PUBLIC TRANSPORT ACCESSIBILITY AND THE OPTIMIZATION OF BUS STOP LOCATIONS: A CASE STUDY IN DA NANG

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Abstract - This study evaluates the accessibility of public bus stops in Da Nang's city center to examine the alignment between spatial distribution and actual user demand within the context of promoting a shift toward public transit. Utilizing **GIS spatial distribution analysis** (within a 300–500m radius) combined with **user surveys**, the results indicate that current accessibility remains limited, particularly within the alleyways of older residential areas. **Regression analysis** identifies that 'Roadside Amenities' (40.8%) and 'Accessibility' (30.4%) are the key factors determining passenger satisfaction. Consequently, the study proposes a **300–500m threshold** (equivalent to a 5–10 minute walk) as the optimal service radius, while providing a practical basis for improving pedestrian infrastructure and "first-mile/last-mile" connectivity for the bus system in Da Nang.

Key words - Accessibility; bus stop location; QGIS; EFA; pedestrian access; user behavior; public transport; Da Nang.

1. Introduction

1.1. The Role of Public Transportation

Public transportation plays a pivotal role in fostering sustainable urban development by mitigating the adverse effects of private vehicle dependency, such as traffic congestion, accidents, and environmental pollution [1]. Beyond improving air quality and promoting energy efficiency, public transit systems significantly enhance accessibility, social equity, and public health by encouraging active commuting habits, particularly walking [2]. In the context of developing cities, bus networks are considered the primary mode of transport to ensure mobility for all social strata, specifically for those who are unable to drive or lack the financial means to afford more expensive transport alternatives [3].

In the context of rapid urbanization within developing nations, the surge in private vehicle ownership has led to severe repercussions, including chronic traffic congestion, environmental degradation, and increased road accidents. Despite substantial investments in bus infrastructure by municipal authorities in cities such as Ha Noi and Da Nang, ridership rates remain below expectations and have even exhibited a downward trend during certain periods [4].

This reality underscores an urgent requirement for policymakers: rather than focusing solely on "hard" engineering solutions (infrastructure), there must be a profound understanding of the "soft" determinants that drive modal choice behavior. Research grounded in behavioral psychology facilitates an explanation of why identical infrastructure systems elicit disparate responses across different user groups. Consequently, such insights enable the formulation of effective behavioral intervention policies aimed at achieving transition toward sustainable mobility.

1.2. User Behavior and Determinants of Bus Choice

The nexus between behavioral theory and urban practice lies in the variable of "Perceived Behavioral Control" In essence, the perceived ease or difficulty of utilizing bus services is not merely a subjective impression; it is directly dictated by physical accessibility and the configuration of the built environment [5]. If a public transport system fails to provide seamless door-to-door mobility, individuals will perceive the effort required to use the service as prohibitive. Consequently, this reinforces the habitual reliance on motorcycles, as the perceived barriers outweigh the benefits of transitioning to transit [5].

Therefore, the decision-making process regarding transport mode selection is governed by a complex interplay between socio-demographic characteristics, trip attributes, and the built environment [1], [6]. Within this framework, walking accessibility and the quality of the pedestrian realm are identified as primary determinants.

Accessibility: is defined as the ease of reaching transit stops and the convenience of traveling to the final destination. In their meta-analysis, Ewing and Cervero [2] demonstrated that factors such as population density, land-use mix, and street network design are strongly correlated with walking and public transport usage. In the unique urban context of Vietnamese cities like Ha Noi, the prevalent structure of narrow alleyways poses a significant barrier to transit Access [7].

Research indicates that for residents living deep within these alleys, the walking propensity is negatively affected by infrastructural deficiencies, such as encroached sidewalks, inadequate lighting, and safety concerns. Consequently, achieving the target of ensuring 80–90% of the inner-city population can access bus services within a 500-meter radius is a critical factor in enhancing the perceived feasibility of public transportation in the public consciousness.

Pedestrian Environment Quality and Station-Level Amenities: The perceived safety and comfort of the pedestrian environment are critical; if commuters experience insecurity or discomfort while walking, they are more likely to undergo a modal shift toward private cars or motorcycles. Infrastructural attributes, such as unobstructed sidewalks, adequate street lighting, even

pavement surfaces, and the absence of impediments-including litter and illegally parked vehicles-exert a positive influence on walking propensity [8].

Furthermore, station-level amenities play a vital role in incentivizing bus patronage. Specifically, the provision of weather protection (shelters) and the availability of clear, legible, and easily accessible transit information are essential catalysts that enhance the overall user experience and encourage the adoption of public transportation.

1.3. Studies on public transportation in Da Nang

Factors influencing modal choice: A study investigating the travel behavior of Da Nang residents utilized a **multinomial logit (MNL) model** based on a survey of 848 respondents. The findings indicate that age, income, trip purpose, travel complexity, motorcycle ownership, and travel distance significantly influence modal selection. Notably, travel distance was found to have a **positive correlation** with the probability of selecting bus transit [6].

Modal shift determinants: Another research focus directed toward the **potential for modal shift** from private vehicles to public buses employed a **binary logit model**. This study emphasizes the key determinants that prompt individuals to transition toward bus usage, providing a quantitative basis for understanding the threshold of behavioral change [9].

Public acceptance and adoption: Further academic inquiries, including postgraduate theses, have examined the factors governing the **public acceptance** of public transportation in Da Nang. By analyzing variables that either facilitate or hinder the adoption of bus services, these studies propose strategic frameworks to enhance the overall utilization of the transit system [4].

2. Research Methodology

This study employs two main methods:

- Exploratory Factor Analysis (EFA) to identify and examine the factors influencing public transport mode choice.

- Spatial analysis using QGIS software to evaluate the service coverage radius of bus stops within the study area.

2.1. Hypotheses

Based on the literature review and research objectives, the initial proposed model was constructed with three latent constructs:Accessibility, Amenities, and Bus stop Coverage. These three constructs were chosen to comprehensively reflect three core aspects that determine the accessibility and attractiveness of the bus system, including: (i) accessibility to destinations after using the bus; (ii) pedestrian environment quality and safety during the first-mile and last-mile; and (iii) the degree of connectivity of the bus route network to important urban functions. These groups were selected based on the theoretical framework of the transport planning community to ensure representativeness [10].

H1: Accessibility positively influences satisfaction.

H2: Roadside Amenities positively influence satisfaction.

H3: Bus stop Coverage positively influences satisfaction.

2.2. Research Objectives

Research Gaps

• **The necessity of separating perceived factors from hard data:** Previous studies in Da Nang have indicated that accessibility (distance to bus stops) and service quality are critical factors influencing bus usage. However, these studies rarely distinguish between the **perceived pedestrian environment** and raw distance metrics. Therefore, a simultaneous analysis of both perceived experiences and spatial data is required to identify priority intervention factors.

• **Optimizing measurement scales via statistical techniques:** Most previous quantitative studies utilized questionnaires and choice models (e.g., Logit) without leveraging **Exploratory Factor Analysis (EFA)** to develop concise, high-reliability scales for complex concepts like "pedestrian environment satisfaction". This study employs EFA to generate clear measurement factors, ensuring higher analytical precision.

• **Enhancing spatial analysis precision:** Many works treat bus stop service distance as a simple variable (Euclidean/as-the-crow-flies distance), lacking detailed spatial analysis. By defining the **actual service catchment area** using **QGIS** (integrating walking networks and urban obstacles), this research will estimate more realistic access distances and correlate them directly with EFA factors.

• **Scientific and practical contributions:** By combining EFA (to measure satisfaction/perception) and spatial analysis via QGIS (to quantify walking quality and access distance), this study fills current research gaps. It provides specific infrastructure thresholds and recommendations for policies aimed at increasing bus patronage in Da Nang.

Research Questions

1. What is the actual spatial coverage of the existing bus network based on pedestrian travel time?

2. Does higher roadside infrastructure quality lead to significantly improved perceived accessibility and a stronger preference for public transport?

Research Objectives

This study aims to evaluate the impact of access distance and pedestrian environment quality (including sidewalk quality, walking safety, path amenities, and connectivity) on the decision to choose buses as a mode of transport in Da Nang.

In terms of methodology, the study utilizes:

• **Exploratory Factor Analysis (EFA):** To measure and reduce satisfaction indicators related to the walking environment and service access experience.

• **Spatial Analysis via QGIS:** To determine the actual service radius of bus stops based on real-world road networks.

• **Modeling:** Integrating EFA results and spatial distances to estimate the relative impacts of pedestrian environment quality and accessibility on the probability of bus selection.

2.3. Study Area

The study area is defined as the central part of Da Nang city, specifically covering Hai Chau and Thanh Khe districts. This area is characterized by high population density, vibrant socio-economic activities, and a relatively dense bus network.

Data were collected through surveys of bus stops and bus users in residential areas with convenient access to the bus stop system within Hai Chau and Thanh Khe districts.

The survey was conducted over the period from October 2025 to December 2025.

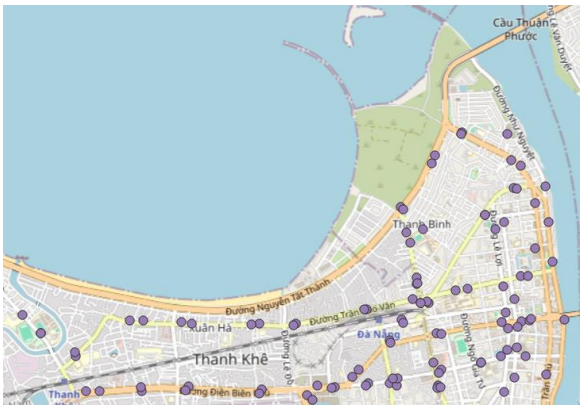

Figure 1. *Study area*

Bus Stop Survey: Data on the bus stop system were collected through field surveys conducted within the study area. Investigators recorded the locations and coordinates of 140 bus stops within the defined boundary. The coordinate data were used to build a spatial database for GIS analysis and to evaluate the service coverage radius of the bus stops.

Bus User Survey: Research data were collected through a sociological survey questionnaire administered to residents living in central urban areas of Hai Chau and Thanh Khe districts who currently use public transportation.

2.4. Mapping Methodology

A map visualizing the service radius of bus stops was generated using QGIS software, based on the GPS coordinates of 140 bus stops collected across Thanh Khe and Hai Chau wards. This study utilized the VN-2000 grid coordinate system (central meridian 107°45', projection zone 3°, ellipsoid WGS84), specifically tailored for the Da Nang city area.

The data was processed within the QGIS to analyze individual stop distances based on empirical field data.

2.5. Data Collection Method

Sample Size: The survey sample was selected using a stratified random sampling method based on demographic characteristics such as gender, age, and occupation to ensure diversity and representativeness of the data.

According to Hair et al, the sample size was determined based on a 5:1 ratio, meaning at least five observations for each observed variable. With a research model consisting of 24 observed variables, the minimum required sample size was 120 observations (24 × 5).

During the survey process, a total of 150 questionnaires were collected from residents living in Hai Chau and Thanh Khe districts. After data screening and the removal of invalid responses, 120 valid questionnaires remained and were used for analysis. Therefore, the final sample size was considered adequate for the requirements of Exploratory Factor Analysis (EFA).

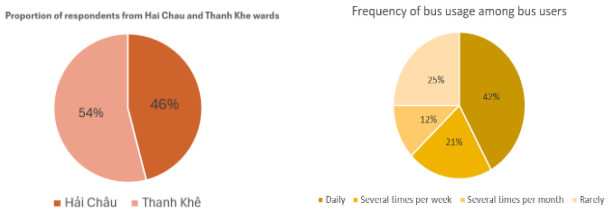

Figure 2. *Proportion of surveyed residents*

Table 1. *Measurement scale of factors influencing user satisfaction*

ID	
1	**AC: post-stop accessibility**
AC1	Accessibility to facilities (hospitals, health centers, etc.)
AC2	Accessibility to educational facilities
AC3	Accessibility to workplaces
AC4	Accessibility to shopping services (markets, shopping malls, etc.)
AC5	Accessibility to community spaces (cultural houses, parks, squares, etc.)
AC6	Accessibility to restaurants and eateries
2	**AM: amenities, infrastructure, and safety factors around bus stops**
AM1	Distance from home to the bus stop is convenient and easy to walk
AM2	Distance from bus stop to destination is convenient and easy to travel
AM3	Sidewalk conditions (clear, not obstructed, not encroached upon)
AM4	Traffic safety on the way to the bus stop
AM5	Lighting conditions at and around bus stops
AM6	Personal security at bus stops during nighttime or in isolated areas
AM7	Level of security and public order along access routes to bus stops (e.g., absence of crime and snatch theft)
AM8	Cleanliness and environmental sanitation along the access route
AM9	Environmental Quality (Level of air and noise pollution)
AM10	Climate protection and thermal comfort
AM11	Visibility and wayfinding at bus stop locations
AM12	Availability of nearby services and amenities (kiosks, convenience stores, public toilets)
3	**CV: bus service coverage**
CV1	Bus network connectivity to hospitals and healthcare centers
CV2	Connectivity to academic facilities
CV3	Connectivity to commercial facilities
CV4	Connectivity to workplaces and public offices
CV5	Connectivity to tourism and public space
CV6	Travel time efficiency

To evaluate the level of user satisfaction (SAT) among bus users, the study proposes an analytical model consisting of three groups of latent constructs (comprising 24 observed variables), as illustrated in Figure 3 and detailed in Table 1. These observed variables are measured using a 5-point Likert scale with five levels: (1) "strongly disagree"; (2) "disagree"; (3) "neutral"; (4) "agree"; and (5) "strongly agree".

The collected data were processed using SPSS 2.0 software to perform Exploratory Factor Analysis (EFA) and to identify the factors influencing user satisfaction with public transportation.

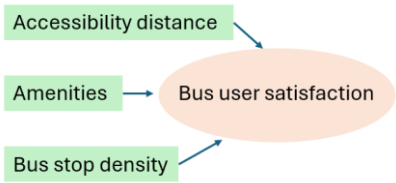

Figure 3. *Factors influencing bus user satisfaction*

3. Research result

3.1. Assessment of Service Coverage

The service coverage of the bus stops was analyzed using the TravelTime plugin within QGIS software to determine public accessibility to the transit system within specific travel time intervals. The analytical procedure consists of the following steps:

- **Spatial Data Selection:** A point vector layer representing the geographic locations of bus stops within the study area was selected as the primary analysis object. This dataset serves as the fundamental baseline for defining the service area of each stop.

- **Parameter Setting:** The travel time thresholds were defined with a starting point and specific intervals of 5 minutes and 15 minutes to simulate different walking accessibility levels**.**

- **Accessibility Analysis:** The TravelTime plugin was activated to calculate the reachable coverage from each bus stop based on the defined time constraints and the actual street network.

- **Service Area Mapping:** The analysis generated a new spatial layer visualizing the geographic extent within which residents can reach each bus stop, considering the established time and average walking speed.

- **Coverage Effectiveness Evaluation:** The generated service areas were analyzed to determine the overall coverage of the bus stop system. Furthermore, overlaps and gaps between service zones were examined to evaluate the rationality of the current bus stop distribution.

The analysis results reveal that within a 5-minute walking radius, several areas remain underserved with limited coverage. However, when the service threshold is extended to 15 minutes, the coverage becomes comprehensive, filling almost all spatial gaps. This indicates that the density of bus stops is relatively well-distributed throughout the city center.

Figure 4. *The simulated service areas of bus stops in the central area of Da Nang*

3.2. Data Analysis Methods

The survey results indicate that the majority of respondents are students and office workers, accounting for 73% of the total sample, predominantly within the 18–50 age group. Detailed descriptive statistics regarding the demographic characteristics of the participants are presented in Table 2.

Table 2. *Demographic Characteristics of Respondents*

Characteristics	Proportion (%)
Gender	
Female	39.9
Male	59.5
Others	0.6
Age Group	
Under 18 years old	16
18 – 25 years old	50
26 – 50 years old	26
Over 50 years old	8
Occupation	
Students	59
Office workers	14
Public servants	5
Retired	4
Freelancers	18
Residential Area	
Hải Châu	54
Thanh Khê	46
Total walking time to the nearest bus stop	
Under 5 minutes	34.7
5 – 15 minutes	49.6
15 – 30 minutes	12.4
Over 30 minutes	3.3

To evaluate the quality of the measurement scales. the study employs Cronbach's Alpha coefficient. This method is utilized to assess the internal consistency among observed variables within the same factor.

A measurement scale is considered reliable and acceptable when the following criteria are met:

- *Corrected Item–Total Correlation coefficient > 0.3;*

- *Cronbach's Alpha coefficient > 0.6.*

Furthermore. during the Exploratory Factor Analysis (EFA). observed variables with a Factor Loading of less

than 0.5 were excluded from the model due to their low correlation with the latent factors.

The reliability test results indicate that the Cronbach's Alpha coefficients for **Factor 1** and **Factor 2** are both greater than 0.6. thus they are retained for further analysis. However. regarding **Factor 3** (**Bus Service Coverage**). two variables-CV4 and CV6-were excluded as their Corrected Item–Total Correlation values were below 0.3. After removing the non-compliant items. the remaining 22 observed variables meet the required quality standards for subsequent Exploratory Factor Analysis (EFA).

Table 3. *Reliability test results*

	Components	Variables	Cronbach's alpha
1	Post-Stop Accessibility	6	0.72
2	Amenities, Infrastructure, And Safety Factors Around Bus Stops	12	0.85
3	Bus Service Coverage	4	0.69

To evaluate the suitability of the data for factor analysis, the study conducted the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's Test of Sphericity. The results yielded:

- KMO = 0.814 > 0.5

- Sig. của Bartlett's Test = 0.000 < 0.05

These findings confirm that the sampling adequacy is sufficient for proceeding with Exploratory Factor Analysis.

Table 4. *KMO and Bartlett's test results*

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.8314
Bartlett's Test of Sphericity	Approx. Chi-Square	828.935
	df	300
	Sig.	0.000

The results of the Rotation Sums of Squared Loadings indicate that the observed variables are categorized into five distinct factor groups, corresponding to the **5 primary factors** of the research model, as shown in the table below.

Table 5. *Rotation Sums of Squared Loadings*

Component	Total	% Of Variance	Cumulative %
1	4,202	19.099	19.099
2	4,178	18.991	38.090
3	2,688	12.219	50.309
4	1,972	8.964	59.273
5	1,761	8.006	67.279

The cumulative variance of the five factors reached 67.279%, meaning that 67.279% of the variation in these factors is explained by the observed variables in the model. This value exceeds the minimum requirement of 50%, indicating that the analytical model has a high explanatory power for the research data (according to Gerbing and Anderson) [11].

During the rotated component matrix analysis, all observed variables yielded factor loadings greater than 0.5; therefore, no additional variables were excluded. The final results indicate that the 22 observed variables were rearranged into five distinct factor groups, as presented in the Rotated Component Matrix table.

Table 6. *Rotated Component Matrix*

	Factor				
Variables	**1**	**2**	**3**	**4**	**5**
AM1	0.782				
CV1	0.718				
CV2	0.674				
CV5	0.671				
AM2	0.628				
AC2	0.606				
AC1	0.559				
CV3	0.541				
AM8		0.738			
AM3		0.738			
AM6		0.727			
AM5		0.711			
AM9		0.684			
AM4		0.602			
AM7		0.600			
AM10		0.598			
AC6			0.827		
AC3			0.695		
AM11			0.632		
AC4				0.758	
AM12				0.622	
AC5					0.817

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

Table 7. *The EFA's results*

Factor	Variables	Explanation
F1	AM1, CV1, CV2, CV5, AM2, AC2, AC1, CV3	Accessibility
F2	AM8, AM3, AM6, AM5, AM9, AM4, AM7, AM10	Roadside amenities
F3	AC6, AC3, AM11	Convenience
F4	AC4, AM12	Surrounding services
F5	AC5	Connecting public spaces

To evaluate the impact of various factors on public transport user satisfaction, the study employs a Multiple Linear Regression (MLR) model in the following general form:

$$SAT = \beta_0 + \beta_1 F_1 + \beta_2 F_2 + \beta_3 F_3 + \beta_4 F_4 + \beta_5 F_5$$

- SAT (Dependent Variable): Public transport user satisfaction level.

- F1 – F5 (Independent Variables): The five factor scores extracted from the EFA.

- β0: Constant.

- β1 – β5 (Regression Coefficients): The standardized regression coefficients of the respective factors.

The results of the multiple regression analysis illustrate the impact of each factor on public transport user satisfaction, as reflected in their respective regression coefficients. The independent variables in the model were determined by calculating Factor Scores from the EFA results using SPSS.

The regression results (Table 8) indicate that 'Roadside Amenities' is the most significant contributor to user satisfaction, accounting for 40.8% of the impact. This is followed by "Accessibility" (30.4%), "Convenience" (14.8%), 'Connecting Public Spaces' (7.2%), and finally "Surrounding Services", which has the lowest contribution at 6.8%. With an R-squared (R^2) value of 0.992, the model explains 99.2% of the variance in the survey data,

demonstrating an exceptionally high goodness-of-fit.

Table 8. *Model Summary*

Model	β	t	VIF	Contribution	Important
β_0	0.030	1,795^{ns}			
F1	0.389	26.387**	2.2	30.4%	2
F2	0.522	42.339*	1.5	40.8%	1
F3	0.189	15.840** *	1.4	14.8%	3
F4	0.087	6.230****	1.9	6.8%	5
F5	0.092	8.030****	1.2	7.2%	4

$R^2 = 0.992$
Durbin-Watson = 1,925
ns: non-significant

4. Discussion

The results indicate that bus accessibility in central Da Nang is influenced by both spatial coverage and the quality of the pedestrian environment. The QGIS analysis shows that most main roads in Hai Chau District and Thanh Khe District are located within a 5–15 minute walking distance from bus stops, indicating relatively good network coverage. However, some residential areas located in narrow alleys remain outside effective walking catchment areas, suggesting that spatial proximity alone does not guarantee practical accessibility.

The theoretical model was initially developed with three latent constructs: Post-Stop Accessibility (AC), Amenities and Safety around Bus Stops (AM), and Bus Service Coverage (CV). After applying Exploratory Factor Analysis (EFA), the observed variables were reorganized into five empirical factors (F1–F5), reflecting that users perceive bus accessibility through a more detailed and multidimensional structure than originally hypothesized. Among these factors, Roadside Amenities (F2) was identified as the most influential determinant of overall satisfaction. This finding is particularly meaningful in the Vietnamese context, where Motorcycles dominate daily travel due to their highly flexible door-to-door mobility. As a result, public transport must compensate by providing safe, comfortable, and attractive walking environments. Improvements in sidewalks, lighting, shading, cleanliness, and personal safety are therefore essential to enhance the competitiveness of bus services relative to private vehicles. Overall, the findings suggest that improving bus accessibility in Da Nang should not focus solely on expanding route coverage. Equal attention should be given to upgrading pedestrian infrastructure and roadside conditions, which play a decisive role in encouraging residents to shift from motorcycles to public transport.

5. Conclusion

The study demonstrates a strong and statistically significant correlation between the public transport infrastructure network structure and resident satisfaction in the surveyed area. Through spatial analysis in QGIS, the 5-minute walking radius map reveals high coverage within the central core, yet "white zones" of accessibility begin to emerge in peri-urban areas. While expanding the radius to 15 minutes results in broader coverage, it confronts the challenge of the "pedestrian fatigue threshold". This explains why "Accessibility" (F1) contributes 30.4% to the satisfaction model.

The linear regression results further confirm that "Roadside Amenities" (F2) is the most critical determinant, contributing 40.8% to the model. This indicates that users prioritize the quality of physical infrastructure at stops as much as their proximity to home. With an R-squared (R^2) value of 0.992, the study affirms that optimizing walking distances within a 5-10 minute threshold (represented by the dense isochrone zones on the map), combined with upgrading infrastructure, amenities, and security both at and around the stops, serves as the most effective strategy for enhancing urban service quality. The alignment between the accessibility "hotspots" on the QGIS maps and the high impact weights of factors F1 and F2 in SPSS provides a robust scientific foundation for planning sustainable and pedestrian-friendly bus networks.

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REFERENCES

[1] T.V. Huong, N.T. Chuong, and T.V. Tich, "Analysis Of Public Transportation Mode Selection In Urban-A Case Study For Hanoi Capital.," *Transport and Communications Science Journal,* vol. 71, no. 8, pp. 881-895, 2020.

[2] R. Ewing and R. Cervero, "Travel and the Built Environment," *Journal of the American Planning Association,* vol. 76, no. 3, pp. 265-294, 2010.

[3] A.Z. Hardi, and A.A. Murad, "A GIS Approach to Evaluate Bus Stop Accessibility in Urban Areas," *Journal of Computer Science*, vol. 19, no. 10, pp. 1190-1202, 2023.

[4] T. Q. Cuong, "Nghien cuu cac yeu to anh huong den su chap nhan cua nguoi dan Thanh pho Da Nang doi voi phuong tien giao thong cong cong [Research on factors affecting the acceptance of public transportation among residents in Da Nang city]", *Master thesis*, The University of Danang - University of Economics, Da Nang, 2019.

[5] M. A. Saif, M. M. Zefreh, and A. Torok, "Public transport accessibility: A literature review," *Periodica Polytechnica Transportation Engineering,* vol. 47, no. 1, pp. 36-43, 2018.

[6] T.T.P. Anh, N.P.Q. Duy, P.C. Tho, and F. Nakamura, "Exploring fators affecting travel mode choice of citizens in Da Nang city," *The University of Danang - Journal of Science and Technology*, vol. 18, no. 41, pp. 8-13, 2020.

[7] N.T. Phuong, M. Kikuchi, A. Kojima, and H. Kubota, "Neighborhood influence on walking acceptability to bus stops in Hanoi, Vietnam," IATSS Research, vol. 48, no. 3, pp. 367-377, 2024.

[8] A.J. Mahdi, J. Hamadneh, S.W. Taha, and D. Esztergár-Kiss, "Sustainable Futures," *Assessing walking accessibility to public transport stops in Budapest,* pp. 10, 101221, 2025.

[9] T.T.P. Anh, N.P.Q. Duy, P.C. Tho, and F. Nakamura, "Factors affecting the ability to shift to public buses among residents in Da Nang", *Journal of Science and Technology in Civil Engineering*, vol. 5, no. 7V, pp. 79-93, 2021.

[10] S. Chowdhury, K. Zhai, and A. Khan, "The effects of access and accessibility on public transport users' attitudes," *Journal of Public Transportation,* vol. 19, no. 1, pp. 97-113, 2016.

[11] J. C. Anderson and D. W. Gerbing, "Structural equation modeling in practice: A review and recommended two-step approach," *Psychol. Bull,* vol. 103, no. 3, p. 411–423, May 1988.