

## 도시스트레스와형태학: 호치민시의통찰

### Urban Stress and Morphology: Insights from Ho Chi Minh City

○원테흥\*  
Nguyen, The Hung

이어진\*  
Lee, Eo-Jin

방기성\*\*  
Bang, Ki-Seong

안용한\*\*\*  
Ahn, Yong-Han

#### Abstract

This paper delves into the intricate relationship between urban stress and urban morphology, with a specific focus on Ho Chi Minh City, Vietnam. Urban stress, characterized by the psychological strain experienced in densely populated environments, is influenced by various factors including noise pollution, overcrowding, and the rapid pace of urban life. Urban morphology, the study of the physical form of urban spaces, plays a pivotal role in shaping these experiences, affecting accessibility, mobility, and environmental quality. Through the lens of Ho Chi Minh City's unique urban dynamics, this paper explores how the city's rapid urbanization and distinctive urban form contribute to the stress levels of its inhabitants. The analysis extends to the potential of incorporating stress level assessments into urban design strategies, highlighting the benefits of such an integrative approach for enhancing urban livability and well-being. This review underscores the necessity of a holistic urban planning perspective that prioritizes human well-being, offering insights that are applicable to urban centers globally facing similar challenges of urban stress and morphology.

키워드 : 도시스트레스, 도시형태학, 호치민시, 도시계획, 웰빙, 도시디자인전략

Keywords : Urban Stress, Urban Morphology, Ho Chi Minh City, Urban Planning, Well-being, Urban Design Strategies

#### 1. Introduction

Urban environments are dynamic ecosystems where physical structures and human experiences intersect, shaping the daily lives of millions. Central to this interaction are two critical concepts: urban stress and urban morphology. Urban stress refers to the psychological and physiological strain experienced by individuals due to the multifaceted pressures of urban living, including but not limited to noise pollution, high population density, and the fast-paced nature of city life. Conversely, urban morphology studies the layout, design, and structure of urban spaces, focusing on how streets, buildings, and public spaces are organized and interconnect. This paper aims to explore the intricate relationship between

\* 한양대학교 대학원 석사과정 스마트시티공학과

\*\* 한양대학교 에리카산학협력단, 공학박사

\*\*\* 한양대학교 건축학부 건축공학과 교수, 공학박사

(Corresponding author: Department of Architecture, Professor, Hanyang University, yhahn@hanyang.ac.kr)

This work was supported by the Korea Institute of Energy Technology Evaluation and Planning(KETEP) grant funded by the Korea government(MOTIE) (20227200000010, Building Crucial Infrastructure in order for Demonstration Complex Regarding Distributed Renewable Energy System)

these two domains, particularly within the vibrant and rapidly evolving context of Ho Chi Minh City, Vietnam. The city's unique blend of historical richness and modern development provides a compelling backdrop for examining how urban form and stress interplay, affecting the well-being of its residents. (Chiang & Li, 2019; Haifler & Fisher-Gewirtzman, 2024; Hematian & Ranjbar, 2022)

#### 2. Urban Stress and Urban Morphology: An Overview

Urban Stress: Urban living, with its inherent hustle and bustle, introduces a range of stressors that can affect individuals' mental and physical health. These stressors include environmental factors like air and noise pollution, social challenges such as crowded living conditions, and economic pressures stemming from the high cost of urban life. The cumulative effect of these stressors can lead to increased levels of stress and anxiety among city dwellers, impacting their overall quality of life. (Knöll et al., 2018; Yang et al., 2021)

Urban Morphology: The physical form of urban environments, or urban morphology, plays a crucial role in shaping residents' experiences. This field examines the spatial configuration of urban areas, including the density and height of buildings, the layout of streets and sidewalks, and the distribution of green spaces. Urban morphology not only

influences the aesthetic appeal of a city but also affects functional aspects such as accessibility, mobility, and environmental quality. (Yan et al., 2024; Zelelew & Mamo, 2024)

The interaction between urban stress and morphology is complex and multidimensional. For instance, high-density areas with limited green spaces may exacerbate feelings of congestion and confinement, contributing to stress. Conversely, well-designed urban areas that balance density with accessible public spaces can enhance social interaction and physical activity, potentially mitigating stress. In the bustling streets of Ho Chi Minh City, this interplay is particularly evident. The city's rapid urbanization has led to significant changes in its urban form, with implications for the stress levels of its inhabitants. As we delve deeper into the specific aspects of Ho Chi Minh City's urban morphology and its relationship with urban stress, we begin to uncover the potential for urban design to not only navigate the challenges of urbanization but also promote the well-being of its residents. (Chiang & Li, 2019; Meloni et al., 2019; Suchday et al., 2006)

### 3. Link between Urban Stress and Urban Morphology in Ho Chi Minh City

Ho Chi Minh City, a bustling metropolis, serves as a fascinating case study for the interplay between urban stress and morphology. The city's rapid urban development, characterized by a swift influx of population and a burgeoning skyline, brings with it a unique set of challenges. The dense urban fabric, marked by narrow streets crowded with motorbikes and sidewalk vendors, epitomizes the city's dynamic yet chaotic nature. This urban layout not only reflects the city's cultural vibrancy but also contributes to the stress experienced by its inhabitants.

Market areas in Ho Chi Minh City, vital for their social

and economic roles, are particularly illustrative of this relationship. These spaces, teeming with activity from dawn till dusk, are microcosms of the city's larger urban stressors. The congestion, noise, and often inadequate infrastructure heighten stress levels, affecting both vendors and shoppers alike. Furthermore, the city's limited green spaces, a consequence of its compact urban morphology, offer scarce refuge from the urban hustle, underscoring the need for a careful reconsideration of urban design principles.

The city's historical layers, interspersed with contemporary development, add another dimension to its urban morphology. Districts with colonial architecture, such as District 1, juxtapose sharply against the more modern, densely packed areas. This mosaic of urban forms not only shapes the city's identity but also influences the spatial distribution of stressors, highlighting the critical role of urban planning in managing urban stress.

### 4. Potential Use of Stressors and Stress Level Assessment in Urban Design

Ho Chi Minh City, a bustling metropolis, serves as a fascinating case study for the interplay between urban stress and morphology. The city's rapid urban development, characterized by a swift influx of population and a burgeoning skyline, brings with it a unique set of challenges. The dense urban fabric, marked by narrow streets crowded with motorbikes and sidewalk vendors, epitomizes the city's dynamic yet chaotic nature. This urban layout not only reflects the city's cultural vibrancy but also contributes to the stress experienced by its inhabitants.

Market areas in Ho Chi Minh City, vital for their social and economic roles, are particularly illustrative of this relationship. These spaces, teeming with activity from dawn till dusk, are microcosms of the city's larger urban stressors. The congestion, noise, and often inadequate infrastructure heighten stress levels, affecting both vendors and shoppers

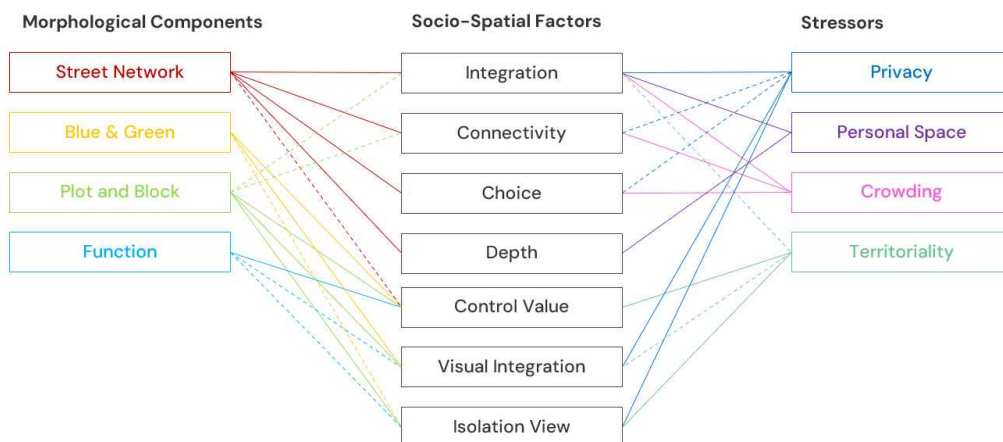


Figure 1. The Connections between Morphological Components and Indicating Stressors in Space Syntax Model for Cities.

alike. Furthermore, the city's limited green spaces, a consequence of its compact urban morphology, offer scarce refuge from the urban hustle, underscoring the need for a careful reconsideration of urban design principles.

The city's historical layers, interspersed with contemporary development, add another dimension to its urban morphology. Districts with colonial architecture, such as District 1, juxtapose sharply against the more modern, densely packed areas. This mosaic of urban forms not only shapes the city's identity but also influences the spatial distribution of stressors, highlighting the critical role of urban planning in managing urban stress.

### 5. Potential Use of Stressors and Stress Level Assessment in Urban Design

The exploration of urban stress and morphology within the dynamic landscape of Ho Chi Minh City reveals the profound impact of urban design on the well-being of its residents. This review underscores the intricate relationship between the physical structure of urban environments and the psychological health of individuals living within them. In Ho Chi Minh City, the rapid pace of urbanization and the unique challenges it presents offer valuable insights into how urban morphology can contribute to or alleviate urban stress.

The findings of this review highlight the necessity for urban planners and designers to integrate considerations of human well-being into the fabric of urban development. By adopting a more holistic approach that includes stress level assessments, cities can evolve into more livable, sustainable, and resilient environments. Specifically for Ho Chi Minh City, the potential to enhance quality of life through thoughtful urban design is immense. Strategies such as

increasing accessible green spaces, improving public transportation, and creating pedestrian-friendly zones not only address the immediate stressors but also contribute to the long-term health and happiness of the community.

As cities around the world grapple with similar challenges of urbanization and stress, the insights from Ho Chi Minh City's experience offer valuable lessons. The integration of urban morphology and stress considerations into urban planning processes is not just beneficial but imperative in the quest to build cities that not only thrive economically but also support the well-being of every inhabitant. In conclusion, this review calls for a paradigm shift in urban design, one that places human well-being at the center of urban development, paving the way for a future where cities are not just places of habitation but sanctuaries of health, happiness, and human flourishing.

#### 참고문헌

1. Chiang, Y.C., & Li, D.Y. (2019). Metric or topological proximity? The associations among proximity to parks, the frequency of residents' visits to parks, and perceived stress. *Urban Forestry & Urban Greening*, 38, 205-214
2. Haifler, Y. T., & Fisher-Gewirtzman, D. (2024). Spatial Parameters Determining Urban Wellbeing: A Behavioral Experiment. *Buildings*, 14(1), Article 211.
3. Hematian, H., & Ranjbar, E. (2022). Evaluating urban public spaces from mental health point of view: Comparing pedestrian and car-dominated streets. *Journal of Transport & Health*, 27, Article 101532.
4. Knöll, M., Neuheuser, K., Cleff, T., & Rudolph-Cleff, A. (2018). A tool to predict perceived urban stress in open public spaces. *Environment and Planning B-Urban Analytics*

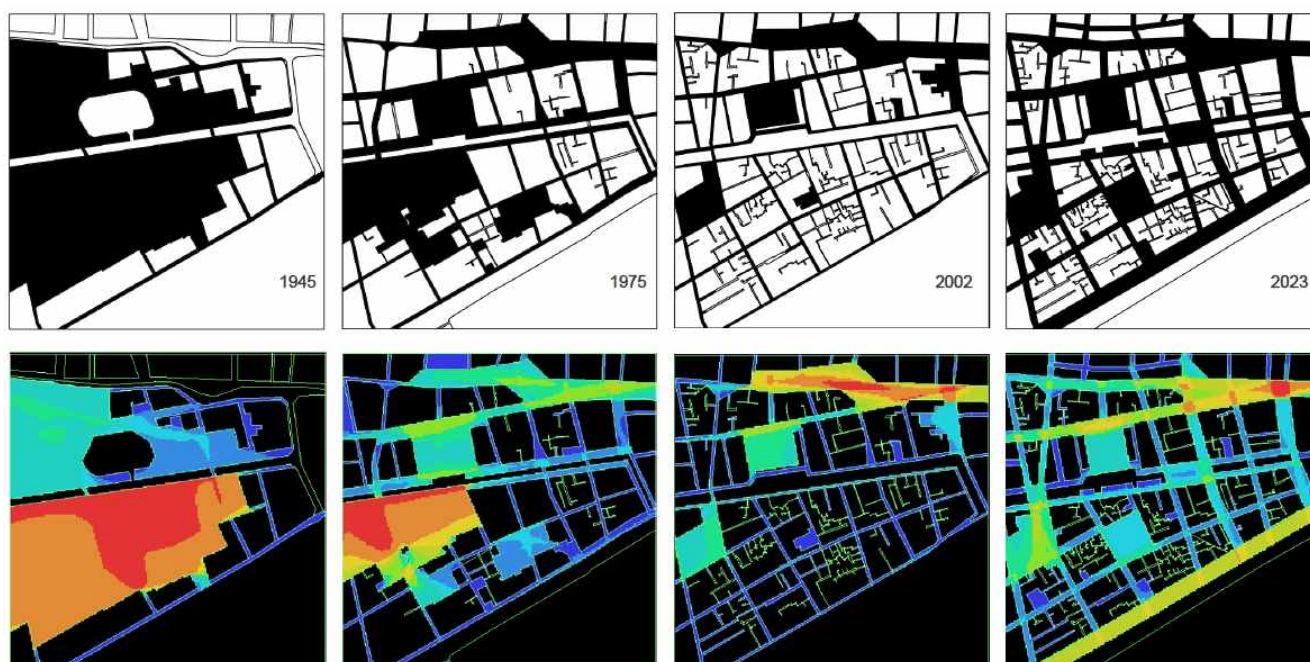


Figure 2. The Transition of Urban Morphology of Binh Tay Market, Ho Chi Minh and its corresponding stress level prediction in year 1945, 1975, 2002 and 2023

and *City Science*,45(4), 797-813.

5. Lai, G., & Lee, R. P. L. (2006). Market reforms and psychological distress in urban Beijing. *International Sociology*,21(4), 551-579.

6. Meloni, A., Fornara, F., & Carrus, G. (2019). Predicting pro-environmental behaviors in the urban context: The direct or moderated effect of urban stress, city identity, and worldviews. *Cities*,88, 83-90.

7. Sadeghpour, F., Ranjbar, E., Esmailinasab, M., Valiloo, M. H. S., & Nieuwenhuijsen, M. J. (2024). Streets and Stress: A Pilot Study on How Quality and Design of Streets Impacts on Urban Stress. *Herd-Health Environments Research & Design Journal*,17(1), 224-248, Article 19375867231200584.

8 Suchday, S., Kapur, S., Ewart, C. K., & Friedberg, J. P. (2006). Urban stress and health in developing countries: Development and validation of a neighborhood stress index for India. *Behavioral Medicine*,32(3), 77-86.

9 Yan, J. F., Wang, J., Su, F. Z., & Liu, B. (2024). Morphology changes and the expansion of major port cities in the Philippines from 1990 to 2020. *Cities*,147, Article 104818.

10. Yang, M., Hagenauer, J., Dijst, M., & Helbich, M. (2021). Assessing the perceived changes in neighborhood physical and social environments and how they are associated with Chinese internal migrants' mental health. *Bmc Public Health*,21(1), Article 1240.

11. Zelelew, S. A., & Mamo, Z. C. (2024). Analyzing the relationship between street hierarchy and land use functions in Dire Dawa City, Ethiopia. *African Geographical Review*.