Redevelopment Bus Terminal based on Sustainable Transportation, Study Case: Kampung Melayu Terminal in Jakarta

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Abstract. This research shows a study related to sustainable economic aspects in a bus terminal. This research is also based on the background of the increasing interest of the people of Jakarta related to the use of public transportation. This continues to the need for government anticipation related to the design that can accommodate the needs of the use of public transportation by the community. Seeing that, arises the problem of facilities and management on the terminal site in general. Departing from that problem, there needs to be a fundamental answer, namely the existence of investment from cooperation between the government and the private sector related to the development of terminal sustainability. Therefore, this research will discuss the feasibility study of investing in the terminal in order to get the highest profit to be able to support the quality of the terminal. This is also supported by government discourse related to cooperation programs with the private sector related to and terminal development. This research was conducted with interviews, observations, and quantitative calculation analysis related to terminal development investment. After analyzing the sustainable economic aspects, it will be concluded that the variables that form the basis and benchmarks in the terminal design later.

Keywords: sustainable economic, bus terminal, investment, sustainable transportation

1. Introduction
Public transportation has become more and more popular for Jakarta people. An example can be seen in rail commuter passengers that increase year by year until now. The average number of Jakarta Commuter Line passengers reached 94,824 people per day during month of July 2019 (as reported by megapolitan.kompas.com, 2019). This situation also faced by public bus (Transjakarta) passengers. The governor said that the number of passenger has almost doubled to 640 thousand passengers per day. The number of fleets has also increased, from 2,380 units in 2017 to 3,548 units in 2019. [1]

Seeing to the increase of passengers and the interests of Jakarta people to use public transportation, it is necessary to anticipate by providing a convenient and safe transportation facilities, such as bus terminal. Actually, Jakarta has many bus terminals spread in the city, however many of them were built many years ago and out of date. The apperance of this terminal seem that could not facing modern transportation model, it built when Jakarta tranportation still served by small public car whereas now Jakarta should used bigger public car. Moreover, many terminals condition are low in quality to serve
many people, it doesn’t have waiting room, toilet, not accesible for disable passenger and proper bus/car pathway. It is not not qualified for supporting the passenger activities as public transportation user, especially safety and comfort factors. One of the terminals in this condition is the Kampung Melayu Terminal. Located in the center of Jakarta, it has been established since the colonial era, but the conditions are very poor. One crucial problem is this Terminal cannot serve with proper facilitites for daily passenger activities, moreover most of the existing buildings are damaged so that in quality they have greatly decreased to support its function as a terminal. This terminal doesn’t have public toilet both for passenger and for driver, no emergency health service rooms, no rest room for driver. The lack and incompleteness of these terminal facilities will adversely affect the safety and comfort of its users. [2]. According to Peraturan Daerah (Local Regulation) No. 5 of 2014 concerning transportation in article 23, it is mentioned that related to the provision of terminal transportation infrastructure facilities, and this is still not found in the conditions in Kampung Melayu Terminal.

Actually, there are various factors that cause this terminal condition to deteriorate, not only because the transportation pattern has changed but also the lack of funds to maintain buildings operation. This problem is certainly also triggered by the limited funds to operate the terminal facilities devoted by the terminal operational that is government in order to manage and especially to maintain the terminal. Behind the sluggish function of this terminal, there is actually a potential given that the terminal's location is very strategic. This situation is very contradictory, the terminal is in a strategic location but seems to be neglected in terms of both function and performance.

The terminal must be built to make it attractive to its users, the city government of Jakarta is certainly easy to build, but later in its operation, public buildings like this are often considered a financial burden, because every year it is budgeted from government finances for management and maintenance costs. However, this budget often decreases later because the allocation of funds changes from year to year. Therefore, it becomes a challenge how the terminal can support itself without receiving funding from the government.

One way is to invite the private sector to collaborate in building and managing terminals within the framework of the Public Private Partnership (PPP). The private sector is involved so that the management of public areas becomes more professional. Refer the Minister of Transportation Budi Karya Sumadi, (as reported by finance.detik.com, 2019) he invited other private parties to take part in the terminal empowerment process, for example inviting retailers who would fill existing shophouses in the terminal. At the same event, Director General of Land Transportation, Budi Setiyadi, said the results of renting terminal shophouses indeed made a large income in addition to building the terminal. [3]

Referring to the program, the private sector here is given the opportunity to be able to jointly with the government to build and manage the existing terminal, so that the funds collected can efficiently overhaul and solve problems related to the clutter of the terminal and in order also to care and manage this terminal for a long time.

One of the indicators of the sustainability of a terminal in the existing literature is the need for commercial and retail areas whose benefits will support and support the sustainability of maintenance costs and the need for terminal facilities so that they are independent for the long term. In this case, the government, as the owner of the land for the terminal operation, invites other parties or partners who will manage and develop this terminal which is also known as the Cooperative Utilization System (Kerja Sama Pemanfaatan / KSP). Understanding the Regulation of the Minister of Finance of the Republic of Indonesia Number 78 of 2014, the KSP aims to utilize the State Property (Barang Milik Negara / BMN) as well as the regions, where this is meant by the site of the Kampung Melayu Terminal. This includes building development and terminal management systems to be better than before and to meet user safety and security standards.
In this design, it provides an overview of what components can be applied to this terminal in order to provide input for the terminal manager to terminal functions. This design is also based on a Sustainable Transportation approach (Todd Litman, 2006), whereas divided into three categories: Economic, Environment and Social Sustainability. Focus on economic sustainability, In context to the Kampung Melayu Terminal development, focus on how commercial and retail areas will support the development and maintenance of terminal facilities during its operational, not only make it is independent for the long term from economic point of view but also meet that terminal standard requirements.

2. The methodology
The research method used is a mixed method between qualitative research and quantitative research. This quantity-related research is analyzed in the calculation process which calculates the investment needs and requirements at the terminal site as well as the aspects that need to be spelled out therein. On the different side, qualitative research is used in the analysis of quality and social aspects and the environment of the terminal site that requires description and explanation as well as the behavior of the subject users.

Data collection methods can be done in various ways such as data collection through interviews with the Kampung Melayu Terminal, namely the management staff, and the terminal head. There is also a field survey conducted through direct observation on the site regarding the indicators that will be used for the analysis process of this study. In addition, there is also a literature study that is by making comparisons using literature studies using research as well as literature and book instructions, journals, and data obtained through various media. The data obtained will be classified as secondary data.

The data that has been collected will be analyzed based on indicators of books and journal literature, as well as through analysis of behavior, sites and buildings. In the existing analysis process, the need for distinguishing variables is made into several alternative choices as research material.

3. Result and Discussion
One indicator of the sustainability of a terminal in the existing literature, namely the need for commercial and retail areas whose profits will support and support the sustainability of maintenance costs and the need for terminal facilities so that they are independent for the long term. In this case, the government as the owner of the land operates the terminal, inviting other parties or partners who will manage and develop this terminal which is also called the Utilization Cooperation System or commonly called in Indonesia as Kerja Sama Pemanfaatan (KSP). Understanding Regulation of the Minister of Finance of the Republic of Indonesia Number 78 Year 2014, KSP aims to utilize State-Owned Property or commonly called in Indonesia as Barang Milik Negara (BMN) as well as regions, where this is meant by Kampung Melayu Terminal site. This includes building and terminal management systems to be better than before and meet user safety and security standards.

The partner carrying out the development needs to analyze the profits from operating results including the costs of rebuilding the terminal, managing and maintaining the terminal. In this context, it is the same as an investment system in which the duration of time follows government directives, namely quoting Peraturan Menteri Keuangan Republik Indonesia (Regulation of the Minister of Finance of the Republic of Indonesia) No. 78 of 2014 article 67, which is for 50 years. Therefore, in the process of empowerment and development, there needs to be economic movement in the terminal, which is also seen through the rental of billboard boards, parking fees, and rental of retail or commercial areas, as well as various other aspects that will bring income or profit. Seeing that, this benefit is obtained through revenue results reduced by terminal daily expenses. This benefit will also be used for terminal development and maintenance needs in the future.

3.1 Site Data
Kampung Melayu Terminal is located on Jl. Jatinegara Timur No.105, Bali Mester, Jatinegara District, East Jakarta City, Special Capital Region of Jakarta with an area of 3,339.9 m² with status as type C terminal.

- Site area: 3,339.9 m²
- Building Coverage Ratio (BCR): 40%
- Floor Area Ratio (FAR): 1.6
- Building Ratio: 4
- Green Area Ratio: 30%
- Basement Area Ratio: 55%

### 3.2 Revenue of leasing retail / commercial space

In the process of running the daily activities of a terminal, it is necessary to invest in involving investors who have the right to make an economic turnaround in the terminal by establishing retail / commercial space leases that will generate income which is also useful for the sustainability and sustainability of the terminal for a long period of time. Therefore it is necessary to have a basic area which is determined from the results of the alternative assumptions for calculating the area to produce the highest income.

### 3.3 Revenue of billboard rent

Reviewing the data provided by one of the Sinergi Media advertising agencies, the billboard installation rates vary. At this terminal site, the LED advertisement type was chosen, namely Rp. 2,000,000 / m² / month. The choice of this type of billboard is determined based on a review of the types of billboards in general transportation facilities, one of which is Gambir Station which also uses the same type of billboard.

### 3.4 Revenue of motorcycle and car parking

According to the results of site observations, the motorbike and car parking object has a high intensity of interest by motor vehicle users so that this is an indicator of revenue. The calculation is calculated from the maximum number of slots obtained compared to occupancy, operating hours, and calculation of hourly payments.

### 3.5 Revenue of BTS (Base Transceiver Station) rooftop tower rent

Another source of income is the rental of BTS, where this antenna can be placed at the very top of the building. From the results of data collection according to ATS Communication (PT. Asia Teknologi Solusi), BTS tower rental prices vary. However, for downtown areas such as Jakarta, the price is Rp. 48,000,000 / year.

### 3.6 Total monthly income

In calculating income, there are various creative business ideas that can be used as a source of revenue (revenue stream) which also supports and supports the daily activities of a building. Therefore, in the case of Kampung Melayu Terminal, it is necessary to have some analysis of income calculations, where the main income of the terminal comes from leasing retail or commercial space in order to maintain the sustainability and economic sustainability of the terminal. In addition, the main income also comes from rental of billboard space. Other supporting additional income is taken from vehicle parking rental, as well as space rental for Base Transceiver Station (BTS) needs.

### 3.7 PPP (Public Private Partnership) contribution cost

Contribution fee in the process of running the PPP is the amount of funds that must be paid by the KSP partner to the government on the basis of having utilized and utilized the land owned by the government. This fee is usually paid annually to be deposited in the state general cash account and is paid no later than March 31 of each year. The percentage of the variable for calculating the KSP cost is 2%, which is generally applied to the KSP implementation process. The amount of the land price is taken in
accordance with the Sales Value of the Tax Object (Nilai Jual Objek Pajak / NJOP) of the site of Rp. 18,423,000 with a site area of 3,339.9 m².

3.8 Maintenance cost
Service fees are obtained from the results of an overview of generally maintained public buildings, which also include electricity, water, and other facility maintenance costs.

3.9 Management Salary
According to data and reviews at the terminal office, the manager's salary is calculated based on the number of staff who are not paid by the government, because several other staff have been included in the calculation of the budget for funds from the government that pays monthly salaries. This non-government paid staff includes cleaning staff and security staff. To achieve a building quality that is maintained and clean for a long period of time, the number of cleaning staff is determined based on the total area of the building that needs to be maintained through cleaning divided by the capacity of the cleaning staff for each m² which is also broken down into 2 working shifts. In the process of calculating the manager's salary, it is also necessary to calculate the holiday allowance, which is added to the calculation of expenses per month so that the cash flow continues to adjust to the monthly calculation unit.

3.10 Total monthly expenditure
Daily expenses to support the sustainability and maintenance of a public area, especially in the context of the Kampung Melayu Terminal, are mostly generated by KSP contribution cost, Maintenance cost, and Management Salary.

3.11 Construction budget cost
The development budget is one of the variables that need to be calculated in the framework of the investment process at the terminal. This amount will later become a benchmark that will be included in the calculation of investment profit based on the duration of the investment period.
In this calculation, it is still rough without the addition of several indicators such as taxes and other formal expenditure calculations, where this calculation aims as a benchmark for a feasibility study.
The terminal development budget assumption includes the assumption of construction costs where each level (floor) tends to have a different unit price per m² which adapts to the general needs and specifications of terminal buildings that meet feasibility standards, such as the standard specifications for reinforced concrete with 80 × 80 cm ceramic. There is also the calculation of Interset During Construction (IDC), which is one of the considerations for the inflation rate during the duration of project implementation. In addition, the assumption is added to other costs including salaries for staff managing internal management during the construction process, which is assumed to be 10 people per month which costs a total staff salary of IDR 60,000,000, and the assumption of a construction process for 24 months plus the calculation. 2 months for 13th salary allowances each year, as well as other assumptions such as taxes, and other calculations.
### Economic scenario alternatives

The various variables calculated in previous analyzes, these can also be replaced according to needs and specifications for certain purposes, for example, to achieve greater income, additional retail area is required.

However, in selecting existing alternatives, it is necessary to pay attention to considerations of various aspects, such as paying attention to the design aspects that will be produced must be in accordance with the variable areas of the alternatives that have been selected, so that they can adjust to site conditions as well as the results of analysis of observations and data collection.

In analyzing this income calculation, it is also necessary to present alternatives in order to achieve the highest and best use objectives, where the selected variables are determined to be several alternatives so that through this study it can be concluded which alternative variables are appropriate to the context of the Kampung Melayu Terminal.

#### Table 1. Table of Bus Terminal development budget

| Classification                        | vol | unit | per unit price (Rp) | total (Rp)     |
|---------------------------------------|-----|------|---------------------|----------------|
| A Construction budget cost assumption |     |      |                     |                |
| Basement construction                 | 1836.9 | m²  | 4.000.000           | Rp  7.347.600.000 |
| 1st floor construction                | 1335.9 | m²  | 5.500.000           | Rp  7.347.450.000 |
| 2nd floor construction                | 1335.9 | m²  | 5.500.000           | Rp  7.347.450.000 |
| 3rd floor construction                | 1335.9 | m²  | 5.500.000           | Rp  7.347.450.000 |
| 4th floor construction                | 1335.9 | m²  | 5.500.000           | Rp  7.347.450.000 |
| Landscaping construction              | 2003.9 | m²  | 1.000.000           | Rp  2.003.900.000 |
| Total                                 | 9184.4 | m²  |                     | Rp  38.741.300.000 |
| B Interest During Construction (IDC)  |    |      |                     | Rp  3.874.130.000 |
| Total                                 |    |      |                     | Rp  3.874.130.000 |
| C Miscellaneous expense               |    |      |                     | Rp  3.060.000.000 |
| Management Salary (eta. 10 people)    | 26 month | Rp  | 60.000.000          | Rp  1.560.000.000 |
| Others (tax, etc)                     | 1   | Rp   | 1.500.000.000      | Rp  1.500.000.000 |
| Total                                 |    |      |                     | Rp  3.060.000.000 |
| **Total, A, B, and C**                |    |      |                     | Rp  45.675.430.000 |
Figure 2. Table of Economic scenario

| Variable | 1 | 2 | 3 | 4 | 5 |
|----------|---|---|---|---|---|
| Income   |   |   |   |   |   |
| Retail leasing area (m²) | 1500 | 1750 | 2000 | 2250 | 2500 |
| Retail rental price /m² | Rp 100.000 | Rp 100.000 | Rp 150.000 | Rp 150.000 | Rp 150.000 |
| Revenue of retail rental | Rp 150.000.000 | Rp 175.000.000 | Rp 300.000.000 | Rp 337.500.000 | Rp 375.000.000 |
| Billboard area (m²) | 128,8 | 160,8 | 192,8 | 202,4 | 208,8 |
| Billboard rental price /m² | Rp 2.000.000 | Rp 2.000.000 | Rp 2.000.000 | Rp 2.000.000 | Rp 2.000.000 |
| Revenue of billboard rental | Rp 257.600.000 | Rp 321.600.000 | Rp 385.600.000 | Rp 404.800.000 | Rp 417.600.000 |
| Revenue of motorcycle parking | Rp 153.576.000 | Rp 155.576.000 | Rp 145.800.000 | Rp 153.576.000 | Rp 153.576.000 |
| Revenue of car parking | Rp 3.456.000 | Rp 3.456.000 | Rp 3.456.000 | Rp 3.456.000 | Rp 3.456.000 |
| BTS tower rental | Rp 4.000.000 | Rp 4.000.000 | Rp 4.000.000 | Rp 4.000.000 | Rp 4.000.000 |
| TOTAL MONTHLY INCOME | Rp 568.632.000 | Rp 657.632.000 | Rp 838.856.000 | Rp 903.332.000 | Rp 953.632.000 |

Expenditure

| KSP contribution cost | Rp 102.551.630 | Rp 102.551.630 | Rp 102.551.630 | Rp 102.551.630 | Rp 102.551.630 |
| Building total area (m²) | Rp 918.4 | Rp 918.4 | Rp 918.4 | Rp 918.4 | Rp 918.4 |
| Total maintenance cost | Rp 183.688.000 | Rp 229.610.000 | Rp 275.532.000 | Rp 275.532.000 | Rp 275.532.000 |
| Management salary | Rp 186.550.000 | Rp 186.550.000 | Rp 186.550.000 | Rp 186.550.000 | Rp 186.550.000 |
| TOTAL MONTHLY EXPENDITURE | Rp 472.789.630 | Rp 518.711.630 | Rp 564.633.630 | Rp 564.633.630 | Rp 564.633.630 |

Profit

| Total income - Total expenditure | Rp 95.842.370 | Rp 138.920.370 | Rp 274.222.170 | Rp 338.699.370 | Rp 388.998.370 |
| Variable contribution cost (5%) | Rp 4.792.120 | Rp 6.946.019 | Rp 13.711.119 | Rp 16.934.919 | Rp 19.449.919 |
| TOTAL MONTHLY PROFIT | Rp 91.050.252 | Rp 131.974.352 | Rp 260.511.252 | Rp 321.763.452 | Rp 369.548.452 |

Annual profit

| Monthly profit x 12 month | Rp 1.092.603.018 | Rp 1.583.692.218 | Rp 3.126.135.018 | Rp 3.861.161.418 | Rp 4.434.581.418 |

| Anggaran |   |   |   |   |   |
|-----------|---|---|---|---|---|
| Basement area (m²) | 1836.9 | 1836.9 | 1836.9 | 1836.9 | 1836.9 |
| Basement construction cost /m² | Rp 3.500.000 | Rp 3.750.000 | Rp 4.000.000 | Rp 4.250.000 | Rp 4.250.000 |
| Total basement construction cost | Rp 6.429.150.000 | Rp 6.888.375.000 | Rp 7.347.600.000 | Rp 7.806.825.000 | Rp 7.806.825.000 |
| 1st - 4th floor area (m²) | 3.433.6 | 3.433.6 | 3.433.6 | 3.433.6 | 3.433.6 |
| 1st - 4th floor construction cost /m² | Rp 4.500.000 | Rp 5.000.000 | Rp 5.500.000 | Rp 5.750.000 | Rp 5.750.000 |
| Total 1st - 4th floor construction cost | Rp 24.046.200.000 | Rp 26.718.000.000 | Rp 29.389.800.000 | Rp 30.725.700.000 | Rp 30.725.700.000 |
| Landscape area (m²) | 2003.9 | 2003.9 | 2003.9 | 2003.9 | 2003.9 |
| Landscape construction cost /m² | Rp 1.000.000 | Rp 1.000.000 | Rp 1.000.000 | Rp 1.000.000 | Rp 1.000.000 |
| Total landscape construction cost | Rp 2.003.900.000 | Rp 2.003.900.000 | Rp 2.003.900.000 | Rp 2.003.900.000 | Rp 2.003.900.000 |
| Building construction cost | Rp 32.479.250.000 | Rp 35.610.275.000 | Rp 38.741.300.000 | Rp 40.536.425.000 | Rp 40.536.425.000 |
| IDC 10% | Rp 3.247.925.000 | Rp 3.561.027.500 | Rp 3.874.130.000 | Rp 4.053.642.500 | Rp 4.053.642.500 |
| Misc. | Rp 3.060.000.000 | Rp 3.060.000.000 | Rp 3.060.000.000 | Rp 3.060.000.000 | Rp 3.060.000.000 |
| TOTAL CONSTRUCTION COST | Rp 38.787.175.000 | Rp 42.231.302.500 | Rp 45.675.430.000 | Rp 47.650.067.500 | Rp 47.650.067.500 |

| Return on capital duration | Total years | 35.50 | 26.67 | 14.61 | 12.34 | 10.75 |

4. Conclusion

Terminal planning based on Sustainable Transportation is closely related to various fields and aspects of sustainability such as economic sustainability, social sustainability, and environmental sustainability. It is also used as a benchmark indicator in research, design, and decision making related to the terminal plan itself.

In terms of design in the view of Sustainable Economic, retail areas need to be considered, namely in the context of Kampung Melayu Terminal requires a minimum area of 1750 m² to achieve maximum benefit or in percentage of 24.3% of the existing terminal building area. Another indicator that is considered is the area of the billboard required is a minimum of 160 m² or 2.2% of the building area. To achieve maximum profits, revenue from parking requires a parking area of 30% of the site area, as well as the addition of creative business ideas by adding BTS antennas at the top of the building for rent to become another source of income every time.

KSP contribution costs that need to be paid must also be 2% of the land price according to the existing NJOP. To achieve sustainability of buildings that are well-maintained and get good attention is to add a minimum service cost or maintenance cost of Rp. 25,000 for each m³ area and require cleaning staff with an index standard of 2 persons (into 2 shifts) to serve an area of 500 m³ cleaning.
In the construction process, it is necessary to pay attention to the amount of the budget spent for its relevance to the building specifications. To achieve quality according to existing standards, the amount of budget needed is the construction cost per m² of Rp 5,500,000 to Rp 6,000,000 and for outdoor space is Rp 1,000,000 for each m².

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