	- 7.310.004.284	- 7.880.856.284
Cash Outflows for investing activity	IDR	-	-	-	-	-
<b>Net Cash Flow</b>	IDR	20.205.112.784	21.346.816.784	22.488.520.784	23.630.224.784	24.771.928.784
<b>Balance</b>	IDR	56.534.116.703	77.880.933.486	100.369.454.270	123.999.679.054	148.771.607.838

Source : Researcher, 2025

#### 4.3.1 Weighted Average Cost of Capital (WACC)

This investment has a Weighted Average Cost of Capital (WACC) of 11.68%. According to Ross, Westerfield, and Jaffe (2019), WACC stands for the company's average cost of financing, which comprises both debt and equity. With a corporate tax rate of 2.65% and a pre-tax interest rate of 12%, the investment in this instance is entirely financed by debt, which influences the after-tax cost of debt and influences the WACC calculation.

WACC is a metric used to evaluate the viability of investments because it shows the bare minimum of return needed to pay for the project's financing. Profitable and financially feasible investments are those that yield a return greater than their weighted average cost of capital (WACC). A tax shield effect, in which interest costs lower taxable income and increase financial efficiency, is another advantage the company enjoys because this investment is entirely debt-financed.

### **4.3.2 Payback Period**

For the investment in the LG 1,000 Ton, the payback period is three years and ten months. The duration of time necessary to recoup the initial investment from the future cash inflows generated by the project is expressed by this metric. The company's ability to recover the investment relatively quickly is indicated by a payback period of 3.04 years, which is deemed advantageous for project liquidity and cash flow management. The average payback period for comparable infrastructure investments in other regions has typically been approximately 20 years, as evidenced by the aforementioned projects completed by PT Wijaya Karya (WIKa) (Wika, 2025). In contrast, the LG 1,000 Ton investment's significantly shorter payback period of 3.04 years illustrates a substantial enhancement in capital recovery efficiency.

### **4.3.3 Return on Investment (ROI)**

The LG 1,000 Ton investment has an annual average ROI of 89.10%, which is a substantial return on the capital invested. This percentage quantifies the investment's profitability by comparing its return to its cost. The investment is expected to generate substantial returns in comparison to its initial cost, as evidenced by its high average ROI of 89.10%. This ROI is regarded as robust, indicating a financially viable and efficient investment decision. When evaluating ROI, it is crucial to compare it to the Weighted Average Cost of Capital (WACC), which is calculated at 11.68%. The investment is a financially sound decision, as the ROI significantly exceeds the WACC, indicating that it generates returns that are well above the minimum required return. If the ROI were less than the WACC, it would indicate that the project is not generating enough value for the company.

Table 4.7 Detailed Yearly ROI

Year	1	2	3	4	5	6
ROI	14,71%	16,88%	19,60%	23,14%	27,97%	35,00%

Year	7	8	9	10	Average
ROI	46,22%	67,10%	119,93%	520,41%	<b>89,10%</b>

Source : Researcher, 2025

Table 4.7 demonstrates the investment's impressive financial results over a number of years. Capital efficiency is guaranteed and the LG 1,000 Ton investment is well justified, as confirmed by the continuously high ROI values. The project can create substantial value for the business and its stakeholders, as evidenced by the higher ROI compared to WACC.

#### 4.3.4 Net Present Value (NPV)

The NPV of the investment is calculated to be IDR 58,987,705,614 (approximately 48.296 billion IDR). The positive NPV indicates that the present value of the future cash flows generated by the project exceeds the initial capital investment. A positive NPV is an important signal that the investment will add value to the company, as it suggests that the project will generate more income than the cost of the capital used. This supports the financial viability and profitability of the investment in the long term.

Thus, based on the positive NPV, it can be concluded that the investment is feasible and should be pursued, as it aligns with financial, operational, and strategic goals.

#### 4.3.5 Profitability Index (PI)

The investment in the 1,000 Ton Launcher Gantry (LG 1,000 Ton) has a Profitability Index (PI) of 2.24. PI is a critical metric in capital budgeting that assesses the efficiency of investments by comparing the present value of future cash flows to the initial investment.

A PI equal to or greater than 1.0 is a reliable indicator that an investment is financially viable and will produce value that surpasses its cost. A PI of 2.24

indicates that the project is anticipated to generate IDR 2.24 in value for every IDR 1 invested, indicating a high level of profitability. This confirms that the investment will not only recoup the initial capital outlay but also generate substantial additional value, rendering it a rational strategic decision.

Consequently, the PI value of 2.24 serves as additional evidence that the 1,000 Ton Launcher Gantry investment is profitable, highly advantageous, and consistent with the company's long-term financial strategy. Consequently, the acquisition is being pursued.

#### **4.3.6 Discounted Payback Period**

For the 1,000-ton Launcher Gantry (LG 1,000-ton) investment, the estimated Discounted Payback Period (DPP) is 3.87 years. The discounted payback period discounts future cash flows to their present value in order to account for the time value of money (TVM), in contrast to the simple payback period, which only takes raw cash inflows into account. This guarantees a more precise estimation of the time required to recoup the initial investment.

It will take slightly more than five years for the investment to produce enough discounted cash flows to cover the entire initial cost, according to a DPP of 3.87 years. This timeline is deemed appropriate for an investment of this size and type, especially in the construction and infrastructure sectors where long-term capital expenditures are typical.

A DPP of 3.87 years is a good result from a financial standpoint since it shows that, after accounting for discounting effects, the investment can be repaid in a reasonable amount of time. It also fits in with the company's financial plan and liquidity goals, guaranteeing that capital is distributed efficiently and without unduly lengthy recovery periods.

#### **4.3.7 Internal Rate of Return (IRR)**

The Internal Rate of Return (IRR) for the LG 1,000 Ton investment has been determined to be 34.25%. IRR is the annualized rate of return at which the Net Present Value (NPV) of the investment is zero. This indicates that the project

generates cash inflows that are sufficient to recover the initial investment and meet the anticipated return threshold.

The project is not only profitable but also has a significant potential to generate excess returns beyond the company's capital costs, as the IRR of 34.25% is significantly higher than the company's Weighted Average Cost of Capital (WACC) of 11.68%. This illustrates that the investment will generate financial value for the organization and increase the wealth of all shareholders.

The investment's financial feasibility is confirmed by a high IRR in relation to the WACC, as it is anticipated to generate a return that is substantially higher than the company's required rate of return. This outcome further solidifies the decision to proceed with the investment, as it is consistent with the company's financial strategy and guarantees that the capital allocated to the 1,000 Ton Launcher Gantry will yield substantial long-term benefits.

Table 4.8 displays a summary calculation that is based on all capital budgeting criteria, including the Payback Period, Return of Investment, Net Present Value, Profitability Index, Discounted Payback Period, Internal Rate of Return, and Weighted Average Cost of Capital (detailed calculation is provided in appendix 2). The outcome suggests that the LG 1,000 Ton acquisition project is feasible.

Table 4.8 Summary Capital Budgeting Analysis

No.	Capital Budgeting	Result	Conclusion
1.	WACC	11.68%	
2.	Payback Period (Year)	3.04	Feasible
3.	Return of Investment (Average)	89.10%	Feasible
4.	NPV (IDR)	58,987,705,614	Feasible
5.	NPV Index / Profitability Index	2.24	Feasible
6.	Discounted Payback Period (Year)	3.87	Feasible
7.	IRR (%)	34.25%	Feasible

Source : Researcher, 2025

#### 4.4 Sensitivity Analysis

In this investment analysis, in addition to evaluating the project's feasibility based on the current budget, a sensitivity analysis was conducted to anticipate potential cost changes in the future. One of the scenarios analyzed is the impact of a 5% annual increase in operational costs, which is assumed to result from the annual increase in labor wages. This analysis aims to assess the extent to which the project remains viable in the event of rising costs, providing insight into the financial resilience of this investment.

Table 4.9 Summary of Capital Budgeting Analysis with Sensitivity Analysis Results

No.	Capital Budgeting	Result Based on Current Budget	Result of Sensitivity (If Cost Increase : 5% per year)	Conclusion
1.	WACC	11.68%	11.68%	
2.	Payback Period (Year)	3.04	3.05	Feasible
3.	Return of Investment (Average)	89.10%	85.43%	Feasible
4.	NPV (IDR)	58,987,705,614	57,767,098,159	Feasible
5.	NPV Index / Profitability Index	2.24	2.21	Feasible
6.	Discounted Payback Period (Year)	3.87	3.89	Feasible
7.	IRR (%)	34.25%	33.96	Feasible

Source : Researcher, 2025

Based on Table 4.9, the results of the sensitivity analysis indicate that the Payback Period slightly increased to 3.05 years, compared to 3.04 years in the current budget scenario, demonstrating that the project can still reach its breakeven point within a reasonable timeframe. Return on Investment (ROI) slightly declined to 85.43%, from 89.10%, due to increased operational costs reducing the project's net profit. Net Present Value (NPV) remains positive at IDR 57,767,098,159, experiencing a slight decrease from IDR 58,987,705,614, indicating that the project still generates added value despite the cost increase. Profitability Index (PI) also slightly decreased to 2.21, from 2.24, but remains above 1, signifying that the project remains profitable. Discounted Payback Period increased slightly to 3.89

years, compared to 3.87 years previously, but remains within acceptable investment limits. Internal Rate of Return (IRR) slightly decreased to 33.96%, from 34.25% in the initial scenario, but remains significantly higher than the WACC of 11.68%, indicating that the investment return rate is still higher than the cost of capital. Based on the results of Table 4.9, it can be concluded that despite the 5% annual increase in costs, the project remains feasible to proceed (detailed calculation is provided in appendix 3).

#### **4.5 Non-Monetary Analysis**

The 1000 Ton Launcher Gantry investment for the Harbour Road 2 Toll Road Project not only improves the project's efficiency and quality, but also significantly contributes to the advancement of several Sustainable Development Goals (SDGs). The project's alignment with specific SDGs and its broader impact on infrastructure development, economic growth, the establishment of sustainable cities, and environmental sustainability are demonstrated in this analysis.

##### **SDG 9 – Industry, Innovation, and Infrastructure:**

The 1,000 Ton Launcher Gantry's deployment directly aligns with SDG 9, which prioritizes the development of resilient infrastructure, innovation, and industrial capacity. The gantry's advanced technology enhances the construction process by incorporating innovation into infrastructure development. It is essential for the construction of sustainable infrastructure, a core objective of SDG 9, due to its high efficiency and automation capabilities, which expedite the construction process and enhance the overall quality. This investment not only broadens the project's scope but also plays a role in the region's overall objective of constructing a resilient infrastructure.

##### **SDG 8 – Decent Work and Economic Growth:**

The investment is also in accordance with SDG 8, which is dedicated to the promotion of economic growth and decent work, in addition to improving infrastructure. The 1000 Ton Launcher Gantry enhances the overall work environment and improves worker safety by reducing the need for manual labor and

Introducing automation. By allowing employees to participate in tasks that are more productive and safer, this contributes to the objective of establishing decent working conditions.

Moreover, the construction process's enhanced efficiency contributes to the reduction of costs, the acceleration of project completion, and the promotion of economic growth by optimizing resources and increasing profitability. The construction sector is important in the generation of employment, as large-scale projects such as this necessitate a substantial workforce for various phases, including planning, logistics, assembly, and maintenance, in addition to improving productivity. The project's promotion of employee welfare and its contribution to the local economy are underscored by the interplay of these factors, which foster sustainable economic development and create job opportunities.

#### SDG 11 – Sustainable Cities and Communities:

The project is also crucial in the advancement of SDG 11, which is dedicated to the promotion of sustainable communities and cities. The 1000 Ton Launcher Gantry guarantees that the toll road construction meets rigorous standards, thereby fostering the development of resilient and durable infrastructure. By emphasizing quality construction practices, the project guarantees the long-term sustainability of urban mobility in North Jakarta, in addition to improving the safety and operational efficiency of the toll road. This initiative supports SDG 11 by ensuring that infrastructure is adaptable, durable, and capable of meeting future demands, thereby promoting the growth of sustainable communities, as cities continue to expand and evolve.

#### SDG 13 – Climate Action:

Lastly, the 1,000 Ton Launcher Gantry offers substantial environmental benefits, which are consistent with SDG 13, which promotes climate action. The environmental impact of the construction process is diminished by the utilization of this sophisticated machinery. The project can significantly reduce emissions associated with construction activities and other energy-intensive processes by expediting the construction timeline and minimizing the necessity for manual labor.

Furthermore, the enhanced pace of construction contributes to the reduction of the long-term environmental impact, thereby promoting a more sustainable approach to infrastructure development and supporting global efforts to combat climate change.