

# Risk Analysis of Licensing and Land Acquisition on Project Performance of Transit Oriented Development / TOD Tanjung Barat

Novie Yocient<sup>1</sup>, Nunung Widyaningsih<sup>2</sup>, Bambang Purwoko K.B.<sup>3</sup>

<sup>1</sup>Magister Teknik Sipil, Universitas Mercu Buana, Jakarta, Indonesia

<sup>2</sup>Magister Teknik Sipil, Universitas Mercu Buana, Jakarta, Indonesia

<sup>3</sup>Magister Teknik Sipil, Universitas Mercu Buana, Jakarta, Indonesia

Corresponding Author: Novie Yocient

## ABSTRACT

The Tanjung Barat TOD project is a development that combines residential areas with transportation facilities. The traffic jam and transportation problems are occurring due to the high level of community activity from utilization of land which is not accompanied by good access. The number of community movements in using transportation modes, the majority of which are using private transportation, is increasing. The purpose of this study is to determine and analyze the Risk of Licensing and Land Acquisition that affects the Performance of Transit Oriented Development / TOD Development Project in Tanjung Barat. This study used a random sample method with a total sample of 56 respondents. Data analysis in research was conducted using Partial Least Square (PLS) which is a variant-based choice method of the Structural Equation Modeling (SEM) method. The result of this study is that the Risk of Licensing and the Risk of Land Acquisition has an effect on Project Performance.

**Keywords:** TOD, Licensing Risk, Land Acquisition Risk, Project Performance, Structural Equation Modeling (SEM).

## PRELIMINARY

Transportation is one of the problems in big cities such as road congestion, traffic jam, mileage and others. The current transportation problems are related to the use of land patterns, because land of patterns has an important role in

determining the activities and the movements of the community. This condition is resulting in congestion and ineffectiveness between community activities and the available accessibility because the relationship between land use patterns and the choice of accessibility for transportation modes is very close. The design system, which can integrate the development of transportation modes with the use of land around the modes of transportation, is needed. The design system that integrates the mode of transportation with the use of the surrounding land is known as the concept Transit Oriented Development (TOD).

Dependence on private vehicles tends to increase in big cities in Indonesia. This will have a negative impact on the environment. Based on the application of TOD in several big cities, it shows a decrease in dependence on private vehicles, because of the fast, cheap, and easy option to reach the destination just by walking, using public transportation, people do not have to bother looking for a parking space, paying high parking fees, operating costs which is high anyway.

The Transit Oriented Development concept is a restructuring of the city development concept that focuses on transit facilities such as train stations and Bus Rapid Transit as mass transportation facilities for commuters in the United States. This project became the basis for the

formation of the theory of Transit Oriented Development by Calthrope 1980.

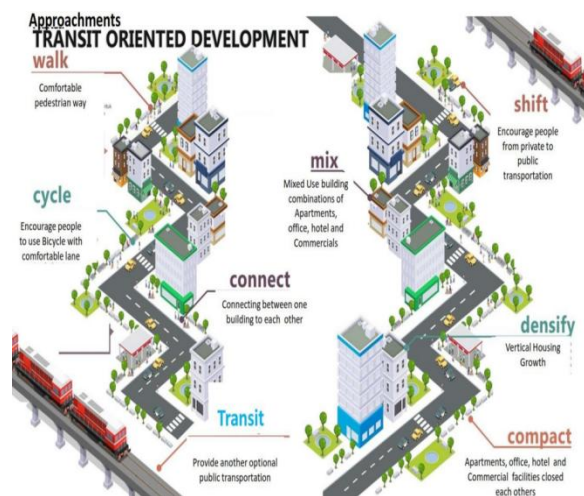


Image 1. Conceptual TOD  
Source by Calthrope 1980

The concept of Transit Oriented Development (TOD) was popularized by Petrus Calthrope in the 1980s. Transit Oriented Development is defined as a concept that uses a mixed-use space pattern that encourages people to live close to transit services and reduces people's dependence on driving. The characteristics of an area built with the general TOD concept are as follows:

- Development combines residential areas with various socio-economic categories, offices, shops, and commercial housing (apartments / hotels).
- Ideally it is built on land owned or under the authority of an institution that manages / operates mass transport services.
- The existence of incentives, promotions, encouragement, and even subsidies provided by mass transport management agencies and (local) governments.

The implementation of the TOD Tanjung Barat Project Development, there are problems related to the permits and land acquisition which have an impact on delays in the completion of the Project or Work according to the contract that is not in accordance with the Cost and Time offered.

Based on the background of Problem, a research was conducted aiming at :

1. Knowing the effect of Licensing Risk on Time and Costs considered in the implementation of the Tanjung Barat TOD project.
2. Knowing the effect of Land Acquisition Risk on Time and Cost Performance in the Tanjung Barat TOD Project.

## LITERATURE REVIEW

### Risk

Risk is the possibility of a bad result or an adverse effect, which cannot be guaranteed one hundred percent that the bad result can be avoided every time, unless the activities that contain risks are not carried out (Darmawi, 2005).

Risk is the effect of uncertainty on the target (ISO 31000: 2018), Effects Deviation from what is expected such as positive, negative, or both, and can be related to creating or generating opportunities and threats. Uncertainty of circumstances and conditions of lack of information related to understanding or knowledge of an event will cause consequences or possibilities that will occur. Goals can have different aspects and categories and can be applied at multiple levels.

### RBS (Risk Breakdown Structure)

RBS (Risk Breakdown Structure) is a risk grouping in a hierarchical organizational risk composition that is logical, systematic, and structured according to the organizational or project structure. The objectives of implementing the RBS are clarity of risk stakeholders or increased understanding of organizational or project risks in the context of a logical and systematic framework. The RBS development process is an activity that is very useful for conducting an overview of these areas of concern and potential.

### Qualitative Risk Analysis

Qualitative analysis and risk management is the process of assessing the impact and likelihood of an identified risk. This process is carried out by compiling risks based on their effect on project objective. This analysis is one of the ways of determining how important it is to pay attention to certain risks using qualitative techniques consisting of several ways (PMI, 2008), i.e.:

- **Possible risks**

Estimating the risks that might occur is done by investigating each risk, specifically, the risk that will occur. Estimating the impact of a risk that will occur by investigating the potential impacts that will occur. Every risk that has been identified must be assessed how it occurs and how the impact will be if the risk occurs.

- **Likelihood and impact matrix**

Risk information with high, medium, or low priorities can also be contained in a matrix. These categories can also be distinguished by their respective colors.

- **Risk data quality assessment**

Qualitative risk analysis requires accurate and objective data to achieve reliable results. Analysis of qualitative data is a technique for risk management.

- **Risk Categorization**

The risks in a project can be classified based on the original risk documents, any areas in the project that are affected, or other useful categories to define which parts of the project have an impact due to uncertainty.

### Quantitative Risk Analysis

Quantitative analysis is the process of numerically analyzing the probability of each risk and its consequences for project objectives (Santosa, 2009). Methods that can be used in risk analysis with quantitative techniques (PMI, 2008), i.e:

- Interviewing (Wawancara)
- Probability distributions
- Expert judgement

### RESEARCH METHODS

In this study using a quantitative approach, the method of collecting data in accordance with the actual situation, as well as presenting and analyzing so that it can provide a clear figure of the object study. The purpose of study is to identify and analyze the risks of licensing and land acquisition on the time and cost performance of the Tanjung Barat Transit Oriented Development / TOD Development Project.

The variables contained in this study consist of two independent variables (X) and two dependent variables (Y). The independent variables contained in this research are work safety behavior, namely the risk of licensing (X1) and the risk of land acquisition (X2), while the independent variables are time performance (Y1) and cost performance (Y2).

Data analysis in this study used Partial Least Square (PLS) where this type of analysis is an alternative method based on variants of the Structural Equation Modeling (SEM) method. The PLS method has its own advantages compared to the CB-SEM method because the sample size is not too large, ranging from 30-100 and the data must not have a normal multivariate distribution (Ghozali, 2006). PLS SEM (Partial Least Square Structural Equation Modeling) research is a research used for multivariate statistical techniques that can handle many response variables as well as explanatory variables at once. This analysis is a good alternative for the method of multiple regression analysis and principal component regression, because this method is more robust or immune. Robust means that the model parameters do not change much when a new sample is taken from the total population (Geladi and Kowalski, 1986).

## Location of Research

This research is located at the Transit Oriented Development / TOD Tanjung Barat which is carried out by PT BA

## Research Samples

The sample that was determined as the subject in the research including the stakeholders of infrastructure project stakeholders who had a direct relationship and were able to have a direct impact on the implementation process of the Tanjung Barat Transit Oriented Development / TOD development project.

Therefore, the source of information in this study is key persons in construction activities in the TOD Tanjung Barat project and the respondents who are intended as samples, i.e:

- Project Manager (PM)
- Site Engineering Manager (SEM)
- Site Operational Manager (SOM)
- Site Administration Manager (SAM)

The population is determined as the subject in this study includes the stakeholders who have a direct relationship and are able to have a direct impact in the project implementation process, which is focused on :

- Main Contractor
- Planning / Supervisory Consultants
- Project Owner

The number of samples used in this study amounted to 56 respondents / construction workers.

## Type of Data

The objectives of the research needed in this study are:

### 1. Primary Data

The data obtained from respondents of construction workers at the Tanjung Barat Transit Oriented Development Project implemented by PT ABS by distributing questionnaires and conducting direct interviews.

## 2. Secondary Data

The data obtained from general project data and literature and media related to the object under study.

## ANALYSIS AND DISCUSSION

### Evaluation of the Measurement Model

The evaluation of the research model is carried out using the outer model and inner model testing. Outer model, which is the initial stage, is an evaluation of the measurement model which aims to measuring the validity and reliability of the research model to be tested.

This test aims to assessing whether the research model is valid and reliable with the measurement model parameters of the convergent validity test by taking into account the loading factor and AVE values, the discriminant validity test by taking into account the AVE root value and its correlation with the latent variable and the cross loading value. While the parameter measurement model is the reliability test by taking into account the results of the Cronbach alpha value and composite reliability (R) as the prediction model parameters.

### Convergent Validity Test

Convergent validity test is performed to examine whether the variables of a construct have a high correlation. In accordance with the rule of thumb used in this study, the measurement parameter is the loading factor value greater than 0.7 and AVE greater than 0.5. The test results using SmartPLS produce the loading factor value in the model path diagram image and the following table.

Based on the result of outer loading shown on the table 1. it can be concluded that all indicators in this research have the value of loading factor more than 0,7 which means that those indicators are considered valid. The next stage is conducting a test using measurement parameter average variance extracted (AVE) >0,5.

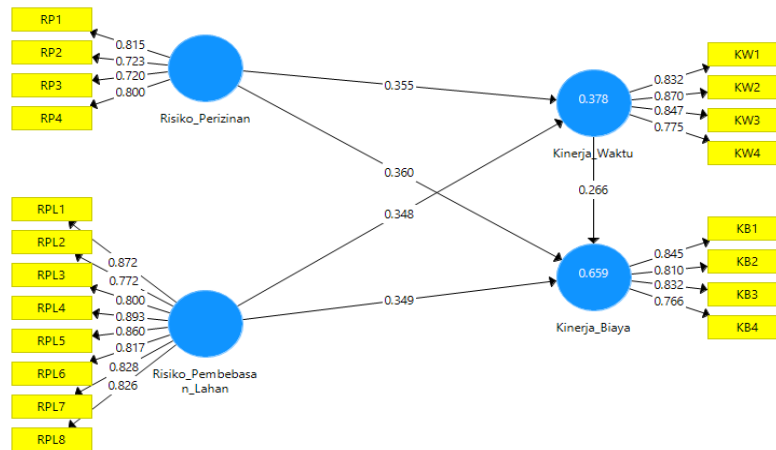


Image 2. Research Model Path Diagram After Calculate  
(Source. Analysis Results, 2020)

Table 1. Loading Factor

	Cost Performance	Time Performance	Land Acquisition Risk	Licensing Risk
CP1	0.845			
CP2	0.810			
CP3	0.832			
CP4	0.766			
TP1		0.832		
TP2		0.870		
TP3		0.847		
TP4		0.775		
LAR1			0.872	
LAR2			0.772	
LAR3			0.800	
LAR4			0.893	
LAR5			0.860	
LAR6			0.817	
LAR7			0.828	
LAR8			0.826	
LR1				0.815
LR2				0.723
LR3				0.720
LR4				0.800

(Source. Analysis Results, 2020)

Table 2. Averages Variance Extracted (AVE)

	Composite Reliability	Average Variance Extracted (AVE)
CP	0.887	0.662
TP	0.900	0.692
LAR	0.948	0.696
LR	0.850	0.586

(Source: Analysis Results,2020)

Table 2 shows the values of Composite Reliability (CR) and Average Variance Extracted (AVE).

A variable is considered to have a valid indicator if the AVE value is > 0.5. Meanwhile, a variable is considered to have a reliable indicator if the CR value is > 0.7. Based on table 4.10, all variables have an AVE value > 0.5, which means that all variables in this study are considered to

have valid indicators. Based on table 2 it can be seen that all variables have a CR value > 0.7 which means that all of the research variables are considered to have reliable indicators.

### Reliability Test

Reliability testing is carried out to measure the internal consistency of the measuring instrument. There are two measurement methods, namely: first with the Cronbach alpha (CA) method and the second with the composite reliability (CR) method as a parameter of the prediction model. To meet the reliability test, the value of Cronbach alpha (CA) and composite reliability (CR) must have > 0.7.

Table 3. Cronbach Alpha

	Cronbach's Alfa
Cost Performance	0.830
Time Performance	0.851
Land Acquisition Risk	0.937
Licensing Risk	0.763

(Source: Analysis Results, 2020)

The test results contained in table 3, the Cronbach alpha value for all variables in this study using the SmartPLS application is more than 0.7. Meanwhile, the value of composite reliability for all constructs has a value above 0.7. So that from the results obtained from the above test it can be said that all constructs in the model pass the reliability test.

### Evaluation of the Measurement Model

Evaluation of the measurement model discusses the inner model. R-Squares are categorized into 3 categories,  $0.19 < R^2 < 0.32$  as the weak category,  $0.33 < R^2 < 0.67$  as the moderate category, and  $R^2 > 0.67$  as the strong category. Table 4 below is the estimation result of R-Squares.

**Table 4. R-Squares**

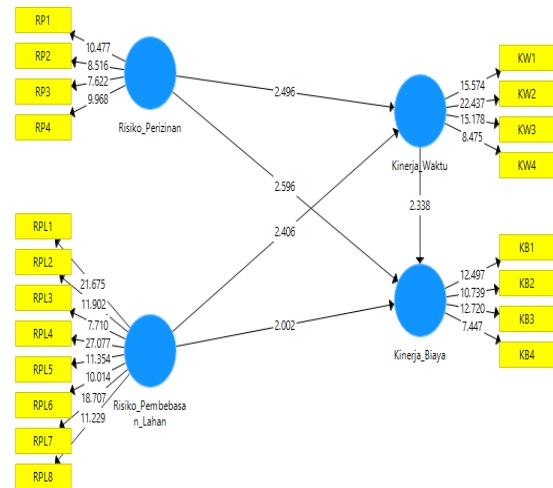
	R Square	R Square Adjusted
Cost Performance	0.659	0.639
Time Performance	0.378	0.355

(Source. Analysis Results, 2020)

Based on the R-Square value above, it can be seen that the results of the R-Square value on the cost performance variable of 0.659 are in the strong category. This means that the licensing risk and land acquisition risk variables have an effect of 65.9% on time performance, while the remaining 34.1% is influenced by other factors. The cost performance variable of 0.378 is included in the moderate category. This means that the licensing risk, land acquisition risk and time performance have an influence on the cost performance of 37.8%, while the remaining 62.2% is influenced by other factors.

### Hypothesis Test

The next stage is to evaluate the t-statistics value of each path to see the significance between constructs. Predictiveness, can be obtained by conducting bootstrapping to obtain stability from the estimation. Bootstrapping is resampling, PLS uses bootstrapping to determine the value of t-statistics so that the level of significance value of the t-statistics value can be found out. The recommended value of T-statistics must be above 1.96 for a two-tailed hypothesis at 5% alpha. This research uses the two tailed hypothesis method.



**Image 3. Research Model Path Diagram After Bootstrapping**  
(Source. Analysis Results, 2020)

Based on the T-statistics column, all variables have a value above 1.96 according to the rule of thumb established in this study. This means that all hypotheses are accepted because they have a score above 1.96.

**Table 5. Path Coefficient Results**

	T Statistics ( O/STDEV)	P Values
TP → CP	2.338	0.020
LAR → CP	2.002	0.046
LAR → TP	2.406	0.016
LR → CP	2.596	0.010
LR → TP	2.496	0.013

(Source: Analysis Results, 2020)

Based on table 5 it can be concluded that all hypotheses are accepted, i.e:

- The licensing risk variable has an influence on time performance, it can be seen from the T-statistics value of 2.496 ( $> 1.96$  for the two-tailed hypothesis).
- The licensing risk variable has an influence on cost performance, it can be seen from the T-statistics value of 2.596 ( $> 1.96$  for the two-tailed hypothesis).
- The risk variable of land acquisition has an influence on time performance, it can be seen from the T-statistics value of 2.406 ( $> 1.96$  for the two-tailed hypothesis).
- The risk variable of land acquisition has an influence on cost performance, it can be seen from the T-statistics value of 2.002 ( $> 1.96$  for the two-tailed hypothesis).

2.002 (> 1.96 for the two-tailed hypothesis).

- The time performance variable has an influence on cost performance, it can be seen from the T-statistics value of 2.338 (> 1.96 for the two-tailed hypothesis).

### **The Effect of Licensing Risk on Time Performance**

The first hypothesis test shows that there is an influence of the licensing risk variable on time performance and has a second major influence which can be seen from the analysis of the T-statistics value of 2.496. The results of the above research indicate that time performance is affected by licensing risk. The fact of the research results above is in line with the opinion expressed by the respondents which stated that the project could be completed on time if the project work permit had been issued by the government. Reforming laws for the development of TOD and financing through LVC (Land Value Capture).

### **Effect of Land Acquisition Risk on Time Performance**

The second hypothesis test shows that there is an influence of the variable risk of land acquisition on time performance and has a number one big influence which can be seen from the analysis of the T-statistics value of 2.596. The results of the above research indicate that time performance is affected by licensing risk. The fact of the research results above is in line with the opinion expressed by the respondents which stated that the project could be completed on time if the land acquisition by PT. BA according to plan. Embedding the TOD concept in the RTRW (Regional Spatial Plan) RDTR (Detailed Spatial Plan).

### **The Effect of Licensing Risk on Cost Performance**

The third hypothesis test shows that there is an influence of the licensing risk variable on cost performance with the results of the analysis of the T-statistics value of 2.490. The results of the above

research indicate that cost performance is influenced by licensing risk. The fact that the results of the research are in accordance with the opinion expressed by the respondents stated that the project could be completed with the planned budget if the project work permit had been issued by the government and was completed legally. Establishment of guidelines for LVC (Land Value Capture) as a financing tool developed from Permen ATR no. 16 ATR no. 16 ATR no. 16 of 2017.

### **Effect of Exemption Risk on Cost Performance**

The fourth hypothesis test shows that there is an influence of the variable risk of land acquisition on cost performance with the results of the analysis of the T-statistics value of 2.002. The results of the above research indicate that the cost performance is influenced by the risk of land acquisition. The fact of the research results is in accordance with the opinion expressed by the respondents that the land acquisition carried out by PT. BA on land owned by the community is a challenge for project work because that the selling price of land offered by the community can increase. Organizing interactive communication platforms with the community (land owners, residents, business actors) so that TOD can be implemented for the common interest.

### **Effect of Time Performance on Cost Performance**

The fifth hypothesis test shows that there is an effect of time performance variables on cost performance with the results of the analysis of the T-statistics value of 2.228. The results of the above research indicate that cost performance is influenced by time performance. The fact of the results of the research is in accordance with the opinion expressed by the respondents that increasing the time performance of the project that has been planned according to the timeline, the costs incurred are according to the proposal submitted because if there is a delay on the

project it will result in additional costs. Developing a KLB system so that the TDR (Transfer of Development Rights) scheme of the Transfer of Development Rights and land consolidation can be optimized. Changes in land values are strategic resources in the life activities of a city. One of the most basic characteristics of land is that its spatial location is consolidation and its total physical stock is relatively constant (tends to decrease). There is a close relationship between value and location price. Land in a transit / TOD-based area certainly has high accessibility and mobility so that its value will be high.

### Research Hypothesis Results

Based on Figure 4 the final model path diagram after conducting hypothesis testing for variables that affect time and cost performance on the Tanjung Barat Transit Oriented Development / TOD development project:

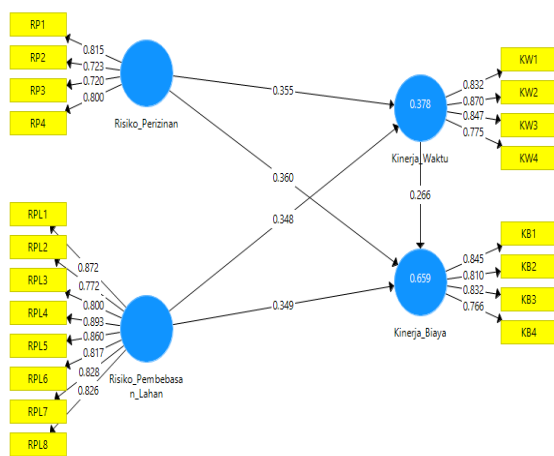


Image 4. Final Model Path Diagram (Source. Analysis Results, 2020)

Based on the results obtained in the research that has been conducted, it can be explained that the first model is a model of the influence of Licensing Risk and Land Acquisition Risk on the Performance of TOD project completion time:

$$\text{Time Performance} = 0.355 \text{ Licensing Risk} + 0.348 \text{ Land Acquisition Risk}$$

The equation model above shows that if the Licensing Risk variable increases

by 1 while the Land Acquisition Risk variable is fixed, it will increase the Time Performance variable by 0.355. If the Land Acquisition Risk variable increases by 1 while the Licensing Risk variable is fixed, it will increase the Time Performance variable by 0.348. Based on the effect, it can be seen that the Land Acquisition Risk variable has the greatest influence on Time Performance. This means that if the TOD project implementer pays close attention to the risks that occur in land acquisition, then the project completion time can be on schedule.

Based on the results of the analysis of the influence model above, it can also be seen that the value of R<sup>2</sup> = 37.8%. This means that the Risk of Licensing and the Risk of Land Acquisition are able to explain the Time Performance of 37.8%, while the remaining 62.2% is explained by other variables not included in the research.

The second model is a model of the effect of Licensing Risk and Land Acquisition Risk on the Cost Performance of TOD project completion:

$$\text{Cost Performance} = 0.360 \text{ Licensing Risk} + 0.349 \text{ Land Acquisition Risk} + 0.266 \text{ Time Performance}$$

The equation model above shows that if the Licensing Risk variable increases by 1 while the Land Acquisition Risk variable is fixed, it will increase the Cost Performance variable by 0.363. If the Land Acquisition Risk variable increases by 1 while the Licensing Risk variable is fixed, it will increase the Cost Performance variable by 0.349. If the Time Performance variable increases by 1 while the Time Performance variable will increase the Cost Performance variable by 0.3266. Based on the effect, it can be seen that the variables of Licensing Risk and Land Acquisition Risk have the same effect on the Cost Performance of the TOD project. This means that if the TOD project implementer pays close attention to the risks that occur in licensing and land acquisition, then the project completion costs can be on time.

Based on the results of the analysis of the influence model above, it can also be



seen that the value of  $R^2 = 65.9\%$ . This means that the Risk of Licensing and the Risk of Land Acquisition are able to explain the Cost Performance of 65.9%, while the remaining 34.1% is explained by other variables not included in the research.

## **CONCLUSIONS AND SUGGESTIONS**

### **CONCLUSIONS**

1. Licensing risk has a positive but insignificant effect on the time performance of the TOD project. However, Licensing Risk still needs to be a concern and adequate anticipation shall be carried out, so that the completion time of the TOD construction project will be in accordance with the contract.
2. Land Acquisition Risk has a positive and significant impact on the time performance of the TOD project. If the Risk of Land Acquisition is well known and adequate anticipation is carried out, the TOD construction project completion time will be in accordance with the contract.
3. Time performance has a positive and significant effect on the cost performance of the TOD project.

### **SUGGESTIONS**

The next research in the future is also expected to be able to add research variables that affect the Time Performance and Cost Performance of Project development by involving other variables.

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