STRATEGIC INVESTMENT DECISION AND EVALUATION TO ACQUIRE 1,000 TON LAUNCHER GANTRY FOR TOLL ROAD HARBOUR ROAD PROJECT OF PT WIJAYA KARYA (PERSERO), TBK. INDONESIA

THESIS

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A THESIS

Submitted in partial fulfillment of the requirements for the

degree of Master Business Administration

CERTIFICATE OF APPROVAL

Name & Student ID	:	Alfi Trianto (20222013)
Topic	:	Strategic Investment Decision And Evaluation To Acquire 1,000 Ton Launcher Gantry For Toll Road Harbour Road Project of PT Wijaya Karya (Persero), Tbk. Indonesia

We hereby declare that this Thesis is from the student's own work, has been read and presented to IPMI Institute's Board of Examiners, and has been accepted as part of the requirements needed to obtain a Bachelor of Business Administration Degree and has been found to be satisfactory.

Jakarta,

Examined by,

NON-PLAGIARISM DECLARATION FORM

This Thesis is a presentation of our original research work. Wherever contribution of others are involved, every effort is made to indicate this clearly, with due reference to the literature, and acknowledgement of collaborative research and discussions.

Also, this work is being submitted in partial fulfillment of the requirements for the Master of Business Administration degree and has not previously been accepted in substance for any degree and is not being concurrently submitted in candidature for any degree.

Jakarta,

Materai Rp 10.000

Alfi Trianto

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ABSTRACT

The East Ancol – Pluit Toll Road (Harbour Road) is an elevated toll road designed to alleviate traffic congestion and enhance mobility in North Jakarta. The project aims to improve transportation efficiency, thereby facilitating economic growth by ensuring the swift and effective movement of goods and individuals. Executed by PT Wijaya Karya (Persero), Tbk. (WIKA), a state-owned enterprise under Infrastructure I, the project commenced in early 2021 and is expected to conclude by 2027. The construction incorporates Precast Box Girders as its primary structural components, necessitating the deployment of a 1,000-ton capacity Launcher Gantry (LG). This study aims to assess the feasibility of investing in a 1,000-ton Launcher Gantry, with key considerations including budgetary constraints, safety improvements, and quality enhancement. A mixed-method approach is employed, integrating: Strategic evaluation through SWOT Analysis, Capital budgeting techniques, including WACC, Payback Period, ROI, NPV, PI (NPV Index), and IRR, and Sustainability assessment based on the Sustainable Development Goals (SDGs). The SWOT analysis highlights the investment's advantages in enhancing operational efficiency and cost reduction while acknowledging challenges such as significant upfront capital requirements and specialized expertise. The capital budgeting analysis presents a positive financial outlook, with a WACC of 9.36%, a payback period of 3.8 years, an ROI of 60.17%, an NPV of IDR 48.3 billion, a PI (NPV Index) of 1.02, and an IRR of 26.59%, confirming the investment's financial viability. Finally, the project aligns with Sustainable Development Goals (SDGs) by contributing to economic growth, infrastructure innovation, and urban sustainability. Based on these findings, this study concludes that investing in the 1,000-ton Launcher Gantry is a strategically viable decision that aligns with financial, operational, and sustainability objectives.

Keywords: *Capital Budgeting, Strategic Analysis, Financial, Feasibility, 1,000 Ton Launcher Gantry*

CHAPTER 1
INTRODUCTION

1.1 Background

The construction sector is the fifth-largest contributor to Indonesian GDP. In 2022, the construction sector contributed 9.77% of GDP (Biro Pusat Statistik, 2022). The growth of this industry is supported by the government's goal through the Ministry of Public Works and People's Housing (PUPR) to develop the nursery infrastructure to improve its connectivity.

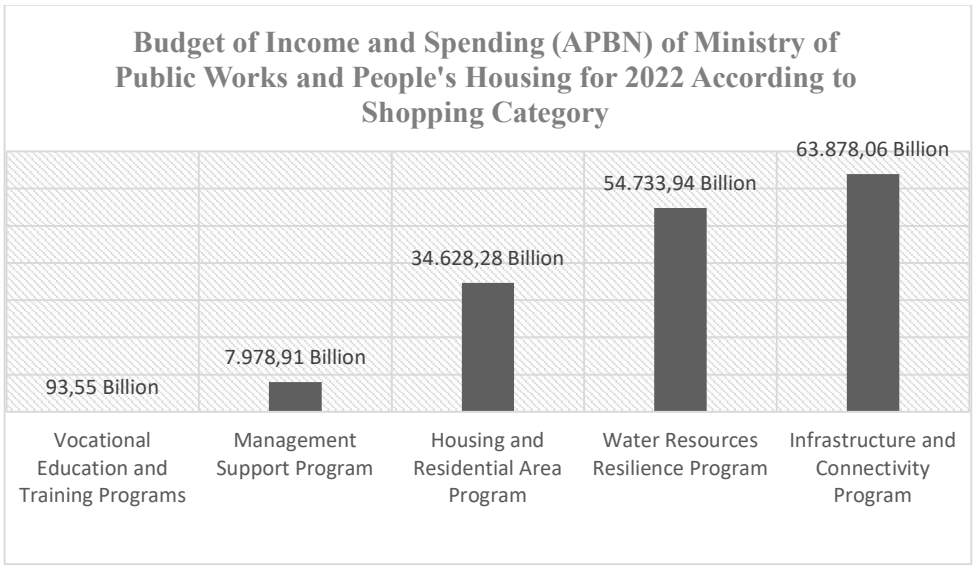

Figure 1.1 Budget of Income and Spending (APBN) of Ministry of Public Works and People's Housing for 2022 According to Shopping Category (Source: Ministry of Public Works and People's Housing Budget Report, 2021)

Based on the Ministry of PUPR Infrastructure Statistics Information for 2022, the PUPR Ministry's APBN for the 2021 Budget Year is allocated to five types of programs. Figure 1.1 shows the largest allocated budget for connectivity infrastructure programs of Rp 63,878,06 billion or 39.60% and the second highest allocation for water resource resilience programs is Rp 54,733,94 billion or 33.93%.

The increased mobility of the population is aligned with the growth and development of residential and industrial areas in urban areas. By 2022, the total population of Indonesia had reached 275,773 million, an increase of 1.13% from the previous year (Figure 1.2).

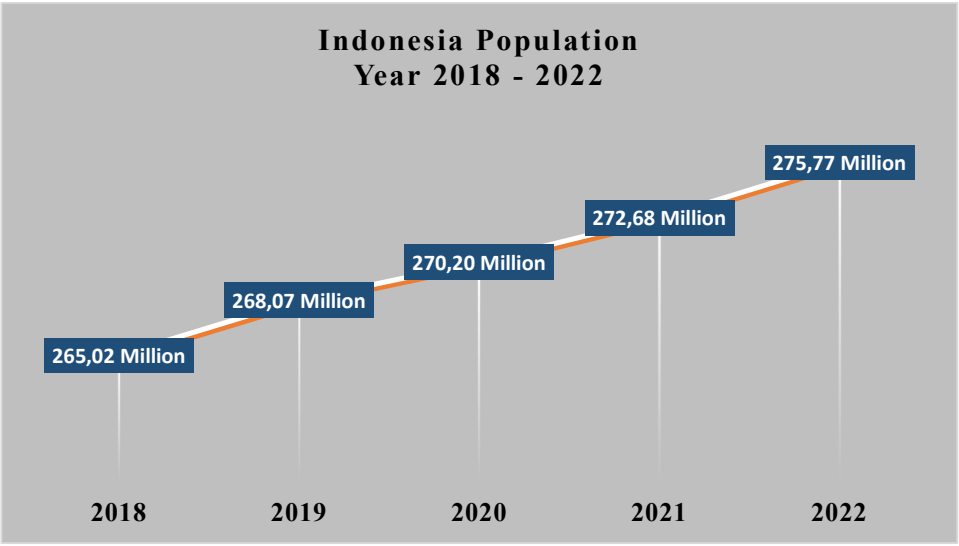

Figure 1.2 Indonesia Population 2018 – 2022 (Source : Badan Pusat Statistik Indonesia, 2022)

With increasing population growth, it requires means of transportation. It requires an effective and efficient planned urban road network management program, consistent with the level of traffic density in a road network. The road network development program across the territory of Indonesia, whether it is maintenance, improvement, or development, requires a measurable planning and in accordance with the technical standards of planning. It is hoped that with the above reference can be carried out proper construction quality and in time, as well as can provide a sense of safety and comfort for road users.

Figure 1.3 shows that the Jabodetabek (Jakarta, Bogor, Depok, Tangerang, and Bekasi) has four major Ring Road networks, including RING-1 (six DKI Tol Street), RING-2 (JIUT), Ring-3 (JORR1), and RING-4 (JORR2). All the rings pass through the existing North Port Tol, which is now known as Harbour Road I. On the harbour road I toll road, the increase in the volume of vehicles is considerable. Moreover, the harbour road I serves the majority of logistical transportation, and

becomes a very important toll road in Indonesia. With these conditions, to anticipate the increased volume and importance of the port line to support economic growth, therefore, it is necessary to increase the service capacity on Harbour roads I tolls with the construction of Harbour Road II tolls.

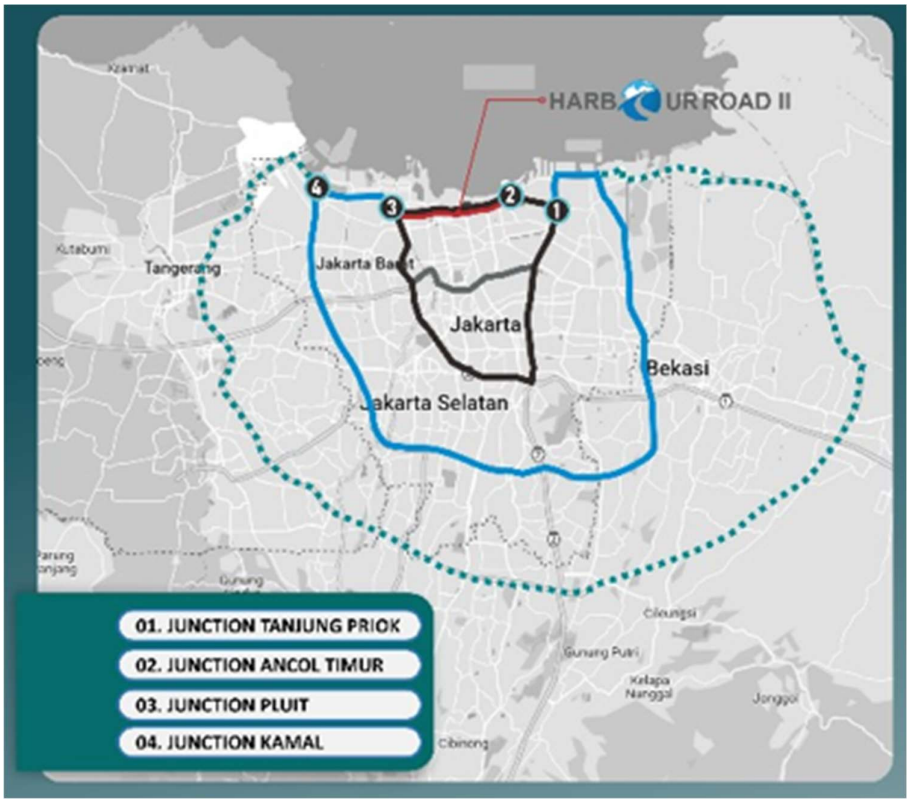

Figure 1.3 Harbor Road II Toll Plan (Source: Ministry of Public Works and People's Housing Budget Report, 2021)

Figure 1.3 also shows the Ministry of PUPR's long-term plan for the construction of toll roads in Jakarta. Tol Harbour Road II is a connection access from Tol In City Road, which is a supporting access to the area of Tanjung Priok, which is also part of the Jakarta Outer Ring Road (JORR) toll network.

Project Name : Construction of East Ancol Tol Road – Pluit (Elevated)

Project Location : Ancol – Pluit, North Jakarta

Project Owner : PT Citra Margha Nusaphala Persada, Tbk.

Contractor	: PT Wijaya Karya (Persero), Tbk.
Contract Value	: Rp 5.022.599.598.182,00
Contract Type	: Design and Build
Project Duration	: 1,825 calendar days

1.2 Background of Launcher Gantry (LG)

The Launcher Gantry (LG) was developed and used to place concrete bridge segments pre-painted after pulling forming bridges and bridge. They are specially designed for use in construction environments that limit to overcome limited land access. LG is designed to consist of lifting devices with mechanical, electrical and/or hydraulic components, and supporting structures. Due to its sophisticated nature, it is necessary to develop detailed procedures, and to limit its strict implementation by experienced operators and workers to ensure the safety of personnel working in or near machines and communities. The guidelines provide a secure operating system framework for LG's use and operation for bridge construction as a reference to all stakeholders including project clients, planners/producers, engineering consultants, residence location staff, security staff, contractors, subcontractors, supervisory and operational staff.

1.3 Launching Girder

Launching Girder is also called Launcher Gantry. Launch girders are generally design and build machines used in precast post-tensioned bridge construction. Consisting of lifting equipment and supporting structures for lifting precast beams and precast bridge segments in a position to assemble. A launch girder typically consists of a main frame girder (“beam”) and a lifting device that can move horizontally across the frame while holding/lifting precast beams, bridge sections and/or work platforms for assembly.

Lifting Frames Lifting frames are generally designed and manufactured machines that are used in segmental bridge construction. It consists of a lifting device and a metal structure to lift the bridge segments into position for assembly.

Some LG are mobile machines moving forward or backward on a connected bridge deck, and are anchored to the bridge deck when they reach their working position.

The lifting frame usually consists of two main cantilever beams attached to the main structure and a lifting device that can move horizontally along the cantilever beams while holding/lifting the bridge segments for assembly. Suspension bridge segments can be moved horizontally or vertically by machines during assembly.

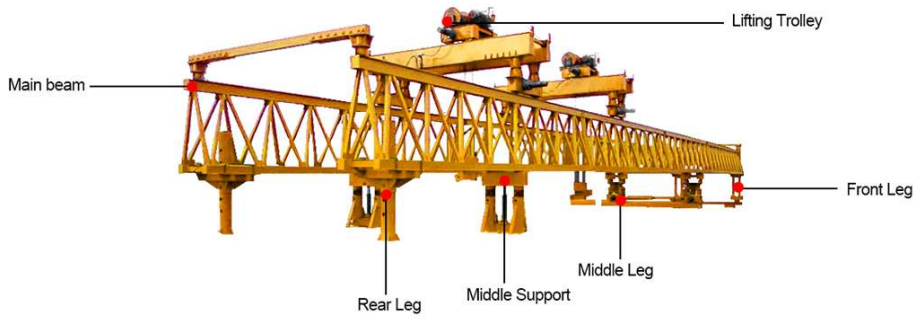

Figure 1.4 Launcher Gantry Parts (Source: Comtec's Manual Book)

1.4 Research Problem

Construction of bridge road structures in urban areas, especially in DKI Jakarta Province, has its own challenges. Limited land area or space, underground and overhead utilities, availability of tools, limited investment value of work owners are some of the challenges in implementing construction. The Ancol Timur-Pluit (Elevated) Toll Road Construction Project or better known as the Harbor Road II Project is in the North Jakarta area which is geographically close to the sea and is a logistics center on the island of Java.

With these challenges, Harbor Road II was designed with an elevated concept using the work area around the Existing Toll Road owned by the Employer (CMNP), namely Harbor Road I. To minimize utility interruptions, the bridge span was made as long as possible. Harbor Road II has an end to end structure plan of 9.7 km with a total elevation of up to 22 km. The typical bridge structure uses a

Segment Box Girder (SBG) span type with a span of 47 m. With a toll road concept with 3x2 lanes, a box girder width of 14.3 m is required, making it the widest non-ribbed box girder construction in Indonesia currently.

Table 1.1 List of Launcher Gantry Ownership in Indonesia

No.	Ownership	Capacity	Brand	Number of Units	Max. Span
1.	WITON	830 Ton	Tolian	1	50 m
2.	WITON	650 Ton	Liando	5	40 m
3.	GI	850 Ton	Liando	1	50 m
4.	GI	850 Ton	Tolian	1	50 m
5.	WIKON	1,000 Ton	Comtec	1	50 m
6.	WIKON	800 Ton	Comtec	1	50 m
7.	WIKON	650 Ton	Comtec	3	43 m
8.	PP	860 Ton	Comtec	2	50 m
9.	PANCANG SAKTI	860 Ton	Comtec	1	50 m
10.	JAKON-ADHI KSO	860 Ton	Comtec	7	50 m

Source: Wika Supply Chain Management, 2023

The erection concept for the box girder structure uses a span by span system with Launcher Gantry heavy equipment. However, the main challenge is that the total load of one span reaches 1,000 tons, where the equipment currently available in Indonesia is only one tool (according to table 1.1), whereas in the planning for the construction of Harbor Road II, which must be completed in 36 months, it requires a total of two Launcher Gantry. Regarding this challenge, by looking at the Launcher Gantry ecosystem in Indonesia which is dominated by a LG capacity of 860 tons, a decision is needed to purchase a Launcher Gantry with a capacity of 1,000 tons imported from abroad which is needed immediately for the Erection Box Girder.

1.5 Research Question

Based on the information and problem statement above, this study would like to answer these questions

1. What is the most suitable operational strategy should be implemented by Wika management to acquire the 1,000 Ton Launcher Gantry on the Harbor Road 2 Toll Road Project of Wika?

2. How is the feasibility of investing in the 1,000 Ton Launcher Gantry on the Harbor Road 2 Toll Road Project of Wika?
3. How does the 1,000 Ton Launcher Gantry investment help Wika in supporting the aspects of the Sustainable Development Goals?

1.6 Research Objective

Based on the Problem Formulation explained in 1.5, the objectives of this study are as follows:

1. To analyze and evaluate the most suitable operational strategy should be implemented by Wika management to acquire the 1,000 Ton Launcher Gantry on the Harbor Road 2 Toll Road Project of Wika.
2. To understand the feasibility of investing in the 1,000 Ton Launcher Gantry on the Harbor Road 2 Toll Road Project of Wika.
3. To find out the 1,000 Ton Launcher Gantry investment help Wika in supporting the aspects of the Sustainable Development Goals?

1.7 Scope and Limitation of The Study

In Indonesia, there is only one Launcher Gantry that has a single span load capacity of up to 1,000 tons and PT Wijaya Karya Rekayasa Konstruksi (WIKON) which is a subsidiary of PT Wijaya Karya (Persero), Tbk is the only company that has a Launcher Gantry with a load capacity of up to 1,000 tons. Therefore, this study will focus on the investment of the 1,000 Ton Launcher Gantry by PT Wijaya Karya (Persero), Tbk. on the Harbor Road 2 Toll Road Project in 2025. It is assume that give the many issues discussed are still open to interpretation and can change at any time according to market conditions or regional regulations.

1.8 Previous Research

Numerous studies, including the Capital Budgeting Technique and the have been carried out in order to ascertain the value of the projects in question.

Table 1.2 List of Previous Study

No	Author & Research Title	Variable	Findings
1.	Hollis, M., Daryanto, W. M., & Zulkifli, M. (2022) Strategic Acquisition of Automated Stacking Machine for Built Core Production: A Case Study Of PT Trafcomp Indonesiaperkasa.	Payback Period, ROI, Weighted Average Cost of Capital, NPV, Profitability Index, and Internal Rate of Return, Monte Carlo	Using SWOT analysis and capital budgeting technique to calculate with the estimated investment of new machine. Positive NPV and Payback Period less than 1 year, SDG goal no. 5 Analysis, sensitivity analysis and NonMonetary Analysis
2.	Merzy, A. M., & Daryanto, W. M. (2018). Financial Feasibility Studies for Perusahaan Gas Negara (PGN) Project: A Case Study of City Gas Project in Indonesia for The Period of 2018-2038.	Payback Period, ROI, NPV, Profitability Index, Discounted Payback Period, IRR, PESTEL	Using Pestel Analysis to help company to considerate the feasibility of the projects. The result of pestel and capital budgeting analysis is acceptable. Payback Period less than 5 yeas ROI more than 10%
3.	Mentari, D., and W. M. Daryanto (2018) Capital budgeting model and sensitivity analysis of the project feasibility in Vietnam for the period of 2019-2037.	NPV, IRR, WACC, Profitability Index, and Payback Period, ROI	ROI of 23%, higher than the expected ROI. A positive NPV with the NPV Index resulted in 144.59 percent and an IRR rate of 22.10%, which was higher than the 9.7 percent discount rate.
4.	Irawati, W., & Daryanto, W. M. (2018).	Payback Period, NPV, Profitability	Payback Period 3.41 years, RoI 33,18%,

	The Application of Capital Budgeting Model for Cost Efficiency in Distribution Pipeline: Case Study in Greenland International Industrial Center (GIIC) Area Block B.	Indeks (PI), Discounted Payback Period, and IRR.	NPV IDR 10,198,232,570, Profitability Indeks 12.74%, Discounted Payback Period 4.40 years, and IRR 16.7%.
5.	Irawati, W., & Daryanto, W. M. (2018). The Application of Capital Budgeting Model for Cost Efficiency in Distribution Pipeline: Case Study in Greenland International Industrial Center (GIIC) Area Block B.	IRR, NPV, Payback Period, ROI, Monte Carlo Analysis, sensitivity analysis and Non-Monetary Analysis	IRR 29.5%, NPV IDR68,210,772,005.06. Payback Period 10 Year, ROI 52%, SDG goal no. 12

Table 1.2 demonstrate that prior research on capital investment analysis has mostly concentrated on quantitative analysis through the use of capital budgeting, in addition to non-monetary and strategic assessments. Research on investments in 1,000 Ton LG construction equipment for construction projects hasn't been done, though. Since 1,000 Ton LG construction equipment is currently unavailable in Indonesia, the author has chosen to investigate PT Wijaya Karya (Persero), Tbk., a construction company, in order to determine whether it would be feasible to acquire it.

1.9 Benefit of The Study

The following is an explanation of this study's advantage:

1. Theoretical Contribution

   Future researchers are encouraged to use this study as a reference when integrating non-monetary, quantitative, and strategic approaches in capital investment decision-making across various industries.

2. Practical Contribution

   PT Wijaya Karya (Persero), Tbk. is required to undergo a comprehensive investigation to assess the feasibility of the 1,000 Ton LG investment.

1.10 Thesis Structure

This thesis is structured into five chapters, each designed to guide the reader through the research process systematically. The content of each chapter is as follows:

Chapter I: Introduction

This chapter presents the foundational aspects of the study, outlining the essential components required for the investigation. It includes the research background, company context, problem statement, research questions, research objectives, scope of the study, contributions to prior research, significance of the study, and an overview of the thesis structure.

Chapter II: Conceptual Framework and Literature Review

This chapter provides a comprehensive review of the theoretical framework and relevant literature, which serves to guide the direction of the research.

Chapter III: Methodology

This chapter details the research methods applied to analyze the problem under study, outlining the approach and techniques used.

Chapter IV: Data Analysis

This chapter presents the analysis of the collected data, including insights from interviews, capital budgeting calculations, sensitivity analysis, and non-monetary evaluation. It also addresses each research question with corresponding answers derived from the data.

Chapter V: Conclusion and Recommendations

The final chapter offers a summary of the conclusions based on the analysis and provides recommendations for the company, as well as suggestions for future

research in this area. This organization ensures a logical flow that supports a clear understanding of the research and its findings.

CHAPTER 2
LITERATURE REVIEW

The literature review chapter sets the stage for this research by establishing its foundational context. It forms the groundwork for explaining and defining the theoretical underpinnings chosen by the author for the research framework, including SWOT analysis, Capital Budgeting Analysis, and Sustainable Development Goals (SDG's).

2.1 SWOT Analysis

2.1.1 Definition of SWOT

SWOT analysis is a widely recognized tool used in strategic planning to assess an organization's internal and external environments. According to Freddy Rangkuti (2002), SWOT is an approach to systematically identifying factors that are crucial in developing an organization's strategic decisions. It provides a method to maximize strengths and opportunities while minimizing weaknesses and threats (Rochman, 2019). SWOT analysis focuses on both the internal environment, which includes the company's strengths and weaknesses, and the external environment, which evaluates the opportunities and threats posed by market conditions.

1. Strengths refer to the internal capabilities and resources that give a business a competitive advantage. These are the aspects of a company that have been effectively managed to enhance its performance, such as skilled personnel, efficient operations, or strong brand recognition.
2. Weaknesses, on the other hand, are internal factors that hinder the organization's ability to achieve its goals. These could include limited resources, poor management practices, or technological deficiencies that result in negative outcomes for the company (Rusmawati, 2017).
3. Opportunities and Threats are external factors that arise from the market environment. Opportunities refer to external conditions that could potentially benefit the organization, such as market trends, emerging

technologies, or changes in consumer preferences. Conversely, threats represent external challenges, like increasing competition or regulatory changes, that could negatively impact the business.

2.1.2 Stages of SWOT Analysis

The process of conducting a SWOT analysis can be broken down into three critical stages:

1. Data Collection: This stage involves gathering information on both internal and external factors that can affect the company's strategy. It is essential to collect accurate and relevant data to ensure that the analysis is grounded in real-world conditions.
2. Analysis: After collecting data, the next step is creating a SWOT matrix. This matrix will categorize the internal and external factors identified in the first stage into strengths, weaknesses, opportunities, and threats.
3. Decision-Making: Based on the SWOT matrix, strategic decisions are made. These decisions aim to align the organization's internal capabilities with external opportunities, while also mitigating risks posed by weaknesses and threats.

2.1.3 SWOT Factors

The process of conducting a SWOT analysis can be broken down into three critical stages:

1. Data Collection: This stage involves gathering information on both internal and external factors that can affect the company's strategy. It is essential to collect accurate and relevant data to ensure that the analysis is grounded in real-world conditions.
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3. Decision-Making: Based on the SWOT matrix, strategic decisions are made. These decisions aim to align the organization's internal

capabilities with external opportunities, while also mitigating risks posed by weaknesses and threats.

As mentioned earlier, SWOT analysis is driven by both internal and external factors:

1. Internal Factors:
    - Strengths: These are the capabilities and resources that a company has mastered and can effectively use to its advantage. Examples might include a highly skilled workforce, proprietary technologies, or a loyal customer base.
    - Weaknesses: These are areas where the organization is lacking or underperforming. They could include ineffective processes, limited resources, or any aspect of the business that is not functioning optimally.
2. External Factors:
    - Opportunities: These are external elements or trends that can be leveraged to benefit the company. For example, new market demands, technological advancements, or favorable regulatory changes.
    - Threats: These refer to external risks or challenges that could negatively affect the business, such as economic downturns, competitive pressures, or shifts in consumer behavior.

2.1.4 SWOT Matrix

The SWOT analysis is typically organized in a matrix format that helps visualize how internal and external factors relate to each other.

Table 2.1 SWOT Matrix

Analyst Objective	Opportunities	Threats
Strengths	S-O Strategy: Leverage strengths to take advantage of opportunities	S-T Strategy: Utilize strengths to counteract or minimize threats
Weaknesses	W-O Strategy: Address weaknesses by taking advantage of opportunities	W-T Strategy: Mitigate weaknesses while defending against threats

Source: Pangabean, (2019)

2.2 Strategy

The following are the strategies used in SWOT analysis (Julianda & Jamiat, 2020).

1. S-O Strategy

   This strategy is made by utilizing all strengths to seize and take advantage of the maximum opportunities. This strategy uses internal strengths to take advantage of external opportunities.

2. S-T strategy

   This strategy uses the strengths of the company to overcome threats. This strategy uses the company's internal strengths to avoid or reduce the impact of threats.

3. W-O Strategy

   The W-O strategy is implemented based on the utilization of existing opportunities by minimizing existing weaknesses. This strategy aims to improve internal weaknesses by utilizing external opportunities.

4. W-T Strategy

   This strategy is based on defensive activities and seeks to minimize weaknesses and avoid threats. This strategy aims to reduce internal weaknesses by avoiding external threats.

Figure 2.1 S.W.O.T Analysis (Source: Widowati et al., 2020)

Description:

1. Quadrant I

   This is a very favorable situation. The company has opportunities and strengths so that it can take advantage of existing opportunities. The strategy that must be applied in this condition is to support an aggressive growth policy (growth oriented strategy).

2. Quadrant II

   Despite facing various threats, the company still has internal strengths. The strategy that should be applied is to use strengths to take advantage of long-term opportunities by means of a diversification strategy (products or services).

3. Quadrant III

   The company faces a huge market opportunity, but on the other hand, it faces some internal constraints or weaknesses. This business condition is similar to the Question Mark in the BCG matrix. The focus of this company's strategy is to minimize its internal problems so that it can seize better market opportunities.

4. Quadrant IV

   This is a very unfavorable situation, the company faces various internal threats and weaknesses

2.3 Capital Budgeting

Capital budgeting is a comprehensive process ranging from collecting, evaluating, selecting, to determining alternative capital investments that will provide income for the company for a period of more than a year (capital

expenditure). There are eight methods used to assess the feasibility of a project to be budgeted. The eight methods are Payback Period, Discount Payback Period, Accounting Rate of Return, Net Present Value, Internal Rate of Return, Modified Internal Rate of Return, Profitability Index, and Perpetuity Rate of Return (Surya, 2020). The research uses six methods, namely Payback Period, Discount Payback Period, Net Present Value, Internal Rate of Return, Profitability Index, Return on Investment. The following is the capital budgeting method:

2.3.1 Weighted Average Cost of Capital (WACC)

The Weighted Average Cost of Capital (WACC) is a fundamental financial metric that represents the average rate of return required by investors to finance a company's investments. It incorporates both cost of debt and cost of equity, weighted according to their proportion in the company's capital structure. WACC is critical in corporate finance as it serves as the discount rate for evaluating investment opportunities using Net Present Value (NPV) and other capital budgeting methods (Brigham & Ehrhardt, 2022).

The formula for WACC is as follows:

$$\text{WACC} = \left(\frac{E}{V} \times Re\right) + \left(\frac{D}{V} \times Rd \times (1 - Tc)\right)$$

Where:

E = Market value of equity

D = Market value of debt

V = Total market value of equity and debt (E + D)

Re = Cost of equity

Rd = Cost of debt

Tc = Corporate tax rate

WACC can be adjusted for project-specific risks using the Capital Asset Pricing Model (CAPM):

$$Re = Rf + \beta \times (Rm - Rf)$$

where:

Re = Risk-free rate (e.g., government bond yield)

B = Beta coefficient (measures systematic risk)

Rm = Expected market return

Rf = Market risk premium

For high-risk projects, WACC adjustments include:

1. Project-Specific Beta – Higher beta for riskier projects (Damodaran, 2020).
2. Risk-Adjusted Discount Rate (RADR) – Higher discount rates for added risk (Brigham & Ehrhardt, 2021).
3. Country Risk Premium (CRP) – Adjustments for political and economic risks (Fernandez, 2019).

Adjusting for these risks helps ensure that high-risk investments yield justified returns.

2.3.2 Payback Period

An investment is measured to determine how quickly the company needs to recover the initial capital spent. The method to measure this is called the payback period method. The result is a unit of time such as months and years. If the payback period is shorter than required, the project can be said to be profitable for the company. And vice versa. The shorter the payback period, the more attractive the investment(Surya, 2020).

Eligibility Criteria: 1) The project can be carried out if the investment capital recovery period is shorter than the economic life, 2) The project is rejected if the

investment capital recovery period is longer than the economic life.The following is the payback period formula:

$$Payback\ Period = \frac{Original\ Investment}{Annual\ Net\ Cash\ Flow} \times 1\ year$$

2.3.3 Discounted Payback Period

The Discounted Payback Period method takes into account the amount of time required for the discounted cash flows of an investment project to equal the initial cash flows of the investment. This calculation method compensates for the shortcomings of the payback period method, which ignores the concept of the time value of money, as discussed earlier. Under the discounted repayment rule, a project can be approved if the discounted payback period of the investment project is less than a predetermined number of years (Afdhila & Rizkianto, 2023).

The decision-making criteria whether the project to be carried out is feasible or not feasible for this method (Eka Wardani Haliasih et al., 2021) are: Project investment will be considered feasible if the Discounted Payback Period has a shorter period of time than the project life. Project investment has not been considered feasible if the Discounted Payback Period has a period of time longer than the project life.

2.3.4 Return on Investment

Return on investment describes the amount of return that can be generated in a certain amount of investment. Investment is the total debt and equity for the project. It also represents the profitability of the project. The criteria are the same as ROE, the value must be greater than zero (Sumawinata et al., 2022). The following is the ROI formula:

$$ROI = \frac{Net\ Income}{Debt + Equity}$$

2.3.5 Net Present Value

Net Present Value (NPV) is the difference between expenses and income that has been discounted by using the social opportunity cost of capital as a discount factor, or in other words, it is an estimated cash flow in the future that is discounted at this time. NPV calculations require data on estimated investment costs, operating costs, and maintenance as well as estimates of the benefits of the planned project. So the NPV calculation relies on discounted cash flow techniques (Hm & Setiawan, 2023).

The advantage of NPV is that it uses the concept of time value of money. So before calculating / determining NPV, the most important thing is to know or estimate future cash inflows and cash outflows (Hm & Setiawan, 2023). The following is the NPV formula :

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

Where:

NPV = Net Present Value: The difference between the present value of cash inflows and the present value of cash outflows.

CFt = Cash Flow at time t: The cash flow received in each period (t).

r = Discount rate: The required rate of return (or cost of capital) used to discount the future cash flows.

t = Time period: The period in which the cash flow is received (for example, t=1 for the first year, t=2 for the second year, etc.).

n = Total number of periods: The total number of periods for which cash flows are considered.

CF0 = Initial investment: The initial cash outflow at the start of the project (typically at t=0).

2.3.6 Profitability Index (NPV Index)

Profitability Index is also often referred to as Benefit Cost Ratio (B/C Ratio). This approach is similar to the NPV method. In the NPV method, it is used to calculate how much excess the present value of cash inflow is compared to the initial investment value, while the profitability index measures the present value for each amount of money invested. As long as the result of the Profitability index calculation is ≥1, the proposed investment is acceptable, but if otherwise, the proposed project must be rejected.(Anggraini & Surindra, 2022). Here is the PI formula:

$$Profitability\ Index = \frac{Net\ Present\ Value}{Initial\ Investment} \times 100\%$$

2.3.7 Internal Rate of Return

IRR is an indicator of the efficiency level of an investment. A project/investment can be made if the rate of return is greater than the rate of return when investing elsewhere (bank deposit interest, mutual funds and others). IRR is used in determining whether an investment is carried out or not, for which a reference is usually used that the investment made must be higher than the Minimum acceptable rate of return or Minimum attractive rate of return (MARR). MARR is the minimum rate of return on an investment that an investor dares to make (Nuraidi, 2021). The following are the formulas or rules in IRR:

Internal Rate of Return	=	*Discount rate that makes NPV=0; implies discounted cash inflowsequal discounted cash outflows*
Internal Rate of Return Rule	=	*Accept investment if IRR is greater than Threshold Rate of Return, else reject* *Discount rate that makes NPV=0; implies discounted cash inflowsequal discounted cash outflows*

2.4 Sustainable Development Goals (SDG's)

Sustainable development goals, a document that will be a reference in the development framework and negotiations of countries in the world. Post-2015, also known as the Sustainabale Development Goals (SDGs) is defined as a framework for the next 15 years until 2030.

According to the United Nations, the Sustainable Development Goals (SDGs) are a global collective plan to end extreme poverty, reduce inequality and protect the planet by 2030. The SDGs are an integral part of the 2030 Agenda for Sustainable Development, which aims to promote a more sustainable future (Prabu Aji & Kartono, 2022) The agenda is intended to tackle global problems, such as poverty, inequality, climate, environmental degradation and justice (Prabu Aji & Kartono, 2022) It is built on the assumption that:

A. Economic prosperity, social progress and environmental protection go hand in hand and must be brought together. As such, all SDGs are interconnected and should be pursued together.
B. Collective efforts involving different actors (governments, companies and civil society) are needed to transform our global society. The SDGs are seen as a means to unify the efforts of these different actors around a common aspiration.

The 17th SDG is particularly important in this regard: The SDGs explicitly emphasize the need for new multi-stakeholder and cross-sectoral partnerships. Without these, the ambition to solve the world's grand challenges will not be possible.

Figure 2.2 Sustainable Development Goals SDG's (Source: The Sustainable Development Goals Report, 2021)

Based on the figure 2.2, the following are the SDGs Goals (Tan, 2021) among others:

1. Without Poverty, there is no poverty of any kind in any part of the world.
2. No Hunger, no more hunger, achieving food security, improved nutrition, and promoting sustainable agricultural cultivation
3. Good Health and Wellbeing Ensure healthy lives and promote wellbeing for all people at all ages.
4. Quality Education, Ensure equitable distribution of quality education and increase learning opportunities for all.
5. Gender Equality, achieving gender equality and empowering mothers and women.
6. Clean Water and Sanitation, ensuring the availability of clean water and sustainable sanitation for all.
7. Clean and Affordable Energy, ensuring access to affordable, reliable, sustainable and modern energy sources for everyone.
8. Economic Growth and Decent Work, supporting sustainable economic development, productive employment and decent work for all.

9. Industry, Innovation and Infrastructure, building quality infrastructure, encouraging sustainable industrial upgrading and promoting innovation.
10. Reducing Inequality, reducing inequalities both within a country and between countries in the world.
11. Sustainability of Cities and Communities, building quality, safe and sustainable cities and neighborhoods.
12. Responsible Consumption and Production, ensuring the sustainability of consumption and production patterns.
13. Action on Climate, acting fast to combat climate change and its impacts.
14. Underwater life, preserving and maintaining the sustainability of the ocean and living marine resources for sustainable development.
15. Life on Land, protecting, restoring and enhancing the sustainable use of terrestrial ecosystems, managing forests sustainably, reducing barren land and land swaps.
16. Strong Justice Institutions and Peace, enhancing peace including communities for sustainable development, providing access to justice for all including institutions and being accountable to all.
17. Partnerships for the Goals, Strengthening implementation and reinvigorating the global partnership for sustainable development.

CHAPTER 3
METHODOLOGY

3.1 Introduction

The methodology is utilized to answer the research topic, and the research will elaborate on its objectives. The research method is a scientific approach used to collect data for a certain purpose and usefulness based on the researcher's integrity. According to Polit and Beck (2004), methodology relates to methods of collecting, organizing, and analyzing data. Creswell (2009) defines methodology as a cohesive set of approaches that complement one another and have the ability to generate data and findings that represent the research question and serve the researcher's aim. This chapter defines the methodologies and steps used to achieve the research objective. This comprises aspects such as the study plan, research instruments, data collection information, and data quality This study used dependability and analytical methods.

The research methodology applied in this chapter is based on a mixed-method approach, incorporating both qualitative and quantitative analyses (Creswell & Clark, 2017). The qualitative aspect involves the Appreciative Inquiry framework, which facilitates the collection of expert insights through structured interviews (Cooperrider & Srivastva, 1987). Meanwhile, the quantitative dimension is grounded in capital budgeting techniques, following the principles of financial analysis and investment evaluation (Ross, Westerfield, & Jaffe, 2019). The integration of these methodologies ensures a comprehensive assessment, allowing for a holistic view of the investment decision. Additionally, the descriptive analysis method (Miles, Huberman, & Saldaña, 2014) is employed to systematically interpret the collected data, providing a structured and evidence-based conclusion.

3.2 Research Design

According to Sekaran and Bougie (2017), research design is a strategy for gathering, analyzing, and interpreting data based on the research goal. The research process for writing this thesis consists of the following steps:

1. Stage 1 : Analyze and evaluate the most suitable operational strategy by the interview with Project Leader of the Company.
2. Stage 2 : Measure and evaluate the feasibility
3. Stage 3 : Non-Monetary Analysis.

3.2.1 Stage 1 – Analyze And Evaluate The Most Suitable Operational Strategy By The Interview With Project Leader of The Company

A strategic analysis entails reviewing the organization's internal and external landscape, evaluating existing strategies, and developing and assessing the most viable strategic alternatives. A strong grasp of the company's identity and values is critical for developing effective business strategies. To develop a strong strategy, a company must have a thorough understanding of its identity and the values that it represents. From the start, a corporation should do an environmental review of its present strategies.

The internal environment's issues to be evaluated include operational inefficiencies, personnel morale, and financial constraints. In contrast, the external environment includes political changes, economic volatility, and shifts in client preferences. The primary goal of strategic analysis is to assess the effectiveness of the current strategy in light of the current business environment.

The effectiveness of the data collection procedure has an impact on the quality of study. The first step of data gathering is designed to acquire insights from managerial viewpoints. An interview was done with the project lead by signing a consent form in order to gain a better understanding of decision-maker’s aims and analyses.

Furthermore, quantitative data gathering methods will be performed, which include project cost, existing capacity, assumptions, and other technical data.

3.2.2 Stage 2: Measure and Evaluate the Feasibility

In this study, the author used data and information from PT. Wijaya Karya (Persero), Tbk to calculate Weighted Average Cost of Capital (WACC), Payback Period, Return on Investment (ROI), Net Present Value (NPV), Profitability Indeks or NPV Index, Discounted Payback Period, and Internal Rate of Return (IRR).

3.2.3 Stage 3: Non-Monetary Analysis

This study includes non-monetary analysis for management to evaluate whether to continue or discontinue the project, examining from the standpoint of the Sustainable Development Goals. Figure 3.1 depicts the flow of methods for conducting research in order to answer research questions and objectives.

Figure 3.1 Research Methodology (Source : Authors, 2025)

1. Interview with project lead of PT. Wijaya Karya (Persero) Tbk
   - Background & analysis of PT. Wijaya Karya (Persero), Tbk. (SWOT)
   - Project assumptions scenario and variables
2. Capital budgeting analysis
   - WACC
   - Payback Period
   - ROI
   - NPV
   - PI or NPV Index
   - IRR
3. Non-monetary analysis by using SDGs

   Defined from 17 SDGs.
4. Final project assesment

   PT. Wijaya Karya (Persero), Tbk Final Decision.

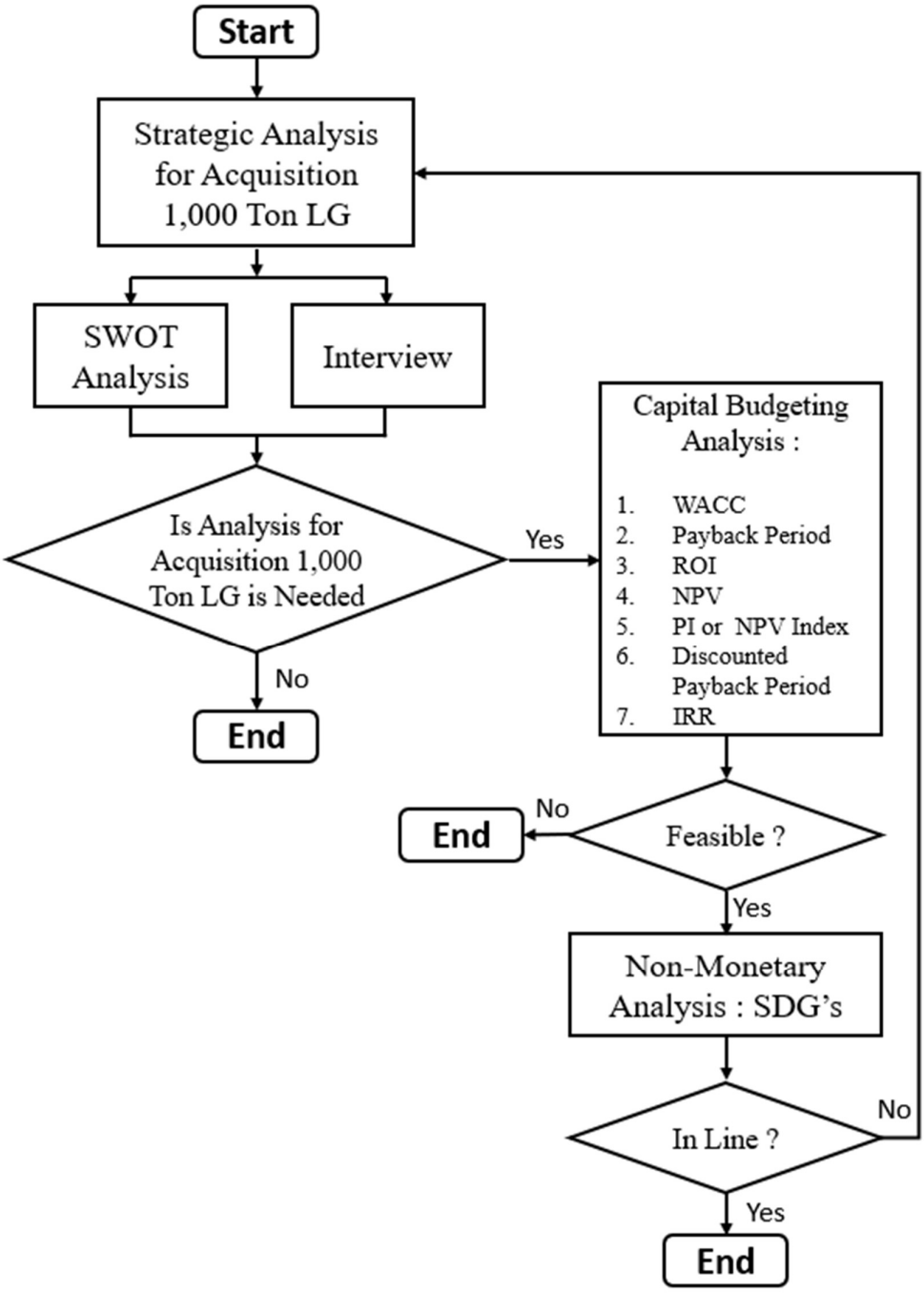

Figure 3.2 Flowchart Workflow for Feasibilty Study (Source : Researcher, 2025)

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.

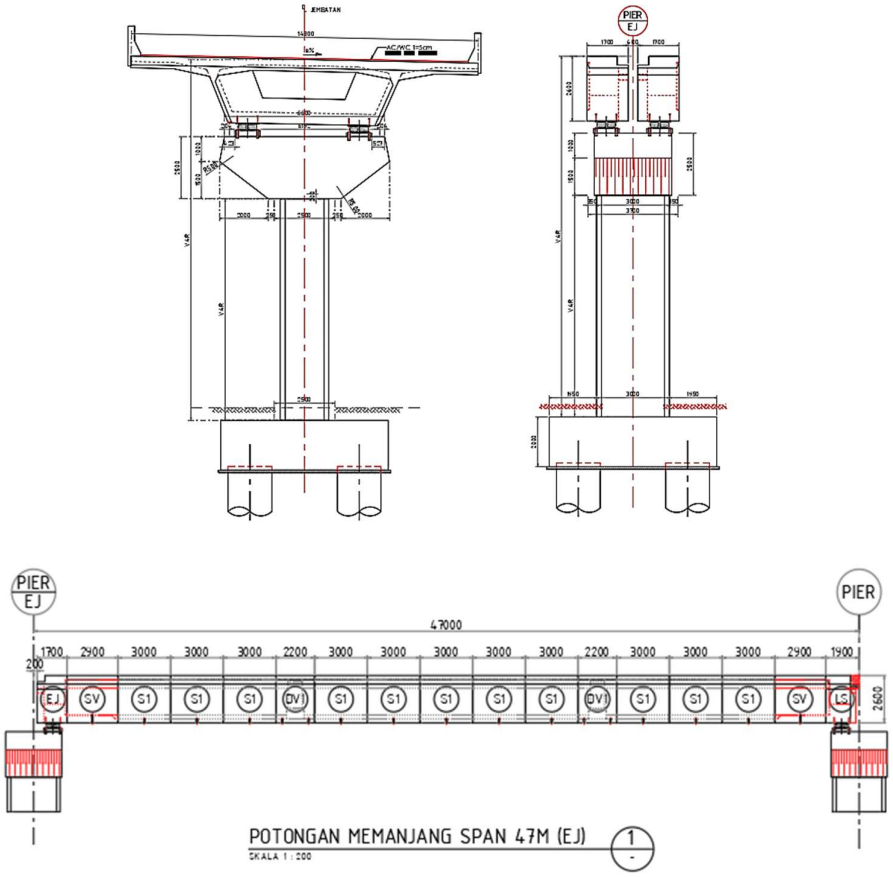

Figure 4.1 Bridge Structure Design Harbour Road 2 Tol Road Project

(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 Gantries 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
Strengths	- **Improved Construction Efficiency:** 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. - **Enhanced Safety:** The gantry is designed for safe handling of heavy loads, reducing risks of accidents and injuries at the construction site. - **Durability:** Built to withstand large-scale infrastructure projects, offering long-term value and reusability for future projects. - **High Construction Quality:** Ensures precise installation of Precast Box Girders, contributing to structural integrity and high-quality construction.

Weaknesses	- **High Initial Cost:** The acquisition of the 1000 Ton Launcher Gantry involves a substantial investment, which could strain the company's finances in the short term. - **Repair**, **Maintenance and Operational Costs:** While durable, the equipment requires regular maintenance, adding significant ongoing operational costs. - **Limited Utilization for Other Projects:** 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.
Opportunities	- **Competitive Advantage:** The advanced technology of the Launcher Gantry provides PT Wijaya Karya with a competitive edge when bidding for large-scale infrastructure projects. - **Long-term Savings:** Enhanced construction speed and reduced labor costs can offset the initial investment, leading to better budget management and profitability in future projects. - **Reputation Enhancement:** 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. - **National Infrastructure Development Needs:** 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 *Launcher Gantry*, PT Wijaya Karya positions itself as a

	key player capable of contributing to national infrastructure projects, aligning with Indonesia's long-term development goals.
Threats	- **Economic Instability:** Economic fluctuations, inflation, or rising material costs could affect project profitability, making the initial investment in the Launcher Gantry more challenging. - **Operational Risks:** Dependence on the performance of the Launcher Gantry presents a risk. Breakdowns or operational failures could cause delays and unanticipated costs. - **Regulatory Changes:** 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.

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	22%
7.	Interest Rate before Tax	12%
8.	Expected Commercial Operation Date	Q2 2025
9.	Long-Term Debt	100%
10.	Equity	0%
11.	WACC	9.36%

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 *(1)							
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 *(2)							
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 Amortixation (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 ***(3)**	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 (22%)	IDR		4.123.680.000	4.123.680.000	4.123.680.000	4.123.680.000	4.123.680.000
Earning After Taxes (EAT)	IDR		3.369.340.500	3.940.192.500	4.511.044.500	5.081.896.500	5.652.748.500

Category	Unit	Year				
		2030	2031	2032	2033	2034
Revenue *(1)						
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 *(2)						
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 Amortixation (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 ***(3)**	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	2.592.619.500	2.021.767.500	1.450.915.500	880.063.500	309.211.500
Earning Before Taxes (EBT)	**IDR**	**10.347.280.500**	**10.918.132.500**	**11.488.984.500**	**12.059.836.500**	**12.630.688.500**
Tax (22%)	IDR	4.123.680.000	4.123.680.000	4.123.680.000	4.123.680.000	4.123.680.000
Earning After Taxes (EAT)	IDR	6.223.600.500	6.794.452.500	7.365.304.500	7.936.156.500	8.507.008.500

Source : Authors, 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		3.369.340.500	3.940.192.500	4.511.044.500	5.081.896.500	5.652.748.500
Depreciation and Amortization			4.757.100.000	4.757.100.000	4.757.100.000	4.757.100.000	4.757.100.000
Net Cash Inflows from operating Activity	IDR		8.126.440.500	8.697.292.500	9.268.144.500	9.838.996.500	10.409.848.500
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	-	-	-	-	-
Net Cash Flow	IDR	- 47.571.000.000	10.869.628.784	12.011.332.784	13.153.036.784	14.294.740.784	15.436.444.784
Balance	IDR		- 36.701.371.216	- 24.690.038.432	- 11.537.001.649	2.757.739.135	18.194.183.919

Category	Unit	Year				
		2030	2031	2032	2033	2034
Earning After Taxes (EAT)	IDR	6.223.600.500	6.794.452.500	7.365.304.500	7.936.156.500	8.507.008.500
Depreciation and Amortization		4.757.100.000	4.757.100.000	4.757.100.000	4.757.100.000	4.757.100.000
Net Cash Inflows from operating Activity	IDR	10.980.700.500	11.551.552.500	12.122.404.500	12.693.256.500	13.264.108.500
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	-	-	-	-	-
Net Cash Flow	IDR	16.578.148.784	17.719.852.784	18.861.556.784	20.003.260.784	21.144.964.784
Balance	IDR	34.772.332.703	52.492.185.486	71.353.742.270	91.357.003.054	112.501.967.838

Source : Authors, 2025

4.3.1 Weighted Average Cost of Capital (WACC)

This investment has a Weighted Average Cost of Capital (WACC) of 9.36%. 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 22% 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 3.8 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 3.8 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 60.17%, 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 60.17%.. 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 9.36%. 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	7,08%	8,79%	10,87%	13,51%	17,04%	22,11%

Year	7	8	9	10	Average
ROI	30,13%	44,96%	82,31%	364,85%	**60,17%**

Source : Authors, 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 48,296,890,164 (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 1.02. 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 1.02 indicates that the project is anticipated to generate IDR 1.02 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 1.02 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 4.7 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 4.7 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 4.7 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 26.59%. 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 26.59% is significantly higher than the company's Weighted Average Cost of Capital (WACC) of 9.36%. 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	9.36%	
2.	Payback Period (Year)	3.8	Feasible
3.	Return of Investment (Average)	60.17%	Feasible
4.	NPV (IDR)	48,296,890,164	Feasible
5.	NPV Index / Profitability Index	1.02	Feasible
6.	Discounted Payback Period (Year)	4.7	Feasible
7.	IRR (%)	26.59%	Feasible

Source : Researcher, 2024

4.4 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.

CHAPTER 5
CONCLUTIONS AND RECOMMENDATION

5.1 Conclusion

Based on the comprehensive analysis conducted in this research, the investment decision regarding the 1000 Ton Launcher Gantry for the Harbour Road 2 Toll Road Project presents substantial strategic, financially feasible, and sustainability benefits for PT Wijaya Karya (WIKA). The findings derived from SWOT analysis, capital budgeting evaluation, and alignment with Sustainable Development Goals (SDGs) provide a well-rounded justification for the feasibility and long-term advantages of this investment. The conclusions are as follows:

5.1.1 SWOT Analysis

According to the SWOT analysis, the acquisition of the 1,000 Ton Launcher Gantry will substantially improve WIKA's competitive positioning and operational efficiency in the infrastructure sector. Enhanced safety measures, long-term durability, and improved construction efficiency are among the primary advantages of this investment, which enables WIKA to execute large-scale projects more efficiently. Higher productivity, reduced construction delays, and improved quality control in precast box girder installation will result from the automation and precision provided by this advanced machinery.

WIKA is positioned to broaden its market share and secure additional government and private sector infrastructure projects by investing in high-capacity equipment. WIKA's reputation is enhanced and its prospect of winning future tenders for elevated toll roads and other large-scale infrastructure developments is increased by its capacity to deliver construction projects more quickly and safely.

The investment, however, is not without its drawbacks, including the necessity of specialized training for operators to ensure the optimal utilization of the equipment and the high initial costs. In addition, the anticipated return on investment may be affected by regulatory changes, fluctuations in market

conditions, and uncertainties regarding the continuity of the project pipeline itself. Nevertheless, the SWOT analysis overall strongly suggests that the advantages of this investment significantly outweigh the challenges, thereby establishing it as a strategic move that is consistent with WIKA's long-term growth objectives.

5.1.2 Capital Budgeting Analysis

The proposed investment's feasibility and profitability are confirmed by the capital budgeting analysis, which provides substantial financial justification. The minimum required return for the project to be financially sustainable has been determined to be 9.36%, which is the Weighted Average Cost of Capital (WACC). The after-tax cost of debt is in alignment with the WACC, which guarantees that financing expenses are efficiently accounted for, as the investment is entirely financed. The initial capital outlay is recovered relatively quickly, as evidenced by the Payback Period assessment, which is 3.8 years. This rapid payback increases financial liquidity and decreases the duration of investment risk exposure. In addition, the Return on Investment (ROI) is recorded at 60.17%, which indicates that the project is anticipated to generate a substantial return in relation to its capital expenditure. This metric emphasizes the investment's substantial profitability potential. The project's economic viability and value generation for the company are further reinforced by the Net Present Value (NPV) calculation, which is IDR 48,296,809,164. This value indicates that the project is anticipated to generate a positive cash flow. Furthermore, the Profitability Index (PI) is determined to be 1.02, indicating that the project is expected to generate IDR 1.02 in returns for every IDR 1 invested. This serves to bolster the effectiveness of financial resource allocation. Additionally, the Internal Rate of Return (IRR) is estimated to be 26.59%, which is significantly higher than the WACC of 9.36%. This differential suggests that the project's anticipated returns exceed the company's financing costs, thereby validating its financial attractiveness and competitive advantage over alternative investment opportunities. These capital budgeting indicators, when considered collectively, underscore that the financial risks associated with this investment are relatively low, while the anticipated long-term benefits are substantial and exceed the initial capital necessary.

5.1.3 Sustainable Development Goals (SDGs) Contribution

This investment significantly contributes to the advancement of sustainability initiatives, in addition to providing financial and operational advantages, and is consistent with numerous United Nations Sustainable Development Goals (SDGs). There are numerous significant SDGs that the 1000 Ton Launcher Gantry contributes to, such as:

1. SDG 8 (Decent Work and Economic Growth) – The adoption of sophisticated machinery, such as the 1000 Ton Launcher Gantry, guarantees safer and more efficient working conditions, resulting in increased productivity and job creation in the construction industry. In addition, the infrastructure expansion and economic growth of Indonesia will be facilitated by the enhanced project execution.
2. SDG 9 (Industry, Innovation, and Infrastructure) – The investment directly contributes to the development of infrastructure and industrial innovation by incorporating advanced construction technologies that prioritize efficiency and high-quality project execution.
3. SDG 11 (Sustainable Cities and Communities) – The rapid and efficient construction of elevated toll roads supports urban mobility, reduces traffic congestion, and enhances connectivity, thereby making cities more livable and sustainable. This expenditure is essential for the development of contemporary infrastructure that facilitates sustainable urbanization.
4. SDG 13 (Climate Action) – The 1000 Ton Launcher Gantry promotes environmentally friendly construction practices by employing state-of-the-art technology to reduce waste, material consumption, and emissions. The investment is a valuable contribution to the fight against climate change by reducing the carbon footprint associated with conventional construction methods.

The investment's potential to generate long-term positive social and environmental impacts is underscored by its alignment with these SDGs, which suggest that it is not solely motivated by financial returns. WIKA's investment in state-of-the-art equipment indicates its dedication to responsible business practices

that are consistent with international sustainability objectives, as sustainability becomes an increasingly significant factor in the development of global infrastructure.

5.2 Contribution of The Study

5.2.1 Theoretical Implication

The results of this study provide a number of theoretical implications that contribute to the current body of knowledge on strategic management, capital budgeting, and investment decision-making in the infrastructure sector. The effectiveness of comprehensive financial analysis tools, including WACC, Payback Period, ROI, NPV, Profitability Index, and IRR, has been demonstrated through their application. These metrics can offer valuable insights into the feasibility of an investment. The theoretical understanding of how companies evaluate long-term investments in capital-intensive infrastructure projects is enhanced by the study's integration of these financial tools into decision-making processes.

In addition, the incorporation of SWOT analysis into the investment evaluation offers a more comprehensive framework for comprehending the operational and strategic implications of such investments. The study emphasizes the significance of ensuring that financial objectives are in accordance with long-term strategic objectives, as it demonstrates that the financial success of an investment is frequently associated with the capacity to capitalize on operational advantages, including safety, efficiency, and sustainability. A more comprehensive approach to strategic decision-making is provided by this dual focus on financial and operational performance, particularly in large-scale infrastructure projects.

5.2.2 Managerial Implication

This study provides valuable insights for decision-makers at PT Wijaya Karya (WIKA) and other similar companies in the infrastructure sector from a managerial perspective. Detailed financial analyses, such as capital budgeting and SWOT analysis, are crucial for evaluating the potential return on investment (ROI) and the project's alignment with the company's long-term strategic objectives, as

emphasized by the findings. Managers can leverage these insights to make well-informed decisions when selecting equipment and technologies that will significantly influence the company's market competitiveness.

The study also emphasizes the operational advantages of investing in advanced machinery, such as the 1000 Ton Launcher Gantry, which include improved construction efficiency, enhanced safety protocols, and equipment durability. These advantages not only benefit the company's long-term sustainability and competitiveness, but also contribute to the success of short-term projects. In addition to contributing to broader social and environmental objectives, managers can position their company for continued growth and leadership in the infrastructure industry by integrating such investments into their strategic planning.

5.2.3 Limitation of Study

Although this study offers valuable insights into the financial and operational feasibility of acquiring the 1000 Ton Launcher Gantry, it is imperative to recognize several limitations in order to preserve a clear scope of interpretation. Initially, the financial, strategic, and operational aspects of the investment are the primary focus of this study, with a particular emphasis on PT Wijaya Karya. The analysis is restricted to critical financial metrics, including the Weighted Average Cost of Capital (WACC), Payback Period, Discounted Payback Period, Return on Investment (ROI), Net Present Value (NPV), Profitability Index or NPV Index, and Internal Rate of Return (IRR). The analysis does not include a comprehensive examination of broader macroeconomic factors, such as inflation rates, global supply chain disruptions, or deviations in government infrastructure spending policies.

Secondly, the study does not provide a comprehensive evaluation of the full impact on labor dynamics and workforce adaptation, despite the fact that it evaluates the efficiency improvements brought by the 1000 Ton Launcher Gantry in comparison to conventional methods. Automation may necessitate workforce reskilling and optimization, despite the fact that the construction sector remains labor-intensive. This matter is not the primary focus of the study. The implications

of technological advancements on job creation and employment shifts are acknowledged; however, they have not been thoroughly investigated. Third, the business operations and project environment of PT Wijaya Karya are the context in which this study is conducted. The findings and recommendations may not be directly applicable to other construction firms that operate in distinct regulatory, financial, or project management environments. Additional research would be required to verify the investment feasibility in various industries, business models, or geographical regions.

In order to evaluate the broader project impacts, non-monetary evaluations related to the Sustainable Development Goals (SDGs) are incorporated as supplementary factors. Nevertheless, this investigation does not conduct a comprehensive sustainability assessment that encompasses environmental compliance, social impact evaluation, or carbon footprint analysis beyond the direct investment implications. The study should be interpreted within the defined scope, and additional research is recommended to address factors outside its primary focus, in light of these limitations.

5.2.4 Recommendation for Future Study

The limitations of this study could be addressed and the scope of analysis could be expanded in future research to further develop the findings. Including a more comprehensive risk analysis that encompasses operational, regulatory, and environmental risks, in addition to financial risks, is one potential direction for future research. Future studies can offer a more sophisticated comprehension of the potential challenges and uncertainties associated with large-scale infrastructure investments by taking into account a broader range of risk factors. In addition, future research could investigate the influence of emerging technologies and innovations on the operational performance and financial viability of infrastructure projects. The financial outlook of such investments could be further enhanced by the adoption of new machinery and techniques, which may provide even greater efficiencies and cost savings as technology continues to advance.

Yet another potential area for future research is the comparative analysis of investment decisions across various infrastructure sectors or geographical regions. By analyzing the performance of comparable investments in a variety of markets, researchers can provide valuable insights into the factors that influence the success of infrastructure projects in numerous contexts.

Finally, further research could concentrate on the social and environmental consequences of these investments, particularly in the context of achieving the Sustainable Development Goals (SDGs). Understanding the broader societal benefits of infrastructure investments will enable companies to more effectively align their strategic decisions with global sustainability objectives.

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APPENDIX 1

List of Questions and Answers

1. Gambaran Umum dan Tujuan Proyek

Q1 : Dapatkah Anda menjelaskan tujuan utama dari Proyek Jalan Tol Harbour Road 2?

A : Proyek Jalan Tol Harbour Road 2 bertujuan untuk meningkatkan konektivitas di Jakarta Utara dengan menyediakan jalan tol layang yang dapat mengurangi kemacetan dan meningkatkan mobilitas logistik. Proyek ini dirancang untuk memperlancar transportasi barang dan orang, yang pada akhirnya akan mendukung pertumbuhan ekonomi di wilayah metropolitan Jakarta.

Q2 : Apa saja tantangan utama yang dihadapi dalam pelaksanaan proyek ini?

A : Tantangan utama termasuk bekerja di lingkungan perkotaan yang padat, meminimalkan gangguan lalu lintas, memastikan kualitas struktur yang tinggi, serta mengelola biaya proyek agar tetap efisien. Selain itu, kompleksitas logistik terkait pengadaan alat berat, termasuk Launcher Gantry 1.000 Ton, menjadi tantangan yang signifikan.

Q3 : Bagaimana proyek ini sejalan dengan rencana pembangunan infrastruktur nasional Indonesia?

A : Proyek ini mendukung rencana induk infrastruktur nasional, yang menargetkan pengembangan jalan tol untuk meningkatkan konektivitas antar kota. Pembangunan jalan tol layang ini sejalan dengan upaya pemerintah dalam meningkatkan infrastruktur transportasi guna mendorong pertumbuhan ekonomi.

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2. Peran Launcher Gantry 1.000 Ton

Q4 : Mengapa Launcher Gantry 1.000 Ton dipilih untuk proyek ini?

A : Proyek ini melibatkan konstruksi jembatan dengan bentang panjang dan elemen berat pada ketinggian yang signifikan. Launcher Gantry 1.000 Ton dipilih karena memiliki kapasitas angkat yang besar, presisi tinggi dalam pemasangan gelagar, serta mampu bekerja di ketinggian hingga 22 meter.

Q5 :Bagaimana Launcher Gantry berkontribusi terhadap efisiensi konstruksi jembatan?

A : Alat ini secara signifikan mempercepat pemasangan girder dibandingkan metode konvensional. Dengan kemampuan mengangkat dan memasang balok secara cepat, proses konstruksi menjadi lebih efisien dan proyek dapat diselesaikan tepat waktu.

Q6 : Apa saja spesifikasi teknis dari Launcher Gantry dan bagaimana perbandingannya dengan peralatan konvensional?

A : Kapasitas: 1.000 Ton, memungkinkan pengangkatan Precast Box Girder yang besar. Rentang Operasi: Hingga 50 meter, cocok untuk jembatan bentang panjang. Kemampuan Kemiringan: 5% longitudinal, 6% transversal, memungkinkan fleksibilitas di berbagai kondisi proyek. Dibandingkan dengan crane konvensional, alat ini lebih efisien dan presisi, serta dapat digunakan dalam area kerja terbatas tanpa membutuhkan ruang yang luas untuk manuver.

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3. Pertimbangan Teknis dan Finansial

Q7 : Faktor apa saja yang dipertimbangkan dalam keputusan pengadaan Launcher Gantry 1.000 Ton?

A : Keputusan ini didasarkan pada kelayakan proyek, keselamatan, justifikasi keuangan, dan penggunaan jangka panjang. Dibutuhkan sistem pengangkatan berkapasitas tinggi yang dapat meningkatkan efisiensi waktu dan biaya.

Q8 : Bagaimana alat ini mempengaruhi biaya keseluruhan proyek, termasuk pengadaan, perawatan, dan operasional?

A : Meskipun biaya pengadaan awal cukup tinggi, penghematan dalam biaya tenaga kerja, durasi konstruksi, dan efisiensi proyek menjadikan investasi ini layak secara finansial dalam jangka panjang. Namun, biaya perawatan dan operasional harus dikelola dengan baik.

Q9 : Apakah ada alternatif peralatan lain yang dipertimbangkan sebelum memilih Launcher Gantry ini?

A : Ya, kami mempertimbangkan beberapa opsi, termasuk crane konvensional dan launcher gantry berkapasitas lebih kecil, tetapi tidak ada yang memenuhi kebutuhan proyek secara optimal. Model Comtec TCS dari Italia dipilih karena telah terbukti handal dalam proyek infrastruktur serupa.

Q10 : Bagaimana investasi ini mempengaruhi keberlanjutan finansial proyek dalam jangka panjang?

A : Dengan potensi penggunaan ulang untuk proyek lain, alat ini dapat memberikan manfaat jangka panjang. Selain itu, efisiensi konstruksi yang lebih tinggi memungkinkan pengelolaan anggaran yang lebih baik dan daya saing yang lebih tinggi dalam tender proyek masa depan.

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4. Keunggulan Kompetitif dan Strategis

Q11 : Bagaimana kepemilikan Launcher Gantry ini memberikan keunggulan kompetitif bagi PT Wijaya Karya?

A : Dengan memiliki alat ini, kami dapat menangani proyek berskala besar yang tidak dapat dilakukan oleh banyak pesaing karena keterbatasan peralatan. Selain itu, kepemilikan alat ini mengurangi ketergantungan pada penyewaan pihak ketiga, sehingga meningkatkan efisiensi biaya dan waktu proyek.

Q12 : Bagaimana pengadaan ini sejalan dengan strategi jangka panjang PT Wijaya Karya?

A : PT Wijaya Karya menargetkan untuk menjadi pemimpin pasar dalam pembangunan infrastruktur, dan investasi dalam teknologi konstruksi canggih merupakan bagian dari strategi ini.

Q13 : Apakah Launcher Gantry ini dapat digunakan untuk proyek lain setelah Harbour Road 2?

A : Ya, alat ini dapat digunakan untuk proyek jalan tol layang lainnya, jembatan bentang panjang, serta infrastruktur kereta api, sehingga meningkatkan nilai investasi jangka panjangnya.

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5. Keselamatan dan Manajemen Risiko

Q14 : Bagaimana Launcher Gantry meningkatkan keselamatan kerja di lokasi proyek?

A : Alat ini mengurangi risiko cedera akibat pengangkatan manual, membatasi eksposur pekerja ke area berbahaya, dan meningkatkan keamanan pemasangan struktur berat.

Q15 : Apa saja risiko potensial dalam pengoperasian alat ini dan bagaimana cara menguranginya?

A : Risiko utama meliputi kegagalan mekanis, kesalahan operator, dan keterbatasan ruang kerja. Risiko ini dikurangi melalui pemeliharaan berkala, pelatihan operator, dan evaluasi keselamatan proyek secara berkala.

Q16 : Apakah penggunaan Launcher Gantry ini telah mengurangi tingkat kecelakaan kerja?

A : Ya, kami melihat penurunan signifikan dalam kecelakaan kerja, terutama yang terkait dengan pengangkatan dan pemasangan elemen beton berat.

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6. Pandangan Masa Depan dan Rekomendasi

Q17 : Apa pelajaran utama yang dapat diambil dari penggunaan Launcher Gantry 1.000 Ton dalam proyek ini?

A : Pentingnya perencanaan matang dalam pengadaan, logistik, dan pemeliharaan alat berat untuk memaksimalkan efisiensi proyek.

Q18 : Apakah alat serupa perlu dipertimbangkan untuk proyek jalan tol dan jembatan lainnya?

A : Ya, proyek infrastruktur berskala besar membutuhkan teknologi canggih untuk menyelesaikan pekerjaan dengan efisiensi tinggi dan kualitas yang baik.

Q19 : Apa rekomendasi bagi perusahaan lain yang mempertimbangkan investasi serupa?

A : Pastikan perencanaan jangka panjang, pelatihan operator, serta analisis biaya-manfaat yang komprehensif sebelum berinvestasi dalam alat berat seperti ini.

APPENDIX 2

Capital Budgeting Calculation in Microsoft Excel

A.	**DATA ALAT**					
	Jenis Alat	Launcher Gantry / Overhead Launcher				
	Merk/Tipe	Comtec tcs				
	Kapasitas	1000T / 50m span, climbable slope 5% longitudinal,				
		6% slope transversal				
	Jumlah unit	1 unit brand new				
	Asal alat	Italy				
	Keterangan	Perubahan spesifikasi beban maksimum				
		untuk memenuhi kebutuhan proyek yang diperoleh				
		(pertama digunakan pada proyek Harbour Road II)				
	LAUNCHER GANTRY COMTEC SETS 1.000 TONS					
	Launcher Gantry Sets 1000 To	**Rp**	**47.571.000.000**	**47.571.000.000,00**		
	Launcher Gantry 1.000 Tons	Rp	35.489.000.000	Comtec		
	Contractor Engineering Service	Rp	4.362.000.000	Expert		
	Erection dan commissioning	Rp	7.720.000.000	Subkontraktor		
	Economif Life		10 Tahun			
	Cost of Capital		12%			
	Revenue & Exchange Rate			Moderate & Pesismistic		
	Period		Sales	Remarks		
	Tariff	Rp	390.500.000	Rp/Span		
	Operational Expenditure					
	Item		QTY	Cost		Total
A	**OPERATION**				**Rp**	**897.000.000**
	General Manager		1	Rp 18.000.000	Rp	234.000.000
	Engineer S1		2	Rp 12.000.000	Rp	312.000.000
	Operator LG		1	Rp 6.000.000	Rp	78.000.000
	Helper		1	Rp 6.000.000	Rp	78.000.000
	Administrator		1	Rp 7.500.000	Rp	97.500.000
	Assistent Adm.		1	Rp 7.500.000	Rp	97.500.000
B	**MAINTENANCE**				**Rp**	**150.000.000**
	LG Equipment Maintenance				Rp	150.000.000
C	**DEPRECIATION**					
	TOTAL				**Rp**	**1.047.000.000**
D	**ECONOMIC FACTOR**					
	Indonesian Corporate Income Tax Rate		22,0%			
	Interest Rate		12,0%			
	PRODUCTION LG COMTECH					
	Maximum Gross Capacity		4	Span/month		
	Net Capacity		4	Span/month		
	Annual Sale		48	Span/year		

Category	Unit	Year									
		Q1 2025	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Revenue												
Tarif	IDR/ Span		390.500.000	390.500.000	390.500.000	390.500.000	390.500.000	390.500.000	390.500.000	390.500.000	390.500.000	390.500.000
Annual Sales	Span/ Year		48	48	48	48	48	48	48	48	48	48
Total Revenue	**IDR/ Year**		**18.744.000.000**	**18.744.000.000**	**18.744.000.000**	**18.744.000.000**	**18.744.000.000**	**18.744.000.000**	**18.744.000.000**	**18.744.000.000**	**18.744.000.000**	**18.744.000.000**
Operational Expenditure												
OPERATIONS												
General Manager	IDR (Salary/ Year)		234.000.000	234.000.000	234.000.000	234.000.000	234.000.000	234.000.000	234.000.000	234.000.000	234.000.000	234.000.000
Engineer S1			312.000.000	312.000.000	312.000.000	312.000.000	312.000.000	312.000.000	312.000.000	312.000.000	312.000.000	312.000.000
Operator Mechanical			78.000.000	78.000.000	78.000.000	78.000.000	78.000.000	78.000.000	78.000.000	78.000.000	78.000.000	78.000.000
Operator Electrical			78.000.000	78.000.000	78.000.000	78.000.000	78.000.000	78.000.000	78.000.000	78.000.000	78.000.000	78.000.000
Administrator			97.500.000	97.500.000	97.500.000	97.500.000	97.500.000	97.500.000	97.500.000	97.500.000	97.500.000	97.500.000
Assistent Adm.			97.500.000	97.500.000	97.500.000	97.500.000	97.500.000	97.500.000	97.500.000	97.500.000	97.500.000	97.500.000
MAINTENANCE												
LG Equipment Maintenance	IDR		150.000.000	150.000.000	150.000.000	150.000.000	150.000.000	150.000.000	150.000.000	150.000.000	150.000.000	150.000.000
Total OPEX			**1.047.000.000**	**1.047.000.000**	**1.047.000.000**	**1.047.000.000**	**1.047.000.000**	**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**	**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	4.757.100.000	4.757.100.000	4.757.100.000	4.757.100.000	4.757.100.000
Amorization (perijinan2-intangible)												
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**	**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	2.592.619.500	2.021.767.500	1.450.915.500	880.063.500	309.211.500
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**	**10.347.280.500**	**10.918.132.500**	**11.488.984.500**	**12.059.836.500**	**12.630.688.500**
Tax (22%)	IDR		4.123.680.000	4.123.680.000	4.123.680.000	4.123.680.000	4.123.680.000	4.123.680.000	4.123.680.000	4.123.680.000	4.123.680.000	4.123.680.000
Earning After Taxes (EAT)	IDR		3.369.340.500	3.940.192.500	4.511.044.500	5.081.896.500	5.652.748.500	6.223.600.500	6.794.452.500	7.365.304.500	7.936.156.500	8.507.008.500
Depreciation and Amortization			4.757.100.000	4.757.100.000	4.757.100.000	4.757.100.000	4.757.100.000	4.757.100.000	4.757.100.000	4.757.100.000	4.757.100.000	4.757.100.000
Net Cash Inflows from operating Activity (8+9)	IDR		8.126.440.500	8.697.292.500	9.268.144.500	9.838.996.500	10.409.848.500	10.980.700.500	11.551.552.500	12.122.404.500	12.693.256.500	13.264.108.500
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	- 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	- 47.571.000.000	-	-	-	-	-	-	-	-	-	-
Net Cash Flow	IDR	- 47.571.000.000	10.869.628.784	12.011.332.784	13.153.036.784	14.294.740.784	15.436.444.784	16.578.148.784	17.719.852.784	18.861.556.784	20.003.260.784	21.144.964.784
Balance	IDR		- 36.701.371.216	- 24.690.038.432	- 11.537.001.649	2.757.739.135	18.194.183.919	34.772.332.703	52.492.185.486	71.353.742.270	91.357.003.054	112.501.967.838
Initial Investment		Rp 47.571.000.000										
Discount Factor			0,9144	0,8361	0,7646	0,6991	0,6393	0,5846	0,5346	0,4888	0,4470	0,4087
PV Yearly			9.939.309.422	10.043.248.221	10.056.585.030	9.994.067.496	9.868.582.497	9.691.366.633	9.472.194.311	9.219.545.733	8.940.756.825	8.642.152.996
Acc. PV		**Rp 95.867.809.164**										
Discounted Payback Period		-Rp 47.571.000.000	- 37.631.690.578	- 27.588.442.357	- 17.531.857.327	- 7.537.789.831	2.330.792.666	12.022.159.299	21.494.353.610	30.713.899.343	39.654.656.168	48.296.809.164
Yearly ROI			7,08%	8,79%	10,87%	13,51%	17,04%	22,11%	30,13%	44,96%	82,31%	364,85%
Average ROI		**60,17%**										

Category	Result	Description
WACC	9,36%	
Payback Period	3,82	years
ROI	60,17%	average
NPV	48.296.809.164,06	IDR
PI	1,02	
Discounted Payback Period	4,76	years
IRR	26,59%	

APPENDIX 3

Jakarta, 6 February 2025
No: 004/IPMI/AO/ThesisResearch/II/2025

To:

PT Wijaya Karya (Persero), Tbk.
Jl. DI. Panjaitan No.Kav. 9-10, RT.1/RW.11, Cipinang Cempedak, Kecamatan Jatinegara
Kota Jakarta Timur 13340

Subject: Request for Participation in 'Thesis Research'

Dear Sir/Madam,

IPMI Institute was founded in 1984, patterned after Harvard MBA Business School in the United States of America. Our programs are delivered in English, and use case study teaching methods. At present, IPMI has produced more than 3000 alumni.

In order to provide Graduate students with an education that is relevant to Indonesian business today, a significant portion of the programs is devoted to Thesis Course which involves real business world integration. This project offers our students an opportunity to assist a company in the formulation of a strategy or the resolution of managerial issues deemed important by management of the company.

The objectives of this project are:
1. As an integral part of IPMI Institute's program, it further develops the skills and attitude required in the present and future business environment.
2. It serves to strengthen the links between the business community and IPMI.
3. It develops specific recommendations aimed at improving the company's business performance.

IPMI Institute would like to invite your company to be involved in the Thesis by allowing our students to conduct project research focused on your company needs, resulting in a strategy that could bring your company great benefits if implemented. In the interest of contributing to the educational process, it is hoped that your company would be willing to join us in this venture.

The student's name for the project is: **Alfi Trianto (Student ID: 20222013, Class: EMBA March 2021)**

We assure you that all data gathered from your organization would be treated as strictly confidential and used for educational purposes only. Please let us know should you prefer to keep the organization's name confidential, as we would disguise it as anonymous.

Should you require more information or clarification regarding this project, you are welcome to contact us.

Sincerely,

Sidrotun Naim, M.P.A., Ph.D
Head of Graduate Program
IPMI Institute

APPENDIX 4

IPMI INSTITUTE - GRADUATE PROGRAM

RECOMMENDATION

☑ **PROPOSAL DEFENSE OF THESES**

☐ **FINAL EXAMINATION OF THESES**

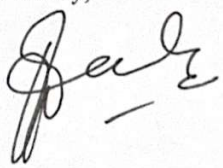
I am pleased to be the advisor of this thesis, and I certify that the students have faithfully achieved the requirements as specified in the *Guideline for the Preparation of Thesis 2023*.

Student Name (Student ID)	: Alfi Trianto (20222013)
Title	: Strategic Investment Decision And Evaluation To Acquire 1,000 Ton Launcher Gantry For Toll Road Harbour Road Project of PT Wijaya Karya (Persero), Tbk. Indonesia
Date of Thesis Defense	: January 13, 2025 (alt. 1) January 17, 2025 (alt. 2)
Time of Thesis Defense	: 07.30 PM WIB

The thesis has been checked and recommended for presentation and comprehensive oral defense towards a Master of Business Administration Degree at IPMI Institute.

Jakarta, January 7, 2025

Approved by,



(Prof. Dr. Wiwiek Mardawiyah D., SE., Ak., M.M., CMA)

APPENDIX 5

IPMI INSTITUTE - GRADUATE PROGRAM

RECOMMENDATION

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Title	: Strategic Investment Decision And Evaluation To Acquire 1,000 Ton Launcher Gantry For Toll Road Harbour Road Project of PT Wijaya Karya (Persero), Tbk. Indonesia
Date of Thesis Defense	: February 20, 2025 (alt. 1) February 21, 2025 (alt. 2)
Time of Thesis Defense	: 07.30 PM WIB

The thesis has been checked and recommended for presentation and comprehensive oral defense towards a Master of Business Administration Degree at IPMI Institute.

Jakarta, February 14, 2025

Approved by,

(Prof. Dr. Wiwick Mardawiyah D., SE., Ak., M.M., CMA)