

Compact Urban Design and Its Role in Sustainable Housing Development in Seoul

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Abstract

This paper explores the implementation of compact urban design in Seoul, South Korea, and its effects on sustainable housing development. It discusses how the integration of high-density housing, mixed-use developments, and transit-oriented designs has enhanced land use efficiency, environmental sustainability, and resident quality of life. Additionally, the study highlights challenges such as infrastructure strain, cultural shifts, gentrification, and public acceptance. By examining Seoul's urban planning efforts, the research offers insights into the complexities of applying compact urban design in a densely populated city, provides lessons for other urban areas, and proposes strategies to address these challenges effectively.

Keywords: compact urban design, high-density housing, mixed-use development

1. Introduction

Seoul, South Korea's vibrant capital, exemplifies both the challenges and achievements of urban development in a densely populated city. Over recent decades, rapid urbanization has transformed Seoul into a bustling metropolis, presenting significant issues such as housing shortages, traffic congestion, and environmental degradation. These challenges highlight the need for innovative urban planning solutions, particularly through compact urban design.

Compact urban design minimizes land use, enhances public transportation, and promotes mixed-use developments, offering a sustainable pathway for urban living. This approach aims to create densely populated yet livable spaces that reduce commuting needs, lower carbon footprints, and improve land use efficiency. In

Seoul, the adoption of compact design principles is not only a strategic response to spatial constraints but also a means to enhance urban life quality.

This paper explores the role of compact urban design in Seoul's urban planning, examining its historical development and the shift towards high-density configurations. It assesses the design's effectiveness in integrating into the city's housing and infrastructure projects and explores its social, economic, and environmental impacts. Additionally, the paper discusses the challenges and limitations of implementing such designs in Seoul, including public acceptance and lifestyle changes. The findings aim to deepen the understanding of compact urban design as an essential element of sustainable development and provide actionable recommendations for policymakers and

planners.

2. Compact Urban Design Principles in Seoul

2.1 High-Density Housing

In Seoul, high-density housing is a critical component of urban planning aimed at accommodating its dense population efficiently. This strategy focuses on constructing apartment complexes and high-rise buildings, which are prevalent throughout the city. Such developments are particularly evident in newly developed districts and are part of Seoul's strategy to maximize the use of limited land resources while addressing housing needs.

Implementation and Impact: To maximize space, Seoul has increasingly turned to vertical housing developments. The ubiquitous apartment towers provide a large number of housing units per square meter compared to traditional low-rise buildings. These high-density complexes often include multiple amenities such as playgrounds, gyms, and community centers, which are designed to enhance the quality of life for residents and foster community interactions within compact spaces.

2.2 Mixed-Use Development

Mixed-use development in Seoul integrates residential, commercial, and recreational facilities, aiming to create self-sufficient communities that reduce the need for long-distance travel. This approach supports sustainable urban living by enhancing the accessibility of everyday needs and services.

Strategic Implementation: In areas like Hongdae and Itaewon, residential buildings are integrated with commercial spaces at the ground level, which includes shops, cafes, and restaurants. This arrangement encourages an active street life and reduces the reliance on transportation for daily errands. Seoul's urban planning policies have been revised to encourage mixed-use in all new developments, ensuring that new constructions contribute to the urban fabric by offering both residential and commercial opportunities.

2.3 Transit-Oriented Development (TOD)

TOD is a key principle in Seoul's urban strategy, focusing on the development of residential and commercial areas around major transit stations. This design principle aims to increase public transit use, reduce car dependency, and promote sustainable urban growth.

Areas around major subway stations, such as Gangnam Station and Jamsil Station, have been developed into high-density hubs with direct access to multiple modes of public transportation. By concentrating development around transit hubs, TOD has significantly contributed to reducing traffic congestion in the city, as more residents opt for public transportation over driving.

3. Impacts of Compact Urban Design in Seoul

In Seoul, the adoption of compact urban design has profoundly transformed the cityscape, affecting everything from housing density to the environmental footprint, and creating a cascade of social and economic effects. The approach has reconfigured urban spaces, maximizing the utility of limited land while accommodating a growing population, which is particularly evident in highly developed areas like Gangnam and Songpa. These districts showcase the city's shift toward vertical expansion—towering residential complexes that house thousands within a modest footprint, thus preserving green spaces and limiting urban sprawl.

This strategy extends beyond just the efficient use of space. It has fostered the development of vibrant, multifunctional neighborhoods where residential buildings are integrated with shops, offices, and leisure facilities. This mixed-use environment reduces the necessity for long commutes, thereby cutting down on vehicular traffic and contributing to significant reductions in carbon emissions and improvements in air quality. Moreover, the proximity of amenities and workplaces facilitates a lifestyle less dependent on cars, encouraging walking and cycling, which has further positive implications for both the environment and public health.

The environmental benefits of Seoul's compact urban design are notable. Centralized systems for heating, cooling, and other utilities in high-density areas enhance energy efficiency dramatically when compared to the less concentrated infrastructures of suburban areas. Additionally, the city has made significant strides in integrating green spaces within its compact framework. Projects like the restoration of the Cheonggyecheon stream and the creation of the Seoul Skygarden illustrate efforts to blend nature with urbanity, improving aesthetic qualities, reducing urban heat effects, and providing residents with much-needed recreational areas. These green initiatives are

vital for maintaining biodiversity and ecological balance in an otherwise concrete-dominated environment.

The social and economic impacts of compact urban design in Seoul are equally transformative. The expansion of the public transit system, including subways and buses, has vastly improved connectivity, making it easier for residents to traverse the city efficiently. Neighborhoods designed for walkability contribute to a more active, health-oriented lifestyle among citizens. Economically, the concentration of population and services in compact areas stimulates business activities. Commercial zones, particularly those near major transit hubs, thrive due to their accessibility and the constant flow of potential customers.

Moreover, the close proximity in which people live and work fosters a greater sense of community and facilitates social interactions. Residential complexes often feature shared spaces such as courtyards and community halls, which become hubs for social gatherings and events, enhancing community bonding and social cohesion. Cultural diversity also thrives in such settings. Areas like Itaewon and Hongdae are known for their cultural dynamism, featuring a blend of international cuisines, arts, and entertainment, drawing both residents and tourists alike.

In summary, the implementation of compact urban design in Seoul has not only addressed the practical challenges of urbanization but also enhanced the city's livability. By fostering environments that promote sustainability, connectivity, and community, Seoul serves as a compelling model for cities worldwide grappling with similar urban challenges. The city's approach highlights the potential for compact urban design to create more sustainable, efficient, and vibrant urban spaces.

4. Challenges and Limitations of Compact Urban Design in Seoul

Implementing compact urban design in a megacity like Seoul, while beneficial in many respects, also presents a series of challenges and limitations. These issues are critical to understand as they offer a balanced perspective on the applicability and sustainability of compact urban design principles.

One of the most immediate challenges of compact urban design is the risk of overpopulation within confined areas.

High-density living, a hallmark of Seoul's urban strategy, can lead to overcrowded living conditions if not managed with careful planning and continual reassessment. The density can exacerbate issues related to noise, privacy, and personal space, potentially leading to a decrease in life quality for some residents. These conditions can also stress public services and amenities, making them less effective and reducing resident satisfaction.

The concentration of population and activities in compact areas places significant demand on existing infrastructure. Seoul has experienced challenges related to transportation congestion, sewage system overload, and even periodic shortages in utilities in highly dense areas. While the city has made considerable progress in expanding its infrastructure, the pace of development and the aging of existing facilities pose ongoing challenges. For instance, the subway system, though extensive and generally efficient, faces issues of overcrowding during peak hours, and road traffic remains a significant concern despite efforts to promote public transport.

Compact urban design necessitates a shift in lifestyle that may not be readily embraced by all segments of the population. In Seoul, where traditional living often involved more spacious and less centralized habitats, the transition to high-density, mixed-use environments has required considerable cultural adaptation. For older generations, in particular, the rapid pace of urban consolidation and the shift away from car-centric lifestyles involve not just physical adjustments but also changes in long-held values and habits.

The success of compact urban design significantly hinges on public acceptance and participation. In Seoul, initiatives like the Cheonggyecheon restoration were initially met with skepticism and resistance, particularly from vendors and small business owners affected by the changes. Gaining public buy-in for large-scale urban projects can be challenging, requiring transparent communication, stakeholder engagement, and often, compromises that can dilute the original vision of projects.

As areas become more developed and desirable due to improvements in infrastructure and amenities, there is a risk of gentrification, where original residents and businesses may be priced

out of newly desirable areas. In Seoul, rapid property value increases in redeveloped areas have led to concerns about economic displacement for lower-income families, who find themselves unable to afford the rising costs of living in these regions.

Despite the green initiatives integrated within compact urban designs, the concentration of buildings and human activity can lead to significant environmental impacts, such as heat island effects, air and water quality degradation, and reduced biodiversity in urban settings. Addressing these impacts requires innovative approaches to urban planning that include sustainable building materials, advanced waste management systems, and enhanced green spaces that are more than aesthetic additions but functional parts of the urban ecosystem.

The challenges and limitations of compact urban design in Seoul illustrate the complexities involved in adapting this urban planning approach to the unique contexts of a mega-city. While the benefits of such designs in terms of sustainability, efficiency, and community enhancement are clear, the ongoing issues of infrastructure strain, cultural adaptation, and economic displacement highlight the need for a nuanced approach that considers both the advantages and the potential drawbacks. These challenges necessitate continuous dialogue, innovation, and adaptive strategies to ensure that the evolution of urban spaces is both inclusive and sustainable.

5. Conclusion and Recommendations

The exploration of compact urban design in Seoul underscores its pivotal role in managing urbanization while advancing sustainability. Integrating high-density housing, mixed-use developments, and transit-oriented designs has enhanced land use efficiency, bolstered environmental sustainability, and enriched the city's social fabric. However, this exploration also reveals challenges such as infrastructure demands, necessary cultural and social adjustments, and issues surrounding gentrification and public acceptance.

Seoul's experiences provide invaluable insights for other global cities facing similar challenges. The city demonstrates that the benefits of compact urban design can be fully realized only when potential drawbacks are addressed through deliberate planning and ongoing community engagement.

To ensure the success of compact urban designs, it is essential for policymakers and urban planners to prioritize community involvement in the planning process. Establishing platforms for public feedback and tailoring projects to local needs can increase acceptance and minimize resistance. Additionally, there is a critical need for continuous upgrading of infrastructure to meet the demands of high-density living, incorporating smart technologies to enhance the efficiency of essential services such as transportation and utilities.

Addressing gentrification and displacement is crucial; policymakers should enforce protective measures to ensure that long-standing residents are not priced out of their neighborhoods. Moreover, encouraging sustainable building practices through incentives can promote environmental stewardship while expanding green spaces to mitigate the ecological impacts of dense construction.

To improve the quality of life in high-density areas, urban spaces should be designed to serve multiple functions, providing opportunities for recreation and socialization. These spaces should be inclusive, catering to diverse populations to foster a sense of community.

Stakeholders should invest in community development initiatives that support local culture and identity, which are essential for maintaining social cohesion amidst rapid urban transformations. Collaborating with local organizations can help deliver valuable community-oriented services and amenities.

Lastly, focusing on long-term sustainability is crucial for stakeholders. Investments should prioritize not only immediate returns but also the long-term viability and resilience of urban areas. Continuous monitoring and adjustment of urban development strategies are necessary to ensure they remain effective and aligned with their goals.

Seoul's approach to compact urban design highlights a pathway toward sustainable urban development, emphasizing that success depends on a balanced approach that accounts for both the advantages and the challenges. Through thoughtful planning, robust community engagement, and a strong commitment to sustainability, cities can utilize compact urban design to create vibrant, efficient, and inclusive urban environments.

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