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Research Paper

Strategy of Design, Build, Finance, Operational, Maintenance, Transfer, on the Revitalization of Rapit Transit Bus Infrastructure (BRT) Transjakarta Corridor 9

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ABSTRACT: *This study analyzes the application of the Design Build Finance Operational Maintain Transfer (DBFOMT) scheme in the revitalization of TransJakarta Bus Rapid Transit (BRT) infrastructure Corridor 9. The main objectives of the study are to identify cooperation between the government and business entities, analyze financing and revenue sharing, and evaluate the attractiveness of these schemes for private investors. The method used is a quantitative approach with case studies and surveys. The results show that the DBFOMT scheme attracts private investors because it offers financial advantages, operational efficiency, and flexibility in design and financing. This research provides insight for the government and business entities in designing PPP-based infrastructure projects.*

KEYWORDS: *DBFOMT, BRT TransJakarta, Revitalization, PPP, Infrastructure Financing, Private Investment.*

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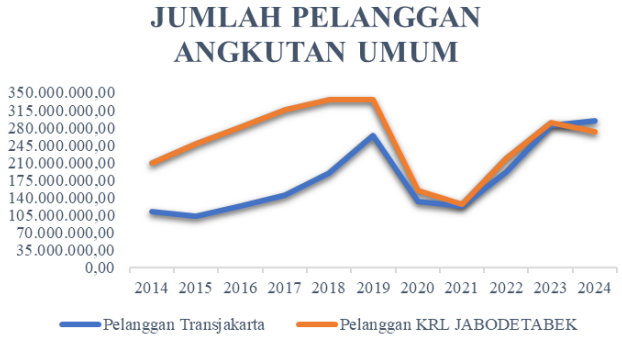
I. INTRODUCTION

Jakarta, as one of the cities with the highest population density in the world, faces significant challenges in providing an efficient public transportation system. With the continuous increase in the number of residents and private vehicles, congestion has become the main challenge affecting the quality of life of its citizens. As an effort to address this issue, the development and revitalization of the public transportation system in Jakarta is crucial, particularly to reduce dependence on private vehicles and decrease air pollution (BPS, 2020).



TransJakarta, as one of the main modes of public transportation, has made a significant contribution to solving congestion in Jakarta. With more than 280 BRT stops and 14 integrated main corridors, TransJakarta serves millions of passengers every day. Although the number of TransJakarta users continues to increase, the quality of infrastructure, especially BRT stops, needs to be improved in order to accommodate the increasing number of passengers and meet better service standards of the Government of the Republic of Indonesia, 2021.

The revitalization of TransJakarta BRT stops is one of the important steps in increasing the capacity, comfort, and safety of public transportation facilities (DKI Jakarta Provincial Government, 2019). This project not only includes physical improvements, but also the addition of supporting facilities such as toilets, prayer rooms, and comfortable waiting rooms. In addition, the revitalization of bus stops is also part of the Jakarta Provincial Government's efforts to increase integration between public transportation modes to facilitate the movement of passengers more efficiently.

However, this infrastructure revitalization faces major challenges related to financing, especially after the impact of the COVID-19 pandemic which resulted in a decrease in the number of passengers and revenue. Therefore, innovative financing methods are needed to ensure the smooth implementation of this project. One of the methods that is considered effective is the DBFOMT (Design, Build, Finance, Operate, Maintain, Transfer) financing scheme, which involves cooperation between the government and the private sector of Revitalization Development (PT Transport Jakarta). This study aims to identify interesting forms of cooperation in the TransJakarta BRT stop revitalization project, analyze the DBFOMT scheme method in financing and revenue sharing, and find financing solutions for this infrastructure project. In addition, this research will also provide insights in attracting private investors in this revitalization project.

II. THEORETICAL STUDIES

2.1 TransJakarta BRT Bus Stop

BRT (Bus Rapid Transportation) is a public transportation system that uses buses as its main mode, with predetermined routes and uses special lanes or bus rapid transit (BRT) lines to facilitate passenger mobility. The BRT system aims to provide a faster, more efficient, and affordable alternative to other public transportation in Jakarta, such as public transportation or regular buses.

Main Features of TransJakarta:

BRT Special Line: TransJakarta uses a separate busway lane from private vehicles to avoid congestion, with more than 14 corridors in Jakarta. Facilities: The bus stop is equipped with modern facilities, such as escalators, disabled access, and a payment system using e-money cards or QR codes. Some buses are also equipped with Wi-Fi and air conditioning. Payment: Passengers can pay using an e-money card or QR code through the Q-Ride application.

Superiority:

Affordable Price: Relatively cheap fares, Separate Lanes: Avoid congestion, Integrated, Connected to other modes of transportation, such as KRL, MRT, and LRT.

Expansion and Development:

TransJakarta continues to develop services, with the addition of new corridors and bus stops, as well as the introduction of electric buses and larger-capacity buses.

2.2 Revitalization of the TransJakarta BRT Bus Stop

The revitalization of the TransJakarta BRT bus stop prioritizes 4 main design principles:

1. Design for People: Focus on the needs and comfort of users;
2. Design for Public: Provide accessibility for all groups;
3. Design for Standardization and Scalability: Ensure that the design can be adapted and standardized for all bus stops;
4. Design for Sustainability: Pay attention to sustainability aspects in design.Pendekatan Desain Halte

2.2.1 Bus Stop Design Approach

Service Function: The design must support service by paying attention to the circulation of customer movements, signage, and facilities to speed up the process of getting on/off and waiting times. Building Reliability: The building must be durable with a minimum lifespan of 20 years, and keep up with modern design and sustainability, Customer Convenience: The design must prioritize accessibility, comfort, and safety, as well as pedestrian mileage efficiency, Commercial Aspects: Utilize space for advertising and retail areas.

2.2.2. Types of TransJakarta BRT Bus Stops

TransJakarta BRT Stops are divided into several types that are adjusted to their functions to serve customers, including:

1. Regular Stops;
2. Transit Stops;

3. Integration Stops;
4. Ends Stops;
5. Under Flyover Stops

2.3. BRT Corridor 9 Bus Stop

TransJakarta Corridor 9 serves the route from Pinang Ranti to Pluit, covering a distance of 29.9 km and passing through five administrative cities in Jakarta. This corridor has strategic routes that cross important areas such as MT Haryono, Gatot Subroto, and Grogol. TransJakarta Corridor 9, which has been operating since December 31, 2009, is integrated with the Jabodek KRL and LRT services, facilitating movement between modes of transportation. The stops in this corridor are designed with two separate buildings for the direction of Pluit and Pinang Ranti, where passengers who change directions must tap out and pay again (DKI Jakarta, 2019).

Corridor 9 has 26 bus stops, including: Pinang Ranti Bus Stop (Ends Bus Stop), Makassar Bus Stop, Cawang Sentral Bus Stop, Cawang Bus Stop, Ciliwung Bus Stop, Cikoko Bus Stop, Tebet Eco Park Bus Stop, Pancoran Tugu Bus Stop, Pancoran Bus Stop, Tegal Parang Bus Stop, Simpang Kuningan Bus Stop, Denpasar Bus Stop, Widya Chandra Bus Stop, Semanggi Bus Stop, Youth Gate Bus Stop, Petamburan Bus Stop, Kemanggisan Bus Stop, Kota Bambu Bus Stop, Tanjung Duren Bus Stop, Grogol Reformasi Bus Stop, Grogol River Bus Stop, Jembatan Besi Bus Stop, Jembatan Dua Bus Stop, Jembatan Tiga Bus Stop, Penjaringan Bus Stop, Pluit Bus Stop (Ends Bus Stop).

2.4. Government Cooperation with Business Entities on the Revitalization of the TransJakarta BRT Bus Stop Corridor 9

Government Cooperation with Business Entities (PPP) is a partnership between the government and the private sector in the provision of public infrastructure, with the aim of overcoming government budget limitations. This model allows the private sector to be involved in the funding, design, construction, operation, and maintenance of infrastructure, thereby improving operational efficiency, quality, and sustainability.

The PPP scheme provides alternative financing solutions through new funding sources, new financing mechanisms, or new funding patterns, which allow private partners to participate. Countries such as India, Mexico, and Brazil have successfully implemented this model, making a significant contribution in meeting infrastructure needs (Suhendra, A., et al. 2017).

Despite its advantages, PPP schemes also have limitations, such as high implementation risks and more expensive costs, depending on efficiency and supportive regulations. Government support is needed for projects that are not financially feasible to be implemented.

2.5. PPP Implementation in the Revitalization of TransJakarta BRT Bus Stop Corridor 9

The implementation of PPP in the TransJakarta Corridor 9 BRT stop revitalization project is faced with government budget limitations. With regulations that allow Regionally Owned Enterprises (BUMD) to collaborate with the private sector, revitalization can be carried out through the PPP model, as stipulated in Presidential Regulation No. 38 of 2015 and Minister of Finance Regulation No. 68 of 2024. This model allows for the involvement of the private sector in the financing and operation of public transport infrastructure (Cheung et al. 2009).Studi Kasus Internasional

2.6. International Case Studies

Several countries, including Brazil, have successfully implemented the PPP model in the BRT system. In the cities of Curitiba and Rio de Janeiro, BRT projects use PPP to increase the capacity and efficiency of public transportation services, reduce government costs and improve service quality.

2.7. Design, Build (Construction), Financing, Maintenance, Operation, and Handover of Infrastructure Assets of the TransJakarta BRT Bus Stop Corridor 9

2.7.1. Design

The design of the TransJakarta BRT bus stop plays an important role in creating an efficient and environmentally friendly transportation system, especially in the revitalization of the Corridor 9 BRT bus stop. The design should focus on increasing passenger capacity, speed, and comfort, as well as providing amenities such as lounges, accessibility for people with disabilities, and clean sanitation. Universal design principles are very important to ensure that facilities are accessible to all levels of society (Harsritanto, 2018).

TransJakarta BRT stops must also pay attention to environmental sustainability by choosing environmentally friendly materials and renewable energy technologies, such as solar panels, to reduce environmental impact. This design also considers greening and urban spatial planning so as not to disturb the ecosystem (Yuliani et al., 2019). PT. Jakarta Transportation together with partners are responsible for

redesigning infrastructure to increase capacity and efficiency, including bus stops, special lanes, and technology systems such as electronic payments and traffic management (Qurrotulayni et al., 2022).

2.7.2. Build (Construction)

The private sector is more selective in choosing experienced contractor partners with a track record of success, as well as preferring competitive construction costs. The construction methods used can include a modular approach to accelerate construction time without sacrificing quality (Qurrotulayni, S., et al. 2022).

2.7.3. Financing

Funding sources can come from governments, private investors, and loans from financial institutions. Clear mechanisms for returning investment, such as advertising revenue, commercial rentals, or cooperation with property developers, should be in place. The Value for Money (VfM) methodology is used to assess the efficiency and effectiveness of project financing. VfM assesses the benefits over public sector costs using the Public Sector Comparator (PSC) concept and cost-benefit analysis.

2.7.4. Operational

The transportation system must be integrated with corridors and other modes of transportation. Experienced operators must be recruited to ensure high-quality service. Operation is regulated in a cooperative agreement.

2.7.5. Maintenance

Maintenance contracts should provide incentives to maintain the quality of the infrastructure during the concession period. A technology-based maintenance system needs to be built to monitor the condition of the infrastructure in real-time.

2.7.6. Transfer (Asset Submission)

After the concession period, the transfer of ownership and infrastructure management must run smoothly with optimal infrastructure conditions.

2.8. Research Concept Framework

This study uses a quantitative method with literature study, questionnaires, and theory testing through the measurement of research variables. The independent variables (X) Financing (X1), Revenue (X2), and PPP scheme (X3). The bound variable (Y) is a DBFOMT strategy that is attractive to investors in the revitalization of the Bus Stop towards the improvement of BRT TransJakarta Corridor 9 services.

III. RESEARCH METHODOLOGY

The research methodology in this study will adopt a financing approach with case study and survey strategies. This method was chosen to gain a deep understanding of the cooperation process between the government and business entities in the construction of TransJakarta BRT infrastructure with the DBFOMT scheme.

3.1. Case Studies

A case study will be conducted to deeply understand how the Government and Business Entities cooperate through the DBFOMT scheme in the development of TransJakarta BRT infrastructure, including aspects of cost calculation, revenue sharing, challenges faced, and potential obstacles. This research will collect data from relevant projects by involving various parties directly involved in the project.

3.1.1. Case study steps:

1. Identify projects that are relevant to the DBFOMT scheme in the construction of TransJakarta BRT infrastructure. Interviews with related parties, such as the government, business entities, and experts.
   Data analysis related to costs, income, and the distribution of cooperation results.
   1. Primary Data
      Primary data sources obtained from expert/expert validation. Primary data collection uses questionnaires.
   2. Secondary Data
      Secondary data sources obtained from literature studies, scientific journals, papers and previous research related to PPP
      Preparation of questionnaires with questions related to each formulation of research problems.

Data collection from respondents who are selected purposively, namely parties who have experience or knowledge of the DBFOMT scheme.

Data analysis using descriptive statistical techniques to provide a clear picture of respondents' opinions and views.

2. Expert Validation

The expert validation process is carried out to ensure the validity and reliability of the model developed as well as the analysis carried out in the research. Experts invited to provide opinions will involve those who have in-depth experience and understanding related to the PPP and DBFOMT schemes

3.2. Data Analysis

The collected data will be analyzed statistically and qualitatively. Statistical analysis is used to assess quantitative data from surveys, while qualitative analysis is used for data obtained through case studies and in-depth interviews. The results of the analysis will be used to draw conclusions related to the implementation of the DBFOMT scheme in the construction of TransJakarta BRT infrastructure and its potential in attracting investment from the private sector.

3.3. Research Variables

Research variables refer to the attributes or values of people, objects, or activities that have a certain variation in the research. There are five types of variables in the study: Independent Variable (free), Dependent Variable (bound), Moderator Variable, Intervening Variable, Control Variable.

3.3. Analysis Methods

1. RQ1: Descriptive analysis of validated data to form the basis of the cooperation scheme.
2. RQ2: Analysis of financing and receipts to determine the feasibility and usefulness of the DBFOMT strategy.

IV. DATA COLLECTION

1. RQ1 Data Collection:

Data for RQ1 was obtained from the literature and applicable regulations related to PPP with the DBFOMT scheme on the Revitalization of the TransJakarta BRT Corridor 9 Bus Stop. Key data sources include government regulations and related decisions, such as:

1. Decree of the Governor of DKI Jakarta, Ministerial Regulation, and Presidential Regulation on the provision of infrastructure, government cooperation with business entities, and guidelines for the management of regional property.
2. The Governor's Regulation is related to the revitalization of bus stops, the integration of public transportation, and TransJakarta service standards.
3. Ministerial Regulation related to infrastructure financing support and the implementation of government cooperation with business entities.

This data is used to build a strong legal foundation in implementing the DBFOMT scheme.

2. RQ2 Data Collection:

To answer RQ2, data from RQ1 is used as a reference. The financing analysis process in the DBFOMT scheme is carried out by paying attention to planning, construction, operational, and maintenance costs. In addition, the projected revenue from bus stop operations is used to attract investors. Financing is also taken into account using customer data and estimated growth in the number of users, which is expected to increase by 5-10% per year. The bus stop is planned to be able to serve the needs of up to the next 20 years, taking into account the projected increase in the number of customers.

V. SIMULATION RESULTS AND DISCUSSION

V.1. Financing

No.	Uraian	Biaya	Factor Compound Interest	Kooef FCI	Total Biaya
I	**PV(cost)**				
1	Biaya Konstruksi				
	Tahap 1	217.602.985.486	*(P/F,18%,1)	0,8474576	184.409.309.734
	Tahap 2	207.466.220.863	*(P/F,18%,2)	0,7181844	148.999.009.525
					333.408.319.259
2	Biaya Operasional				
	Tahap 1	19.051.948.767	*(P/A,21,07%,1)	0,8259684	15.736.308.554
	Tahap 2	38.103.897.533	*(P/A,21,07%,18)	4,5941425	
			*(P/F,21,07%,1)	0,8259684	144.589.688.740
					160.325.997.294
3	Biaya Perawatan				
	Tahap 1	4.209.615.883	*(P/A,18%,1)	0,8474576	3.567.471.087
	Tahap 2	8.419.231.765	*(P/A,18%,18)	5,2731642	
			*(P/F,18%,1)	0,8474576	37.623.721.802
					41.191.192.889
	Total PV(cost)				**534.925.509.441**

V.2. Income:

Total Annual Revenue: The annual revenue for this project is projected to reach Rp 244,319,807,833. This income comes from various sources.

Source of Income:

1. Sale of Stop Names: Selling the rights to use the name of a bus stop for a specific company or entity.
2. Commercial Area Rental: Rental of space in a bus stop for retail businesses, kiosks, or restaurants.
3. Conventional Advertising: Static advertising such as billboards in bus stop areas.
4. Videotron Ads: Digital ad placement (videotron) for higher revenue.

The projected annual revenue for PPP projects with the DBFOMT scheme on the Revitalization of the TransJakarta BRT Stop Corridor 9 is IDR 244.319.807.833.

Table: Annual Revenue Projections on DBFOMT PPP Project

Source of Income	Revenue Projections (Rp)
Naming Right's	166.500.000.000
Commercial area rental	17.935.307.833
Conventional advertising	2.164.500.000
Videotron Ads	57.720.000.000
Total Revenue	**244.319.807.833**

VI. CONCLUSION

REFERENCES