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The Influence of Perceived Accessibility and Highway Nuisance on Residential Satisfaction: Case Study in Serang-Panimbang Toll Road

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ABSTRACT

Investment in roads such as toll roads is considered a catalyst for regional connectivity. On the other hand, there are negative and positive externalities that are felt in the area where the infrastructure is being developed. This research was conducted to identify the influence of perceived accessibility and highway nuisance experienced by residential areas due to the presence of new road infrastructure, specifically the Serang-Panimbang Toll Road. This research studied the extent of the impact of the perceived trade-off between increased accessibility and nuisance highway activities on residential satisfaction and the desire to move. The Structural Equation Modelling - Partial Least Square (SEM-PLS) method was used to examine the framework of influences shaping residential satisfaction. The analysis was based on a survey collected from 603 respondents lived within a 1000m radius of the Serang-Panimbang Toll Road Section 1, covering 3 districts/cities: Serang City, Serang Regency, and Lebak Regency. The constructs include components of perceived highway nuisance, perceived accessibility, perceived and residential characteristics, and socioeconomic characteristics. The results show that perceived highway disturbances (such as perceived noise, air pollution, and interaction restrictions/barrier effect), residential characteristics, and socioeconomic characteristics do not have a significant effect on residential satisfaction. However, increasing perceived accessibility (such as perceived destination attributes, activity distribution, travel resistance, and transportation supply) and perceived occupancy are important factors in increasing residential satisfaction. The results also show that perceived residential satisfaction still increases the moving intention.

Key words: *Residential Satisfaction, Moving Intention, Perceived Highway Nuisance, Perceived Accessibility, Serang-Panimbang Toll Road.*

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INTRODUCTION

Investment in road infrastructure is a key policy measure aimed at enhancing connectivity and fostering inter-regional integration. Beyond the reduction in vehicle operating costs and travel time, improved accessibility is a crucial factor when evaluating investments in new toll road projects (Ardiyono et al., 2018). The presence of toll road infrastructure within a region can serve as a significant indicator of both macro and micro-level development progress. Moreover, toll roads can act as catalysts for advancing and sustaining a dynamic and modern civilization. When mobility is facilitated, economic development becomes more achievable. Additionally, the construction of toll roads plays a vital role in stimulating investment growth in the regions they traverse (Marpaung et al., 2021).

On a smaller scale, other implications also arise for residential areas located near the road. These settlements benefit from positive externalities due to improved accessibility perceived through the provision of closer road access to the surrounding environment (Hamersma et al., 2014). This is related to an individual's travel behaviour and residential choice, which have been widely identified as intermediary factors between the human physical environment and travel patterns. People tend to choose residential environments that match their preferences (Bijker et al., 2012). The selection of residential locations based on travel attitudes also influences the level of satisfaction with the surrounding environment (Bijker et al., 2012). Additionally, some groups consider travel time and costs when choosing where to live (Tillema et al., 2010). However, travel decisions and accessibility are only part of a complex trade-off of overall utility in residential location choice (Pot et al., 2023). Residential areas near roads must compensate for negative externalities, particularly the decline in environmental conditions (Bateman et al., 2001). In some cases, proximity to major roads can also lead to health issues related to air pollution (Barros et al., 2013)

The construction of toll roads in Indonesia has been one of the government's strategic projects in recent years. According to the Toll Road Regulatory Agency (BPJT), as of November 11, 2022, the length of toll roads in Indonesia reached 2,583.42 km, with the majority, 1,138.51 km, located in Java. The remaining 907.26 km are distributed across Sumatra, Bali, Sulawesi, and Kalimantan. Additionally, based on the Infrastructure Statistics by Ministry of Public Works and Housing (2022), there are 68 operational toll road sections spanning 2,545 km, and 27 toll road sections under construction totalling 1,813 km in length. This extensive toll road infrastructure development highlights the government's efforts to promote regional development and ensure equitable growth across the country. Presidential Regulation Number 109 of 2020, which amends Presidential Regulation Number 3 of 2016 on the Acceleration of the Implementation of National Strategic Projects, states the need for optimization to maximize the impact of National Strategic Projects for accelerating development. One such project is the Serang-Panimbang Toll Road. One of the completed tolls exits, the Rangkasbitung Toll Exit, is strategically located and enhances road connectivity to Jakarta through the commuter line, which has a direct route to Jakarta including other routes it passes.

Therefore, this study aimed to identify the impact of perceived accessibility and nuisance, as well as the implications of socioeconomic conditions and residential characteristics, on residential satisfaction resulting from the Serang-Panimbang Toll Road construction project. This research is conducted by analysing several factors, including perceived of accessibility (e.g., land-use, transport, temporal components), perceived of highway nuisance, socioeconomic characteristics, and residential characteristics, on residential satisfaction along Section 1 of the Serang-Panimbang Toll Road up to the Rangkasbitung Toll Exit. Those factors are analysed using both observable and latent variables which are represented as unobserved variables.

RESEARCH METHOD

Research Location and Sampling

The study utilizes a non-probability sampling approach, specifically purposive sampling, where the selection of samples is guided by certain criteria. The primary focus is on the geographical distribution within a 1000 m radius of the Serang-Panimbang Toll Road, chosen due to the possible disturbances affecting nearby households (Hamersma et al., 2014). Using the Lemeshow sample size calculation for large, unknown populations, with a 5% margin of error and a T-statistic of 1.96, the minimum sample size required for this study is 385. However, considering the varying population densities across the three districts traversed by the Serang-Panimbang Toll Road, the sample size was increased to 603 respondents.

Framework and Methodology

This study employs the Structural Equation Model – Partial Least Square (SEM-PLS) method. Unlike covariance-based SEM (CB-SEM), which is used to confirm or reject existing theories and hypotheses, SEM-PLS is a "causal-predictive" approach that explains variance in the dependent variables. PLS-SEM is more efficient for small, complex samples and is nonparametric, meaning it doesn't require normal distribution assumptions.

Hair et al. (2021) outline that SEM-PLS consists of two key components: the structural model (inner model), which details the relationships between different constructs, and the measurement model (outer model), which illustrates the connection between constructs and their corresponding indicators. The measurement models can be categorized into two types: exogenous latent variables, which are constructs that influence other constructs in the model, and endogenous latent variables, which are constructs that are influenced within the model. This research specifically utilizes the disjoint two-stage approach for analysing SEM-PLS with higher-order constructs divided into two stages (Sarstedt et al., 2019). The first stage involves considering indicators at the lower-order construct level, which serve as the basis for calculating latent variable scores according to the relevant theory. These scores are then used as indicators for higher-order constructs in the second stage. The evaluation will include both measurement and structural models, examining formative and reflective indicators.

Error! Reference source not found. illustrates the conceptual framework that will be tested during the analysis phase to examine the relationships between perceived accessibility, perceived nuisance, residential satisfaction, and moving intention, based on indicators derived from a literature review. These constructs and their relationships will then undergo hypothesis testing as shown in Error! Reference source not found., based on the final SEM-PLS model.

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Table 1. Hypothesis Statement

Hypothesis
H1: There is a negative influence of the perceived nuisance variables on residential satisfaction
H2: There is a positive influence of the component variables of perceived accessibility on perceived accessibility
H3: There is a positive influence of perceived accessibility on residential satisfaction
H4: There is a negative influence of residential satisfaction on moving intention
H5: There is an influence of perception and housing characteristics on residential satisfaction and moving intention
H6: There is an influence of socioeconomic characteristics on residential satisfaction and moving intention

(Source: Author, 2024)

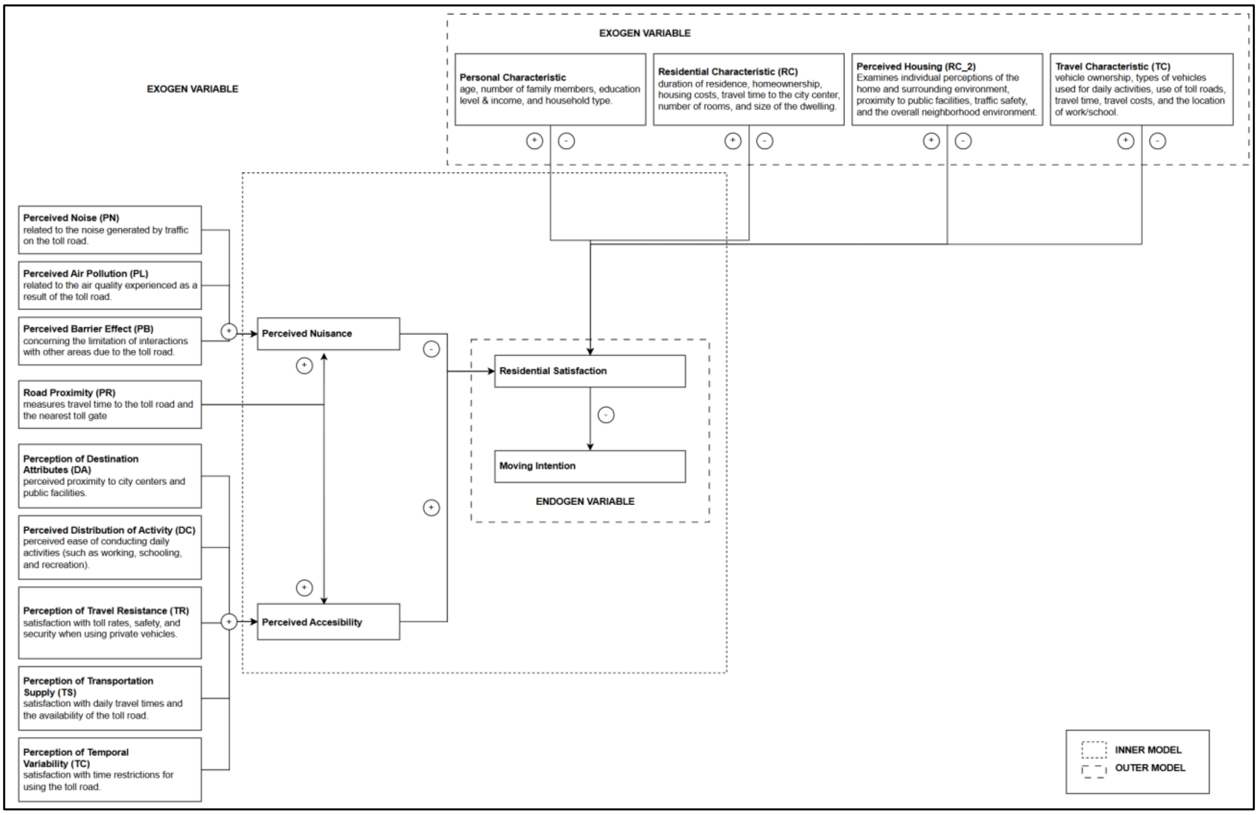

Figure 1. Conceptual Framework
(Source: Author, 2024)

RESULT AND DISCUSSION

Model Estimation Result

In designing the research model, the focus will be on various constructs derived from the established conceptual framework. This involves considering both formative and reflective indicators as foundational elements of the model. Hair Joseph F. et al. (2021) explain that reflective indicators are those influenced or determined by a latent construct, whereas formative indicators are those that contribute to the development of a construct. In this model, the classification of indicators into formative and reflective types is illustrated in **Table 4**.

This study consists of two measurement model for SEM-PLS analysis. The measurement model was employed to assess both reflective and formative indicators. The testing phase for reflective indicators focuses on evaluating them as represented by their constructs. This phase includes tests such as indicator reliability, convergent validity, consistency reliability, and discriminant validity. The threshold values for each test are set according to the limits specified in the analysis method. **Table 2** and

Table 3 present the results for each assessment, including the loading values, average variance extracted (*AVE*), composite reliability (*rho_c*), and cross-loadings.

Table 2. Loading, AVE, and CR

Cons.	Item	Loading	AVE	CR
PL	PA1	0.77	0.611	0.824
	PA3	0.856		
	PA4	0.712		
PB	PB1	0.934	0.599	0.739
	PB3	0.571		
PN	PN1	0.627	0.514	0.808
	PN2	0.733		
	PN3	0.719		
	PN4	0.778		
DA	DA1	1	-	-
DC	DC1	0.714	0.644	0.782
	DC2	0.882		
TR	TR6	0.833	0.675	0.806
	TR8	0.81		
TS	TS2	1	-	-
TP	TP2	1	-	-
RC	RC6	0.525	0.579	0.87
	RC8	0.824		
	RC10	0.848		
	RC12	0.838		
	RC14	0.719		
RS	RS1	0.99	0.621	0.748
	RS2	0.511		
MI	MI1	0.854	0.675	0.831
	MI1_2	0.833		

(source: Author, 2024)

Note: PL = perceived air pollution; PB = perceived barrier effect; PN = perceived highway noise; DA = perception of destination attributes; DC = perceived distribution of activities; TR = perception of travel resistance; TS = perception of transport supply; TP = perception of temporal variability; RC = perceived housing characteristic; RS = residential satisfaction; MI = moving intention.

This study also conducted a formative construct test for the measurement model. The formative constructs are represented by single indicators, such as gender, travel time to work/school, weekly travel costs, and frequency of toll road usage. Additionally, there are formative constructs with multiple indicators, including less prosperous households (*LH*), prosperous households (*HH*), and residential characteristics (*RC_2*). Table xx presents the values for weight significance, indicator loadings, loadings significance, and validation for each formative indicator within the model.

Following the evaluation of the measurement model, the structural model will be assessed based on R-squared, significance values, effect size, and path coefficients. The model includes R-squared values for constructs such as Perceived Accessibility, Residential Satisfaction, and the Moving Intention. The R-squared value for Perceived Accessibility is 0.065, indicating that the exogenous model of Perceived Accessibility, formed by the constructs *DA*, *DC*, *TR*, *TS*, and *TP*, explains only 6.5% of the variance. This value suggests that the representation of this construct is considered "weak," as it is below 0.19. The same applies to Residential Satisfaction (RS), which has an R-squared value of 0.167, or 16.7%. For the Moving Intention, the R-squared value is 0.195, accounting for 19.5% of the variance and falling into the "moderate" category.

Table 3. Cross Loading Value

Indicator	PL	PB	PN	RC	MI	RS
PA1	0.748*	0.263	0.321	0.116	0.07	0.039
PA3	0.839*	0.376	0.483	0.075	0.021	0.039
PA4	0.748*	0.189	0.531	0.005	0.018	0.043
PB1	0.337	0.943*	0.407	0.042	0.057	0.081
PB3	0.178	0.55*	0.239	-0.024	-0.003	0.032
PN1	0.566	0.474	0.6*	0.043	-0.014	0.027
PN2	0.445	0.188	0.75*	0.037	0.011	0.081
PN3	0.444	0.61	0.694*	0.088	0.088	0.101
PN4	0.36	0.119	0.794*	0.092	0.138	0.117
RC10	0.012	-0.027	0.052	0.851*	0.229	0.296
RC12	0.014	0.003	0.026	0.84*	0.223	0.287
RC14	-0.04	-0.001	-0.003	0.715*	0.188	0.218
RC6	0.216	0.091	0.193	0.53*	0.158	0.209
RC8	0.123	0.054	0.124	0.825*	0.249	0.314
MI1	0.106	0.036	0.143	0.234	0.893*	0.294
MI1_2	-0.054	0.047	0.018	0.239	0.785*	0.214
RS1	0.068	0.093	0.142	0.362	0.342	0.984*
RS2	-0.052	-0.021	0.006	0.124	-0.024	0.545*

(source: Author, 2024)

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Table 4. Model Indicators

Item	Statement	Ind	N	Mean	Med	Mode	Min	Max	Std. Dev
Personal Characteristic									
PC1_1*	Gender	For	603	0.56	1	1	0	1	0.5
PC2_a*	Age 30 years and above	For	603	0.46	0	0	0	1	0.5
PC2_b*	Age below 30 years	For	603	0.54	1	1	0	1	0.5
PC7_c*	Monthly income > 8 million IDR	For	603	0.29	0	0	0	1	0.45
PC7_ab*	Monthly income ≤ 8 million IDR	For	603	0.71	1	1	0	1	0.45
PC8a*	Family members ≤ 3	For	603	0.65	1	1	0	1	0.48
PC8b*	Family members > 3	For	603	0.35	0	0	0	1	0.48
PC9_ac*	Families with multiple workers & couples with two workers	For	603	0.63	1	1	0	1	0.48
PC9_bde*	Families with one worker, couples with one worker, and single workers	For	603	0.37	0	0	0	1	0.48
Travel Characteristic									
TC1_1a*	private cars ownership > 1	For	603	0.51	1	1	0	1	0.5
TC1_1b*	private cars ownership ≤ 1	For	603	0.49	0	0	0	1	0.5
TC1_2a*	motorcycles ownership > 2	For	603	0.11	0	0	0	1	0.31
TC1_2b*	motorcycles ownership ≤ 2	For	603	0.89	1	1	0	1	0.31
TC2e*	Private car users	For	603	0.35	0	0	0	1	0.48
TC2f*	Non-private car users	For	603	0.65	1	1	0	1	0.48
TC3	Frequency of toll road usage	For							
TC3_d*	*Never*	For	603	0.7	1	1	0	1	0.46
TC3_abc*	*Every day, 1-3 times a week, only at certain times*	For	603	0.3	0	0	0	1	0.46
TC5***	Travel time to work/school	For	603	17.8			5	60	6.25
TC7_1***	Travel cost in a week (Including weekdays and weekends) (IDR)	For	603	101			0	1500	99.1
Perceived Highway Nuisance									
PA1**	I feel that the air quality in my residential area has deteriorated due to the toll road.	Ref	603	3.74	4	4	2	5	0.83
PA2**	I am concerned that the effects of air pollution from the toll road will disturb me.	Ref	603	3.11	3	3	1	5	0.87
PA3**	I feel that air pollution from the toll road is bothersome when I am inside my home.	Ref	603	3.57	4	3	1	5	0.96
PA4**	I have health issues due to pollution from the toll road.	Ref	603	2.63	3	2	1	5	1.05
PN1**	I hear toll road noise when I am at home.	Ref	603	3.58	4	3	1	5	1.04
PN2**	I am concerned that the effects of noise from the toll road will disturb me.	Ref	603	2.56	2	2	1	5	1.13
PN3**	I feel that noise from the toll road is bothersome when I am at home.	Ref	603	3.27	3	3	1	5	1.12
PN4**	I have health issues due to noise from the toll road.	Ref	603	2.63	3	2	1	5	1.18
PB1**	The toll road increases the time it takes for me to reach areas on the other side of the toll road.	Ref	603	3.47	3	3	1	5	1.14
PB2**	The toll road requires me to travel a greater distance to reach areas on the other side of the toll road.	Ref	601	2.82	3	3	1	5	1.18
PB3**	The toll road was constructed without accompanying infrastructure, so it is not integrated with my environment.	Ref	603	2.93	3	3	1	5	0.83
Perceived Accessibility									
DA1**	I feel that the Serang-Panimbang Toll Road has made public facilities more accessible	Ref	603	4.47	5	5	2	5	0.66

Item	Statement	Ind	N	Mean	Med	Mode	Min	Max	Std. Dev
	(hospitals, places of worship, clinics, shopping centers/markets).								
DA2**	I feel that the Serang-Panimbang Toll Road makes it easier to reach the city center.	Ref	603	3.62	4	3	1	5	0.96
DC1**	I feel that the Serang-Panimbang Toll Road makes it easier for me to travel to work/school.	Ref	603	4.45	5	5	1	5	0.74
DC2**	I feel that the Serang-Panimbang Toll Road makes it easier for me to travel to recreational/tourist destinations.	Ref	603	3.57	4	4	1	5	1.12
TR1**	I find the toll fees for the Serang-Panimbang Toll Road to be affordable.	Ref	603	3.37	3	5	1	5	1.38
TR2**	I feel that driving a private car is more expensive compared to other modes of transportation.	Ref	603	3.99	4	4	1	5	0.94
TR3**	I feel that driving a private car is faster compared to other modes of transportation.	Ref	603	3.78	4	5	1	5	1.23
TR4**	I feel safer when traveling by private car compared to walking.	Ref	603	3.77	4	5	1	5	1.23
TR5**	I feel that my safety is more assured when traveling by private car compared to walking.	Ref	603	3.79	4	5	1	5	1.11
TR6**	I feel safer when traveling by private car compared to riding a motorcycle.	Ref	603	3.88	4	5	1	5	1.22
TR7**	I feel that my safety is more assured when traveling by private car compared to riding a motorcycle.	Ref	603	3.77	4	5	1	5	1.19
TR8**	I feel safer when traveling by private car compared to using public transportation.	Ref	603	3.74	4	5	1	5	1.25
TR9**	I feel that my safety is more assured when traveling by private car compared to using public transportation.	Ref	603	3.7	4	5	1	5	1.27
TS1**	I feel that travel time will be shorter when using the Serang-Panimbang Toll Road compared to other roads (arterial & local roads).	Ref	603	3.77	4	5	1	5	1.14
TS2**	I am satisfied with the travel time I experience on a daily basis.	Ref	603	4.02	4	5	1	5	1
TP1**	I feel that I can travel on the toll road whenever I want.	Ref	603	4.07	4	5	1	5	0.97
TP2**	I feel that I will only use the toll road at specific times.	Ref	603	3.66	4	4	1	5	1.13
PR1***	Travel time from home to the nearest toll gate	Ref	603	19.33			10	30	5.87
Residential Characteristic									
RC1_1***	Duration of residence (year)	For	603	6.91			0.08	66	9.15
RC2_12***	Cost of rent and non-rent housing	For	603	1267			100	6000	650.3
RC3***	Distance from the city center	Ref	603	23.09			0	40	4.71
RC4***	Number of room	Ref	603	2.12			1	20	1.34
RC5***	House size	Ref	603	138.9			30	500	87.14
Perceived Housing									
RC6**	My residence is close enough to my workplace/school.	Ref	603	4.34	4	4	2	5	0.63
RC7**	My residence is close enough to shopping centers.	Ref	603	3.25	3	3	1	5	0.76
RC8**	My residence is close enough to public facilities (hospitals, places of worship, clinics, shopping centers/markets).	Ref	603	4.22	4	5	1	5	0.83

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Item	Statement	Ind	N	Mean	Med	Mode	Min	Max	Std. Dev
RC9**	I am satisfied with the size of my residence.	Ref	603	3	3	3	1	5	1.02
RC10**	I am satisfied with the number of rooms in my residence.	Ref	603	4.38	5	5	1	5	0.83
RC11**	I am satisfied with the level of social interaction and contact I have with others in my neighborhood.	Ref	603	3.14	3	3	1	5	1.04
RC12**	I feel that the traffic conditions in my residential area are safe.	Ref	603	4.23	5	5	1	5	0.99
RC13**	There is adequate green space in the vicinity of my residence.	Ref	603	3.14	3	3	1	5	1.19
RC14**	I am satisfied with the appearance of my residence.	Ref	603	4.16	5	5	1	5	1.03
RC15**	I feel that the security conditions in my residential area are good.	Ref	603	2.95	3	3	1	5	1.18
Residential Satisfaction and Moving Intention									
RS1**	Overall, I am satisfied with the house I currently live in.	Ref	603	4.28	4	4	1	5	0.75
RS2**	Overall, I am satisfied with the neighborhood/community/block where I currently live.	Ref	603	3.42	3	4	1	5	0.83
MI1**	I intend to move house within the next five years.	Ref	603	4.38	5	5	1	5	0.77
MI1_1**	If possible, I would like to move from my current neighborhood/community/block to one closer to the toll gate.	Ref	603	2.93	3	3	1	5	0.97
MI1_2**	If possible, I would like to move from my current neighborhood/community/block to one farther from the toll road.	Ref	603	3.97	4	5	1	5	0.98

(Source: Author, 2024)
Note: * = nominal; ** = ordinal; ** = continous; For = formative indicator; Ref = reflective indicator
(source: Author, 2024)

This study also conducted a formative construct test for the measurement model. The formative constructs are represented by single indicators, such as gender, travel time to work/school, weekly travel costs, and frequency of toll road usage. Additionally, there are formative constructs with multiple indicators, including less prosperous households (LH), prosperous households (HH), and residential characteristics (RC_2). **Table 5** presents the values for weight significance, indicator loadings, loadings significance, and validation for each formative indicator within the model.

Following the evaluation of the measurement model, the structural model will be assessed based on R-squared, significance values, effect size, and path coefficients. The model includes R-squared values for constructs such as Perceived Accessibility, Residential Satisfaction, and the Moving Intention. The R-squared value for Perceived Accessibility is 0.065, indicating that the exogenous model of Perceived Accessibility, formed by the constructs DA, DC, TR, TS, and TP, explains only 6.5% of the variance. This value suggests that the representation of this construct is considered "weak," as it is below 0.19. The same applies to Residential Satisfaction (RS), which has an R-squared value of 0.167, or 16.7%. For the Moving Intention, the R-squared value is 0.195, accounting for 19.5% of the variance and falling into the "moderate" category.

Subsequently, the structural model will be examined for the direction and significance of the path coefficients. Significance testing will compare the T-statistic values of the model against the T-table values, with thresholds of 1.96 for a 95% confidence level and 1.64 for a 90% confidence level. In this analysis, a 90% confidence level will be used to obtain a broader range of significance for each path coefficient as shows in **Table 6.**

Table 5. Formative Indicator

Form Indicator	weight sig	loading	loading sig
PC2a -> HH	0.341	0.303	0.256
PC7_c -> HH*	0.266	0.718*	0.226
PC8a -> HH	0.87	0.218	0.463
PC9_ac -> HH	0.504	0.155	0.574
TC1_1a -> HH	0.736	0.124	0.638
TC1_2a -> HH*	0.243	0.613*	0.24

Form Indicator	weight sig	loading	loading sig
TC2e -> HH	0.841	0.003	0.988
PC2b -> LH	0.341	0.303	0.256
PC7_ab -> LH*	0.266	0.718*	0.226
PC8b -> LH	0.87	0.218	0.463
PC9_bde -> LH	0.504	0.155	0.574
TC1_1b -> LH	0.736	0.124	0.638
TC1_2b -> LH*	0.243	0.613*	0.24
TC2f -> LH	0.841	0.003	0.988
RC1_1 -> RC_2*	n/a	1*	n/a
RC2_12 -> RC_2	0.134	0.206	0.132
RC3 -> RC_2*	0.106	0.557*	0.111
RC4 -> RC_2*	0.839	0.279	0.053*
RC5 -> RC_2*	0.079*	0.75*	0.03*

Note: * means construct relationship is significant
(source: Author, 2024)

Table 6. Path Construct

Construct	T statistics	P values	Path Coef
DA -> PA	4.17	0.00*	0.168
DC -> PA	2.61	0.01*	-0.126
TP -> PA	1.60	0.11	-0.067
TR -> PA	3.22	0.00*	0.130
TS -> PA	2.70	0.01*	0.108
HH -> MI	0.89	0.37	-0.187
HH -> RS	0.11	0.92	0.011
LH -> MI	0.89	0.37	0.187
LH -> RS	0.11	0.92	-0.011
PA -> RS	2.61	0.01*	0.117
PB -> RS	1.25	0.21	0.060
PL -> RS	0.59	0.56	-0.027
PN -> RS	1.54	0.12	0.083
RC -> RS	5.73	0.00*	0.285
RC -> MI	3.87	0.00*	0.159
RS -> MI	4.65	0.00*	0.206
PC1_1 -> RS	1.12	0.26	0.090
RC_2 -> MI	1.79	0.07*	-0.242
RC_2 -> RS	0.99	0.32	-0.081
TC3_2_2 -> RS	0.36	0.72	0.017
TC5 -> RS	0.64	0.52	0.024
TC7_1 -> RS	1.63	0.10	0.064

Note: * means construct relationship is significant
(source: Author, 2024)

The f-square test is also conducted on the structural model to determine the contribution of exogenous variables to endogenous variables or their impact on the R^2 value.

Table 7. F-Square Value

Construct	F-Square
DA -> PA	0.028
RS -> MI	0.067
RC_2 -> MI	0.027
RC_2 -> RS	0.083
TC5 -> RS	0.046

(source: Author, 2024)

Table 7 shows the effect size values for constructs with small effect sizes. Meanwhile, the relationships between other constructs do not have an effect on the model. **Figure 2** presents the final SEM-PLS model of this study. Additionally, Figure 2 illustrates the interrelationships between constructs for both reflective and formative indicators, following the various tests conducted in the earlier stages. Furthermore, the figure depicts the differing relationships between prosperous and less prosperous families in relation to residential satisfaction and the desire to move, highlighting an inverse relationship between these groups.

Based on the established model, the results indicate that perceived Accessibility is formed based on five constructs: Destination Attributes (DA), Distribution of Activities (DC), Travel Barriers (TR), Transportation Supply (TS), and Temporal Variability (TP). Among these constructs, only the perceived Temporal Variability (TP) is not significant in building the construct of Perceived Accessibility (PA). DA, TR, and TS have positive coefficient values of 0.168, 0.13, and 0.108 respectively, while DC is significant with a negative coefficient of -0.126. However, only the perceived Destination Attributes (DA) shows an effect on Perceived Accessibility, albeit small. This suggests that the ease of traveling to access public facilities due to the Serang-Panimbang Toll Road enhances the perceived Accessibility. Conversely, there are other significant indicators aligned with the increase in perceived Accessibility but do not have effects similar to the Serang-Panimbang Toll Road, such as the use of the toll road at specific times, perceived safety when traveling by car compared to motorcycle and public transport, and satisfaction with current daily travel times. There are also significant but negatively related indicators, such as the ease of traveling to work/school and recreation using the Serang-Panimbang Toll Road, which suggests that perceived Accessibility improves when not using the toll road. Additionally, the significance among the four mentioned constructs also indicates an indirect relationship with residential satisfaction and the moving intention, showing that only ease of access to work and school via the toll road decreases residential satisfaction while increasing the moving intention to a location farther from the toll road.

Regarding the perceived nuisance, the model indicates that all constructs—perceived air pollution, noise, and barrier effect—are not significant in determining residential satisfaction

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and the desire to move. Furthermore, these three nuisance constructs have no effect on residential satisfaction according to effect size tests. This contrasts with Hamersma et al., (2014), which showed a strong negative influence of perceived highway nuisance on the the moving intention through mediation of residential satisfaction. Perceived barrier effect and noise have a positive direction with residential satisfaction, while perceived air pollution has a negative direction. In contrast to perceived nuisance, perceived Accessibility shows a significant positive value of 0.117 towards residential satisfaction, although it does not have a significant effect. This indicates that individuals' accessibility is an important component in determining residential satisfaction, enhanced by the ease of accessing public facilities due to the Serang-Panimbang Toll Road. This finding contrasts with Hamersma et al., (2015), which explained that perceived Accessibility is not related to increased residential satisfaction or decreased desire to move.

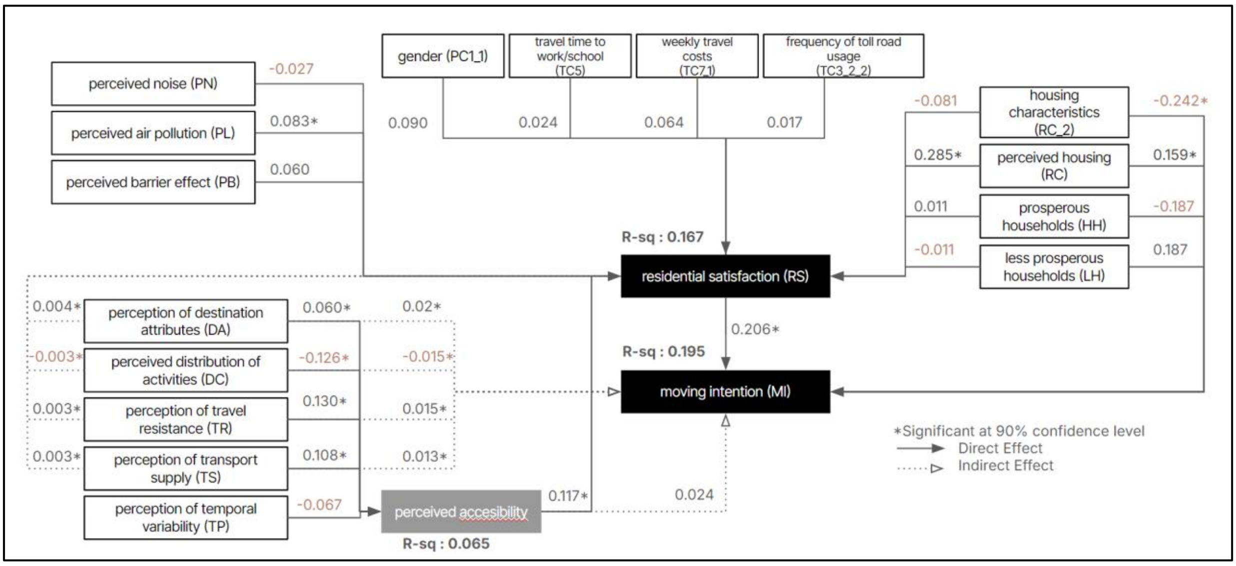

Figure 2. Final Model
(source: Author, 2024)

Another construct showing significance towards residential satisfaction is the perceived housing with a value of 0.285. This indicates that the proximity of housing to work/school, public facilities, satisfaction with the number of rooms, traffic conditions, and building appearance increases residential satisfaction (Galster & Hesser, 1981; Hamersma et al., 2015). Contrary to this research, the perceived housing actually increases the individual's intention to move away from the toll road with a value of 0.159, although this effect is not significant. On the other hand, housing characteristics significantly decrease the intention to move away from the toll road by -0.242, with a small effect. This means that the longer an individual resides, the longer it takes to reach the city center, the more rooms and the larger the housing, the lower the decision to move. However, these housing characteristics are not significant in reflecting residential satisfaction. This result aligns with Olfindo (2021), which explains that longer residence tends to have a lower moving intention. According to the model, residential satisfaction is significant in describing the moving intention away from the toll road, with a positive relationship (0.20). This indicates that even though satisfaction with the residence increases, there remains a high moving intention.

Table 8 shows that an increase in income (PC7_3) has a positive correlation with residential satisfaction, though the strength of this relationship is weak. Additionally, residential satisfaction is moderately positively correlated with moving intention, but weakly positively correlated with the intention to move away from the toll road. This indicates that, despite high residential satisfaction, there is still a desire to relocate, although this desire is not necessarily linked to moving away from the toll road.

This finding aligns with **Figure 1**, which illustrates that HH respondents have a lower intention to move and higher residential satisfaction, as evidenced by the path coefficient values, compared to LH respondents. The presence of an income indicator suggests that residential satisfaction increases with higher income levels (Campbell et al., 1976; Lu, 1999).

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Table 8. Gamma and Tau-b Kendall Test

	RS1 Residential satisfaction	**RS2** Neighborhood satisfaction	**MI1** Moving intention within the next 5 years	**M1_2** Moving intention farther than toll road
Gamma test				
PC7_3	0.193*	0.162*	0.090*	0.122*
Tau-b kendall test				
RS1		0.314**	0.352**	0.250*
RS2	0.314**		0.005*	-0.014*
MI1	0.352**	0.005*		0.385**
M1_2	0.250*	-0.014*	0.385**	

*Weak
**Moderate

(Source: Author, 2024)

CONCLUSION

Based on the research findings, residential satisfaction is significantly influenced by two key aspects: perceived accessibility and perceived housing. Perceived accessibility is shaped by factors such as destination attributes (ease of accessing public facilities), activity distribution (ease of commuting to work/school and recreational areas), travel barriers (safety when driving a car compared to using a motorcycle or public transport), and transport supply (satisfaction with travel time). Meanwhile, perceived housing, illustrated by the proximity of the residence to work/school, public facilities, satisfaction with the number of rooms, traffic conditions, and building appearance, has the strongest positive influence on enhancing residential satisfaction.

On the other hand, perceived nuisance, residential characteristics, and socioeconomic factors, whether from prosperous or less prosperous families, do not show a strong influence on residential satisfaction or moving intention away from the toll road. Additionally, the research shows that an increase in residential satisfaction is accompanied by a moving intention to a location further from the toll road. Furthermore, perceived accessibility in this study is a more significant trade-off compared to highway disturbances in the neighbourhoods around the Serang-Panimbang Toll Road. This indicates that the mediation concept for the moving intention due to residential satisfaction in this study is more influenced by how the surrounding community perceives accessibility resulting from the presence of the Serang-Panimbang Toll Road. Conversely, highway nuisance has not yet become a significant mediating indicator of residential satisfaction. However, it is possible that once sections 2 and 3 of the toll roads are fully operational, highway nuisance may become more pronounced for certain community groups along the toll road.

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