

## How PPP Approach can be implemented for Jakarta LRT Development: An Unsolicited Proposal for Development of LRT Jakarta

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**Abstract:** PPP scheme has been widely introduced to accelerate the provision of urban transport infrastructure. It is known that Government in developing countries has invited the private sectors to create an unsolicited proposal for the PPP project. Therefore, the private sectors need to gain financial viability in the absence of the Government's support. This paper examines how to develop a proper PPP project while maintaining its benefit for both parties. Two PPP structure options were developed and assessed using the financial viability parameters, such as FIRR and FNPV. This approach ensures that the private sector can recover its investment, operation, and maintenance cost using fare revenue at the least. Moreover, this study also found that the Government's role is still strongly needed, as the urban transport project is one of the Government's projects that requires a huge amount of investment and rarely profitable.

*Keywords:* PPP, PPP Structure, Availability Payment, Financial Viability

### 1 INTRODUCTION

Financing in the transportation infrastructure sector has become one of the biggest challenges experienced by many countries in the last years due to the central Government's shrinking role (Shatkin, 2019). As one of the four pillars of sustainable urban transportation, the development of efficient and long-term funding is essential to meet the city's needs for mass public transport systems, both in investing in new infrastructure procurement and for long-term operation and maintenance of existing systems (Hueskes et al., 2017; Kai & Robert Tiong, 2008; Kennedy et al., 2005). Cooperation between the government and business entities (PPP) has long been part of the urban infrastructure development process; however, an objective and fair method is still needed to assess the involvement of business entities in financing transportation infrastructure (Kennedy et al., 2005).

Public-Private Partnership (PPP) has become a cooperation scheme accepted in many countries in the world (Osei-Kyei & Chan, 2015) as an alternative to developing infrastructure for public services (Hueskes et al., 2017; Silvestre & De Araújo, 2012; Soomro & Zhang, 2016; World Bank, 2017a), in particular, to address the Government's lack of budget and technical inability to provide and manage public infrastructure services effectively (Osei-Kyei, Chan, Dansoh, Ofori-Kuragu, & Owusu, 2018).

PPP is defined explicitly as a long-term contract between the Government and private entities in the provision of services or public assets. The private party bears a significant risk burden and manages responsibility associated with payment remuneration as part of the performance appraisal (World Bank, 2017a). In line with this definition, (Chang & Phang,

2017) explained the Government's role as the leading partner that binds a contract agreement with partners from the private sector, which is generally motivated by the possibility of financing from the private sector. PPP is also defined as forming different strategic alliances, understood as a contractual collaboration between government and business entity organizations to create new benefits for both parties through a joint commitment to the use of resources owned by the business entity (Kivleniece & Quelin, 2018). According to the Indonesian Government, the PPP scheme is defined as cooperation between the government and business entities to provide public service infrastructure upon a set of agreed specifications using partly or wholly business entity's resources regarding the risks between the parties (PERMEN PPN/Bappenas, 2015).

From various definitions, PPP schemes carry similar aspects, such as regulations involving: (1) the roles of the Government and the private sector; (2) the optimal part of the private sector in providing services to the public; (3) a paradigm shift from asset creation orientation to public service-oriented; and (4) transfer of significant risk to the private sector and remuneration of payments in exchange for the private sector's services (Chang & Phang, 2017; Garg & Garg, 2017).

The participation of business entities in the rail-based urban mass public transport sector has developed quite rapidly in the last two decades. Metropolitan cities in Asia, such as Tokyo, Hong Kong, Singapore, and Beijing, have various PPP contract designs according to rail-based public transport development features. For example, for a city with no experience in developing and operating rail-based mass transit systems, the private sector may take part as a partner to provide expertise, reduce operating costs and improve efficiency, as happened in Beijing, Hangzhou and Shenzhen (Chang & Phang, 2017).

PPP projects can be in the form of solicited and unsolicited proposals (Public-Private Infrastructure Advisory Facility, 2014). Solicited projects are initiated by the Government, starting from the identification stage to project transactions, while unsolicited project proposals are by business entities without any invitation from the Government that covers the activity on the project identification to the planning stage (PERMEN PPN/Bappenas, 2015; World Bank, 2017c). The fundamental difference between the two schemes is that the private sector cannot obtain support from the Government in the unsolicited projects, meaning that the project must be financially viable (PERMEN PPN/Bappenas, 2015).

As the common practice in developing countries, research has revealed critical motivation of conducting unsolicited mechanism, such as: (1) to enhance private sector involvement in terms of innovation and creativity; (2) lack of knowledge in public sector side to identify potential projects, (3) investor's interest to involve in high-risk project in remote areas, and (4) rapid implementation of PPP projects development (Hodges & Dellacha, 2007; Osei-Kyei, Chan, Dansoh, Ofori-Kuragu, & Owusu, 2018).

The most crucial issues regarding implementing the unsolicited proposal in the urban transport project are the lack of competition and transparency (Osei-Kyei, Chan, Dansoh, Ofori-Kuragu, & Owusu, 2018; World Bank, 2017b). These issues occur because most unsolicited projects were developed unilaterally by private sectors, which relates to intellectual property rights over the project concept (Hodges & Dellacha, 2007). But, on the other hand, because of the high involvement of private sectors, the project tends to be solely profitable to private parties, potentially resulting in corruption (Osei-Kyei, Chan, Dansoh, Ofori-Kuragu, & Oppong, 2018).

The different motivations between the Government and the private sector in proposing this type of PPP proposal will affect the proposed PPP structure (Delmon, 2010). More often, PPP projects in the urban rail sector are less profitable for the private sector as the proposer due to unconsidered risks during the planning stage (Bray & Sayeg, 2013; Chang & Phang, 2017;

Phang, 2007). Therefore, the structure of this PPP scheme needs to be scrutinized and arranged proportionally to the risks that both parties will bear (Cruz et al., 2015; Phang, 2007; Poliak et al., 2015).

The purpose of this paper is to determine the PPP structure proposed for the unsolicited project by considering the financial viability of the project on the private sector side. This paper is organized in the following order: Section 2 is a methodology that includes the proposed line, financial viability parameters, and availability payment. Section 3 presents the results of the proposed PPP structure, project cost structure, and financial viability for each PPP structure. Finally, section 4 summarizes the research and identifies the directions for further research.

## 2 METHODOLOGY

The unsolicited PPP proposal recommended LRT Corridor 1 Kebayoran Lama-Kelapa Gading stretches 19,5 km from the west to the east part of Jakarta. It connects city centers and strategic areas, like Senayan, Tanah Abang, Bank Indonesia, Kebon Sirih, Senen, Cempaka Putih, and Kelapa Gading. Kebayoran Lama serves as the transfer point of the Serpong line commuter train and Busway corridor 8 to the Lebak Bulus-Harmoni route. On the other side in the eastern part is the Kelapa Gading area known as the mixed-use area, dominated by commercial areas (Mall Kelapa Gading) and housing complexes, apartments, and condominiums that cater to the middle to upper economic class. This location is also suitable for the LRT depot to support its operation.

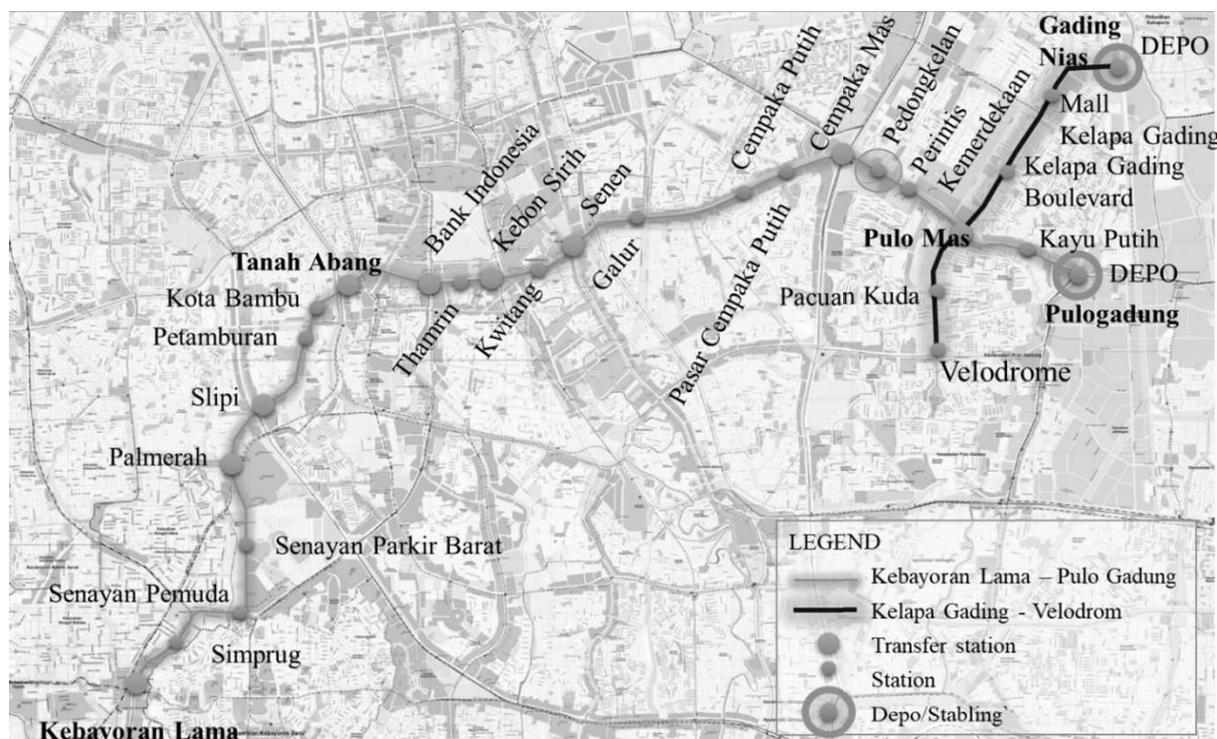


Figure 1 Unsolicited Proposal of LRT Corridor 1 Kebayoran Lama-Kelapa Gading

The target LRT users primarily reside in the western and eastern parts of the city and work in the city center. The lack of proper public transportation capable of accommodating west-east movements is a strong reason for the Provincial Government to prioritize LRT development in this corridor. Integration is also the primary key to support the success of this plan. As shown

on figure above, intermodal integration with other mass transit system will be at Kebayoran Lama, Palmerah, Tanah Abang, Bank Indonesia, Kebon Sirih, Senen, Cempaka Mas, and Pulo Mas.

This corridor is expected to cater to 227.156 daily passengers in 2024, boarding on 23 stations along corridors. It will utilize the existing right-of-way in an elevated structure to minimize the land acquisition and provide current access for users. The headway during peak hour will be at 5 minutes. The system requires 43 train set with a three-car configuration to serves more than 200.000 daily passengers.

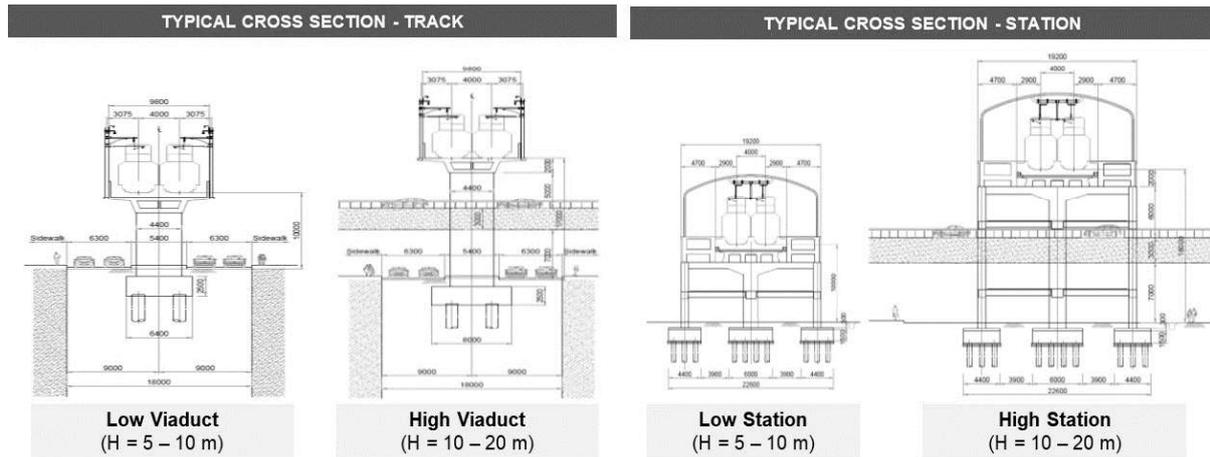


Figure 2 Typical Design of Physical Structure LRT Corridor 1 Kebayoran Lama-Kelapa Gading

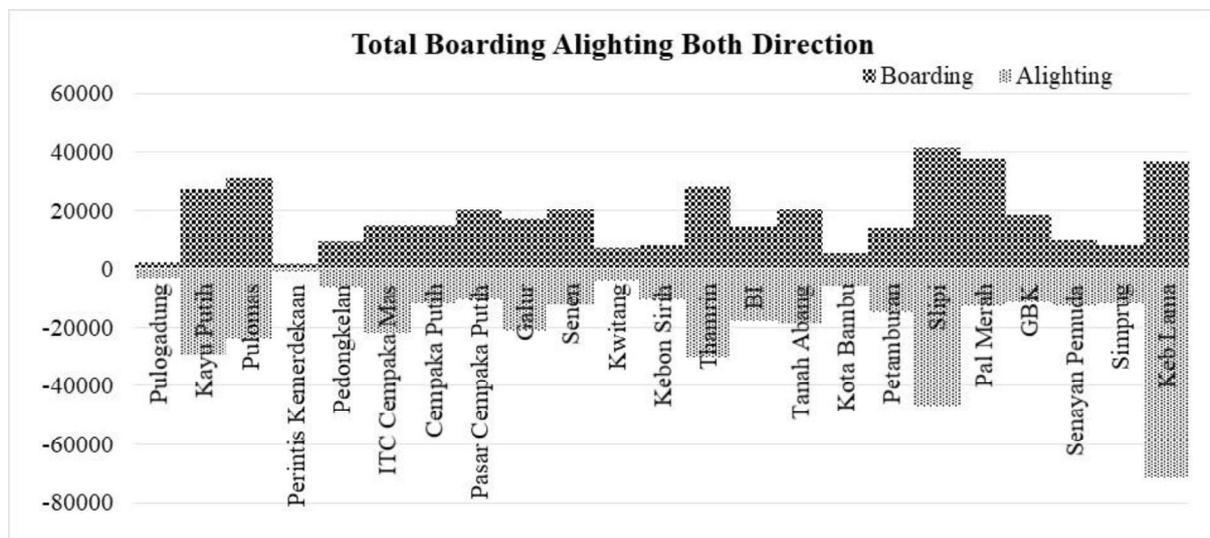


Figure 3 Passenger Boarding Alighting along LRT Corridor in Opening Year 2024

An approach on how the PPP scheme will be implemented in this project is developed using literature research combined with a quantitative method for availability payment determination and the financial analysis, based on FIRR dan FNPV. Those parameters are often used to determine the financial viability of the project. It is analyzed and benchmarked to the standard IRR and NPV for the transport project in Indonesia and then tested and compared based on the proposed PPP structure. In this research, the proposed PPP structure is considered into two alternative options.

## 2.1 Public-Private Partnership (PPP) Structure in Urban Rail Transit System

Much research in seeking an appropriate arrangement of PPP structure in urban rail transit has been widely conducted. (Cruz et al., 2015) has explained the four most typical contractual arrangements for PPP projects in urban light rail system: (1) Design–Build–Finance–Operate; (2) Operation Concessionaire; (3) and (4) Design–Build–Operate–Transfer, which can also include assets maintenance. (Bray & Sayeg, 2013) has formulated five generic models to describe the involvement of business entities in the development of rail-based transportation projects, such as:

- 1) the conventional model in which the Government plays a central role in both financing and operations and does not involve business entities;
- 2) the conventional model in terms of infrastructure provision that the Government is still carrying out, while for operations it involves business entities;
- 3) the business entity as the concession holder will procure a rolling stock investment complete with an electrical and mechanical system as well as operate the system;
- 4) the business entity as the concessionaire carries out the design and builds of permanent infrastructure and operates the system; the Government makes conventional payments for fixed infrastructure to avoid the need to mobilize additional funds needed in terms of providing fixed infrastructure
- 5) Conventional PPP model where funding from business entities is allocated for all infrastructure.

Table 1 General Model for Business Entity Involvement in the Rail-based Urban Transport Sector

Feature	Procurement by Government	Infrastructure Procurement by Government, Operational Concessionaire By Private Entity	Fixed Infrastructure by Government, Rolling Stock and Operational Concessionaire by Private Entity	Financing for Fixed Infrastructure by Government, Rolling Stock, Construction and Operational Concessionaire by Private Entity	Design, Build, Finance, Operate and Transfer
Model	A	B	C	D	E
<b>Construction</b>					
Civil Structure and Trackwork	Business Entity and Government contracting			A consortium of business entity through a performance-based contract with Government	
Rolling stock and Control System	Business Entity and Government contracting		A consortium of business entity through a performance-based contract with Government		
Rolling Stock and Infrastructure Maintenance	Government/through negotiation with other government entities.	Business entity involvement through a performance-based contract with Government			
Ticketing System	Supply contract of fare revenue system and management with third parties				
<b>Finance</b>					

Civil Structure and Trackwork	Financed by Government			Finance by Business Entity, Government pays cost based on concessionaire agreement (payment covers infrastructure investment and OM)	
Mechanical and Electrical Equipment System	Financed by Government			Finance by Business Entity, Government pays cost based on concessionaire agreement (payment covers infrastructure investment and OM)	
Rolling Stock and Infrastructure Maintenance	Financed by Government	The Government pays OM cost based on the concessionaire agreement			
Fare Revenue	Government's revenue	The Government retains fare revenue fewer costs it pays to if used, a third-party operator			
<b>Risk Transfer</b>					
	Limited transfer of risk. The Government retains all operating risk through its ownership of the operator	Some operating risk remains with Government because it supplies all infrastructure. Some patronage risk can be transferred through incentives and penalties.	As for Model B, but the most operating risk can be transferred to the concessionaire because they have more control over assets and service quality	More risk is transferred to the concessionaire than in Model C because the concessionaire can optimize total long-term costs	Transfers a little more risk than Model D but incurs the higher cost of capital

It is recognized that the variation on PPP arrangement are often influenced by various factors, such as risk allocation between parties (Bray & Sayeg, 2013; Cruz et al., 2015; Ferreira Da Cruz & Marques, 2014; Phang, 2007) and scope and complexity of Project (Chang & Phang, 2017; Delmon, 2010; Osei-Kyei, Chan, Dansoh, Ofori-Kuragu, & Owusu, 2018). Therefore, a suitable PPP arrangement should be introduced based on the specific case since there is no such thing as a one-size-fits-all model (Cruz et al., 2015).

## 2.2 Availability Payment

Availability Payment (AP) concession is firstly brought in most toll road projects, basically a binding contract between the government contracting agency and the business entity to provide the public service in return for a periodic payment based on its performance (FHWA, 2015). According to the Indonesian (Presidential Decree Number 38/2015 regarding Public-Private Partnership, 2015), the availability payment is an instrument that can be used to return the investment in public infrastructure provision.

The most common PPP form combined with the availability payment mechanism is Design-Build-Finance-Operate-Maintain (DBFOM), translated to a performance-based ability payment contract. The public service can be available when the infrastructure is adequately delivered; by then, the government contracting agency must pay a certain amount of money periodically for the service available during the operation and maintenance phase based on its performance (FHWA, 2015). The AIAI Association stated the sum of fixed money allocated

for paying the service availability payment (Rohimat, 2020) could be calculated using the following formula:

$$\text{Availability Payment (AP)} = \frac{\text{Capex} + \text{Opex} + \text{ROI}}{\text{AP Return Period}} \quad (1)$$

where,

- AP : the amount of AP annual payment
- Capex : capital expenditure (include capital expenses, financing and life cycle cost)
- Opex : operational and maintenance expenditure
- ROI : the expected return of investment
- AP Return Period : length period of AP

Suppose a condition occurs and affects the availability of services that causes its performance to be below standard. In such cases, the business entity will be subject to a penalty, and the actual AP payment must be reduced by the penalty fee, as shown in the following formula:

$$\text{MAP} = \text{AP} - \text{Penalty} \quad (2)$$

where,

- MAP : the maximum amount of AP annual payment
- AP : AP annual payment based on the contractual agreement
- Penalty : reduction in AP payment due to service unavailability based on penalties criteria on the contractual agreement

### 2.3 Financial Viability Parameters for Unsolicited PPP Proposals

Investors' role is quite heavy in the unsolicited PPP proposal, since it bears almost all risks. Having said earlier that the investor should deliver viable financial feasibility of this project. On the contrary, it is rarely a project in urban rail transit that only relies on the fare revenue (Bray & Sayeg, 2013; Phang, 2007). Therefore, financial viability parameters play an important role in designing a specific PPP model to adapt to the project situation (Cruz et al., 2015).

The parameter used in this research will be represented by Financial Net Present Value (FNPV) and Internal Financial Rate of Return (FIRR) (Rahman et al., 2019). The NPV is a parameter to give a signal to the investor. A positive figure meaning the project gives positive value to the project and, therefore, adds more wealth to the investor. This parameter is one of the most popular and sophisticated economic valuation techniques. It consists of discounting all future project cash flows (both in- and out-flow) with a given discount rate and then summing them together (Ond, 2014), as describes below:

$$\text{FNPV} = \sum_{t=0}^n \frac{\text{NCF}_t}{(1+r)^t} \quad (3)$$

where,

- NPV : Net Present Value
- NCF<sub>t</sub> : Net Cash Flow generated by project in year t
- r : discount rate

An FNPV higher than zero indicates that the forecasted revenues of the project are sufficient to recover its costs (Consult et al., 2012). Furthermore, to represent the minimal return that the IRR shows the investor willing to achieve while the NPV is zero (Setiawan & Surachman, 2015), as describe below:

$$FNPV = \sum_{t=0}^n \frac{NCF_t}{(1+FIRR)^t} = 0 \quad (4)$$

where,

FIRR = discount rate at NPV equals to zero

### 3 RESULT AND DISCUSSION

#### 3.1 Proposed PPP Structure

This unsolicited project proposed two options of PPP structure; those are:

- 1) Option 1: Infrastructure development by the Contracting Agency through the Procurement of Goods and Services, Rolling stock provision by the Business Entity and Implementation of Operation and Maintenance through Public-Private Partnership (PPP) – Operation Concessionaire
- 2) Option 2: Implementation of LRT project through PPP scheme (Design-Build-Finance-Operate-Maintenance) hybrid through Availability Payment

This option was developed considering the regulations in Indonesia, which state that the return on investment of implementing business entities in PPP projects can come from:

- 1) Payments from user charges
- 2) Availability Payment (AP)
- 3) other forms as long as they do not conflict with regulations

Other considerations such as the fiscal capacity of Jakarta's Government and demand risk are also important factors to consider when developing the PPP structure.

##### 3.1.1 Option 1 - Operation Concessionaire

Under Option 1, the contracting agency fully finances infrastructure development through the standard procurement method. At the same time, the business entity will invest infrastructure through the PPP scheme and carry out the operation and maintenance during the PPP period. The return comes from the fare revenue derived from LRT and Non-Farebox Revenue from the asset utilization and rail corridor during the concession period.

Two different procurement schemes for each scope (infrastructure built by the Government and the operation and maintenance by the private sector) bring consequence to align and integrate between infrastructure and operation and develop risk interfacing risk during project preparation, development and operation. Therefore, a system integrator is required to deliver a smooth service.

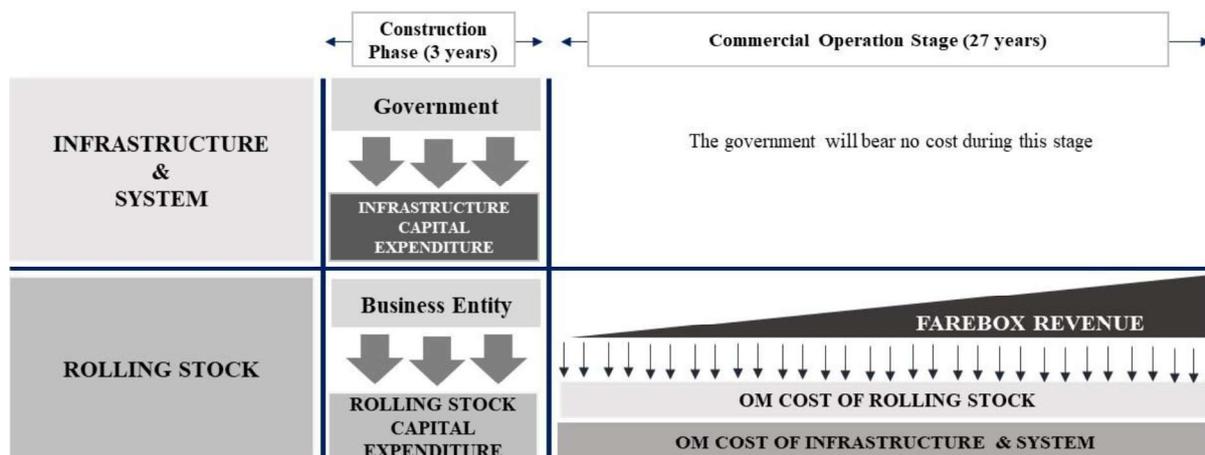


Figure 4. PPP Structure Option 1

As for the OM cost, the Business Entity bears the OM infrastructure costs but does not pay for the Track Access Charge (TAC) for using the rail infrastructure. This scheme implementation will expose the demand risk for the business entity if the demand projection is not achieved.

### 3.1.2 Option 2 – DBFOM Hybrid through Availability Payment

In Option 2, the business entity will provide the infrastructure, rolling stock, and funding for the project. Return on the investment consist of:

- 1) Contracting Agency pays a certain amount of Availability Payment to the business entity for 5 (five) years from the Commercial Operation Date (COD). After that, the Contracting Agency will bear no cost until the end of the concession period. The responsibility for all O&M expenses to operate the LRT system Corridor 1 remains to the business entity.
- 2) Farebox Revenue and Non-Farebox Revenue will be the source of return on investment and O&M cost until the end of the concession period. The business entity will bear demand risk if the demand projection is not achieved.

The AP period is determined only for five years, in contrast to the AP scheme, which is carried out during the concession period. It considers that the longer the AP term, the greater the interest expense throughout the concession period affecting the Government's cash flow. It also impacts the certainty of the investment return of the business entity. The reference interest rate used in this calculation uses a conventional interest rate in the Indonesian market of 11.5% per year.

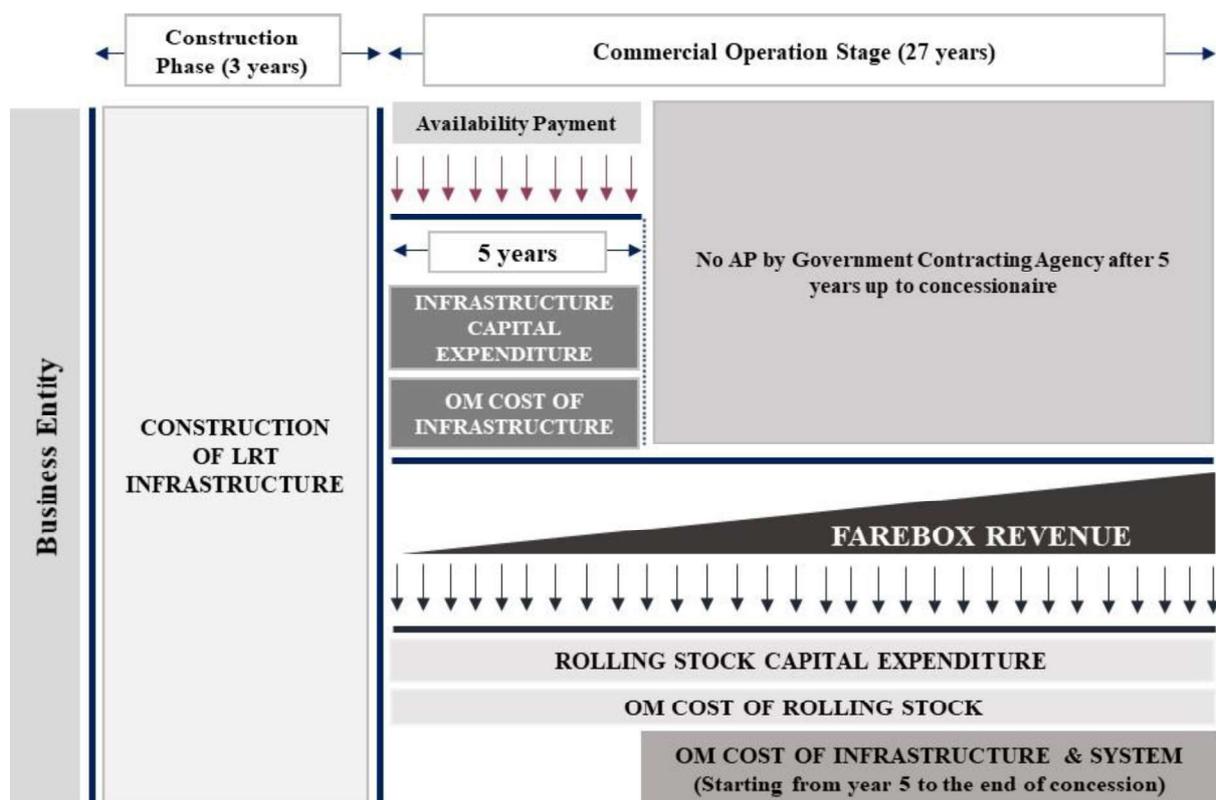


Figure 5. PPP Structure Option 2 for Unsolicited Project of LRT Corridor 1

### 3.2 Investment Cost

The investment cost comprises capital expenditure of infrastructure, system, rolling stock, and other costs. For example, LRT Corridor 1 Kebayoran Lama-Pulo Gadung's total investment cost amounted to IDR 17,6 Trillion, which the civil works component 48% of the total investment cost.

Table 2 Total Investment Cost for LRT Corridor 1

	Investment Component	Infrastructure and System (IDR mil)	Rolling Stock (IDR mil)	Total (IDR mil)
1	Land Acquisition	-	-	
2	Detailed Engineering Design	120.001	-	120.001
3	Civil Works (Structure, Track Work, Stations, Depot)	8.165.666	-	8.165.666
4	Railway System (Train control, Passenger Information, Fare Collection)	1.437.850	-	1.437.850
5	Rolling Stocks	-	2.396.578	2.396.578
6	Construction Supervision	120.001		
7	Escalation (Physical Works)	810.256	179.501	989.757
8	Contingency (Physical Works)	480.176	119.829	600.005
9	Tax	1.110.912	268.971	1.379.884
10	Overhead (Project Management)	240.088	59.914	300.002
	<b>Total Capital Expenditure</b>	<b>12.484.950</b>	<b>3.024.794</b>	<b>15.509.744</b>
11	Financial Cost (Bank Provision. Fees)	227.410	44.876	272.286
12	Interest During Construcion	1.442.139	135.758	1.577.896

<b>Total Investment Cost</b>	<b>14.154.499</b>	<b>3.205.428</b>	<b>17.359.927</b>
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### 3.3 Operation and Maintenance Cost

OM costs for unsolicited projects consist of the OM cost of infrastructure and system. Option 1 will be borne entirely by the business entity from the beginning of commercial operation until the concession period. The value of OM cost of rolling stock in 2024 is projected at IDR 156 billion, which will increase every year, reaching IDR 476 billion in 2050. In comparison, the OM cost of infrastructure and system has amounted to IDR 291 billion and will increase, reaching IDR 744 billion by 2050. The value of OM cost during the PPP period is shown in the following figure.

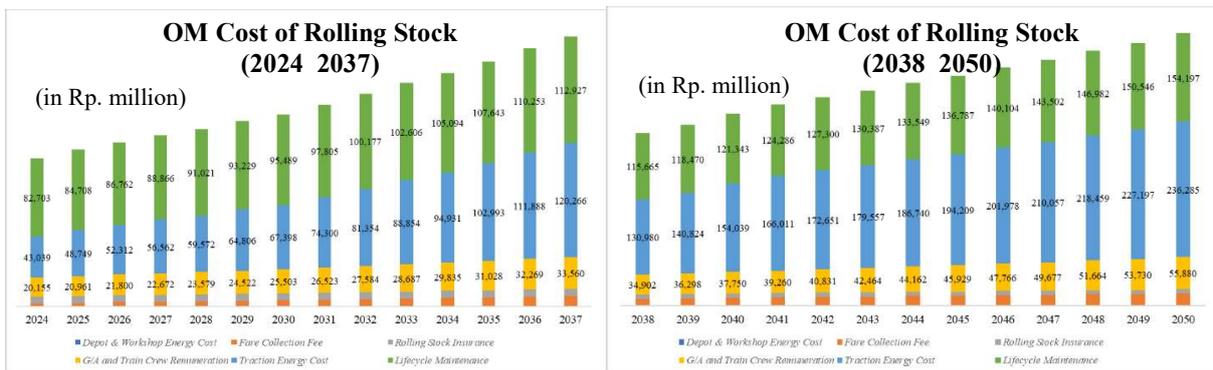


Figure 6. Projection of Rolling Stock OM Cost for LRT Corridor 1 (2024-2050)

Based on the figure above, the largest components of OM costs at the beginning of operation are lifecycle maintenance (50%) and traction energy costs (30%). For the following years, the portion of traction energy cost will be significant, along with the increase in ridership and operating rolling stock to serve the ridership. The growth of OM cost of infrastructure is shown in Figure 5.

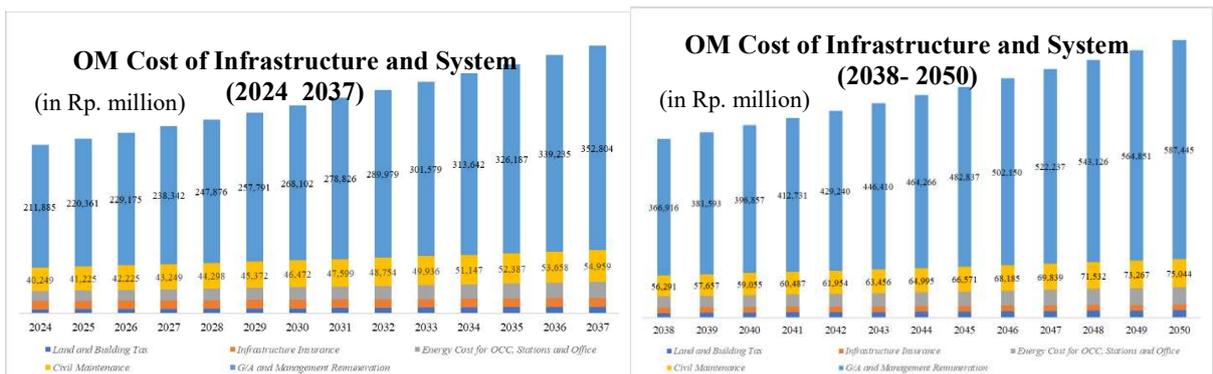


Figure 7. Projection of Infrastructure and System OM Cost for LRT Corridor 1 (2024-2050)

Based on the picture above, the O&M cost of infrastructure and system administration costs and employee salaries (> 70% of the total OPEX Infrastructure costs) will be significant. Meanwhile, the business entity does not pay the Track Access Charge (TAC) to the Government since it has borne all the OM cost of infrastructure and system during the concession period.

### 3.4 Fare Revenue

The only source of unsolicited project revenue is ticket fare. As for conservative reasons, the non-farebox revenue is assumed to be non-existent. The basic fare for Corridor 1 LRT is charged at IDR 1,000 / km in 2019 or equals IDR 1,170 / km in 2024. With an average distance of 8.5 km for people traveling, the passenger fare is IDR 9.944 / passenger at the start of commercial operations (2024) and is adjusted accordingly every two years at 8%.

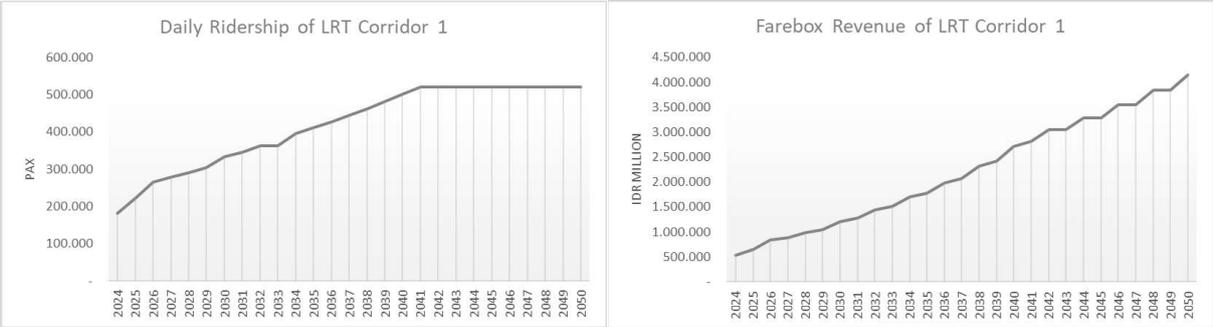


Figure 8. Daily Ridership and Farebox Revenue for LRT Corridor 1 (2024 – 2050)

### 3.5 Financial Analysis

As for further analysis, the result of the financial analysis is indicated in the following table.

Table 3 Financial Feasibility Comparison between Options of PPP Structure

Indicator	Option 1: Operation Concessionaire	Option 2: DBFOM
FIRR	15,77%	17,62%
FNPV	IDR 1,68 Trillion	IDR 2,31 Trillion

Based on the information above, the FIRR for option 1 and option 2 are higher than the WACC (11,25%) and both FNPV shows positive values. Therefore, it means that both options are feasible to implement. Furthermore, comparing both options shows that the FIRR and the FNPV for option 2 are higher than option 1.

Some considerations to consider to select the best option for unsolicited PPP structure regarding this case is on the amount of the budget allocated by the Contracting Agency, the advantage, and disadvantage of both options. As in Option 1, the Contracting agency should allocate IDR 4,16 Trillion/year, lower than in Option 2, whereas the Contracting agency should allocate IDR 6,42 Trillion/year. As a result, there is a difference of IDR 6 trillion compared to the AP amount within five years of the AP period in option 2. Moreover, the Contracting Agency will bear more risk of planning, funding, construction, and infrastructure integration. However, the contracting agency should still allocate more budget to procure the consultancy service related to infrastructure and system integration design.

While in option 2, the Contracting Agency should allocate IDR 6,42 Trillion/year for the Availability Payment budget and disburse the payment to the business entity based on the service delivery performance. This budget allocation is larger than option 1. On the other hand, the Contracting Agency will not bear the risk of construction as well as the consequences on financing cost and loan interest as bundling package of the unsolicited PPP proposals, and more risks exposure to the business entity. Table 4 describes both options' advantages and disadvantages from the Government Contracting Agency's point of view.

Table 4 The Advantage and Disadvantage of Option 1 and 2

	<b>Option 1: Operation Concessionaire</b>	<b>Option 2: DBFOM</b>
The advantage for Government Contracting Agency (GCA)	<ul style="list-style-type: none"> <li>• Demand risk is transferred to the business entity</li> <li>• O&amp;M cost for infrastructure is transferred to the business entity</li> </ul>	<ul style="list-style-type: none"> <li>• Construction risk transferred to the business entity</li> <li>• AP is disbursed concerning a minimum service standard agreement</li> <li>• Demand risk is transferred to the business entity</li> </ul>
The disadvantage for Government Contracting Agency (GCA)	<ul style="list-style-type: none"> <li>• Risk regarding planning, financing, construction, and infrastructure integration born by GCA</li> <li>• Needs to procure consultancy regarding infrastructure construction and system integrator</li> </ul>	<ul style="list-style-type: none"> <li>• Financing cost and interest consequently transferred to GCA</li> <li>• Operational and maintenance cost is born by GCA during AP period</li> </ul>

#### 4 CONCLUSION AND FURTHER RESEARCH

The urban rail transit project in Jakarta has been developed using the unsolicited PPP approach to attract business entities to involve in the public infrastructure provision (Hodges & Dellacha, 2007). As the unsolicited method requires a financially viable proposal from the business entity, the FIRR and FNPV are significant parameters to calculate the business entity's financial risk in a particular infrastructure project (Singh et al., 2019).

Two options of PPP structure have been proposed. Those are through a combination of government procurement on fixed infrastructure and operation concessionaire and DBFOM hybrid through availability payment. The DBFOM option brings FIRR and FNPV higher than other options, but it requires a significant budget allocated for the availability payment.

The similarity between both options regarding the proposed PPP structure is that the business entity will bear the demand risk, which also occurs when implementing PPP schemes in other countries (Bray & Sayeg, 2013). This risk should be appropriately addressed to ensure public service delivery as well as to encourage more interest in the business entity to involve in urban rail transit system development, which usually requires a huge investment, heavy risks, and less profitable (Bray & Sayeg, 2013; Chang & Phang, 2017; Phang, 2007).

Since the unsolicited PPP market is still limited in Indonesia, the Government needs to seek and evaluate proper PPP structure by identifying service and infrastructure to set the private sector roles. The thorough process to find the most realistic option of PPP structure is still on progress by examining many aspects related to the specific project, both technical and non-technical aspects. There is a tendency that the PPP structure that will be chosen is Option 1 (Operation Concessionaire) with the consideration that the amount of budget that needs to be provided by the Government is less than Option 2. Moreover, the selected PPP structure will influence the contractual arrangement. It should address the intention in urban rail transit development and the government policy by considering the long duration of the contract (Bray & Sayeg, 2013).

Further research is required to solve some limitations in this paper. For example, it may vary from the risk identification on the unsolicited project and transferred from the Government

to the private sector. Therefore, the risk analysis and assessment should be performed to define the most realistic PPP structure. Moreover, non-farebox revenues development and its policy to support the project feasibility should be created as one of the key successes to the unsolicited proposal for the PPP project, which may trigger more private sector investment attractiveness in the provision of urban transport infrastructure.

## 5 ACKNOWLEDGMENTS

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