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Investment Feasibility Study with the Capital Budgeting Method for the Construction Project of Facilities for Overnight Parking Services at APT Pranoto Airport in Samarinda City, East Kalimantan

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Abstract

The rapid development of transportation infrastructure has significantly increased the demand for vehicle parking facilities, particularly at strategic locations such as APT Pranoto Airport in Samarinda, East Kalimantan. This study evaluates the investment feasibility of constructing an overnight parking facility at the airport. Using a qualitative descriptive approach, financial analysis methods—including Net Present Value (NPV), Internal Rate of Return (IRR), Payback Period (PP), and Profitability Index (PI)—were applied. Primary data were collected through interviews with project managers and airport officials. The findings indicate that the current parking facilities are insufficient to meet demand, especially during peak seasons. Financial feasibility tests confirmed the project's viability, with positive NPV values, an IRR surpassing the required rate of return, a PI exceeding 1, and a short payback period. These results demonstrate the project's potential profitability and its ability to enhance service quality. Consequently, this investment is recommended as a sustainable initiative to support the airport's increasing transportation needs and promote operational efficiency.

Keywords: APT Pranoto Airport, capital budgeting, financial analysis, investment feasibility, overnight parking.

INTRODUCTION

In the context of globalization and rapid economic development, the availability of adequate supporting infrastructure, such as parking facilities, is critical, particularly in strategic transportation hubs like airports (Bhattarai et al., 2021). Aji Pangeran Tumenggung Pranoto Airport (APT Pranoto) in Samarinda City, East Kalimantan, serves as the main airport for a broad service area encompassing five cities and regencies: Samarinda City, Bontang City, Kutai Kartanegara Regency, East Kutai Regency, and West Kutai Regency, as well as surrounding areas. However, addressing the challenges associated with meeting the increasing demand for efficient parking facilities in such a key location remains a significant issue requiring deeper exploration and innovative solutions (Ma et al., 2024).

The airport has witnessed substantial passenger growth in recent years, driven by the economic and tourism development in the province of East Kalimantan (Endy Marlina, 2017).

This rapid increase in passenger volume and airport activities has underscored the critical need for enhanced supporting facilities, particularly overnight parking spaces. In 2023, APT Pranoto Airport accommodated a total of 752,913 passengers, with a monthly average of 62,743 passengers. These figures highlight the growing density and demand for improved infrastructure at the airport (Jacquillat & Odoni, 2018).

In line with the increasing number of passengers, APT Pranoto Airport has allocated a sizable parking area of 30,000 m². As part of its 2024 development plan, the airport is set to introduce a new service: overnight parking for visitors, spanning an area of 2,046 m². This service aims to cater to the needs of four-wheeled vehicle users seeking extended parking options, enhancing convenience for long-term users (Huang, 2024).

Currently, Samarinda A.P.T Pranoto Airport faces significant limitations in providing adequate in-parking services, as the existing parking area is exposed to heat and rain, potentially leading to vehicle damage. This situation not only inconveniences passengers but also risks harming the airport's reputation. Recognizing this challenge, PT Kaltim Melati Bhakti Satya (Perseroda), a Regional-Owned Enterprise (BUMD) of East Kalimantan Province, plans to undertake strategic business development to enhance its portfolio by managing parking lot services at A.P.T Pranoto Samarinda Airport. This initiative aims to provide safer and more comfortable parking facilities, thereby improving customer satisfaction, boosting the airport's reputation, and creating new revenue streams. Additionally, the development is expected to contribute to the regional economy by setting a benchmark for modernized parking services and fostering opportunities for local businesses (Sánchez-Hernández & Maldonado-Briegas, 2023).

Based on the description of the background above, the problems of this research can be formulated are: "How is the investment feasibility analysis of the construction of facilities for the parking lot service business at the apt proto airport." The objectives of this study are 1) To determine the feasibility of investing in the construction of facilities for the overnight parking service business at apt proto airport.

RESEARCH METHODS

The research employed a descriptive qualitative approach, with the discussion presented in the form of descriptive data. The study utilized methods such as net present value, internal rate of return, payback period, and profitability index to analyze the data. To ensure the reliability and validity of the results, the researchers collected both primary and secondary data. Primary data were gathered through interviews with relevant project managers and officials at the Apt Pranoto Airport public service agency. These interviews were conducted to ensure the adequacy of data required for analyzing the feasibility of the Supporting Facilities development project at Apt Pranoto Airport, Samarinda City, managed by PT Kaltim Melati Bhakti Satya. A deeper consideration of potential biases, challenges, and limitations encountered during the research process would further strengthen the methodology section (Saharan et al., 2020).

RESULT AND DISCUSSION

Passenger and Air Traffic Data

Based on the data obtained from the APT Pranoto Class I Airport Operator Unit Public Service Airport, the monthly number of recorded aircraft passengers during the research period is summarized and analyzed in the following section, accompanied by detailed visual representations such as graphs or tables to enhance accessibility and comprehension.

Table 1. Number of Passengers

	Historical			
Keterangan	**2020**	**2021**	**2022**	**2023**
Passanger/Year	572.918	490.737	728.501	752.913
Growth (CAGR) Passanger		-14,3%	48,5%	3,4%
Visitor/year	20.682	17.216	26.299	27.180
Visitor/Months	1.724	1.476	2.192	2.265
Visitor/days	57	49	73	76
Growth (CAGR) Visitor		-14,3%	48,5%	3,4%

This data is important for assessing parking capacity needs and for planning more efficient parking space management in the future, as there has been a surge in the number of passengers flying using the facilities at APT Pranoto (Fukurai et al., 2021). The decline in 2021 is still indicated by the impact of the Covid 19 Virus which paralyzed almost all sectors (not just the aviation sector).

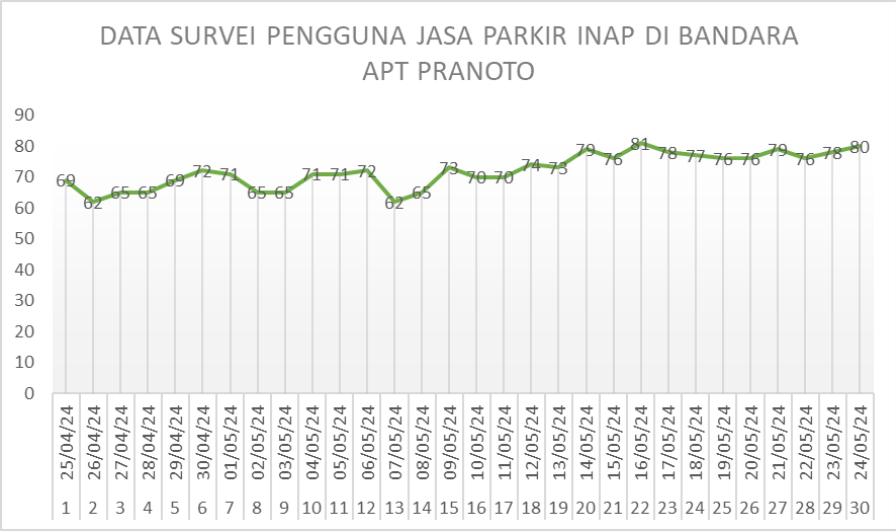

Figure 1. Field observation graph

Table 2 above is a field observation and interview with the main parking lot manager conducted during April 2024; it was found that an average of 2,131 airplane passengers would generate about 62-81 units of vehicles per day that require parking spaces taken in the past month.

Table 2. Projected number of users of parking facilities at APT Pranoto Airport

Information	Projection				
	2024	**2025**	**2026**	**2027**	**2028**
Passanger/Year	778.143	804.219	831,168	859.020	887.806
Growth (CAGR) Passanger	3,4%	3,4%	3,4%	3,4%	3,4%
Visitor/year	28.091	29.032	30.005	32,011	32,050
Visitor/Months	2.341	2.419	2.500	2.584	2,671
Visitor/days	78,03	81	83	86%	89
Growth (CAGR) Visitor	3,4%	3,4%	3,4%	3,4%	3,4%

Table 2 above shows the projected number of users of parking facilities at APT Pranoto Airport. It can be seen that the number of long-term parking users is expected to increase each year, with an average growth of around 3.4% per year. This can be attributed to the increasing number of flights operating, which is likely to lead to an increase in the number of passengers and vehicles using the parking facilities over the next five years (Allen et al., 2018).

Analysis of Parking Capacity Limitations and Impacts

In April-June or December (during Lebaran and Nataru), when the volume of vehicles increases sharply, there is congestion in the parking area, causing passengers to have difficulty finding available parking spaces. This has the potential to cause delays in the check-in process and flights, as well as create inconvenience for passengers (Mujica Mota, 2015).

Based on existing data, the parking capacity at APT Airport can only accommodate around 500 vehicles at its maximum capacity. Therefore, to cope with the surge of vehicles, additional parking areas or the development of more efficient parking systems, such as automated parking or more intensive use of public transportation during peak periods, are required.

Aircraft Parking Lot Construction Cost Requirement Analysis Based on Air Traffic

Based on the air traffic data presented in Chapter 4.1, the number of passengers and aircraft movements at APT Pranoto Airport continues to increase. In 2023, APT Airport recorded 752,913 passengers per year. Projections show that the number of aircraft movements will increase to 887,806 per year by 2028, in line with the increasing need for air transportation.

Construction Cost of Inpatient Parking Lot

This parking lot construction cost calculation provides a clear picture of the budget requirements in the construction project. With a cost of approximately IDR 2,000,000,000 (two billion rupiah) for the airport's in-parking lot, this is an important component in the overall project budget plan.

Table 4. Calculation of Inpatient Parking Fee

No	Type of work	Sum
	Making an INAP parking roof	
A	Preparatory work	
I.	Preliminary work	86,014,563,50
II.	Occupational health safety management system	13,505,000,00
B	Making a parking roof	
I.	Concrete work	14,949,419,32
II.	Ironwork	847,382,835,50
III.	Roofing work	335,313,775,12
IV.	Electrical installation work	44,505,000,00
C	Construction of the Posjaga	
I.	Preparatory work, market and land	1,125,378,40
II.	Reinforced concrete cast work	4,754,733,77
III.	Wall and plaster pairs	6,943,980.03
IV.	Work on window frames and doors	8,287,281,34
V.	Floor and wall covering work	4,743,553,12
VI.	Easel and roof work	5,464,202,00
VII.	Frame work & ceiling cover	3,237,701,39
VIII	Pekerjaan Cat-Catan	218,186,873
IX	Electrical Installation Work	3,675,000,00
X	Other jobs	12,020,000,00
D	General Tolilet Development	
I.	Sand and soil preparation work	812,689,20
II.	Foundation Work	4,132,357,14
III.	Reinforced concrete cast work	3.499.010.07
IV.	Pairing dinging and plastering	6,163,589,66
V.	Work on window frames and doors	3,057,217,50
VI.	Floor and wall covering work	4,446,112,98
VII.	Horse and roof workman	3,047,693,41
VIII	Frame workers and ceiling covers	1,556,988,84
IX	Paint work	1,764,933,20
X	Electrical installation workers	800,000,000
XI	Sanitation workers	12,275,000,00
E	Drainage Creation	
I	Preparatory work	37,595,742,04
II	Spouse work	245,420,034,64
F	Pedestrian work	19,332,866,53

The table above presents the estimated cost of building parking facilities at the airport, which is compiled based on the results of a study from an independent consultant. The preparation of this

table aims to provide a detailed description of the allocated costs, including materials, labor, and other operational needs. (details can be seen in the attachment). The cost estimation table prepared by the consultant shows that the calculation has considered various crucial factors so that it can be a valid basis in the decision-making process of this project (Yildiz et al., 2014).

Analysis of the Relationship between Air Traffic and the Cost Requirement for the Construction of a Parking Lot

In operational cost analysis, there are two main categories that need to be considered, namely fixed costs and variable costs. These two types of costs play a very important role in determining the operational efficiency and sustainability of infrastructure development in the aviation sector (Sobieralski, 2023). By understanding the difference between fixed and variable costs, airport or air facility managers can plan appropriate financial strategies to support sustainable growth and development.

Fixed Cost

Fixed costs are costs that do not change with changes in air traffic volume or other operational activities. In the context of an airport or air facility, these fixed costs include various expenses that must be incurred each period, regardless of how many aircraft operate or how many passengers are served (Vasigh & Rowe, 2019).

Variable Cost

While fixed costs are constant, variable costs are those that change according to the volume of operations and facility requirements (Schuh et al., 2019). In the context of traffic, these variable costs are often influenced by the number of flights in progress, the number of passengers served, or the maintenance activities required.

The Effect of Cost on Infrastructure Development

The distinction between fixed and variable costs provides important insights into financial management for infrastructure development. Large fixed costs, such as land rent and employee salaries, need to be carefully considered in long-term plans. Variable costs, while more flexible and adaptable to operational volumes, should be closely monitored to ensure that increased activity does not lead to uncontrolled cost overruns (Callegari et al., 2018).

Estimated Operating Costs and Revenue Generated

Table 5. Estimated Operating Costs and Revenue Generated

No	Cost Structure	Moon		Year		Total
1.	Fix Cost	Land lease 2049 M2	Rp 30.690.000	Land for rent 2049 m2	Rp. 368.280.000	Rp. 536.280.000
		Employee salary (4 Orang)	Rp. 14.000.000	Employee salary	Rp. 168.000.000	
		Internet	Rp. 1.500.000	Internet	Rp. 18.000.000	
		Therapy	Rp. 1.500.000	Therapy	Rp. 18.000.000	
		Electricity & Water	Rp. 2.000.000	Electricity & Water	Rp. 24.000.000	

No	Cost Structure	Moon		Year		Total
2.	Variable Cost	Liability insurance costs	Rp. 2.000.000	Liability insurance costs	Rp. 24.000.000	
		Depreciation Expense	Rp. 17.815.204	Depreciation Expense	Rp. 231.782.448	
		BLU Profit Share 15%	Rp. 35.113.705	BLU Profit Share 15%	Rp. 421.364.460	
		CP Profit Share 25%	Rp. 52.679.557	CP Profit Share 25%	Rp. 632.154.684	
Sub Total		Operating Exp/Month	Rp. 157.289.466	Operating Exp/Year	Rp. 1.887.473.597	
		Sewa + bagi hasil BLU	Rp. 65.803.705	Rent + BLU Profit Share	Rp. 789.644.458	
		CP Profit Sharing	Rp. 157.289.466	CP Profit Sharing	Rp. 632.046.687	

The table presented above details the estimated operating costs involved in the construction and management of an on-airport parking facility. These estimates are divided into several interrelated categories. Each of these cost categories has been carefully calculated to provide a comprehensive overview of the budget required for this project.

Payback Period (PP) Test Results

Table 6. Payback results

Year	Cash flow	Cumulative Cash Flow
0	(1.929.189.460)	(1.929.189.460)
1	426.930.701	(1.502.258.759)
2	511.650.001	(903.050.521)
3	599.208.237	(213.349.8980)
4	(689.700.542)	476.350.562
5	783.225.235	1.259.575.796

However, keep in mind that this payback period method has limitations; this method does not take into account the time value of money and only focuses on the return on the initial investment without considering the cash flow that occurs after the payback period. Therefore, it is recommended that further analysis be conducted using other methods such as net present value (NPV), internal rate of return (IRR), and profitability index (PI) to get a more comprehensive picture of the business feasibility of this project.

Net Present Value (NPV) Test Results

The NPV calculation is carried out using a discount rate that reflects the rate of return expected by investors, which is 10%. In addition to the basic NPV calculation, a sensitivity test to changes in the discount rate was also conducted to find out how much influence these changes have on the NPV results. In this sensitivity test, the discount rate was tested at 10%, 12%, 15% and 20%. The results can be seen in the table below:

Table 7. Sensitivity Test Results

Cost Of Capital (r) / MARR	10%	NPV	Rp. 289.370.612
	12%	NPV	Rp. 169.127.697
	15%	NPV	Rp. 6.664.567
	20%	NPV	Rp. (223.966.478)

A negative NPV result at a 20% discount rate indicates that the project is less financially viable, assuming such a high rate of return. This indicates that the project may face greater risks or the expected revenue projections are not sufficient to cover investment and operating costs at the requested rate of return.

Internal Rate of Return (IRR) Test Results

The IRR is the discount rate at which the NPV equals zero, meaning that the present value of the cash flows generated by the project is comparable to the initial investment cost. In practical terms, IRR can be used to determine whether a project can provide a return large enough to cover the investment costs and provide a profit for investors.

The IRR formula =

$$0 = NPV = \sum_{t=1}^{T} \frac{CF_t}{(1 + IRR)^t} - C_0$$

The results of the calculation of the internal rate of return (IRR) can be seen in the figure below:

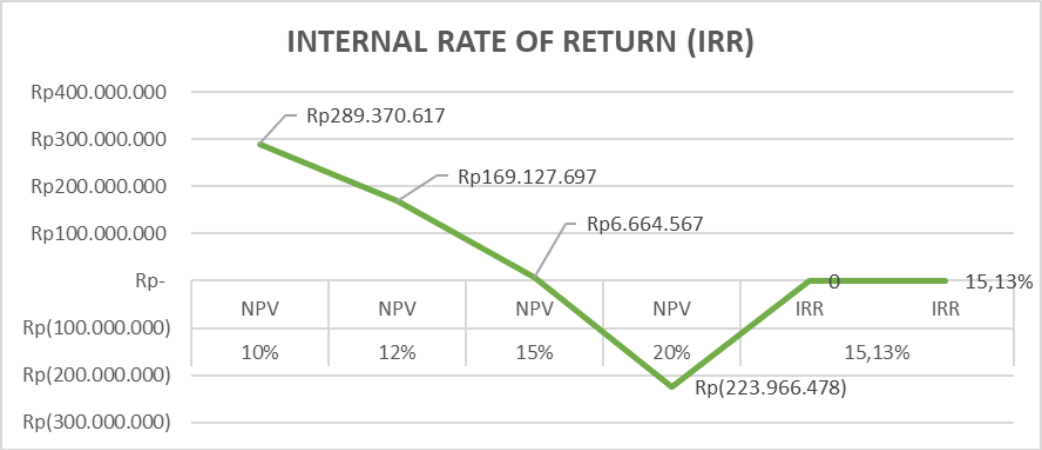

Figure 2. Calculation Results of Internal Rate Return (IRR)

This IRR value indicates that the project can provide a rate of return of 15.13% per year on the investment made. By comparing this IRR value with the discount rate used in the NPV calculation (i.e. 10%), it can be said that this project has a higher rate of return than expected by investors, which usually ranges from 10% to 15% for similar investment projects. This indicates that this vehicle parking lot development project has good profit potential and is feasible from a financial return perspective (Figueiredo et al., 2017).

Profitability Index Test Results

The Profitability Index is one of the important indicators in assessing the feasibility of an investment, which is calculated by comparing the present value of expected cash flows with the initial project investment.

The formula for calculating the Profitability Index is as follows:

$$PI = \frac{Present\ Value\ (PV)\ Arus\ Kas\ Masa\ Depan}{Investasi\ Awal}$$

CONCLUSION

Based on the calculations conducted in the previous chapter, it can be concluded that the investment in the construction of a vehicle parking facility at APT Pranoto Airport Samarinda, managed by PT KMBS, is financially feasible and highly promising. The evaluation of investment feasibility—using NPV, PI, IRR, and Payback Period—indicates that the project has the potential to deliver substantial long-term benefits for investors. With a relatively fast payback period, a positive NPV, a high IRR, and a PI greater than 1, this project not only ensures the recovery of the initial investment but also provides significant added value for stakeholders.

To enhance its impact, the study highlights the potential of the project to contribute to operational efficiency and facility improvements at APT Pranoto Airport, thus supporting the airport's overall growth and service quality. Future research could explore the broader economic and social implications of this project, such as its role in supporting regional development or addressing parking congestion challenges. Policymakers and stakeholders are encouraged to consider these findings to maximize the project's contributions to the community and the transportation sector.

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