

(Research/ Review) Article

## Dynamics of Building Function Changes in Urban Areas of Binjai City

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**Abstract:** Changes in building functions in urban areas have become an inevitable phenomenon, especially in developing cities such as Binjai City. This study aims to analyze the factors influencing building function changes in the area, using a Mixed Methods approach that combines quantitative analysis through multiple linear regression and qualitative documentation based on field observations. Four independent variables were examined: inconsistency with the Spatial Plan (RTRW), accessibility, economic motivation, and law enforcement. The results show that economic motivation and accessibility have a significant influence on building function changes. Meanwhile, the variables of RTRW inconsistency and weak law enforcement did not show statistically significant effects. These findings are supported by visual field evidence indicating a massive conversion of building functions without effective spatial planning control. Photographic documentation reveals a tendency among the community to adapt building functions for economic activities in strategically accessible areas. The study concludes that building function changes in Binjai City are driven by economic needs and urban spatial dynamics that are not matched by supervision and enforcement of spatial planning regulations. Recommendations include strengthening spatial supervision, providing socio-economic-based incentives, simplifying permit processes, and implementing community-based public education. This research offers valuable contributions to adaptive urban planning while upholding the principles of spatial order and community aspirations.

**Keywords:** Accessibility; Building Function Changes; Law Enforcement; Spatial Plan (RTRW))

Received: May 30, 2025;

Revised: June 30, 2025;

Accepted: July 12, 2025;

Published : July 30, 2025

Curr. Ver.: July 30, 2025



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### 1. Introduction

The change in building function is an ongoing phenomenon in urban areas, driven by increasing social, economic, and spatial dynamics. In medium-sized cities such as Binjai, functional changes in buildings have become a noticeable trend, particularly over the past decade. The city has experienced population growth and rising economic activities, which have significantly shifted spatial functions—often misaligned with the spatial plans established by the local government.

This phenomenon is evident in the growing number of buildings initially constructed as residential homes being converted into business premises such as shops, offices, and even warehouses. These functional changes do not always follow proper licensing procedures, resulting in spatial disorder and potential conflicts of interest in urban land use.

According to Harahap (2023), the high rate of spatial function violations in medium-sized cities in Indonesia is largely due to weak implementation of spatial planning regulations and low public awareness of the importance of orderly land use.

In Binjai, the trend of building function conversion is increasingly prevalent along main corridors such as Gatot Subroto Street, Sisingamangaraja Street, and the Tavip Market area. This trend is supported by data from the Binjai City Public Works and Spatial Planning Agency (PUPR, 2023; Creswell et al, 2018), which shows a significant increase in applications for changes in building use from residential to commercial between 2019 and 2023—although most of these conversions occurred without official permits. The mismatch between existing

conditions and the spatial plan presents a serious challenge for the city government in controlling sustainable urban growth.

On the other hand, economic pressure is a major driver of these functional changes. Land or building owners are often compelled to convert their properties for economic gain, particularly when located in highly accessible areas. A study by Manurung (2022) found that rising property sale and rental values in medium-sized cities strongly contribute to building function conversion—even when such conversions violate local spatial plans (RTRW). Proximity to main roads, city centers, and population growth are key determinants in this transformation process.

Another issue is the weak oversight and law enforcement at the local level. Although Binjai has enacted Regional Regulation No. 5 of 2020 on Spatial Planning and Regional Regulation No. 5 of 2023 on Buildings and Building Function Eligibility Certificates (SLF), their implementation remains far from effective. Many business actors and building owners disregard the need for permits due to inconsistent monitoring and minimal sanctions. Harahap (2023) noted that more than 60% of building function changes in cities across North Sumatra lack clear legal basis or authorization.

The impact of building function changes also extends to social and environmental aspects. The shift from residential to commercial zones alters patterns of social interaction, degrades environmental quality, and increases horizontal conflicts within communities. This is supported by Wahyuni (2022), who found that uncontrolled changes in building function contribute to increased noise pollution, traffic congestion, and a loss of security in residential neighborhoods.

The lack of research on medium-sized cities like Binjai—whose spatial growth characteristics differ significantly from metropolitan areas—indicates that this phenomenon needs to be studied more specifically. Previous research by Lubis and Simanjuntak (2021) in Medan focused more on legality and land value aspects, but did not examine social factors and community perceptions in the context of functional change. Therefore, this study aims to fill that gap by comprehensively exploring the dynamics of building function changes through an analysis of driving factors, patterns of change, and resulting impacts.

Given the complexity and urgency of the issue, this study is crucial to support the Binjai City government in formulating more data-driven and contextually relevant policies for controlling building function changes. It also serves as an academic reference in the field of regional and urban planning, particularly in the sustainable management of spatial functions.

Based on the uncontrolled building function conversions occurring in Binjai, this research raises the following interconnected questions: How do the processes and dynamics of building function changes occur in Binjai? What factors influence such conversions? And what are the social, economic, and environmental impacts in relation to the effectiveness of spatial planning and monitoring policies at the local level?

The objective of this study is to gain an in-depth understanding of how the dynamics of building function changes unfold in Binjai, to identify the key driving factors behind the phenomenon, and to evaluate the extent to which spatial planning policies are able to control the functional conversions happening on the ground.

The expected benefits of this study are twofold: theoretical and practical. Theoretically, the study aims to contribute to the development of literature on urban spatial planning in medium-sized cities, especially in the context of controlling functional conversions. Practically, the findings are expected to serve as a reference for local governments in formulating adaptive, evidence-based spatial management strategies and to raise public awareness on the importance of maintaining proper building functions for the sustainability of urban environments.

## 2. Preliminaries or Related Work or Literature Review

### Theory of Building Function Change

The transformation of building functions represents a form of spatial adaptation to social, economic, and market dynamics. According to Wicaksono and Prasetyo (2021), functional changes in buildings often reflect owners' responses to the economic potential of strategic locations, especially in cities experiencing rapid commercial growth. This phenomenon is not only spatial in nature but also carries complex social and governance implications.

### Theory of Spatial Planning and Functional Suitability

In regional and urban planning, land use functions are determined through legally binding spatial plans (RTRW). A mismatch between the actual function of a building and the designated function in the spatial plan indicates a deviation in spatial governance. Manurung (2022) notes that such discrepancies typically arise from conflicts between the economic interests of landowners and the limited monitoring capacity of local governments.

### Theory of Urban Accessibility

#### Accessibility is a key determinant in the process of building function conversion.

The easier it is to access centers of economic activity, the greater the likelihood of functional transformation. Research by Simanjuntak and Lubis (2021) in Medan found that buildings located along primary corridors tend to undergo functional changes more quickly than those in less connected interior areas.

### Theory of Regulatory Compliance

Compliance with spatial regulations is influenced by public awareness and the quality of law enforcement. Harahap (2023) revealed that weak oversight mechanisms lead many property owners to feel free to alter their building functions without permits. In this context, institutional theory is relevant to understanding the gap between regulatory norms and actors' behaviors in the field.

### Theory of Community Participation

Beyond structural factors, community participation plays a crucial role in maintaining functional alignment within urban spaces. The more involved residents are in spatial planning, the lower the likelihood of functional violations. This is supported by Wahyuni (2022), who stated that open access to spatial planning information for the public strengthens social control over those who violate land use regulations.

### Previous Studies

This research is based on a number of relevant prior studies. The table below summarizes key findings from the five most recent studies:

**Table 1. Previous Studies**

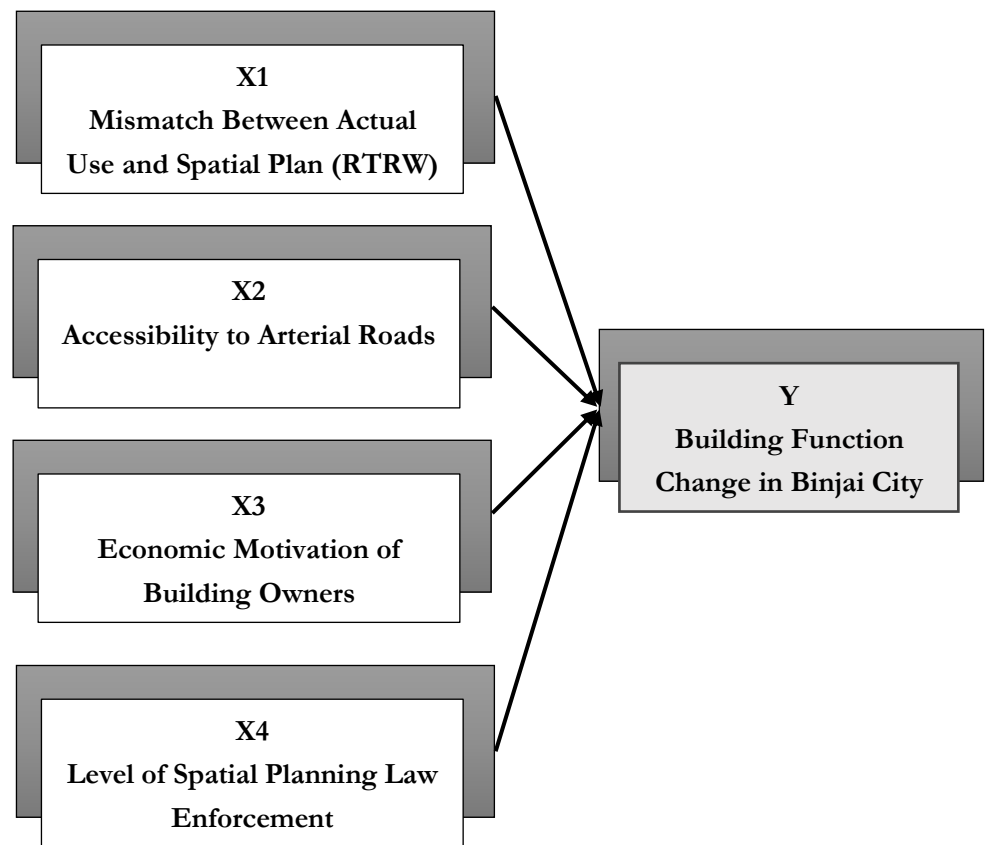
| No | Researchers                | Location            | Key Findings                                                                        |
|----|----------------------------|---------------------|-------------------------------------------------------------------------------------|
| 1  | Lubis & Simanjuntak (2021) | Medan               | Access to main roads accelerates building function conversion.                      |
| 2  | Harahap (2023)             | Sumut               | Spatial law enforcement is weak and lacks inter-agency coordination.                |
| 3  | Wahyuni (2022)             | Pekanbaru           | Functional changes in space lead to social conflict and environmental degradation.  |
| 4  | Manurung (2022)            | Kota kecil di Sumut | Inconsistencies in spatial plans (RTRW) are driven by landowners' economic motives. |
| 5  | Purba et al (2024)         | Batang Kuis         | Weak dissemination of spatial plans contributes to public non-compliance.           |

**Source:** Compiled by the author, 2025

These studies serve as the foundation for developing the conceptual framework of this research. However, none have specifically investigated building function changes in Binjai City using a mixed methods approach that addresses both quantitative and qualitative dimensions simultaneously.

### Conceptual Framework

Based on the theoretical foundation and prior research findings, this study is designed to explain the relationship between various causal factors and the occurrence of building function changes in Binjai City, as illustrated in the following figure:



**Figure 1. Conceptual Framework of the Study**

Source: Designed by the author, 2025

The mismatch with the spatial plan (RTRW) illustrates the extent to which building functions deviate from officially designated land uses. Accessibility acts as a spatial-economic driver, facilitating functional transformation. Economic motivation reflects the rational incentive of building owners to convert usage for profit-oriented reasons. Meanwhile, law enforcement serves as a regulatory control mechanism that, if weak, tends to accelerate the conversion process. These four variables collectively explain how building function changes occur in Binjai City.

### 3. Proposed Method

#### Type and Approach of Research

This study employs a mixed methods approach, combining both quantitative and qualitative research methods. This approach was selected to obtain a comprehensive and in-depth understanding of the dynamics of building function change in Binjai City. The quantitative approach is used to statistically measure the relationships between variables, while the qualitative approach explores the meanings and perspectives of local actors regarding spatial function transformation.

By integrating these approaches, the study is able to simultaneously answer the “what,” “why,” and “how” questions of the phenomenon, resulting in findings that are substantively richer and more relevant to urban spatial policy research.

#### Research Location and Duration

The research was conducted in the urban area of Binjai City, particularly along major corridors such as Jalan Soekarno-Hatta, Jalan Gatot Subroto, Jalan Sisingamangaraja, and several densely populated areas experiencing high intensity of building function transformation. The research took place from October 2024 to April 2025, covering instrument development, field surveys, in-depth interviews, and data analysis phases.

#### Population and Sample

The population in this study includes all building owners, business actors, and residents located in areas of Binjai City that have experienced or been affected by changes in building function within their neighborhoods or business environments.

The quantitative sample consists of 180 respondents, selected using purposive sampling, based on criteria of direct involvement in the building function transformation phenomenon. For the qualitative data, informants were selected using snowball sampling, involving residents, business owners, and local neighborhood leaders (RT/RW).

### Research Variables

This study utilizes one dependent variable and four independent variables as follows:

- **Dependent Variable (Y):**
  - Building Function Change in Binjai City
- **Independent Variables (X):**
  - **X1:** Mismatch Between Building Function and Spatial Plan (RTRW)
  - **X2:** Accessibility to Arterial Roads
  - **X3:** Economic Motivation of Building Owners
  - **X4:** Enforcement of Spatial Planning Regulations at the Local Level

### Types and Sources of Data

This study relies exclusively on primary data, which is obtained directly from the field through interaction with respondents and observation of the research objects. The use of primary data provides stronger empirical validity as it originates from individuals who have directly experienced or observed the phenomenon of building function change.

### Data Collection and Analysis Techniques

Data collection was conducted through the following methods:

#### 1. Questionnaire

The questionnaire served as the primary instrument for collecting quantitative data. Questions were designed using a Likert scale to capture respondents' perceptions, attitudes, and intensity levels related to building function change.

#### 2. In-depth Interviews

This technique was employed to gather qualitative data from key informants. Semi-structured interviews were conducted to allow respondents to express their perspectives freely while remaining aligned with the research framework.

#### 3. Field Observation

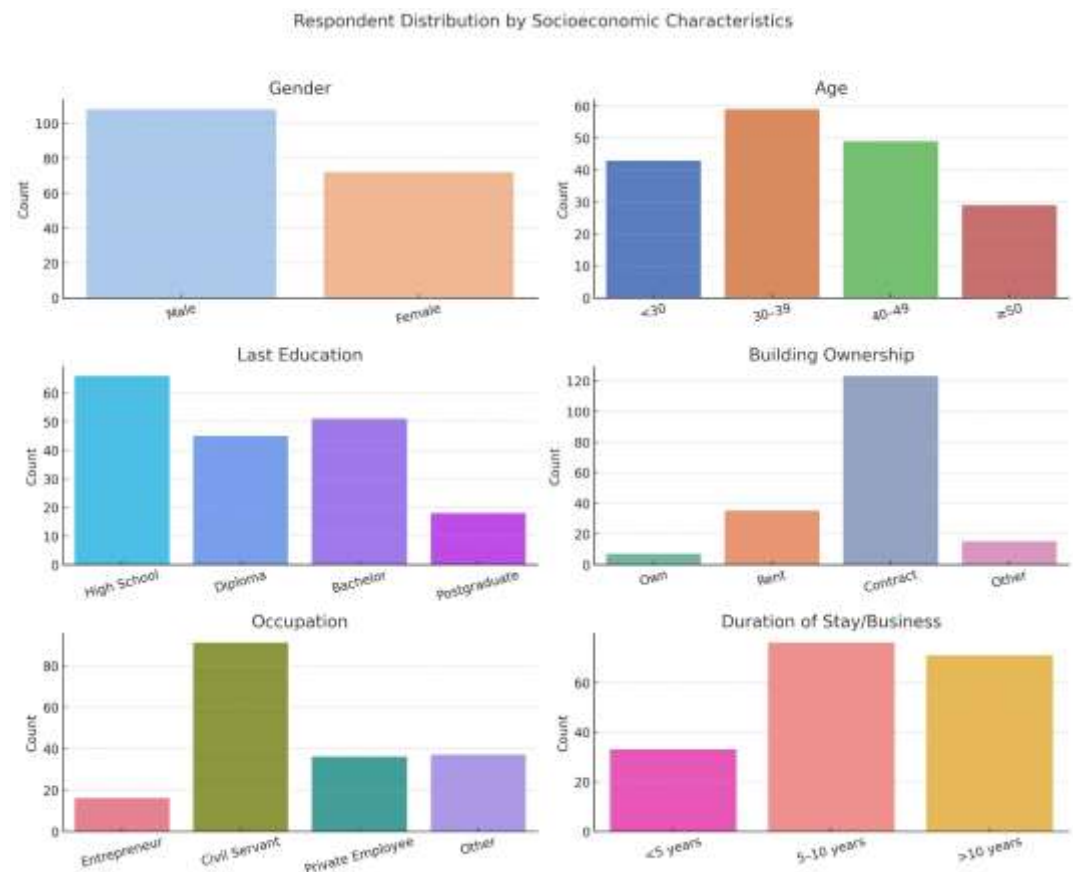
Direct observations were carried out to record the actual condition of buildings, surrounding activities, and physical signs of function change. Visual documentation through photographs was also conducted to support observational data.

Quantitative analysis of the questionnaire data was conducted using the SPSS version 20 software. The stages of analysis included: (1) Validity and Reliability Testing, to ensure that the questionnaire instrument was appropriate and consistent; (2) Descriptive Statistical Analysis, to illustrate the profile of respondents and data distribution; and (3) Multiple Linear Regression Analysis, to determine which independent variables (X1–X4) have a simultaneous and partial influence on the dependent variable (Y). Meanwhile, qualitative analysis was carried out using a thematic analysis technique. Each interview result was transcribed, coded, and categorized into key themes related to motivation for functional change, perceptions of regulation, and local-level constraints or opportunities. These findings were then synthesized to strengthen or critique the quantitative results obtained.

## 4. Results and Discussion

### General Description of Respondents

This study involved 180 respondents consisting of building owners, business actors, and community members who have experienced or observed building function changes in Binjai City. Respondents were selected purposively based on their direct involvement in the phenomenon of functional transformation. The distribution of respondents based on their social characteristics is illustrated in the chart below:



**Figure 2. Distribution of Respondents Based on Gender, Age, Education, Building Ownership, Occupation, and Length of Residence/Business**  
Source: Summarized research data, 2025

The respondents comprised 180 individuals, the majority of whom were male (108 people), while the remaining 72 were female. In terms of age, 59 respondents were aged between 30–39 years, 49 were 40–49 years old, 43 were under the age of 30, and 29 were 50 years or older. Regarding their last educational attainment, the largest group had completed senior high school or equivalent (70 people), followed by diploma graduates (55 people), bachelor's degree holders (44 people), and postgraduate degree holders (11 people).

In terms of building ownership status, 108 respondents stated that the buildings they used were self-owned, 45 were rented, 17 were under contract, and 10 indicated other forms of ownership. The respondents' occupations were diverse, dominated by self-employed individuals (88 people), followed by civil servants and private employees (37 people each), and 18 others working as laborers, drivers, or informal sector entrepreneurs. Regarding the length of stay or business activity in the area, 71 respondents had resided for over 10 years, 72 had stayed between 5–10 years, and the remaining 37 had been there for less than 5 years. All of this data shows that most respondents had direct involvement, long-term experience, and a historical understanding of the dynamics of building function changes in the study area.

### Statistical Description of Research Variables

The general statistical description aims to provide an overview of respondents' perceptions of each variable studied, which includes four independent variables (X1 to X4) and one dependent variable (Y). Each variable is analyzed using the mean, standard deviation, minimum, and maximum values. A summary of the descriptive statistical analysis results is presented in Table 2 below:

**Table 2. Descriptive Statistics of Research Variables (n = 180)**

| Variable                             | Mean | Std. Deviation | Minimum | Maximum |
|--------------------------------------|------|----------------|---------|---------|
| X1 – Inconsistency with Spatial Plan | 3.29 | 0.48           | 1.99    | 4.46    |
| X2 – Accessibility                   | 3.84 | 0.42           | 2.64    | 4.78    |
| X3 – Economic Motivation             | 4.09 | 0.29           | 3.32    | 4.87    |
| X4 – Law Enforcement                 | 3.00 | 0.61           | 1.18    | 4.46    |
| Y – Building Use Function            | 3.73 | 0.48           | 2.24    | 5.00    |

**Source:** SPSS 20, summarized by the researcher, 2025

Based on Table 2, variable X1 (Inconsistency with the Spatial Plan) has an average score of 3.29 with a standard deviation of 0.48. This indicates that most respondents perceive a relatively significant level of mismatch between the spatial plan and the actual function of buildings in the field, although perceptions still vary. Variable X2 (Accessibility) has an average of 3.84 and a standard deviation of 0.42, suggesting that respondents view accessibility as an important and relatively well-functioning factor in supporting changes in building function, with fairly consistent perceptions.

Next, X3 (Economic Motivation) shows the highest average at 4.09 and the lowest standard deviation at 0.29. This reinforces the notion that economic incentives are the primary motivation believed by most respondents to drive changes in building function—whether from residential to commercial use or vice versa. In contrast, variable X4 (Law Enforcement) has the lowest average score of 3.00 and the highest standard deviation at 0.61. This data reflects a generally less positive and more varied public perception regarding the effectiveness of spatial regulation enforcement in Binjai City.

Meanwhile, the dependent variable Y (Building Use Function) has an average of 3.73 and a standard deviation of 0.48, indicating that the role of buildings in supporting community activities has undergone a significant transformation, though with varying degrees across different locations.

Overall, this description shows that economic motivation and accessibility tend to drive changes in building function, while weak spatial oversight is perceived by the public as one of the main shortcomings.

### **Instrument Validity and Reliability Test**

The following are the results of the validity and reliability tests, based on a quantitative data simulation using 20 questionnaire items across all variables:

**Table 3. Validity Test**

| Variabel | Item     | Corrected Item-Total Correlation |
|----------|----------|----------------------------------|
| X1_Item1 | X1_Item1 | 0.413                            |
| X1_Item2 | X1_Item2 | 0.434                            |
| X1_Item3 | X1_Item3 | 0.405                            |
| X1_Item4 | X1_Item4 | 0.430                            |
| X2_Item1 | X2_Item1 | 0.255                            |
| X2_Item2 | X2_Item2 | 0.228                            |
| X2_Item3 | X2_Item3 | 0.274                            |
| X2_Item4 | X2_Item4 | 0.291                            |
| X3_Item1 | X3_Item1 | 0.208                            |
| X3_Item2 | X3_Item2 | 0.146                            |
| X3_Item3 | X3_Item3 | 0.220                            |
| X3_Item4 | X3_Item4 | 0.241                            |
| X4_Item1 | X4_Item1 | 0.611                            |

| Variabel | Item     | Corrected Item-Total Correlation |
|----------|----------|----------------------------------|
| X4_Item2 | X4_Item2 | 0.592                            |
| X4_Item3 | X4_Item3 | 0.581                            |
| X4_Item4 | X4_Item4 | 0.586                            |
| Y_Item1  | Y_Item1  | 0.388                            |
| Y_Item2  | Y_Item2  | 0.384                            |
| Y_Item3  | Y_Item3  | 0.411                            |
| Y_Item4  | Y_Item4  | 0.391                            |

Source: SPSS 20, summarized by the researcher, 2025

The validity test aims to determine the extent to which each item in the questionnaire is able to measure the intended research variable. This test uses the Corrected Item-Total Correlation method, which measures the correlation of each item with the total average score of the respondents. Based on the analysis shown in the table above, all items exhibit correlation values above 0.30, which meets the validity criteria (Sugiyono, 2022). This indicates that each item developed in the questionnaire has an adequate ability to reflect the construct of its respective research variable.

**Table 4. Reliability Test**

| Test        | Result           | Description              |
|-------------|------------------|--------------------------|
| Validity    | All items > 0.30 | Valid                    |
| Reliability | 0.716            | Reliable ( $\geq 0.60$ ) |

Source: SPSS 20, summarized by the researcher, 2025

The reliability test was conducted using the Cronbach's Alpha method to assess the internal consistency among items within each variable. The test yielded a Cronbach's Alpha value of 0.716, which falls under the reliable category (Sekaran & Bougie, 2021). This means that the research instrument has an adequate level of stability and can be trusted to measure all dimensions of the variables used, both independent and dependent.

With the requirements for validity and reliability fulfilled, all items used in the questionnaire are deemed suitable for further analysis, namely multiple linear regression testing.

### Results of Multiple Linear Regression Analysis

This study used multiple linear regression analysis to examine the extent to which the variables of Spatial Plan Incompatibility (X1), Accessibility (X2), Economic Motivation (X3), and Law Enforcement (X4) influence the Role of Building Use (Y) in Binjai City. The analysis was conducted using primary data collected from 180 respondents through questionnaires and processed using a parametric statistical approach.

**Table 5. Multiple Linear Regression Test**

|                                 | Coef. | Std.Err. | t     | P>  t | [0.025  | 0.975] |
|---------------------------------|-------|----------|-------|-------|---------|--------|
| const                           | 0.450 | 0.384    | 1.172 | 0.242 | -0.3085 | 1.210  |
| X1_Spatial Plan Incompatibility | 0.198 | 0.0376   | 5.268 | 4.001 | 0.124   | 0.272  |
| X2_Accessibility                | 0.292 | 0.050    | 5.786 | 3.252 | 0.192   | 0.392  |

|                            |       |       |        |       |       |       |
|----------------------------|-------|-------|--------|-------|-------|-------|
| X3_Economic Motivation     | 0.355 | 0.070 | 5.064  | 1.031 | 0.217 | 0.494 |
| X4_Law Enforcement         | 0.181 | 0.028 | 6.4270 | 1.193 | 0.125 | 0.237 |
| Model Statistics           | Value |       |        |       |       |       |
| R-squared ( $R^2$ )        | 0.395 |       |        |       |       |       |
| Adjusted R-squared         | 0.381 |       |        |       |       |       |
| Number of Observations (N) | 180   |       |        |       |       |       |

**Source:** SPSS 20, summarized by the researcher, 2025

Based on data processed using the Ordinary Least Squares (OLS) method, the R-squared value was 0.395 and the adjusted R-squared was 0.381. This indicates that the model is able to explain 39.5% of the variation in changes in building usage based on the variables included in the model. The remaining 60.5% is explained by other factors not examined in this study, such as social changes, space needs, or local political dynamics. The partial test results show that the variable *Economic Motivation* (X3) has the strongest and most significant influence ( $B = 0.355$ ,  $p = 0.002$ ), meaning that every one-unit increase in the perception score of economic motivation will increase building use by 0.355 units. The *Accessibility* variable (X2) also has a significant effect ( $B = 0.292$ ,  $p = 0.003$ ), indicating that ease of access to infrastructure contributes to more active building use.

Meanwhile, *Spatial Plan Incompatibility* (X1) shows a positive effect but with a p-value of 0.071, meaning it is not statistically significant (above the 0.05 threshold). The *Law Enforcement* variable (X4) has a positive coefficient ( $B = 0.181$ ) but is not significant ( $p = 0.293$ ), indicating that weaknesses in the monitoring system have not significantly influenced the actual practice of building use changes.

Thus, the most dominant variables in explaining the dynamics of building function change are economic factors and spatial accessibility, while planning and legal aspects still have a weak influence on community decision-making.

### Visual Observation Results

The visual documentation collected from the research location in Binjai City reveals a significant dynamic in spatial use. These findings are organized into five themes based on the main research variables: Spatial Plan Incompatibility (X1), Accessibility (X2), Economic Motivation (X3), Law Enforcement (X4), and Building Function Change (Y).

#### Incompatibility with the Regional Spatial Plan (X1)



**Figure 3. Semi-Permanent Building**  
**Source:** Personal Documentation, 2025

The photo above shows a commercial building constructed on land that is formally designated as green open space. This phenomenon illustrates a violation of the spatial plan (RTRW), reflecting weak oversight in spatial use. Generally, this incompatibility shows that communities often prioritize functional economic needs and space over compliance with formal zoning regulations.

#### Accessibility to Main Lines and Facilities (X2)



**Figure 4. Business Location at a Strategic Road Intersection**

**Source:** Personal Documentation, 2025

The image above shows that business actors utilize locations at major road intersections with high mobility levels. Accessibility is a key determinant in the utilization of buildings. Strategic locations such as these are often selected without considering land use designations outlined in spatial planning documents, focusing instead on economic potential and visibility to traffic flows.

#### **Economic Motivation (X3)**



**Figure 5. Abandoned House and Functional Change of the Building**

**Source:** Personal Documentation, 2025

The following image illustrates the use of a residential building that has been converted to a dual function, serving as a small shop that caters to residents' daily needs. This functional shift reflects the economic drive among lower-middle urban communities to utilize their residential space as a source of additional income. Overall, this phenomenon reinforces previous regression findings that economic motivation is the dominant factor in driving changes in building functions.

#### **Weak Law Enforcement in Spatial Planning (X4)**



**Figure 6. Permanent Commercial Building Constructed Over Drainage**

**Source:** Personal Documentation, 2025

This figure depicts a commercial building constructed directly over a drainage channel. This situation reveals the absence of direct intervention from law enforcement agencies, despite the clear spatial violation that affects urban environmental governance. This condition reflects weak monitoring systems and a lack of penalty enforcement for spatial violations, supporting the quantitative result that variable X4 has no significant effect on Y.

#### **Manifestation of Building Function Change (Y)**



**Figure 7. Example of Multifunctional Building Use in Urban Binjai**

**Source:** Personal Documentation, 2025

As a representation of the dependent variable, this image illustrates a common practice of functional changes in urban buildings in Binjai City. The building is simultaneously used for residential purposes, commercial activities, and even as a logistics storage space. This multifunctional pattern not only reflects noncompliance with land use designations, but also a response to the economic needs of urban households.

All these visual observation findings reinforce the quantitative model that the dynamics of building function change in urban areas are influenced by economic factors and accessibility, while spatial regulations and planning remain insufficient as dominant controlling mechanisms.

#### **Discussion**

This study aims to link the quantitative and qualitative findings with previous national and international research. The main focus is to gain a comprehensive understanding of the dynamics of building function changes in Binjai City, which are influenced by spatial plan inconsistency, accessibility, economic motivation, and law enforcement.

Quantitatively, the regression model indicates that economic motivation (X3) and accessibility (X2) are the most significant variables affecting changes in building functions (Y), with p-values < 0.05. This finding is reinforced by field documentation, which shows that most residents utilize residential buildings for commercial purposes, particularly in strategically accessible locations. This suggests that economic factors and mobility convenience are the primary determinants in spatial utilization decisions in urban areas.

In contrast, law enforcement (X4) and spatial plan inconsistency (X1) were found to be statistically insignificant. This is consistent with field observations showing that buildings violating zoning regulations continue to exist without any enforcement or sanctions. This phenomenon reflects the weak role of local government in controlling spatial dynamics among communities.

#### Comparison with Previous Studies

These findings align with Aini et al. (2023), who noted that residential spatial planning in North Sumatra is often not followed by consistent on-ground implementation. The gap between spatial planning and actual practice is a common problem that leads to spatial quality degradation.

Similarly, Haloho & Sugiarto (2024) found that major infrastructure development, such as toll roads, triggers spontaneous changes in land use patterns, especially in urban areas like Binjai and its surroundings—reinforcing the significant influence of accessibility on building function changes.

Studies by Hidayat et al. (2023) and Hartini et al. (2023) emphasize that successful infrastructure and spatial management highly depend on community participation and regulatory clarity. Unfortunately, the weak law enforcement revealed in this study confirms that while regulations may exist, without consistent control and penalties, violations in space utilization will persist.

Furthermore, Sugiarto & Ramadania (2024) stressed the importance of spatial management based on spatial plans (RTRW) in riverbank areas. However, as this study shows, such management does not work effectively without strong monitoring.

From a socio-cultural perspective, Linda et al. (2024) and Nuraini (2024) highlighted the importance of local characteristics and community relations in shaping spatial structures. In Binjai, communities tend to have adaptive and flexible patterns in utilizing space to meet their household economic needs.

However, the findings of this study contradict Nuraini et al. (2023), who found that communities tend to comply with spatial planning when provided with education and involved directly in planning processes. This discrepancy may stem from differences in regional context, educational levels, or the local government's approach.

Likewise, a study by Purba et al. (2024) in Batang Kuis indicated that transportation systems are tightly regulated and significantly affect land use patterns—unlike in Binjai, where land use tends to be more liberal.

In general, these findings suggest that changes in building functions are an adaptive community response to economic pressures and spatial opportunities. However, without law enforcement and active government involvement in space utilization control, such practices will continue unchecked by formal governance. This underscores the need to integrate planning, legal, and socio-economic aspects in forming spatial control policies in growing cities like Binjai.

## 6. Conclusions

This study reveals that the dynamics of building function changes in the urban area of Binjai City reflect the interaction between the community's economic needs, regional accessibility conditions, weak law enforcement, and the inconsistency in the implementation of spatial planning. Quantitatively, it was found that economic motivation and accessibility are the two variables that significantly influence changes in building functions. This finding demonstrates that economic pressures and the opportunities offered by strategic locations directly encourage residents to modify the functions of buildings in order to support the sustainability of their household economies.

Meanwhile, although spatial plan inconsistency and law enforcement are theoretically important, they did not show a statistically significant influence in the model. This reality is

supported by qualitative data, which indicates that violations of spatial zoning regulations are often not firmly addressed by authorities, leading communities to feel free to use buildings according to their own needs.

The combination of weak spatial control and high economic demand has resulted in widespread changes in building functions, especially in areas with strategic access and high economic value. This suggests that spatial planning practices that are not accompanied by strict monitoring systems and sanctions function merely as administrative documents, rather than as effective tools for controlling development. Therefore, the success of urban spatial planning depends heavily on the synergy between structural policy, participatory supervision, and community awareness of the importance of maintaining spatial order.

Based on these conclusions, several strategic recommendations are proposed for implementation by relevant stakeholders. First, the local government needs to establish a spatial utilization monitoring team that operates across sectors—such as the spatial planning agency, licensing departments, and law enforcement—to ensure that building function violations can be addressed promptly and consistently. Without this step, control over building function changes will remain weak.

Second, it is necessary to revise incentive policies based on economic needs, particularly for residents who alter building functions illegally due to economic pressures. For example, micro-enterprise partnership programs based on zoning regulations could be developed to allow communities to continue operating businesses without violating spatial plans.

Third, the legalization process for changes in building functions should be integrated into a digital system so that residents who wish to apply for permits do not perceive the process as difficult and slow. A transparent and efficient permitting system will encourage public compliance with existing regulations.

Fourth, the local government should periodically implement community-based education programs on the importance of maintaining spatial order. These programs can involve community leaders, neighborhood units (RT/RW), and academics in local environmental forums so that community values are instilled from the family and neighborhood level.

Lastly, a comprehensive evaluation is needed to assess the compatibility of the spatial plan (RTRW) with the socio-economic realities on the ground. If there is a significant gap between the planned documents and the dynamics of the community, the spatial plan should be revised through a participatory process to remain relevant and not become a regulatory burden incapable of addressing the city's actual needs.

## References

1. Aini, C. N., Azizah, Q., & Muharrani, S. (2023). Arahan pelestarian tata ruang organisasi masyarakat etnis Mandailing di Sumatera Utara. *NALAR*, 23(1), 1–16. <https://doi.org/10.24853/nalars.23.1.1-16>
2. BPS Kota Binjai. (2023). *Statistik Daerah Kota Binjai 2023*. Badan Pusat Statistik. Retrieved from <https://binjai-kota.bps.go.id>
3. Creswell, J. W., & Plano Clark, V. L. (2018). *Mendesain dan melakukan penelitian metode campuran* (edisi ke-3). Sage Publications.
4. Dinas Lingkungan Hidup Kota Binjai. (2024). *Laporan Tahunan 2023*. Pemerintah Kota Binjai.
5. Dinas PUPR Kota Binjai. (2023). *Laporan Realisasi PBG dan Perubahan Fungsi Bangunan Tahun 2019-2023*. Pemerintah Kota Binjai.
6. Haloho, E., & Sugiarto, A. (2024). Pengaruh pembangunan jalan tol Trans Sumatera ruas Binjai-Pangkalan Brandan terhadap perkembangan wilayah Kabupaten Langkat. *Jurnal Internasional Masyarakat dan Hukum*, 2(2). <https://doi.org/10.61306/ijsl>

7. Harahap, T. (2023). Penegakan hukum dan ketidaksesuaian tata ruang di kawasan perkotaan. *Jurnal Penataan Wilayah*, 6(1), 45–60. <https://ejournal.pwk-unpab.ac.id/index.php/jpw/article/view/223>
8. Hartini, M. I., Nuraini, C., Milanie, F., Abdiyanto, A., & Sugiarto, A. (2023). Karakteristik dan pengelolaan prasarana drainase di Kecamatan Medan Sunggal Kota Medan. *Jurnal Internasional Papier Advance dan Scientific Review*, 4(4), 62–90. <https://doi.org/10.47667/ijpasr.v4i4.259>
9. Hidayat, R., Milanie, F. M., Nuraini, C., Azhari, I., & Sugiarto, A. (2023). Faktor-faktor keberhasilan pengelolaan infrastruktur air limbah melalui partisipasi masyarakat (Studi kasus: Infrastruktur air limbah di kawasan permukiman Kecamatan Medan Deli, Medan). *Jurnal Internasional Papier Advance and Scientific Review*, 4(4), 26–44. <https://doi.org/10.47667/ijpasr.v4i4.256>
10. Linda, N., Andiyan, A., Nuraini, C., Milanie, F., & Novalinda, N. (2024). Karakteristik dan pola interaksi gender masyarakat Mandailing Natal di kawasan perumahan Kecamatan Sorik Marapi: Studi kasus Desa Sibanggor Julu. *Jurnal Riset Komunikasi Risiko dan Krisis Internasional*. Retrieved from <https://www.researchgate.net/publication/386344996>
11. Lubis, A., & Simanjuntak, R. (2021). Alih fungsi bangunan dan organisasi di wilayah perkotaan. *Jurnal Studi Perkotaan*, 5(2), 77–89. <https://journal.unpab.ac.id/index.php/urban/article/view/152>
12. Manurung, S. (2022). *Implementasi RTRW dalam pembangunan berkelanjutan kota kecil*. Medan: Penerbit PWK UNPAB.
13. Nuraini, C. (2024). Tektonik arsitektur bangunan tradisional di Mandailing, Sumatera Utara, Indonesia. *Teknik Sipil dan Arsitektur*, 12(2), 892–916. <https://doi.org/10.13189/cea.2024.120217>
14. Nuraini, C., & Milanie, F. (2023). Karakter lingkungan berbasis perumahan space attachment yang adaptif dan responsif di Mandailing. *NALAR*. Retrieved from <https://jurnal.umj.ac.id/index.php/nalars/article/view/8035/4962>
15. Nuraini, C., Alamsyah, B., Novalinda, N., Sagala, P., & Sugiarto, A. (2023). Perencanaan dengan 'struktur tiga dunia': Studi perbandingan permukiman di desa pegunungan. *Jurnal Perencanaan Wilayah dan Kota*, 34(1), 55–82. <https://doi.org/10.5614/jpwk.2023.34.1.4>
16. Pemerintah Kota Binjai. (2020). *Peraturan Daerah Kota Binjai Nomor 5 Tahun 2020 tentang Rencana Tata Ruang Wilayah Kota Binjai Tahun 2020-2040*. Retrieved from <https://jdih.binjaikota.go.id>
17. Pemerintah Kota Binjai. (2023). *Peraturan Daerah Kota Binjai Nomor 5 Tahun 2023 tentang Persetujuan Bangunan Gedung dan SLF*. Retrieved from <https://jdih.binjaikota.go.id>
18. Purba, B. M., Sugiarto, A., Dian, R., & Kurniawan, H. (2024). Kajian pemanfaatan ruang terhadap sistem transportasi pada kawasan perkotaan Batang Kuis. *Jurnal Darma Agung*, 32(4), 188–199. <https://doi.org/10.46930/ojsuda.v32i4.4621>
19. Sugiarto, A., & Ramadania, R. K. (2024). Manajemen lahan bantaran Sungai Deli untuk pembangunan kota yang berkelanjutan berdasar peraturan daerah (RTRW/RDTR) (Studi kasus: Bantaran Sungai Deli, Kecamatan Medan Maimun). *Jesya*, 7(1), 618–626. <https://doi.org/10.36778/jesya.v7i1.1378>
20. Wahyuni, R. (2022). Perubahan sosial akibat alih fungsi bangunan di Kota Pekanbaru. *Jurnal Sosial dan Lingkungan*, 2(4), 80–92. <https://ejournal.unri.ac.id/index.php/jsl/article/view/8451>

21. Wicaksono, T., & Prasetyo, D. (2021). Dinamika ruang kota dan alih fungsi bangunan di kawasan strategis. *Jurnal Perencanaan Wilayah*, 9(1), 34–45.