Highest and Best Use for Mall's Motorcycle Parking Area Surabaya

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Abstract— **Property growth for residence, office building, and other uses is increasingly higher. This results in the development plan for a land that can change along with changes in its surroundings. Therefore, an analysis is needed to determine the utilization of land so that it can produce alternative properties with the highest income and land value. This research uses the Highest and Best Use (HBU) method to analyze Tunjungan Plaza parking area to the best and highest use of a land which was originally a parking lot. This research begins with an analysis of land development trends around the location and the respondent/stakeholders analysis through questionnaire and interview techniques to formulate which type of property and development that will be analyzed by the Highest and Best Use method. From the results from the identification of alternative land uses, five alternative developments using the mixed-use building consisting of apartment-hotel and office-apartment systems were obtained. From the results of the analysis conducted, the highest value of land productivity was obtained by developing land with mixeduse building system which consists apartment (50%) - hotels (50%) that gives enhancement the land value of Rp. 463.051.849, - / m2 or an increase of 1.267,25 % from before development was conducted.**

Keywords—**Maximum Productivity, Land Value, Highest and Best Use (HBU).**

I. INTRODUCTION

PROPERTY growth for residence, office building, and other uses is increasingly higher. This results in the development plan for a land that can change along with changes in its surroundings. Therefore, an analysis is needed to determine the utilization of land so that it can produce alternative properties with the highest income and land value

Such as vacant land in Tunjungan Plaza motorcycle parking area at 39 Embong Malang street, Kedungdoro, Tegalsari, Surabaya. This land is currently used for the Tunjungan Plaza Mall motorcycle parking lot with an area of 11,945 m2. But as the development around the area, the value of land continues to increase resulting in the current use of the land is not necessarily its best choice. Furthermore, its location in the central business of Surabaya makes this land potential to become a commercial building. Therefore, a deeper analysis is needed to formulate the type of property that is best for the land.

One of the assessment analyzes is using the Highest and Best Use method. Highest and Best Use (HBU) is an analysis of the best and highest use of a vacant land, land under development, or land that is considered empty. This HBU analysis is one method of land valuation that is very useful in considering land use that is suitable and has the highest value. The concept of valuing this method is to get the highest and best value from a property that is legally permitted, physically possible, and financially acceptable.

II. METHOD

This research use highest and best use analysis to formulate the best land use in the Tunjungan Plaza motorcycle parking area at 39 Embong Malang Street, Surabaya. Data obtained from various sources are processed using several assessments including: Determination of alternative properties, estimates of land values so that they can be analyzed by the HBU method with reviewing the legal, physical, financial and maximum productivity aspects.

A. Alternative Formulation Function Land use

Formulation of possible alternative land functions on land assets at 39 Embong Malang Street, Kedungsari, Tegalsari, Surabaya is derived from land use alternatives based on field observations of similar locations in Surabaya city, and based on respondents' perceptions through questionnaire and interview. Respondents chosen have influence and interest in land development plans, namely land owners, property businesses man, and service user communities.

B. Estimated Value of Market Land

The method use to arrange property value is data comparison similar land/buildings and evaluating the study site (market data approach). The procedure for market data approaches applied to the study area is as follows:
1. Select the appropriate comparison unit, including land price, building price, road class.
2. Calculate the estimated investment, expenditure and income when developing land use.

C. Legal Aspect

The provisions discussed in the legal aspect are follows:
1) Zoning
In this zoning analysis, it is necessary to pay attention to the City Spatial Plan (RTRK) in force by the government so that property does not violate the rules
2) Intensity of Land Use
Each building plan must not exceed the maximum limits set, namely : Building Border Line (GSB), Building Base Coefficient (KDB), Building Floor Coefficient (KLB), Green Area Coefficient and Building Height. From the legal aspect this will provide a maximum capacity for the land that is legally permitted.

D. Physical Aspect

The provisions discussed in the physical aspect are follows:
1) Land Location
Land location is a place where the land is located when viewed from the surrounding environment.
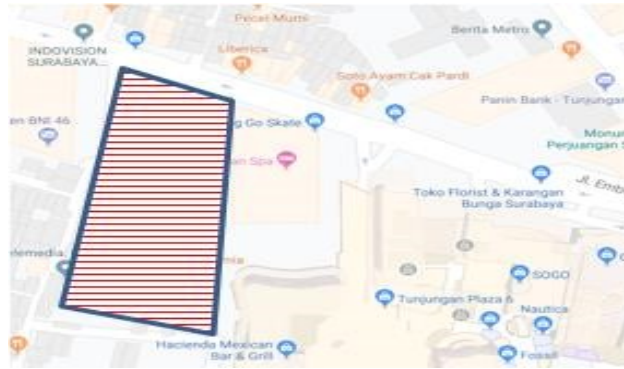
Figure 1. Object Location.

Table 1.
Land Development Intensity

Component	Mixed Use Apartemen, Office, Hotel	
	Provisions	Allowable Area
Building Base Coefficient (Mixed Use) Maximum	50%	5.972,5 m^2
Building Floor Coefficient - KLB	12	143.340 m^2
Green Area Coefficient - KDH	10.00%	1.194,5 m^2
Basement Coefficient	70.00%	8.361,5 m^2/storey
Maximum Basement Floors	3 stories	3 Stories
Maximum Height Of Buildings	≤ 200 m	200 m

Table 2.
Unit Design Planning for Alternative 1

Apartment		Hotel	
Unit Type	Number of Units	Room Type	Number of Rooms
1 BR (52 m^2), 8 Floors	432	Deluxe Twin (48 m^2),11 Floors	253
2 BR (78 m^2), 5 Floors	160	Deluxe King (58 m^2),8 Floors	152
2 BR (86 m^2), 5 Floors	145	Suite Room (92 m^2),3 Floors	36
3 BR (138 m^2), 3 Floors	54	Executive Suite (138 m^2), 2 Floors	16
3 BR Suite (156 m^2), 2 Floors	32		

Table 3.
Unit Design Planning for Alternative 2

Apartment		Hotel	
Unit Type	Number of Units	Room Type	Number of Units
1 BR (50 m^2), 5 Floors	360	Deluxe Twin (48 m^2),11 Floors	360
2 BR (80 m^2), 2 Floors	90	Deluxe King (58 m^2),8 Floors	240
2 BR (90 m^2), 2 Floors	80	Suite Room (92 m^2),3 Floors	80
3 BR (144 m^2), 2 Floors	50	Executive Suite (138 m^2), 2 Floors	25
3 BR Suite (180 m^2), 1 Floors	20		

2) Land Design and Size

Land design is an expression of land design, while the size of the land indicates the length, width and area of the land. The design and size of the land can be used to estimate whether the land is possible or not to be used as an alternative property for land use.

3) Utilities

Utilities are supporting facilities such as the availability of electricity, water, telephone networks, and dirty water disposal. The better the existing public facilities, the better the land use.

4) Accessibility

Accessibility is the ease of a location to be reached by people. Accessibility that is easily accessible, close to the city center, and can be reached from various directions is a strategic location.

E. Financial Aspect

After doing the legal and physical aspects of feasibility, then the financial aspects are carried out. Matters discussed in this analysis are: a. Investment Cost.

Investment costs must be incurred to establish property. These costs represent land costs and building costs. b. Income

Table 4.
Unit Design Planning for Alternative 3

Apartment		Office	
Unit Type	Number of Units	Room Type	Number of Rooms
1 BR (52 m^2), 9 Floors	432	Office U1 (70 m^2)	288
2 BR (78 m^2), 5 Floors	160	Office U2 (140 m^2)	96
2 BR (86 m^2), 5 Floors	145		
3 BR (138 m^2), 3 Floors	54		
3 BR Suite (156 m^2), 2 Floors	32		

Table 5.
Unit Design Planning for Alternative 4

Apartment		Office	
Unit Type	Number of Units	Room Type	Number of Units
1 BR (58 m^2), 9 Floors	180	Office U1 (78 m^2)	768
2 BR (80 m^2), 5 Floors	70	Office U2 (156 m^2)	96
2 BR (86 m^2), 5 Floors	65		
3 BR (140 m^2), 3 Floors	8		
3 BR Suite (160 m^2), 2 Floors	7		

Table 6.
Unit Design Planning for Alternative 5

Apartment		Hotel	
Unit Type	Number of Units	Room Type	Number of Rooms
1 BR (44.5 m^2), 9 Floors	576	Deluxe Twin (48 m^2),11 Floors	198
2 BR (89m^2), 5 Floors	160	Deluxe King (58 m^2),8 Floors	104
2 BR (95 m^2), 5 Floors	150	Suite Room (92 m^2),3 Floors	27
3 BR (150 m^2), 3 Floors	57	Executive Suite (138 m^2), 2 Floors	12
3 BR Suite (178 m^2), 2 Floors	32		

Table 7.
Summary of Return on Capital Analysis

Alternative	Investment Cost (Rp)	NPV	IRR	Discounted Payback Period	Analysis Result
Alternative 1	2,626,785,739,375	1,349,905,646,545	14.14%	18.77	Accepted
Alternative 2	2,615,706,996,079	1,789,426,744,848	15.49%	15.07	Accepted
Alternative 3	2,541,008,949,399	-398,832,193,667	7.17%	> 20	Rejected
Alternative 4	2,446,977,695,647	374,490,514,507	10.29%	19.69	Accepted
Alternative 5	2,652,747,450,897	364,848,854,586	10.35%	19.65	Accepted

Income considers the results acquisition from the establishment of the property. Revenues or receipts on alternative buildings are obtained from the cost of renting a room (for markets, shopping centers and offices), service charges and revenue in terms of parking. The amount of the service charge that charged to the tenants of the room is obtained from comparable data on similar property. c. Expenditure

Expenditure considers the costs and expense that must be incurred to support the course of the property. d. Return on Capital

At this stage will be calculated, the value of NPV, IRR, and Discounted Payback Period to determine the feasibility of the investment, where in this method uses Discounted Cash Flow (DCF) income. The interest rate / MARR (Minimum Attractive Rate of Return) used to discount the difference between incoming and outgoing cash flows is obtained from the calculation of the cost of capital used (WACC). Own capital costs are obtained from the sum of Safe Rate ± Risk Level. The Safe Rate is obtained from the average of several bank deposit rates in Indonesia.

F. Maximum Productivity

The maximum productivity test is based on land values. Land values can be obtained using the land retention method. The value of land per m2 is obtained by calculating the value of the property minus the value of the building divided by land area. Building values are obtained based on the calculation of building investment costs while property

Table 8.
Recapitulation of Land Productivity Analysis

No	Information	Alternative 1	Alternative 2	Alternative 4	Alternative 5
1	Property Value	6,925,054,527,848	7,710,391,037,462	6,248,699,640,832	5,425,029,131,534
2	Building Value	2,190,315,439,375	2,179,236,696,079	2,010,507,395,647	2,216,277,150,897
3	Land Value	4,734,739,088,473	5,531,154,341,383	4,238,192,245,185	3,208,751,980,637
4	Land Value/m^2	396,378,325	463,051,849	354,808,895	268,627,206
5	Initial Land Value/m^2	36,540,000	36,540,000	36,540,000	36,540,000
6	Productivity	1084.78%	1267.25%	971.02%	735.16%

Table 9.
Summary of Financial Aspects and Maximum Productivity

Alternative	Land Value/m2	Productivity	NPV	IRR (%)	Discounted Payback Period
Alternative 1	396,378,325	1084.78%	1,349,905,646,545	14.14	18.77
Alternative 2	463,051,849	1267.25%	1,789,426,744,848	15.49	15.07
Alternative 3	191,912,780	525.21%	-398,832,193,667	7.17	> 20
Alternative 4	354,808,895	971.02%	374,490,514,507	10.29	19.69
Alternative 5	268,627,206	735.16%	364,848,854,586	10.35	19.65

values are obtained using a future income approach that has been discounted to present value. Result and Discussion.

III. RESULT AND DISCUSSION

A. General Description

The location of this research area reviewed is the property asset's PT. Pakuwon at 39 Embong Malang Street, Kedungsari, Tegalsari, Surabaya. The area of the land is 11,945 m2. The condition around the land being reviewed is one of the business centers in Surabaya. There are a lot of business activities and multilevel residential activities making the surrounding land to be commercial area. Existing properties on surrounding land include apartments, office buildings, shopping centers and others.

B. Formulation of Alternative Land Development

Formulation of possible alternative land functions on land assets at 39 Embong Malang Street, Surabaya is derived from land use alternatives based on field observations of similar locations in the Surabaya city, and based on respondents' perceptions through questionnaire and interview. Some parameters in formulating alternative land development include:
1. Propensity of land development around the study site,
2. The tendency of developing mixed use buildings in Surabaya,
3. Stakeholder analysis related to the research field development plan with questionnaire media and weighting methods.

A survey and data collection are done by distributing questionnaires to specified stakeholders. The variables explored in the survey conducted were the opportunities and types of research land development. From the results of the scoring questionnaire filling, determined 5 alternative land uses including alternative 1 : 70% Apartment - 30% Hotel, alternative 2 : 50% Apartment - 50% Hotel, alternative 3 : 70% Apartment - 30% Office Building, alternative 4 : 70% Office Building - 30% Apartmen, alternative 5 : 20% Hotel - 80% Apartment.

The five alternatives will be analyzed and tested legally, physically, financially and productivity in determining the highest and best use of land development.

C. Analysis of Legal Aspects

This analysis relates to whether a property or alternative property that will be developed on a certain area of land is supported or permitted by the provisions of existing regulations. Regulatory provisions in the form of zoning (land allotment), building intensity and provisions regarding General Spatial / Regional Plan (RUTR/W).

1) Zoning (Providing Land)

Research land is located at 39 Embong Malang Street, Tegalsari, Surabaya. Based on Surabaya regulation no. 8 of 2018. The land is located in Tunjungan VI development unit which is included development trade, national/international scale services and high density residential development area.

2) Building Intensity

Limitation related to the land development are guided by Perwali 52 of 2017 concerning technical guidelines for controlling spatial use in the context of building construction in Surabaya city which regulates the technical providing space of zoning and land use intensity. The floor area of the building from the rest of the building border (GSB) is 9,733.75 m2. The maximum basic building coefficient (KDB) requirement is 50%, with an area of 11,945 m2. Consideration of the selection of ground floor area is chosen on the basis of the comparison of the floor area of the building border and the maximum coefficient of the building base. Remaining Land Area GSB

So the remaining land area GSB cannot use for limit of ground floor area because it exceeds the maximum KDB value. Boundary of development intensity that applies to the study area can be seen in the following Table 1.

Based on legal aspect analysis, each requirement will be used as a basis for determining alternative building designs to be erected.

D. Analysis of Physical Aspect

Physical aspect is reviewed based on technical matters related to physical land. Physical aspects analyzed include

location land, accessibility, utility and suitability of dimension land with alternative uses.

1) Location and shape of Land

This research is located area at 39 Embong Malang Street, Kedungsari, Tegalsari, Surabaya. The condition around land being reviewed is one of business in Surabaya. The land is next to Tunjungan Plaza 6 which is one of the biggest malls in Surabaya. The land area of 11.945 m2 is not symmetrical. With a large enough land area, the land has the potential to be used as building with a large enough use of space such as apartment, offices and hotels.

2) Accessibility

The land is located on Jalan Embong Malang which is a one-way primary arterial corridor with a road width of 35 m. The transportation system around the research area includes urban buses, taxis, microbuses and online transportation services. From the observations in the land, the accessibility of the research land is very good.

3) Utilities

Based on observations, the study area has the availability of complete and adequate utilities. Some of the available utilities include clean water channels, drainage networks, electricity, internet network, telephones, and fire prevention.

E. Building Design for Each Alternatives

From the results of the physical and legal aspects analysis, alternative building design planning is carried out from several land development alternatives that have been formulated. This is includes building design in accordance with the requirements of the legal aspects.

1) Alternatve 1

Alternative 1 design consists of a combination from 70% apartment buildings and 30% hotels. Total buildings area in alternative 1 is :

Total Building Area = 5.654 m2/floor x 25 floor = 141.350 m2

On the 1st floor of the apartment and hotel has a function as a lobby, swimming pool, and other public facilities for hotel. . The number of apartment units and hotel rooms can be seen in Table 2.

2) Alternatve 2

Alternative 2 design consists of a combination from 50% apartment buildings and 50% hotels. Total buildings area in alternative 2 is:

Total Building Area = 5.654 m2/floor x 25 floor = 141.350 m2

On the 2nd floor of the building has a function as a lobby, swimming pool, and other public facilities for hotel. On the 14th floor has a function as a lobby, swimming pool, restaurant and public facilities for apartment. The number of apartment units and hotel rooms can be seen in Table 3.

3) Alternative 3

Alternative 3 design consists of a combination from 70% apartment buildings and 30% office building. Total buildings area in alternative 3 is :

Total Building Area = 5.654 m2/floor x 25 floor = 141.350 m2

On the 1st floor of the apartment and office has a function as a lobby, swimming pool, and other public facilities for hotel. . The number of apartment units and hotel rooms can be seen in Table 4.

4) Alternative 4

Alternative 4 design consists of a combination from 30% apartment buildings and 70% office building. Total buildings area in alternative 4 is :

Total Building Area = 5.654 m2/floor x 25 floor = 141.350 m2

On the 1st floor of the apartment and office has a function as a lobby, swimming pool, and other public facilities for hotel. . The number of apartment units and hotel rooms can be seen in Table 5.

5) Alternative 5

Alternative 5 design consists of a combination from 70% apartment buildings and 30% hotels. Total buildings area in alternative 5 is :

Total Building Area = 5.654 m2/floor x 25 floor = 141.350 m2

On the 1st floor of the apartment and hotel has a function as a lobby, swimming pool, and other public facilities for hotel. . The number of apartment units and hotel rooms can be seen in Table 6.

F. Analysis of Financial Aspects

The financial aspects of the study area are used to analyze investment costs, estimated income, expenses and cash flow on the alternatives provided. Then the rate of return on capital from the cash flow will be analyzed in each alternative. Investment costs consist of land costs determined using a market data approach that will be adjusted to the land being reviewed, as well as building costs consisting of construction and non-construction costs.

The project is planned to use a loan capital of 50% with a loan duration of 10 years and a loan interest rate of 9.9% and use own capital of 50% with a safe rate of 4,725 and the risk level is assumed to be the same as the safe rate. Deposit and credit interest rates are obtained from the average interest rates of bank in Indonesia, april 2020. Using the WACC approach, a Minimum Attractive Rate of Return (MARR) value of 8.83% was obtained.

From the results of the analysis of financial aspects, Alternative 1, Alternative 2, Alternative 4 and Alternative 5 meet all the required financial criteria.

G. The Maximum Productivity

Alternative that has fulfilled the legal, physical and financial aspect will be analyzed for maximum productivity to formulate development alternatives that have the highest increase in land value. The calculation can be seen in this Table 8.

H. Discussion

The maximum productivity recapitulation table shows the change in land value if the land is developed based on the existing utilization composition in each alternative. Based on the calculation of maximum productivity, alternative 2 with apartment functions scenario is 50% and 50% hotel produce the highest increase in land value of Rp. 463,051,849, - / m2 or an increase of 1,267.25% of the initial land value. In alternative 1 with a 70% apartment function scenario and 30% hotel produce an increase in land value is Rp. 396,378,325 / m2 or an increase is 1,084.78% of the initial land value. A similar condition is shown in Alternative 4 with a 30% apartment function scenario and 70% office building

resulting in an increase in land value is Rp. 354,808,895 / m2 or an increase is 971.02% of the initial land value. Whereas in alternative 5 with 80% apartment function scenario and a 20% hotel scenario results in an increase in land value is Rp. 268,627,206 / m2 or an increase 735.16% of the initial land value. In alternative 3 with a 30% apartment function scenario and 70% office building not shown in the maximum productivity recapitulation because the alternative does not meet the requirements of one of the aspects analyzed, namely the financial aspect. However, the alternative still provides an increase in land value of Rp. 191,912,780 / m2 or an increase of 525.21% of the initial land value. This can be shown in the following Table 9.

From the results of the analysis of maximum productivity, the value of land productivity will increase along with the increase in hotel functions in a combination of mixed use building. In addition, the value of land productivity will decrease when the composition of the allotment of apartments is increased. This is largely influenced by the low occupancy rate of apartment rentals in Surabaya. In addition, the composition of the allotment of hotels in alternative 1, alternative 2 and alternative 5, produces a significant productivity contribution.

IV. CONCLUSION

Based on the observations of development trends around the research area and identification of land development trends in the Surabaya city, it is known that the most dominant functions used are offices, hotels, apartments and malls. The results of interviews and questionnaires conducted with stakeholders conducted indicate that the use of mixed-use is the most recommended. The recommendation for the development of mixed-use land formulated include:

1. Alternative 1: 70% Apartments - 30% Hotels
2. Alternative 2: 50% Apartments - 50% Hotels
3. Alternative 3: 70% Apartments - 30% Offices
4. Alternative 4: 70% Office Buildings - 30% Apartments
5. Alternative 5: 20% Hotels - 80% Apartments

The building is planned by taking into account the limits of the intensity of land development that has been regulated by Perwali number 52 of 2017. The shape and location of the land makes it possible to utilize buildings in a combination of apartment-office buildings as well as a combination of hotel and apartment buildings. Accessibility, and utilities on the land is very good, and adequate for the sustainability of building user activities. From the results of the analysis of the financial aspects, land development in alternative 1, alternative 2, alternative 4, and alternative 5 meet financial criteria. The best results from the financial aspect are the second alternative which has an investment cost of Rp 2,615,706,996,079, - and has an NPV value of Rp 1,789,426,744,848, - with an IRR value of 15.49% and a Discounted Payback Period of 15,07 years. After testing the maximum productivity, it is known that alternative 2 with the composition of the development of Apartments 50% and Hotels 50%, has the highest productivity of Rp. 463.051849,/ m2 or an increase of 1,267.25% from before the development was carried out. In the development of land consisting of apartment-hotel functions, hotel functions provide value generating significant revenue contributions.

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