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Analysis of the Role of the TRIZ Model and the TOD Concept of Changes in Urban Mass Transportation toward Comfort of Life (Case Study around Soekarno-Hatta Airport, Tangerang, Banten)

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Abstract: The purpose of this study is to analyze the extent of the role of the TRIZ (Theory of Incentive Solving) Model to the negative impact of gentrification of urban changes around Soekarno Hatta Airport Tangerang, Banten, with the concept of Mixed Use Building and the concept of TOD (Transit Oriented Development) can overcome the comfort of living in the suburbs around Soekarno Hatta Airport Tangerang, Banten, especially the area of 5 sub-districts, namely Benda, Kosambi, Neglasari, Rawabokor, and Teluk Naga sub-districts, where the poorest of the three sub-districts are Pakuhaji, Teluknaga, and Kosambi. there has not been much attention from the academic community, so this is a concern to be used as an object of research. The realization of this development concept usually utilizes existing infrastructure, optimizes the use of Mass Transportation networks and increases Community Mobility at the local level. The TOD concept is applied by combining residential areas, shops, offices, open spaces and public facilities within a comfortable walking distance. . it is known that the adjusted R Square value is 0.704, this means that the simultaneous influence of variables X1 and X2 on variable Y is 70.4%, the remaining 29.6% is influenced by other factors.

Keywords: TRIZ Model, Transit Oriented Development (TOD), Mass Transportation Transportation, and Living Comfort.

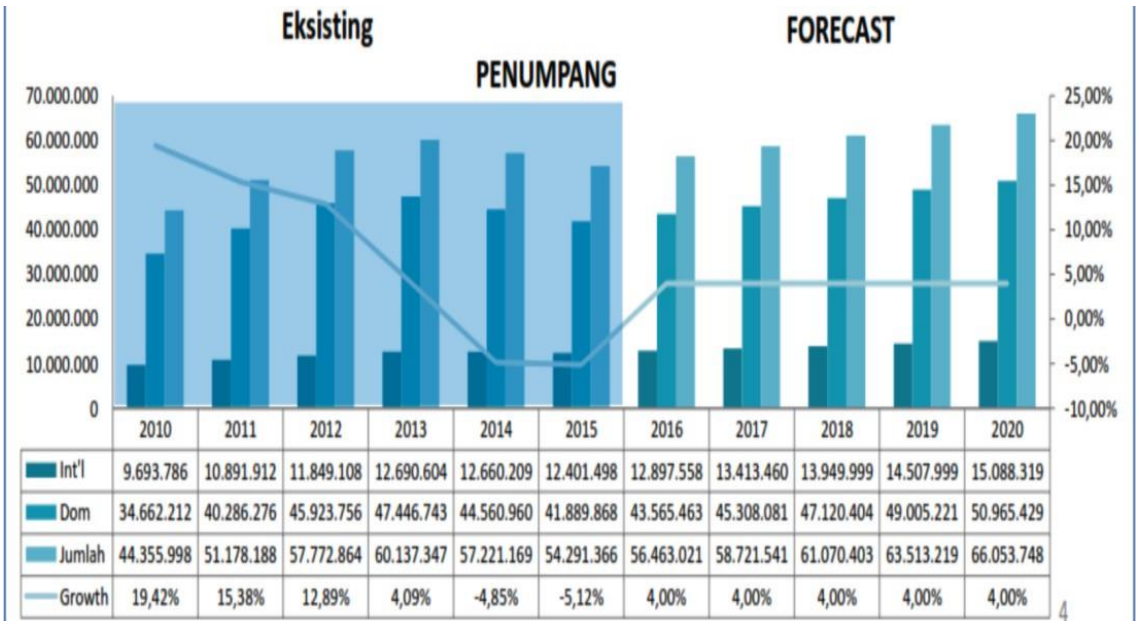
INTRODUCTION

Soekarno-Hatta International Airport (BISH) is currently not only the busiest airport in Indonesia, but has also become the busiest airport in the Asia Pacific region. In 2009, Soekarno-Hatta International Airport with a passenger movement of 37 million was ranked 22nd busiest airport in the world. Based on data from the Airport Council International in February 2011, Soekarno-Hatta International Airport was ranked 13th with a passenger movement of 44 million, surpassing Svarnabhumi Airport in Thailand and Changi in Singapore (Environmental

Impact Analysis (AMDAL) of the Soekarno-Hatta International Airport Development Plan in 2017), Development of the growth of comfort of life in the Tangerang and Jakarta areas (Siwi, 2014) , (Tamin dalam Kusbiantoro, 2007) , (Calthrope, 1993) , (Jambareen, 2011), (Aryanti,W,2019). (Aulia Ariestiarini F,2018),(Knox,1982), (Pu Hao, Richard Sliuzas & Geertan, 2010).

Urban development into a megapolitan, thus increasing economic, social and cultural changes (PP number 15 of 2010 concerning Spatial Planning Organizers) → development of mixed-use areas (Mixed use) Building with the TOD (Transit Oriented Development) concept, a way to solve problems related to Mass Public Transportation and mixed land (Mixed use Building), so it must be rich in activity choices (rich mix of choices), Place making and a compact environment → Negative impact: GENTRIFICATION (Aulia Ariestiarini F,2018),(Knox,1982), (Pu Hao, Richard Sliuzas & Geertan, 2010).

The researcher is interested in "Analyzing the role of the TRIZ Model on the impact of Economy, Social and Culture and Mass Transportation on changes in Soekarno Hatta Airport to urban areas around Tangerang and Jakarta, especially 5 sub-districts, namely Benda, Kosambi, Neglasari, Rawabokor, and Teluk Naga". The results of this study are expected to provide input to Soekarno-Hatta Airport, Tangerang regarding improvements in service quality and can increase the comfort of life for the surrounding community.

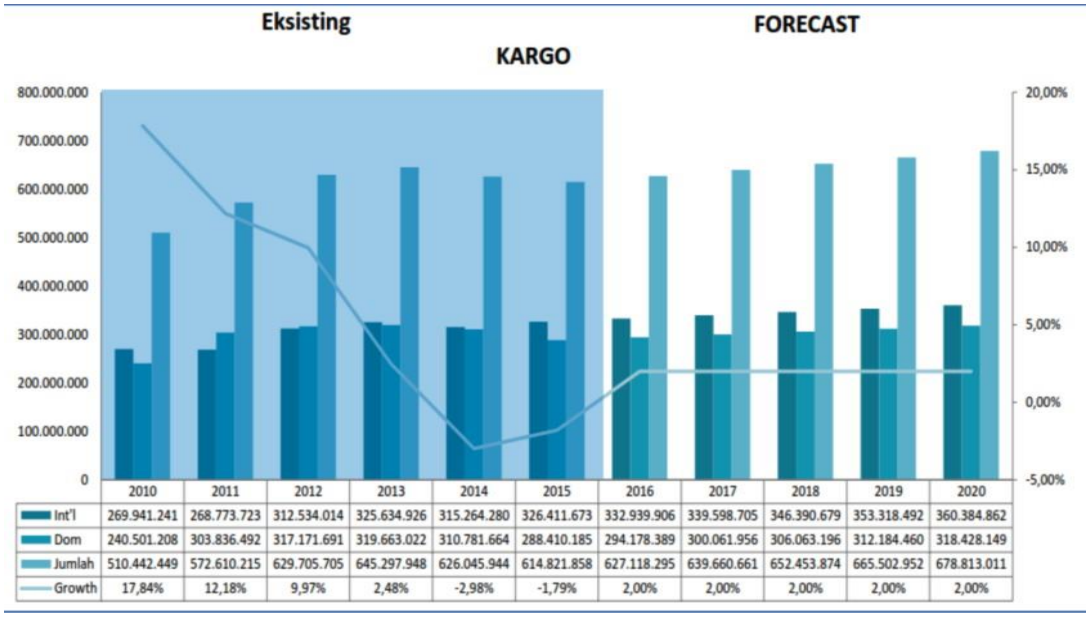


	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Int'l	9.693.786	10.891.912	11.849.108	12.690.604	12.660.209	12.401.498	12.897.558	13.413.460	13.949.999	14.507.999	15.088.319
Dom	34.662.212	40.286.276	45.923.756	47.446.743	44.560.960	41.889.868	43.565.463	45.308.081	47.120.404	49.005.221	50.965.429
Jumlah	44.355.998	51.178.188	57.772.864	60.137.347	57.221.169	54.291.366	56.463.021	58.721.541	61.070.403	63.513.219	66.053.748
Growth	19,42%	15,38%	12,89%	4,09%	-4,85%	-5,12%	4,00%	4,00%	4,00%	4,00%	4,00%

Figure 1. Passenger Movement at Soekarno Hatta International Airport and in Indonesia



Figure 2. Aircraft Movement at Soekarno Hatta International Airport



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Int'l	269.941.241	268.773.723	312.534.014	325.634.926	315.264.280	326.411.673	332.939.906	339.598.705	346.390.679	353.318.492	360.384.862
Dom	240.501.208	303.836.492	317.171.691	319.663.022	310.781.664	288.410.185	294.178.389	300.061.956	306.063.196	312.184.460	318.428.149
Jumlah	510.442.449	572.610.215	629.705.705	645.297.948	626.045.944	614.821.858	627.118.295	639.660.661	652.453.874	665.502.952	678.813.011
Growth	17,84%	12,18%	9,97%	2,48%	-2,98%	-1,79%	2,00%	2,00%	2,00%	2,00%	2,00%

Figure 3. Cargo Movement at Soekarno Hatta International Airport

Table.1.Capacity of Soekarno Hatta Airport Passenger Terminal

Terminal	Kapasitas disain (2015)	Eksisting (2014)	Kapasitas rencana (2030)
1 (penumpang/tahun)	9 juta	25,73 juta	18 juta
2 (penumpang/tahun)	9 juta	24,23 juta	19 juta
3 (penumpang/tahun)	4 juta	7,26 juta	25 juta
4 (penumpang/tahun)	-	-	25 juta
JUMLAH	**22 juta**	**57,22 juta**	**87 juta**
Kargo (ton/tahun)	343.000		1.500.000

Table 2. Aircraft Movement at Soekarno Hatta International Airport

NO.	TERMINAL	JUMLAH PENERBANGAN (Pergerakan/Tahun)
1	Terminal 1A	38.491
2	Terminal 1B	64.981
3	Terminal 1C	58.041
4	Terminal 2A	44.082
5	Terminal 2B	38.443
6	Terminal 2C	97.462
7	Terminal 3G	45.115
	TOTAL	386.615

NO.	TERMINAL	JUMLAH PENUMPANG (JPT)
1	Terminal 1A	22.931.441
2	Terminal 1B	25.580.276
3	Terminal 1C	5.779.649
	TOTAL	54.291.366

Source: Secondary Data of PT. Angkasa Pura II (Persero)

From the table above, it is known that the number of passengers per year (JPT) is 54,291,366 or 148,744 JPT/day On.

Other the hand, the condition of the population around Soekarno-Hatta Airport can be seen, with the level of poverty and suitable housing, as well as vehicle ownership and the level of congestion around the airport.

Kabupaten/Kota	Jumlah Penduduk Miskin Menurut Kabupaten/Kota di 2019	2018	Persentase Penduduk Miskin Menurut Kabupaten/Kota di Provinsi Banten (Persen) 2019	2018	Garis Kemiskinan Menurut Kabupaten/Kota di Provinsi Banten (rupiah/kapita/bulan) 2019	2018
Kab Pandeglang	114	116	9,42%	9,61%	326.517	310.859
Kab Lebak	108	109	8,30%	8,41%	298.201	283.901
Kab Tangerang	194	190	5,14%	5,18%	476.636	451.325
Kab Serang	62	64	4,08%	4,30%	309.036	294.829
Kota Tangerang	98	103	4,43%	4,76%	584.318	556.782
Kota Cilegon	13	14	3,03%	3,25%	459.469	428.867
Kota Serang	36	36	5,28%	5,36%	379.641	350.237
Kota Tangerang Selatan	29	28	1,68%	1,68%	593.781	549.150
Provinsi Banten	654	661	5,09%	5,24%	462.726	431.069

Source : Environmental Impact Analysis Document (ANDAL) I - 9 AMDAL Study of the Soekarno-Hatta International Airport Development Plan (Development of Terminal 4 Phase I, Runway 3 and Automatic People Mover System), 2017.

Kabupaten/Kota	Mobil penumpang	Bus	Truk	Sepeda Motor	Jumlah Kendaraan Bermotor Menurut Kabupaten/Kota dan Jenis Mobil		Bus		Truk		Sepeda Motor	
	2019	2019			2019	2018	2019	2018	2019	2018	2019	2018
Kab Pandeglang	2,17%	15,75%	4,55%	4,75%	18031	15909	489	457	8508	7736	213342	195102
Kab Lebak	2,02%	1,00%	4,97%	5,76%	16766	14547	31	22	9306	8411	259097	234962
Kab Tangerang	23,15%	12,89%	29,53%	29,80%	192302	168626	400	245	55246	50043	1339870	1216558
Kab Serang	4,38%	5,90%	6,71%	9,26%	36381	31917	183	113	12558	11411	416249	380143
Kota Tangerang	28,10%	33,57%	25,85%	24,80%	233458	206115	1042	747	48351	43814	1114765	1026993
Kota Cilegon	4,31%	8,05%	5,62%	4,10%	35795	32166	250	164	10522	9526	184410	172008
Kota Serang	4,90%	3,19%	4,62%	4,51%	40687	36536	99	67	8637	7871	202846	186521
Kota Tangerang Selatan	30,97%	19,65%	18,14%	17,02%	257258	226548	610	382	33932	30263	764939	698867
Provinsi Banten	100,00%		100,00%	100,00%	830.678	732.364	3.104	2.197	187.060	169.075	4.495.518	4.111.154
% Komposisi					15,1%		0,1%		3,4%		81,5%	

Figure 4. BPS-Growth in the number of motor vehicles, 2014-2018
Source : BPS-Central andBanten Province, Access date26-11-2021, 22.30 hours

Literature Review

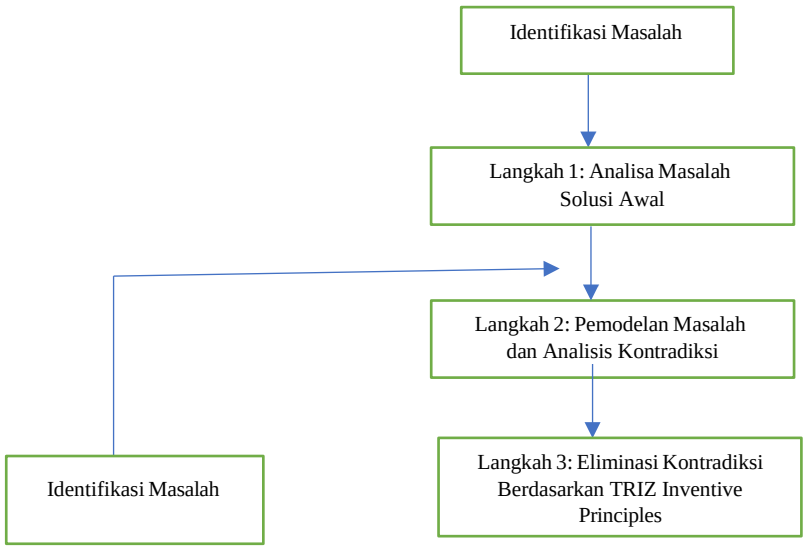
TRIZ Concept

This study was conducted to find out how much satisfaction level the change in urban development with the concept of TOD along with the change in mass transportation to the comfort of life around the development of Soekarno Hatta Airport, Tangerang, Banten. The reason for using the TRIZ method and the TOD concept. In addition, to group attributes that fall into the category of advantages and disadvantages. As a medium or tool in designing proposals for service improvements at Soekarno Hatta Airport, Tangerang uses the TRIZ method. is to provide more systematic and directed proposals starting from problem identification, problem formulation, and problem solving processes.

This theory is needed. Because without theory, often people generate ideas by guessing and choosing what they like or what they think others will like. With TRIZ, researchers will be able to generate better ideas in a faster time and we will solve problems effectively. The idea in question is an idea that can solve a contradictory problem, improve the ideal system, and use available resources (Rantanen & Domb, 2002).

TRIZ Application Steps in the field of Services.

Steps to apply TRIZ in the service sector to achieve systematic innovation through innovative problem solving, modification of TRIZ in service design can be seen in Figure 1.1, (Chang,2003), (Altshuller, Genrich,2000), (Alexander, John;2007).



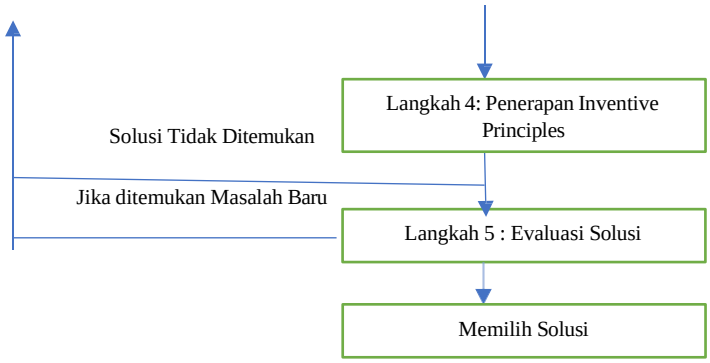


Figure 5. TRIZ Modification in Service Design

TOD Concept

Population growth and the city's economy are one of the causes of the increase in the volume of travel of people and goods and can encourage changes in the development of the industrial and trade sectors. Building Solutions (Mixed Use Building), is one of the causes, namely buildings that are problematic due to land use that is not in accordance with their function. (Domb, Ellen,2009) , (Spears, S, dkk. 2014).

TOD (Transit Oriented Development) Theory Solution, a way to solve problems related to Mass Public Transportation and mixed land, it must be rich in activity choices (rich mix of choices), place making and a compact environment. Negative Impact: GENTRIFICATION. (Knok,1982). https://youtu.be/jKJ9Z1_RrRQ, (ATR Regulation number 16 of 2017, concerning the development of TOD areas). Transit Oriented Development (TOD) is an urban development approach that adopts a mixed spatial layout of commercial and mixed use residential areas designed to maximize access to public transportation and combines features to encourage transit passengers by maximizing the use of mass transportation such as Busway or BRT, Mass Rapid Transportation (MRT), Light Rail Transit (LRT), and equipped with pedestrian or bicycle networks. Thus, the trip will be dominated by using public transportation that is directly connected to the destination. Public transportation stops, especially airports, have a relatively high density and are usually equipped with facilities in the form of arrival corridors, boarding lounges, baggage claims, parking and others. Soekarno-Hatta Airport is one of the largest airports which is the main gateway in Indonesia which was built since 1985 and has implemented the TOD concept in the management of terminal 3 (Aryani .W,2019). The development of big cities in Indonesia recently has caused the rise of urbanization so that a regional phenomenon occurs, namely urban sprawl. Urban sprawl is caused by the difficulty of accessing land in the city center that is close to complete facilities, resulting in uneven distribution of population and urban facilities and problems in services by certain facilities (Siwi, 2014). The transportation sector must be able to provide convenience for all people in all activities (Tamin dalam Kusbiantoro, 2007).



Figure 6. Soekarno Hatta Airport TOD Building. 2022

Literature Review

The development of an area can be seen from the aspect of zones that are within the urban area itself. The addition and subtraction of social, economic and cultural aspects over time has made the city a considerable size in urban development. Many benefits can be obtained from the meeting of transportation routes). (Yunus, 2012 : 63). (Bruce, C. 2012), (Griffin, Kenneth W. 2004).

Land Use Change

The land allocation for the planned location of the Soekarno Hatta International Airport Development is an allocation area for the airport owned by the people of Benda Village, Benda District, Selapajang Jaya Village, Neglasari District, Tangerang City and Bojong Renged Village, T eluk Naga District, Rawa Rengas Village, Rawa Burung Village, Kosambi District, Tangerang Regency, Banten Province. Most of the owners of the land are residents of the village/sub-district, but there are also residents who live on the land as well as people who are not land owners. The current function of the land is to be used as agricultural land and settlements. The price basis used in land acquisition negotiations is an appraisal from an independent institution that is appointed.

Table 1. Number of Land to be Cleared

No	Kecamatan	Kelurahan / Desa	Bidang	Luas (ha)	KK
1	Neglasari	Selapajang jaya	108	10.89	300
2	Benda	Benda	109	25.73	135
3	Teluk Naga	Bojong Renged	57	10.03	6
4	Kosambi	Rawa Burung	1188	60.69	1.300
		Rawa Rengas	1155	65.85	1.600
Jumlah			**±2.617**	**±173.19**	**3.341**

Source : PT Angkasa Pura II (Persero), 2016

Land use is an important element in regional planning. Land use change is the transfer of land functions or mutations in general regarding the transformation in the allocation of land resources from one use to another (Tjahjati, 1997:505). Overall, the development and change of land use patterns in residential and urban areas runs and develops dynamically and naturally to nature, and is influenced by:

- Human factors, which consist of:
- human needs for housing, human potential, financial, socio-cultural and technology. The physical factors of the city, including the center of activity as the center of urban growth and the transportation network as the accessibility of easy accessibility.
- Landscape factors in the form of slopes and land elevations.

Socio-Economic Changes

Basically, everyone realizes that people live and work in an environment that is constantly experiencing rapid changes (Soekanto, 1990 : 179). Changes in improving living standards will affect and change the attitudes and values embraced by the community. The values that have been guidelines are beginning to experience collisions due to the entry of external value influences. This means that every society in his life must undergo changes. These changes can affect social values, social norms, behavior patterns, social organizations, the structure of social institutions, social layers in society, the power of authority, social interaction and others (Soekanto, 1990:333).

Factors that affect social change in society can arise from within (endogenous) or from external factors (exsogen) of the social system. The exogenous factors of change are the genetic changes of the population and changes in the physical environment articulated in technology. According to Davis (Soekanto, 1990), social change is a change that occurs in the structure and function of society. As said by Selo Soemarjan (Soekanto, 1990),social change is all changes in social institutions in a society that affect its social system, including in the values, attitudes and patterns of behavior between groups in society. Social change occurs because members of society at a certain time feel dissatisfied with their old life, social norms and institutions, or old means of livelihood are considered inadequate to meet the needs of the new life.

Changes in Land Value

According to Berry (Yunus, 2008) stated that the increase in land value occurred in the city center and experienced a regular decline away from the city center. The factors that determine the price of land include the condition and location of the land. Land conditions can determine the level of land prices, the better the existing land conditions, the more expensive the land price. Location also determines the price of land which is determined by the distance of the land location to public access such as shopping centers, hospitals, tourist attractions, and others (Yunus, 2008).

Changes in land value occur due to the needs of a space. The need for space on the land is a basic need so that land becomes an economic commodity that can be exchanged through certain mechanisms. This shows that the land has value. In the journal American Institute of Real Estate Appraisers (Wolcott, 1987: 22- 63), four factors that can affect the value of real estate and buildings are proposed, including:

- Economic factors, in the form of the relationship between demand and supply with the economic ability of a community to meet its needs and desires. Demand variables include the number of workers, wage levels, income and purchasing power levels, interest rates and transaction costs. Bidding variables include the amount of land available, licensing fees, taxes and other overhead costs.
- Social factors, in the form of population characteristics which include the number of population, the number of families, the level of education, the level of crime and others.
- Government factors, in the form of government legislation on land use (zoning), provision of facilities such as security, health, education, transportation networks, tax regulations and others.
- Physical factors, in the form of environmental conditions, layout or location and availability of social facilities.

Impact of Airport Development

Airport construction will trigger the growth of other new activities around the airport area because it is also influenced by the demand pattern that will occur in the future. Airport construction is an effort to provide and improve effective and efficient air transportation facilities and infrastructure, namely to improve the smooth flow of people, goods and services,

and help form an even distribution pattern of air transportation services throughout the country (Adisasmita, 2012: 32).

Economic Impact

The construction of the airport will have an impact on changes in economic aspects. The changes that occur will provide development to other sectors such as trade and services, industry, and other economic activities. This activity will bring positive influences, for example, there will be an increase in negotiations and trade agreements, the delivery of trade goods, and will be followed by an increase in productive activities in the primary (agriculture), secondary (industry), and tertiary or service sectors (trade, banking and others). An increase in productive activities will encourage economic improvement, both nationally and regionally and locally . (Adisasmita, 2012 : 34-35).

Social Impact

The construction of this airport will also have a social impact on the lives of the surrounding communities, which is marked by an increase in the mobility of the population of an area. The increase in population mobility will encourage people to have a broader perspective and have a forward mindset. In addition, there is also an increase in the social network of the community, with the increase in air transportation services that are increasingly extensive and smooth, will create a stronger and more intensive social network between residents and between institutions between various regions. The wider the social network, the wider the social interaction (Adisasmita , 2012: 35-36).

Regional Impact

The impact caused by the improvement of the region's economy will also have a positive impact on the welfare of the community which is supported by the creation of new jobs for the community, an increase in people's income, and can realize healthy price stability. This will also help create a good and dynamic national distribution pattern, as well as support regional development in people's lives in the future (Adisasmita, 2012: 36-38).

Framework of Thought

So theoretically, it is necessary to explain the relationship between independent and dependent variables. The relationship between these variables is then formulated into the form of a research paradigm. Therefore, every research preparation must be based on a theoretical framework. This study shows overall that "Analysis of the role of the TRIZ Model and the TOD concept of changes in urban Mass Transportation on Living Comfort (Case study around Soekarno Hatta Airport, Tangerang, Banten)" The relationship between the free variable of the TRIZ Model (X_1) and the TOD Concept (X_2) and the bound variable of "Living Comfort (Y)" can be illustrated as follows:

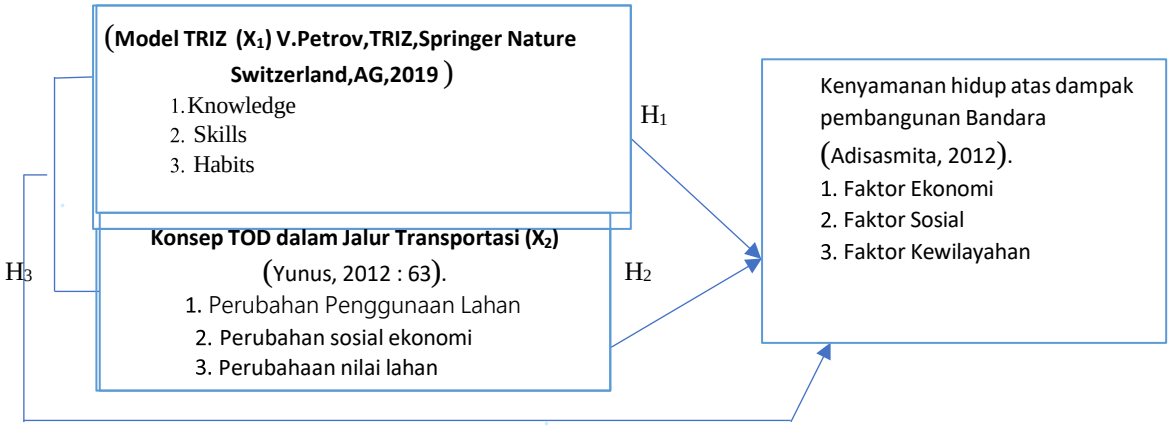


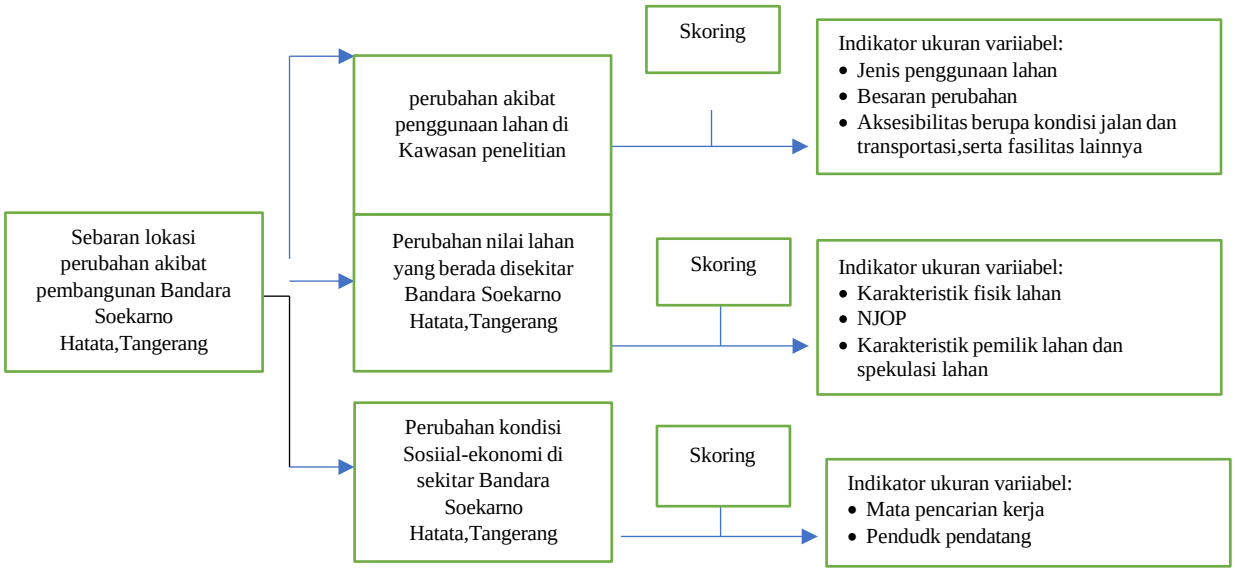
Figure 6. Theoretical Framework
Source: Processed by The Author (2022)

METHODS

This research study is the influence of the existence of Soekarno-Hatta-Tangerang Airport, on changes in socio-economic conditions and physical changes in the surrounding area. The object of this research was carried out to see the growth and development of the area around the airport from the baggage aspect. The approach used in this study is by using a quantitative approach method, namely by analyzing the variables contained in the research space. (Husein Umar. 2011) , (Muhidin, SA. 2007).

The object of the research and the population of this study are the physical space and society around the Soekarno Hatta Airport Area, Tangerang. The object of the research was carried out by identifying and analyzing the changes that occurred as a form of influence due to the construction of Soekarno-Hatta-Tangerang Airport, by paying attention to activities that grew and developed through variables of land use activities, socio-economic conditions, and land value. (Litman, Todd. 2010).

This study is a research with a quantitative approach, so that each variable is grouped and analyzed spatially, namely by using the results of primary data collection (observation and questionnaire) and agency data collection which is then processed using scoring based on the data that has been obtained. The design of this study is as follows.



Population and Sample

According to (Sugiyono.2011).. Quantitative, qualitative and (Sekaran, 2006:121), research methods, population refers to the entire group of people, events or things of interest that the researcher wants to investigate. While the sample is a part of a particular population of concern. The population in this study is all employees In connection with the large population of service users and residents around the Soekarno-Hatta-Tangerang Airport facility, as many as 60 people, the sample used is as many as = 59 people.

Data Collection Techniques

The data collection methods in this study are as follows:

a. Observation, which is a method of collecting data by visiting and observing directly at the research location.
b. Interview, which is conducting a direct interview with a party or section related to service users (Customers) and residents around Soekarno-Hatta airport, Tangerang,
c. Questionnaire, which is to distribute a list of questions asked to service users (Customers) and residents around Soekarno-Hatta airport, Tangerang, in order to get better data.

Data Analysis Methods

Path Analysis

Path analysis is an extension of multiple linear regression analysis, or path analysis is the use of regression analysis to estimate the casual relationship between variables (casual models) that have been previously determined based on theory. Path analysis is used to test the influence of intervening variables. What path analysis can do is determine patterns of relationships between three or more variables and cannot be used to confirm or refute imaginary casualness hypotheses. This path analysis can show the influence of a causal variable (exogenous) on the causal variable (endogenous) through the trajectory coefficient or path coefficient (Riduwan dan Kuncoro, 2011:115), (Juanim,2004:17).

As is known, the use of path analysis is to determine the direct or indirect influence between variables. Direct influence, for example, to determine the influence of independent variables directly on dependent variables without going through other variables. While the indirect influence is to know the influence of independent variables on dependent variables through other variables. This research will use the help of Smart PLS software version 3. Jogiyanto, in (Hamid & Anwar, 2019).

Path Diagram

A path diagram is a tool for graphically depicting the structure of causal relationships between independent variables, intermediary and dependent. Muhidin, SA. 2007. Correlation, Regression, and Path Analysis in Research, to present the casual relationship of a path chart using the single-headed arrow symbol, this indicates that there is a direct influence between the exogenous or intervening variable and the dependent variable, this arrow also correlates the error with the dependent variable, and to present the correlation or covariance relationship between two variables using a two-headed arrow. Each variable is symbolized in the form of a box while other variables that are not analyzed in the model or errors are depicted in the form of a circle

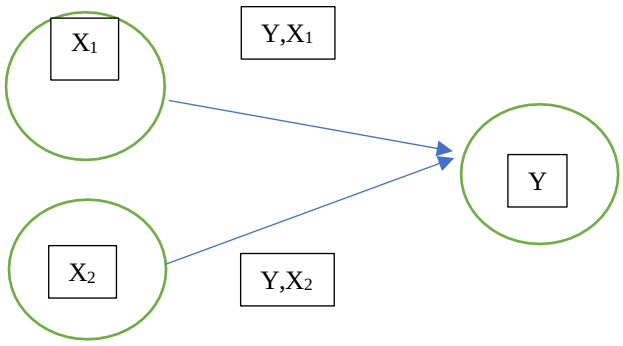


Figure 2. Path Analysis, 2022

Structural Equations

In addition to using path diagrams to express the model being analyzed, path analysis can also be displayed in the form of equations commonly called structural equations. Structural equations describe causal relationships between the variables studied expressed in the form of mathematical equations. Paying attention again to the path diagram in figure 2, this model can be made a mathematical structural equation model as follows

$$Y1 = \rho y1.x1 X_1 + \rho y1.x_2 X_2 + e1$$

Information:

1. X_1 = Model TRIZ
2. X_2 = TOD Concept
3. Y = Comfort of life over the construction of the airport
4. ρy.x = Path coefficient for the direct influence of X on Y
5. e = Coefficient of correlation outside the model (error)

RESULTS AND DISCUSSION

Analysis of Contradictory Change Location Points and Problem Solutions with the TRIZ Model.

The construction of Soekarno-Hatta-Tangerang Airport uses a total land area of ± 216 Ha with land to be freed ± 173.19 Ha in Bojong Renged Village, Teluk Naga District, Rawa Burung Village and Rawa Reengas Village, Kosambi District, Tangerang Regency and Selapajang Village, Neglasari District, Benda Village, Benda District, Tangerang City, Banten Province has had an influence on changes to the surrounding area.

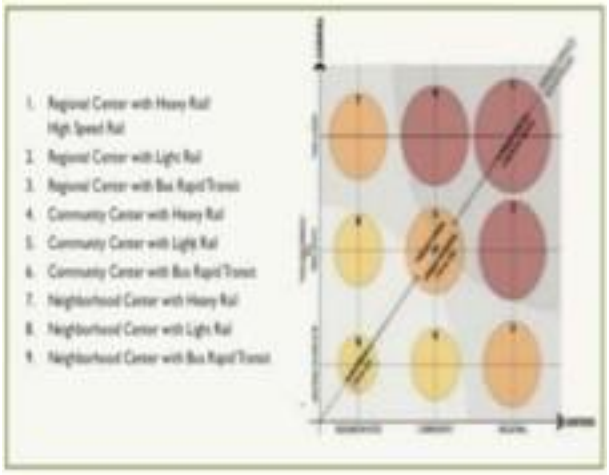
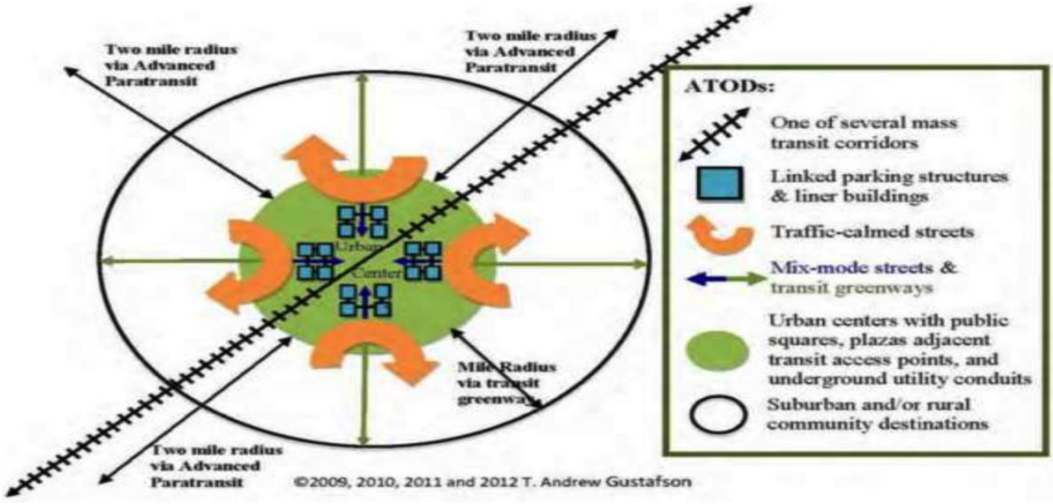


Figure 1. TOD Policy Concept

The form of the implications of the existence of the airport that is used as a consideration for regional changes is in the form of changes in land use activities and changes in the socio-economic conditions of the surrounding community, as well as changes in land value due to the construction of Soekarno-Hatta-Tangerang Airport. So that from the various types of identification that have been carried out, it can be seen the distribution of areas that will experience changes in physical and non-physical activities. The current change that is most felt is the change in the value of land in the surrounding area. All villages in the sub-district have experienced a very drastic change in land value when compared to the condition of land value in previous years. This change in land value is also supported by changes in land use in the surrounding area. This can be seen from the increasing access in Bojong Renged Village, Teluk Naga District, Rawa Burung Village and Rawa Reengas Village, Kosambi District, Tangerang Regency as well as Selapajang Village, Neglasari District, Benda Village, Benda District, Tangerang City, Banten Province which connects each other. (Ofyar Z, Tamin, 2000),(Soegijoko, Budhy Tjahjati S., Kusbiantoro, B.S. 1997).

(Keputusan Menteri Nomor 11 Tahun 2010"Tatanan Kebandarudaraan Nasional".
Peraturan Pemerintah No.40 Tahun 2012 tentang "Pembangunan dan Pelestarian Lingkungan Hidup untuk Kawasan Bandara".)



Source: Rennaisance-Planning-Group-(2011)

Figure 7. Relationship of TOD Category with Mass Transportation Mode

The increase in accessibility is marked by the addition of infrastructure both in terms of quantity and quality in the form of road networks, drainage, and others that aim to support the activities of Soekarno-Hatta-Tangerang Airport. As for the changes in social and economic activities of the community around the airport at this time, the growth that has occurred has not been so significant with the previous conditions, because the construction of Soekarno-Hatta-Tangerang Airport has not been fully completed as a whole. It's just that along with the rapid activities that will occur at Soekarno-Hatta-Tangerang Airport, of course, it will also further affect the rapid changes that occur in the surrounding area.

The results of the measurement of the level of distribution of locations that have changed due to the construction of Soekarno-Hatta Airport, Tangerang are seen from measurement indicators from several aspects as a Contradiction on the Impact of Airport Development as follows:

Aspects of changes in land use activities

- The increase in built-up land is quite rapid compared to other areas, namely based on building permits in the area around Soekarno-Hatta Airport, Tangerang and the level of land acquisition.
- It has high accessibility and the process of building a utility network (such as road networks, transportation systems, drainage, electricity, and others) that supports flight transportation activities at Soekarno-Hatta-Tangerang Airport.
- There are additional public facilities at several points in the area.

Aspects of social and economic change

- The increase in population and the prediction of population development in the future will experience quite rapid growth.
- The change in the livelihood of the population from farming to trade and services has changed.
- The availability of utility networks and public facilities that will revive the economic activities of an area.

Aspects of land value change

- The existence of Soekarno-Hatta-Tangerang Airport causes outsiders to invest in the development of the area.
- The availability of infrastructure and public facilities has increased the accessibility of the area.
- Increasing the Selling Value of Tax Objects (NJOP) around the Soekarno-Hatta-Tangerang Airport area.
- The increase in land prices is quite drastic compared to previous years.

Analysis of Solutions as Incentive Principles for Changes in Land Use Activities

The influence of the existence of Soekarno-Hatta-Tangerang Airport on changes in land use activities in this area turns out to greatly affect the pattern of land use in the surrounding area. From the results of the analysis that has been carried out on the aspects of changes in land use activities in the surrounding area, it is obtained that villages have experienced changes in land use activities with large, medium and small changes. The amount of change in land use activities is spread across every village in Bojong Renged Village, Teluk Naga District, Rawa Burung Village and Rawa Reengas Village, Kosambi District, Tangerang Regency and Selapajang Village, Neglasari District, Benda Village, Benda District, Tangerang City, Banten Province.

From the results of the research that has been carried out, it is found that most of the changes in land use activities in the area around Soekarno-Hatta-Tangerang Airport have moderate changes. However, there are also villages whose changes in land use activities have undergone major changes compared to previous conditions. The villages in Bojong Renged Village, Teluk Naga District, Rawa Burung Village and Rawa Reengas Village, Kosambi District, Tangerang Regency and Selapajang Village, Neglasari District, Benda Village, Benda District, Tangerang City, Banten Province.

This change mostly occurs on the main roads connecting to the Soekarno-Hatta-Tangerang Airport line and the line towards Tangerang City. Looking at the current trend, the changes in land use activities that have occurred have developed towards commercial and residential activities. These changes are seen from the variable factors of land use types and patterns, changing conditions of land use activities, and the availability of accessibility and facilities in the research area. (Yunus, Hadi Sabari. 2008).

Analysis of Solutions as Principles Incentives for Changes in Socio-Economic Conditions

This change in land function experts has resulted in a change in the lifestyle of the people in the surrounding area who initially worked as farmers to become non-farmers. This change in the condition of society can lead to positive things, namely by advancing the quality of human resources. Based on the results of a survey to the research area, most of the residents around Soekarno-Hatta-Tangerang Airport are natives of Teluk Naga Regency. According to various preferences of the surrounding community, the existence of Soekarno-Hatta-Tangerang airport will affect social and economic change activities. This is because more and more investors from outside Teluk Naga Regency are buying land in the surrounding area. The increasing number of investors in the area around Soekarno-Hatta-Tangerang airport, there will be many immigrants to the area. Community activities are generally still in the agricultural sector. However, after the existence of Soekarno-Hatta-Tangerang Airport, the influence on changes in people's socio-economic activities is increasingly visible. The change that occurred is that the longer the people's houses in the area began to change their function, which were initially only used as residences, now they are also used as a place to trade and other businesses. It turns out that the existence of Soekarno-Hatta-Tangerang Airport has a high influence on changes in the social and economic conditions of the surrounding community. With the occurrence of these changes, of course, it will have an impact on the growth and development of the surrounding area. From the results of the analysis that has been carried out through the scoring analysis, it is obtained that the level of change that has occurred can be seen in the figure below which is the level of change in socio-economic activities. The results of the study show that most of the changes in the socio-economic conditions of the surrounding community are still moderate, and there are even several other villages that are still low in the rate of change. The rate of change that is starting to be high is only in Ngalasari Village.

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even several other villages that are still low in the rate of change. The rate of change that is starting to be high is only in Ngalasari Village.

Analysis of Solutions as Principles Incentives for Land Value Change

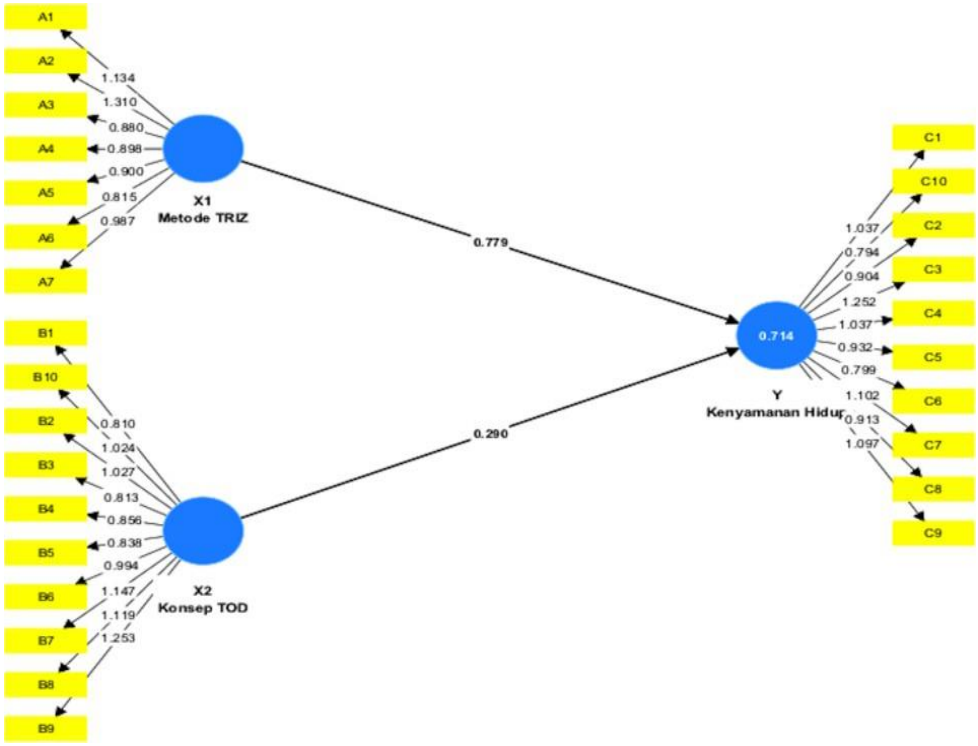
The existence of Soekarno-Hatta-Tangerang Airport has triggered the development of built land and commercial activities of the local community. The development occurred due to the increase in accessibility that supports the activities of Soekarno-Hatta-Tangerang Airport, namely by increasing the fulfillment of infrastructure. The improvement of infrastructure as a result of meeting the needs of Soekarno-Hatta-Tangerang Airport activities turns out to indirectly affect the increase in the value of the surrounding land. Based on the results of the field survey that has been carried out, land prices in Bojong Renged Village, Teluk Naga District, Rawa Burung Village and Rawa Reengas Village, Kosambi District, Tangerang Regency and Selapajang Village, Neglasari District, Benda Village, Benda District, Tangerang City, Banten Province after the existence of Soekarno-Hatta-Tangerang Airport have undergone very drastic changes. Land prices around the Sekarno-Hatta-Tangerang Airport area have changed with an increase of approximately 10 times when compared to the conditions before and after the airport.

Land prices in this area began to experience significant changes, occurring from 1985 to 1986, when Soekarno-Hatta-Tangerang Airport began to be completed, land prices in the surrounding area began to increase quite drastically until reaching an increase of approximately 2 times. The development of land prices in this area is the influence of the existence of Soekarno-Hatta-Tangerang Airport which has triggered an increase in the value of land in the surrounding area. The rate of change in land value that occurred at each village point in Rawabokor District and Teluk Naga District experienced a high change due to the existence of Airport-Soekarno-Hatta-Tangerang. In the analysis of changes in land value, it also pays attention to indicators in the form of physical characteristics of the land, the condition of the Selling Value of Tax Objects (NJOP) and land prices, as well as the characteristics of land ownership.

When studied theoretically regarding the theory of land demand, the area around Soekarno-Hatta-Tangerang Airport has a pattern that follows the center of activity. This means that the development of land value in the area is developing a lot in areas that have high activity, namely along the main routes that connect Soekarno-Hatta-Tangerang Airport with other city centers, so that the location that is closer to the center of activity, the higher the price of the land. This is in accordance with the statement of Thunen (1826) which discusses the relationship between the location that is far from the city center and the land rental value, so the farther the location from the center of business activities will cause the rental value to be cheaper. From the results of the research conducted, it can be seen that the high land values in this research area are villages close to Soekarno-Hatta-Tangerang Airport and villages close to urban areas.

Based on the data of respondents who have been conducted on 59 customers and residents around Soekarno-Hatta-Tangerang Airport processed using SEM Smart PLS version 3.2, (Hamid & Anwar, 2019), (Kurniawan, J. (2020).) ,as follows;

Testing the First Hypothesis (H1) and (H2) and (H3) against Y in the Path diagram



Validity Test:

	X1_Metode TRIZ	X2_Konsep TOD	Y_Kenyamanan Hidup
X1_Metode TRIZ			
X2_Konsep TOD	0.886		
Y_Kenyamanan Hidup	0.951	0.757	

Reliability Testing :

	Cronbach's alpha	Keandalan komposit (rho_a)	Keandalan komposit (rho_c)	Rata-rata varians diekstraksi (AVE)
X1_Metode TRIZ	0.716	0.724	0.806	0.380
X2_Konsep TOD	0.933	0.945	0.944	0.632
Y_Kenyamanan Hidup	0.918	0.929	0.932	0.583

Determination Coefficient (R-Square/ R2)

	R-square	Adjusted R-square
Y_Kenyamanan Hidup	0.714	0.704

Based on the output above, it is known that the adjusted R Square value is 0.704, this means that the simultaneous influence of variables X_1 and X_2 on variable Y is 70.4%, the remaining 29.6% is influenced by other factors.

There is a positive influence between the TRIZ Model on the comfort of life

There is a Positive Influence of the TOD Concept on Life Comfort

The Positive Influence between the TRIZ Model and the TOD Concept Simultaneously on Life Comfort

Results of the Study on TRIZ Model Principle Incentives

The result of the findings of the study that has been carried out is that the influence of the existence of Soekarno-Hatta-Tangerang Airport on socio-economic changes and physical changes in the surrounding area greatly affects the growth of an area. From the influence of the existence of the airport on the changes that occur, it is predicted that in the future it will have an impact on the growth of new activities, both those that occur quickly, moderately, and slowly. The growth of this area is spread to every village in Bojong Renged Village, Teluk Naga District, Rawa Burung Village and Rawa Reengas Village, Kosambi District, Tangerang Regency as well as Selapajang Village, Neglasari District, Benda Village, Benda District, Tangerang City, Banten Province.

areas that experience fast, medium, or slow growth. The results of the growth of this area are obtained through the results of scoring each level of change which is an indicator of measuring the growth rate. Based on the results that have been found, it can be seen that most of the villages in the research area are still experiencing slow growth. In addition, there are also several villages that are currently at a moderate growth rate, namely in Ngalasari Village, Teluk Naga Village, and Rawabokor Village. Meanwhile, the village that is experiencing rapid growth at this time is Rawabokor Village. The changes that occurred in Rawabokor Village were marked by an increase in the construction of shophouses along the main road, while in several hamlets in Rawabokor Village there was also an increase in housing development.

If studied based on existing studies, later the impact of the construction of this airport tends to lead to a region's policy on the role of the infrastructure sector in increasing the economic productivity of the region or country. Several studies have measured some of the local economic impacts resulting from the influence of airports related to the involvement of investors who have the opportunity to invest in the region. As is the case in the research by (Button, 2010) on "Econmic Aspects of Regional Airport Development" states that the existence of airports that affect local investment in infrastructure improvement has provided several benefits to local economic development, including:

- There are short-term benefits to the area from the construction of facilities such as runways, terminal building construction, navigation system construction, and so on that have provided opportunities for job opportunities.
- There are local economic benefits in running and operating airports that have an effect on increasing employment, government revenue, and regional taxes.
- There are advantages in encouraging the regional economy in terms of cooperation in improving transportation services from several airline companies.
- It can encourage the acceleration of economic growth in a region which is characterized by an increase in economic productivity.

In addition, there is also a study that looks at the development of the air transportation sector in Asia. This development can be seen from the growth rate of air transportation passengers which continues to increase every year. In the journal "The Development of Regional Airports in Asia", one of the countries in Asia that has experienced a drastic increase in the number of air transportation passengers is Indonesia (Chang, 2010).. From the study of these studies, if examined with this study, it can be predicted that in the future the growth rate of air transportation at Soekarno-Hatta-Tangerang Airport will increase very rapidly. Moreover, in its planning, Soekarno-Hatta-Tangerang Airport prioritizes infrastructure development and increased investment as business opportunities to support airport activities. This will also provide benefits to local and regional economic growth in the future.

The growth of the area around Soekarno-Hatta-Tangerang Airport is also supported by the plan to use the airport city model adapted from the concept of "Aerotropolis". The concept of Aerotropolis is a concept that is integrated with the airport and in the surrounding area there is a cluster of hotels, offices, distribution and logistics facilities with all types of activities provided and improved by the airport (Kasarda and Lindsay, 2011), (Cervero R. and Arrington G. B,2008).

The attraction of this aerotropolis concept is that it provides commercial facilities that support the aviation business and other activities. With this concept, airport managers will benefit more from non-aero businesses because they can develop their business not only as airport managers, but can also profit from the provision of clean water for the entire region, electricity, to the basic needs of another region. This will certainly have a big impact on the emergence of new activities that trigger the growth and development of the surrounding area.

CONCLUSION AND RECOMMENDATIONS

Conclusion

Conclusion and Recommendations To create efficient development of cities and regions or regions by reducing the level of motor vehicle use, the concept of integrating land use with the transportation system must be applied. One of the good strategies that has been successfully implemented in several cities is to apply Management and the concept of TOD (Sastrohadiwiryo, Siswanto. 2006), (Chen,X.2010). In this paper, various aspects of the application of the TOD concept have been discussed including the understanding, definition and characteristics of TOD, the relationship of the TOD category with the mass transportation system both at the network level and at the corridor level, especially around the station location, the benefits of the implementation of TOD in several cities which are illustrated through the reduction of the level of travel by motor vehicle (private), increase in the use of mass transportation and pedestrians, increase in land value, increase in economic benefits at the local and city levels (JPWK 12 (3) Nur Arif, F,2017), (Khisty, C Jotin dan Lall, BKent. 2005) , (Kasarda, Jhon D., dan Greg Lindsay. 2011) . In addition, various obstacles and factors inhibiting the implementation of the TOD concept and finally the opportunities for the implementation of the TOD concept in the Soekarno Hatta International Airport area were discussed, along with the things that must be prepared by Angkasa Pura. The construction of Soekarno-Hatta-Tangerang International Airport in Rawabokor Regency which replaced the function of Kemayoran Airport, Jakarta has affected the development of the region. The existence of the airport caused a rise and attraction in the area around the airport which caused changes in the area, especially Rawabokor and Teluk Naga Districts. The changes that occurred in this research area as a result of the existence of Soekarno-Hatta-Tangerang Airport were changes in land use activities, changes in socio-economic conditions, and changes in the value of land in the surrounding area.

From the results of the research that has been carried out, it can be concluded that the existence affects socio-economic changes and physical changes in the surrounding area. From the results of the analysis that has been carried out on several aspects including changes in land use activities, changes in socio-economic conditions of the community, and changes in the value of land in the surrounding area will trigger the growth of new activities both that occur quickly, moderately, and slowly. The growth of this area is spread to every village in Rawa Bokor District and Teluk Naga District. The areas that will experience growth and development in this research area include:

- The distribution of locations that have changed is that all villages have experienced changes in the value of regional land. However, not all villages have experienced changes in land use and socio-economic activities.
- Changes in land use activities around the Soekarno-Hatta-Tangerang Airport area that have undergone major changes are in Ngalarsari Village, Rawa Bokor Village and Teluk Naga Village.

- The only change in socio-economic conditions that has undergone a high change is Rawa Bokor Village.
- Changes in land value, almost all villages in both Rawa bokor and Teluk Naga sub-districts have experienced very high changes in land value, which has increased 10 times compared to the conditions before the Soekarno-Hatta-Tangerang Airport.

Recommendations.

The construction of Soekarno Hatta Airport, Tangerang is a trigger for the growth of the surrounding areas. The development of this airport area has an impact on land use activities, community socio-economic activities, and increasing the value of the surrounding land. Based on the results of the conclusions that have been obtained, the directions and recommendations in overcoming regional growth that are influenced by the scope of various aspects that have been discussed as a form of the implications of the existence of Soekarno-Hatta-Tangerang Airport are as follows.

- The need for further studies on the development of the Soekarno-Hatta-Tangerang Airport area in the future.
- The need for spatial planning guidelines in the form of RDTR which functions to provide regulations for optimal control and utilization of space around the Soekarno-Hatta-Tangerang Airport area.
- Equitable distribution of infrastructure development in each area around Soekarno-Hatta-Tangerang Airport.

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