

Article

Interpreting Tactical Urbanism through Innovation–Diffusion Theory: Insights from a Collaborative Design Studio Experience

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Abstract: This article explores the application of innovation–diffusion theory to tactical urbanism projects. The objective of the study is to comprehend how innovation–diffusion theory can be utilized to analyze and evaluate these projects and identify the factors contributing to their success. The research was conducted through a collaborative design studio experience, using qualitative methods that largely depended on participatory observations and interviews with key participants. The findings indicate that the Innovation–Diffusion theory can serve as a comprehensive theoretical framework for the analysis and evaluation of tactical urbanism projects. The study also identified factors that contribute to the success of these projects, such as the involvement of opinion leaders, the use of low-cost and temporary interventions, and the flexibility to adapt to on-site variables.

Keywords: tactical urbanism; innovation–diffusion; collaborative design; qualitative research methods; urban design



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1. Introduction

Tactical urbanism, which officially launched in 2010 [1] and has been experiencing sustained growth up to the present, has gained attention due to its practical, participatory, and cost-effective flexible approach [2–5]. Owing to its prompt and convenient implementation, it has been particularly employed for a wide range of purposes such as stimulating citizen participation [6], reinvigorating the perception of urban issues [7], and pre-testing urban design policies [8]. However, despite its widespread application in various urban improvement initiatives, the development of its theoretical foundations remains limited. This is largely because its evolution has been more driven by practitioners than by theorists. While tactical urbanism has inherited many traditions from existing planning approaches, such as incremental and transactive planning, the instrumental theories necessary for its effective application have not been extensively studied. Developing these instrumental theories is crucial for systematically understanding how each ‘tactic’ functions in different contexts.

The innovation–diffusion theory, which explains the mechanism by which new ideas are distributed and accepted [9], may provide an appropriate theoretical framework for better implementation of tactical urbanism. Tactical urbanism can be considered an innovation–diffusion process, as it develops new ideas for spatial improvement, implements them in reality, and allows citizens to experience these transformed spaces, thereby shifting their perceptions and facilitating acceptance.

This paper aims to understand tactical urbanism through the lens of innovation–diffusion theory, employing a two-fold approach: a literature review and a case study. The literature review provides the theoretical background for the subsequent case study. It begins by identifying connections between tactical urbanism and existing planning theories, then offers an overview of the core components of innovation–diffusion theory. This is followed by an interpretation of tactical urbanism from an innovation–diffusion

perspective. The case study examines the process and outcomes of a collaborative urban design studio that applied tactical urbanism in a real-world context. The case study tests and demonstrates the potential of innovation–diffusion theory as an instrumental framework for effectively implementing tactical urbanism.

2. Literature Review: Tactical Urbanism and Innovation–Diffusion

2.1. Tactical Urbanism’s Connections with Existing Urban Planning Theories

Although tactical urbanism has evolved as a practical movement among planners and residents, its core strategies are grounded in established planning theories, such as incrementalism and transactive planning. Mike Lyndon has identified the main characteristics of tactical urbanism as “A deliberate, phased approach to instigating change; The offering of local solutions for local planning challenges; Short-term commitment as a first step towards longer-term change; Lower-risk, with potentially high rewards; and The development of social capital between citizens and the building of organizational capacity between public and private institutions, non-profits, and their constituents [10]”. The first four of these characteristics align with Lindblom’s incremental planning theory, famously termed “disjointed incrementalism [11,12]”. In Lindblom’s incremental approach, “plans would never be written ‘once and for all’, but would evolve through a series of successive, but potentially disjointed, incremental changes [13]”. Meanwhile, the latter characteristics, which emphasize collaboration and relationship building among various actors, including planners and residents, resonate with Friedmann’s transactive planning theory [14].

We can observe that two theoretically different planning traditions coexist harmoniously in the practical implementation of tactical urbanism. These theories provide insight into the philosophical roots of tactical urbanism but have limitations as instrumental theories for its systematic and efficient application. Conversely, the innovation–diffusion Theory offers a practical framework to analyze and evaluate tactical urbanism projects, helping to identify the factors contributing to their success.

2.2. Core Ideas of Innovation–Diffusion Theory

Diffusion theorists have suggested that the rates and patterns of innovation adoption vary significantly depending on who is communicating, what kind of innovations are being communicated, and through which communication channels [9,15–17]. That is, the characteristics of these three elements—(1) the actors who participate in the diffusion process, (2) the innovations themselves, and (3) the communication channels used for diffusion—have a significant influence on the rates and patterns of innovation–diffusion.

2.2.1. Five Perceived Attributes of an Innovation

Innovation adoption behavior is significantly influenced by an individual’s perception of its attributes. These perceived attributes, according to Rogers, are comprised of “relative advantage”, “compatibility”, “complexity”, “trialability”, and “observability” [9]: “Relative advantage” examines the perceived superiority of an innovation over its predecessor, with factors such as economic or social benefits influencing the perception. Different adopter groups may prioritize different aspects of relative advantage, like community quality or market appeal, leading to variations in adoption behavior. “Compatibility” assesses the perceived alignment of an innovation with existing values and practices of potential adopters. Tornatzky and Klein (1982) distinguished between cultural and practical compatibility, both of which are positively related to adoption rate but often difficult to disentangle [18]. “Complexity”, a barrier to adoption, reflects the perceived difficulties of understanding and using an innovation. To foster a positive correlation with adoption rates, this paper substitutes complexity with simplicity, or ease of understanding and use. “Trialability” refers to the potential for limited experimentation with an innovation, affecting its adoption rate, while “observability” concerns

the visibility of an innovation's outcomes, with more observable innovations having higher adoption rates. In short, an innovation that is more advantageous relative to others, more compatible with existing values and practices, simpler, more trialable, and more observable, is likely to be adopted more readily. These attributes, interlinked with adopter characteristics, offer substantial explanatory power for transitions of urban design models. They underscore the nuanced perceptions of innovation attributes that inform adoption behaviors.

2.2.2. Actors in Diffusion Process

Diffusion processes involve various actors, which have been classified in numerous ways in the literature: individuals and organizations [19]; cities, regions and countries [20,21]; early and later adopters; change agents, opinion leaders, and general adopters [9]; and so on. Among these classifications, two are more relevant to this research: adopters' "innovativeness" and actors' "roles" in the diffusion process. First, innovativeness refers to the relative timing of adopting new ideas, and Rogers suggested five adopter categories based on innovativeness: innovators, early adopters, early majority, late majority, and laggards. Innovators actively seek new ideas, while laggards are the last to adopt innovations and lack leadership [9]. Second, regarding roles of adopters, Rogers distinguishes change agents and opinion leaders from other adopters. Change agents influence their clients' innovation choices in the direction that the change agency thinks is best, while opinion leaders informally influence individuals' attitudes or behavior [9]. Change agents often use opinion leaders to promote the diffusion of innovations. Classification according to the role of actors is related to classification according to innovativeness. For instance, innovators are the core of change agent groups, and early adopters usually show the highest level of opinion leadership among adopter groups [9].

Besides the classification of individual actors, numerous researchers have suggested the effects of the actors' social networks on the diffusion patterns [9,22–24]. In particular, network effects greatly influence the value of interactive technologies like phones, emails, and instant messages. These effects occur when a product or service becomes more useful as more people use it.

2.2.3. Communication Channels

Rogers (2003) conceptualized communication channels as the means by which messages are disseminated, highlighting two principal types: mass media and interpersonal channels. While mass media, which is one-way in nature, is more effective in increasing awareness among large audiences, interpersonal channels, being two-way, are more persuasive for local audiences in adopting innovations [9].

These communication channels are integral to the diffusion process and are closely linked with the actors involved, each demonstrating unique communication behaviors. Early adopters, for instance, display heightened social engagement, interconnectivity through interpersonal networks, and more active pursuit of information about innovation. They have a superior understanding of innovations and exert a higher degree of opinion leadership compared to later adopters [9].

Recently, however, new media, which share characteristics of both mass media and interpersonal communication channels—that is, they reach a large audience while remaining two-way, like YouTube, Twitter, and Instagram—have become dominant [25]. As a result, the influences of communication channels have become more complicated than Rogers initially suggested.

2.2.4. Five Stages of the Innovation–Decision Process

The characteristics of three critical elements—actors, innovations, and communication channels—collectively influence the process of innovation adoption, affecting both the rates and patterns of diffusion. Furthermore, the manner in which these ele-

ments shape the adoption process varies according to the stages of innovation–diffusion. These stages include: ‘Knowledge’ stage: At this stage, individuals become aware of the innovation’s existence and gain an understanding of how it functions; ‘Persuasion’ stage: Here, individuals develop either a favorable or an unfavorable attitude towards the innovation; ‘Decision’ stage: This stage involves engagement in activities that lead to a decision to adopt or reject the innovation; ‘Implementation’ stage: In this phase, the new idea is put into use; and ‘Confirmation’ stage: At this final stage, individuals seek validation of a previously made decision regarding the innovation. However, they may reconsider and reverse this decision if they encounter conflicting messages about the innovation [9].

2.3. Tactical Urbanism as an Innovation

The innovation–diffusion theory has been employed as a theoretical framework for analysis in various Urban Design related studies. Particularly, because it is one of the crucial theories that explain how new ideas change the world, it has been used to elucidate the spread pattern of newly introduced urban design models [26–30]. For instance, Kim empirically analyzed the phenomenon of variance in the actual implementation of New Urbanism’s design principles based on the innovation–diffusion theory through a comparative case study [30]. This study similarly adopted the innovation–diffusion theory as a theoretical framework to systematically understand tactical urbanism.

Tactical urbanism as an innovation can be discussed in two different dimensions. First, there’s the macro dimension that sees the overall tactical urbanism movement as a process of disseminating innovation. Next is the micro dimension that views each project based on tactical urbanism as small-scale innovations. Here, we looked at the two dimensions of tactical urbanism centered around the five attributes of innovations discussed in Section 2.2.1 [9].

2.3.1. Macro Perspective: Tactical Urbanism as an Innovative Movement

The rapid expansion of tactical urbanism, which emerged only in 2010¹, can be explained from a macro perspective as follows. Firstly, it offers a relative advantage over traditional urban planning by providing cost-effective solutions to urban challenges. Its focus on small-scale, temporary initiatives allows for the testing of ideas before committing to larger, long-term projects [31].

Secondly, the movement resonates with the growing call for citizen participation in urban development, espousing responsive, flexible, and collaborative decision-making processes [1,4,5]. This alignment with modern community engagement and empowerment ideals bolsters the acceptance of tactical urbanism.

Thirdly, the simplicity of tactical urbanism’s methods enables their widespread adoption. Emphasizing the use of inexpensive materials, temporary setups, and grassroots efforts allows for easy replication without the need for extensive resources or expertise, facilitating the dissemination of the movement’s ideas [32]. In addition, its focus on small places and short timelines reduces the complexity of planning [31,33].

Fourth, tactical urbanism supports a trial-and-error ethos, enabling communities to evaluate the feasibility of different ideas before full-scale implementation. This trialability aspect reduces the perceived risks associated with adopting new ideas, thus encouraging broader engagement.

Finally, the visibility of tactical urbanism has increased through social media, publications, conferences, and case studies, spotlighting successful projects. This observable success not only demonstrates the movement’s positive impact but also stimulates awareness and inspires further adoption.

2.3.2. Micro Perspective: ‘Tactics’ of Tactical Urbanism as Small Innovations

From a micro perspective, researchers have considered each ‘tactic’—which refers to an individual project grounded in tactical urbanism—as a small innovation [4,34,35].

Consequently, innovation–diffusion theory could be used to predict the rate and pattern of its diffusion. For example, Davidson described San Francisco’s parklet program as ‘innovation spotting’ [34].

‘Parklets’ are small parks created from parking spaces or unused pieces of land to provide a small oasis of green and a place to sit and relax within the urban environment. This tactic can be evaluated as an innovation as follows: These innovations are relatively easy to adopt, requiring minimal technical knowledge, and are visible to the public, making them more likely to be accepted. However, the diffusion might be slower in areas where open spaces are not valued or where parking is limited. In fact, Lydon and Garcia, the founders of the tactical urbanism movement, recommend testing each project to bring about long-term changes in relation to Rogers’ five attributes of innovation [2].

In normal urban design projects, it takes a long time from planning to implementation, and the agents of design and implementation are usually different. In contrast, tactical urbanism-based projects are performed by the same entity, from planning to post-implementation monitoring, in a relatively short period. Thus, one can observe all stages of innovation–diffusion—‘knowledge, persuasion, decision, confirmation’—through one project. Therefore, tactical urbanism projects can be seen as more suitable for analysis from the perspective of innovation–diffusion than general urban design projects.

3. Research Objective and Methods

The primary objective of this case study presented in this paper is to assess and demonstrate the potential of the innovation–diffusion theory as an instrumental framework for enhancing the implementation of tactical urbanism projects in practice. The current case study specifically focuses on the micro-level aspect of tactical urbanism, which involves tactics applied within a studio project. It seeks to analyze the factors that influenced the acceptance of individual tactics by users in a collaborative urban design studio class based on tactical urbanism.

The current case study employed qualitative research methods, focusing on ethnographic techniques. Wolcott identified the primary procedures of qualitative research as description, analysis, and interpretation: description, which conveys observations to the reader; analysis, which shares insights gleaned from the data; and interpretation, which imparts the researcher’s understanding of the findings [36]. In line with these procedures, the research initially outlined the project’s process. It then progressed to analysis and interpretation, both grounded in the innovation–diffusion theory. By interpreting the results, this case study seeks to provide insights for systematically drawing out the potential of tactical urbanism.

As a participatory case study, data were collected through observations and interviews throughout the studio. The data collection was facilitated by the principal researcher and participating students. In particular, the principal researcher actively partook in all phases of the studio, from its preparation to the final evaluation, documenting significant events daily using photos and notes. Furthermore, the students comprehensively recorded the entire process using multimedia sources such as photos, videos, and audio recordings. They also conducted interviews with key participants during the project’s implementation. During the monitoring phase, an anonymous satisfaction survey was conducted on users.

4. Case Study: A Collaborative Tactical Urbanism Studio in Seongnam-Dong²

4.1. Description of the Studio Progress

From 21 November to 16 December 2022, a temporary project aimed at enhancing the urban environment was carried out. Implemented in real-world urban spaces, the project spanned a four-week intensive studio class. A professor with expertise in urban design and eleven third-year students majoring in urban planning were the active participants in this studio.

Considering the condensed four-week timeframe of the studio, preparations were initiated approximately two months in advance to ensure the efficient progression of the class. These efforts included selecting optimal project sites, building rapport with users, identifying crucial issues, and securing appropriate on-site workspaces. We also held preliminary meetings with key individuals from potential project sites, carried out field surveys, and conducted interviews (Figure 1).



Figure 1. Preparation meetings for project orientation, site selection and rapport formation.

4.1.1. Site Selection

The Seongnam City Community Support Center³ recommended Seongnam-Dong⁴ and Sunae-3-Dong⁵, which are active in community participation, as target areas for our studio class and research. A month prior to launching the studio, we initiated discussions with community leader groups within each prospective area. These prospective areas exhibited distinct variations in the attributes of their leader groups, such as professionalism, initiative, and representativeness, as well as the specific urban environmental issues they were confronting. Given these disparities, particularly in terms of the leader group's characteristics, we eventually selected Seongnam-Dong as the target area since it best aligned with the timeline and objectives of our studio class.

In Seongnam-Dong, the staff at the Jungwon Senior Welfare Center, who have a high level of understanding of public policy, and the elderly members of clubs run by the welfare center, were already involved in improving the environment of Seongnam-Dong through their club activities. This made it relatively straightforward to foster empathy and resonance for the studio's purpose. Located in a commercial area, the center confronted various challenges, including illegal parking, homelessness, and littering. By focusing the project on the outdoor spaces of the welfare center and adjoining commercial streets, the center was able to take a proactive role. Furthermore, the collaboration between the welfare center staff (professional counselors) known for their communication skills, and the professor and students of urban planning, experts in proposing spatial solutions, was anticipated would create a synergy.

In Sunae-3-Dong, the individuals managing a community-run library were spearheading community activities and addressing issues, such as digital literacy challenges among the elderly, and shared kickboard problems like disorderly parking and risk of traffic accidents. They had successfully implemented an educational program to address digital literacy for the elderly, but issues related to shared kickboards remained unresolved. This was due to disagreements among stakeholders (users, non-users, service providers, local governments, etc.) and a lack of expertise in spatial planning. Our studio initially aimed to focus on the shared kickboard issue. However, the library operators, who were not an official representative for the apartment complex, faced decision-making hurdles. Their delayed confirmation of participation led to the project's unfeasibility in Sunae-3-Dong.

4.1.2. Participant Groups—Citizens, Public Organizations, and a University

Given that this project requires the temporary redesign of a public space currently in use, collaboration was essential with both the public organizations responsible for managing these spaces, and their primary users—the local citizens. The key groups involved included (1) spatial design experts, specifically a professor and students from Gachon University, as well as welfare policy and communication experts, such as the staff from the welfare center, and (2) users of the space, including senior citizens at the welfare center, local retailers, residents, and members of the resident autonomy association. Additionally, public entities such as the Environment and Sanitation Department of Jungwon District Office and staff from the Seongnam Public Support Center provided critical support to the project. The specific roles of each group are detailed in Figure 2.

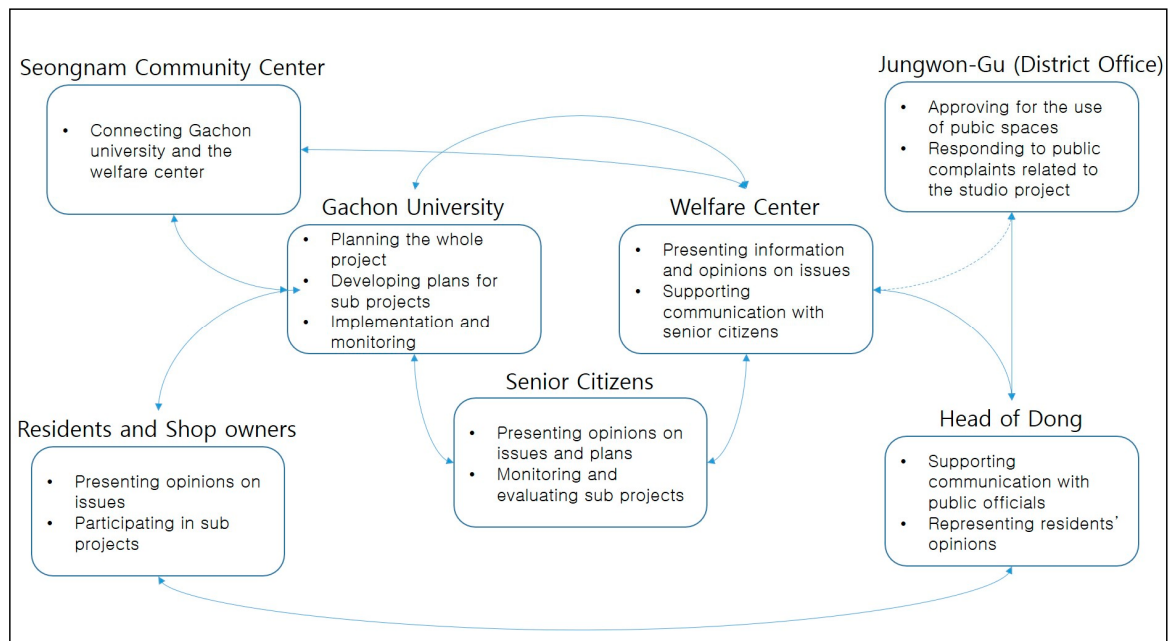


Figure 2. Academic-private-public collaboration for the studio.

4.1.3. The 4-Week Process of the Studio

This studio class took place over a total of four weeks from 21 November to 16 December 2022, and the process included planning, installation, usage monitoring, and evaluation (Figure 3).

Studio detail schedule	November										December															
	21	22	23	24	25	26	27	28	29	30	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri
Field investigations and Planning																										
Preparation of materials for temporary installation																										
Installation of temporary facilities																										
Operation of the facilities and monitoring																										
Preparation for the final presentation																										
Studio orientation for students	●																									
Presentation of the plans - the 1st round -					●																					
Presentation of the plans - the 2nd round -								●																		
Presentation of the final outcome of the studio																										●

Figure 3. Timeline of the studio.

- Week 1—Design charrette for project selection and plan development

The first week was spent identifying specific tasks to address within the project and developing improvement plans. This work was carried out through a design charrette in which urban planning students, specialized in design, and “senior citizens,” who regularly used the target spaces, participated together. The charrette took place at the welfare center, which was the project site, every day from Monday to Friday during the first week. Therefore, throughout the planning process, participants had the opportunity to establish their plans while assessing the current situation as needed. The students were divided into three teams of three to four people each, and the senior citizens from the welfare center were welcome to join any team that sparked their interest. The specific process of the design charrette is as follows.

- (1) The staff and senior citizens of the welfare center presented the following current issues related to the surrounding environment: illegal disposal of cigarette butts on commercial streets, illegal disposal of trash at the boundary of the welfare center, lack of outdoor exercise space, homelessness problem, illegal parking problem, and inconvenience caused by excessive use of the welfare center parking lot by retailers (Figure 4).



Figure 4. Site survey photos—homeless people on a plaza near the site (left); trash dumped near the east entrance (middle); and signs urging people not to litter (right).

- (2) Students considered the problems raised by the welfare center, and conducted field observations and interviews on their own to tentatively identify the tasks to be handled by each team.
- (3) The students presented their analysis of the site’s current status and the proposed planning direction for the tentative tasks to the senior citizens (Figure 5). Following a subsequent discussion, they collectively confirmed the following three tasks: (1) improvements of the main entrance, (2) creation of a seating area at the front plaza, (3) installation of a trash separation collection stand (Figure 6).



Figure 5. Presentation of site analysis and schematic plans.

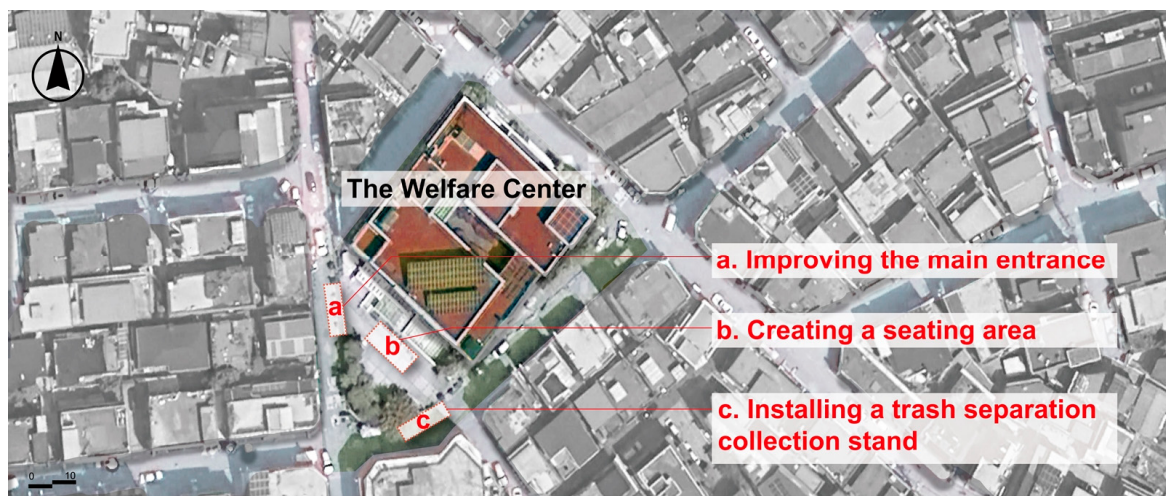


Figure 6. Location of the three projects.

- (4) In two rounds, the students developed detailed environmental improvement plans for each task, incorporating feedback from the senior citizens. Initially, they presented schematic plans in the first round to gather input. Subsequently, they presented the final implementation plan in the second round (Figure 3).
- Week 2—Implementation of the plans

In the following week, the students procured materials and erected temporary facilities according to the plans. The materials were selected with consideration for aesthetics, cost, ease of purchase, installation, demolition, and safety. For projects executed in street spaces adjacent to the welfare center site (such as the improvements to the main entrance and the creation of the garbage collection stand), the students conducted promotional activities and encouraged participation to garner the cooperation of citizens. Additionally, the students liaised with relevant organizations (such as Jungwon-Gu Office and the

responsible cleaning service agency) to facilitate the temporary installation and operation of facilities in public spaces.

- Week 3—Monitoring the usage of the modified spaces

After installing the facilities, each team monitored their use for one week using various methods such as on-site observation, interviews, surveys, and video recording. During this monitoring period, we promoted the facilities to the users of the welfare center and requested feedback. In certain instances, based on this feedback, the facilities were rearranged and feedback was solicited again.

- Week 4—Sharing the results with the public

After the monitoring period, each team prepared a 10-min PowerPoint presentation encompassing the overall content of the project, including planning, execution, and monitoring. This was presented to the residents of Seongnam-Dong and the senior citizens of the welfare center on the last day. The students also shared their reflections and opinions on the project as a whole.

4.1.4. Overview of Each Team's Project

Improvement of the Main Entrance

The first team's project was chosen based on concerns raised by the senior citizens and observations made by the students at the site. Heavy pots, intended to deter illegal parking, were obstructing the main entrance of the welfare center (Figure 7, left). This caused visibility issues, increased the risk of accidents, and impeded access due to a lack of adequate ramps for bicycles and wheelchairs. Additionally, these pots obscured the main entrance, hindering the proper display of the center's symbolic value. Despite the evident safety and aesthetic problems, these heavy pots were utilized because the law prohibits permanently affixing objects to the ground on public roads.



Figure 7. Improvement of the main entrance space (left: before, right: after).

“People using walkers or wheelchairs are having a tough time getting into the welfare center because the plant pots too close together at the entrance area. If we clear away those big plant pots and add some cool signs and colors, it would make the place easier to get to and more welcoming.” (Welfare Center Staff, female, age 40s)

“If we use tape instead of big plant pots, there's a risk that small cars might end up parking there.” (Welfare Center Staff, female, age 30s)

The primary goal of this project was to prevent illegal parking and maintain visual and physical openness at the entrance without the need for permanent structures. To tackle these issues, the students replaced the pots with a large palm fiber mat (10 m × 2 m)

and installed plastic bollards atop the mat. They enhanced the entrance's appearance by painting the bollards and the mat, and also added wooden ramps to improve accessibility for wheelchair users and cyclists (Figure 7, Right).

Feedback gathered through user interviews was largely positive, though some mentioned that the mats could become slippery in snowy conditions. The welfare center evaluated the project positively, deciding to incorporate it into their environmental improvement efforts for the following year.

"It used to be so narrow and hard to get in. Now it's not slippery, and it's so much easier to enter. Thanks a lot. It's the best." (Senior citizen, female, age 60s)

Flexible Pallet Benches

The second team chose to tackle issues raised by the senior citizens: (1) the lack of sufficient resting places in the welfare center's front plaza (Figure 8, left), and (2) an underutilized bulletin board situated in a remote area (Figure 8, right).



Figure 8. Front square with no place to sit (left) and an underused bulletin board due to its remote location (right).

"The existing chairs in the outdoor square don't look good. On warm days, it would be nice if the square had chairs or spaces where people can sit, have a cup of tea, and chat." (Senior citizen, female, age 70s)

"If the pallet benches are too high, it's dangerous because kids passing by could climb up and fall off." (Seongnam-Dong resident, female, age 40s)

The students sought to resolve these issues by installing a bulletin board and adjustable benches in the heavily visited front plaza, which previously lacked seating. They designed the adjustable benches in a modular fashion using wooden pallets, making them transformable according to need. Throughout the monitoring period, the placement of the benches was adjusted three times, and usage patterns were observed. Monitoring was conducted through video recordings and interviews. The usage of the benches and bulletin board between 11 a.m. and 5 p.m., the expected peak period, was recorded on video (Figure 9). However, overall usage was low during the monitoring period due to a sudden temperature drop. In addition, the benches made from pallets initially had a lower usage rate because many users were unfamiliar with the purpose of the installed facilities. However, after the students installed informative signs about the benches, their usage increased.



Figure 9. Senior citizens resting on the benches (left) and video recording of the behavior of bench users (right).

Installation and Operation of the Trash Separation Collection Stand

The third team decided to tackle the issue of illegal dumping of trash around the welfare center, which was one of the main environmental problems first raised by the center's staff. Residents and retailers near the welfare center were routinely disposing of their trash near the east entrance of the center, rather than in front of their homes or stores, causing discomfort to the visitors of the center.

"Trash is a problem. Oh, the trash issue in Seongnam-Dong is so serious. It smells when you pass by here. It would be nice if it got cleaned up." (Seongnam-Dong resident, female, age 50s)

In order to improve the environment of the east entrance and the nearby street that had been damaged by indiscriminate trash disposal, the students planned to install and operate a trash separation and collection stand about 5 m from the entrance of the welfare center.

For the first week, they observed the behavior of illegal dumping to identify those who (residents and retailers) were mainly doing it and the amount of trash, in order to plan the size, shape, and location of the collection place (Figure 10). They obtained agreement from local retailers and residents who had been dumping waste illegally to participate in the experiment, and after installing the trash separation collection stand, they monitored its usage for a week (Figure 11).

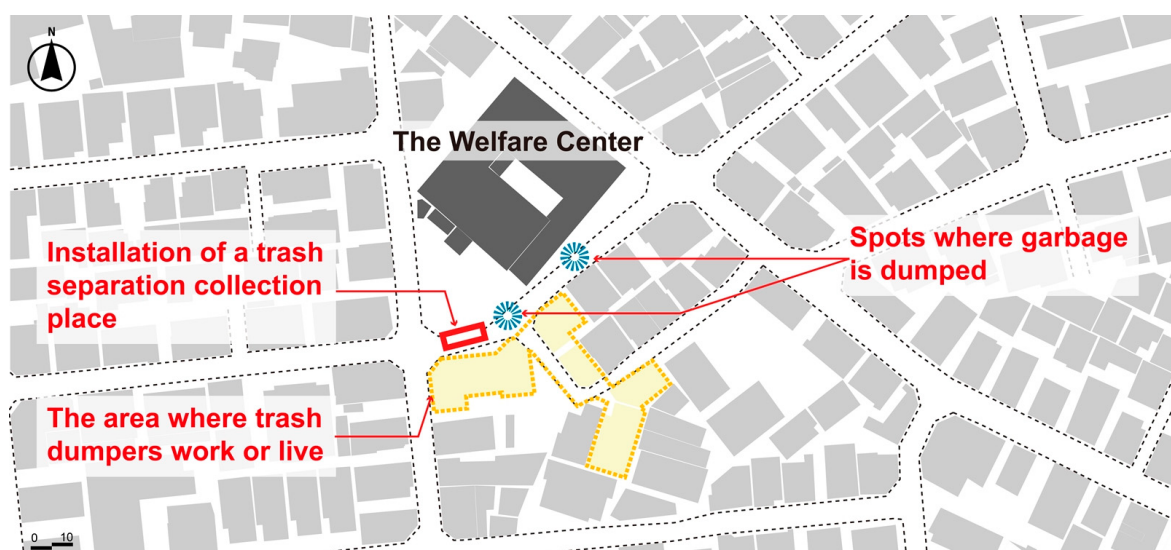


Figure 10. Status of those who are littering and where littering takes place.

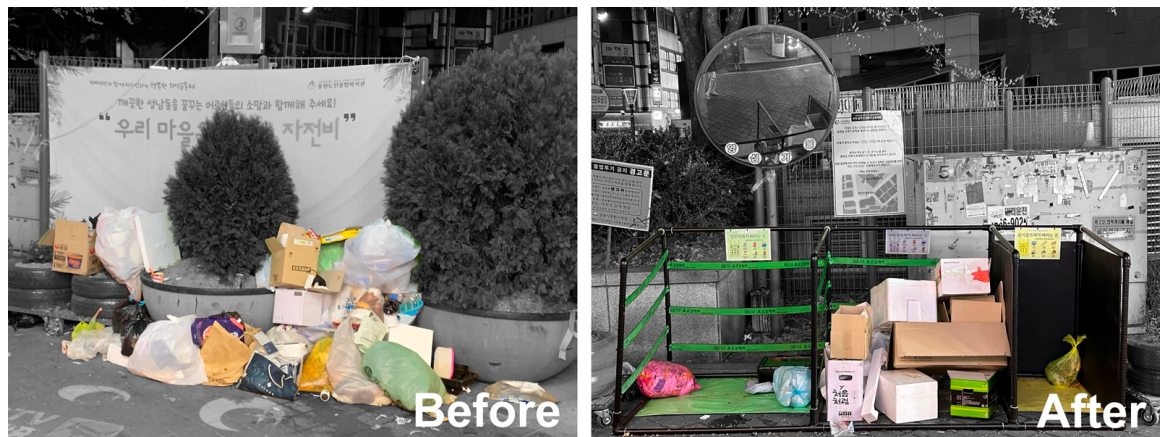


Figure 11. Before and after the installation of the trash separation collection stand (Left: before, Right: after).

They also secured cooperation from the Jungwon District Office and the waste collection agency in order to install and operate the facility on the public street. During the monitoring period, on-site observations were conducted three times a day for an hour each in the morning, afternoon, and evening, and additional improvements, such as the installation of information boards, were implemented in real-time based on the monitoring results.

4.2. Case Analysis

Each project, reflecting the distinctive nature of tactical urbanism with its contextual and flexible approach, embraced different tactics and incorporated unplanned responses to various unexpected situations encountered during implementation. As such, a rigid analysis within a uniform framework is not appropriate. In response to this, we employed hypotheses related to the relationships between the characteristics of innovations and adopters, and the patterns of diffusion in innovation–diffusion theory, forming a loosely structured analytical framework. With this framework, we were able to flexibly analyze episodes from each project that hold academic or policy implications based on our observations.

4.2.1. Analysis Based on the Attributes of Innovations

Relative Advantages of the Main Entrance Improvement Plan

The benefits of the main entrance improvement plan were immediately recognized by the senior citizens and welfare center staff who participated in the planning process, more so than the other two plans. The proposal to create rest areas by repurposing cargo pallets in the flexible pallet benches project was somewhat unfamiliar to them. In the case of the trash separation collection stand project, there were concerns that the designated area could inadvertently encourage further illegal trash dumping. As a result, these two projects did not inspire a high level of confidence among the welfare center staff and senior citizens.

On the contrary, the main entrance improvement project aimed to improve access by replacing the large, physically and visually obstructive pots with lightweight, small bollards. These bollards, anchored to a mat to prevent arbitrary relocation, were a clear improvement. This benefit was easily understood by the welfare center staff and senior citizens, which facilitated the project's progression without any significant opposition.

Simplifying Complex Ideas through Visualization

During the first week of the planning process conducted jointly by students and senior citizens, the students used various visual materials such as photos of similar cases to the proposed plan, and 3D simulations of the plan (see Figure 5). This facilitated communication with the senior citizens and made it easier for those unfamiliar with spatial planning and tactical urbanism-style approaches to understand and accept the plan. Also,

the fact that the charrette was conducted within the welfare center enabled both the students and senior citizens to jointly assess the current situation and problems of the target sites, which made easy to understand the improvement plans.

Compatibility Issues with the Flexible Pallet Bench Project

For the flexible pallet bench project, the unconventional design of the benches, made from pallets, was different to what users were accustomed. As a result, many users initially did not recognize these pallet benches as seats, leading to lower utilization. This could be seen as a problem arising from the discrepancy between the form of the installation and the users' typical environmental perceptions. To increase usage, explanatory signs detailing the purpose of the installation were posted in various locations.

During the monitoring period, a sudden drop in temperature, along with the occurrence of snowfall, led to a decrease in the use of the flexible pallet benches, which were designed for optional activities such as resting and chatting. Conversely, the improved main entrance and the trash separation collection area, intended for essential activities like entering/exiting the welfare center and disposing of trash, maintained their usage as these activities were less impacted by the cold weather [37]. This indicates that the flexible pallet bench did not accommodate typical outdoor behaviors in cold weather.

Trialability of the Tactical Urbanism Studio

The welfare center staff agreed with the overall purpose of the studio class aiming for the improvement of the welfare center and its surrounding environment. However, they showed a somewhat passive attitude regarding the specific plans for the projects, worrying about residents' complaints and the rigidity of responsible officials. However, the core characteristic of tactical urbanism as a temporary event had a positive effect on the staff accepting the specific plans. That is, by explaining that the facilities would be temporarily installed and operated for only one week, we were able to persuade the staff to accept the detailed plans. The temporary nature of the tactical urbanism project was also effective in persuading participants other than the welfare center staff. For example, in the process of persuading residents and retailers to participate in the trash separation collection stand project, the fact that it was a temporary operation had a positive effect.

Observability in the Trash Separation Collection Stand Project

Efforts to boost the observability of an innovation to enhance its diffusion were implemented when persuading a late adopter—specifically, one of seven local shop owners who had been uncooperative—during the operation of the trash separation collection site. Namely, after the students first set up the trash separation collection site, they encouraged the previously uncooperative shop owner to participate. This was achieved by allowing him to observe other shop owners and residents using the site before making a subsequent request.

All tactical urbanism projects can be viewed as attempts to enhance the observability of innovative concepts relating to urban spaces. Rogers contended that trials serve two purposes: an experimental function for assessing the impact of innovation under field conditions, and an exemplary function for promoting the diffusion of innovation [9]. The case described above corresponds to the latter, an exemplary function.

4.2.2. Analysis Based on the Characteristics of Adopters

Issues Associated with the Adopters' Innovativeness

During the initial studio preparation period, two locations were selected as candidates: Seongnam-Dong, where the welfare center staff led community activities, and Sunae-3-Dong, where the library management team was in charge. Several rounds of discussions were held with community leader groups from each area in preparation for the project. However, Sunae-3-Dong was eventually excluded from the project due to issues arising in the decision-making process relating to project participation.

In the case of Seongnam-Dong, despite having no experience in spatial planning, the welfare center director and staff—who were adept at promoting and operating public policies—responded positively and proactively to the new initiative. Conversely, in Sunae-3-Dong, the resident volunteers running the community library had little understanding and confidence in spatial planning and public policy. Not being a representative organization for the entire residential community, they needed approval from the residents' representative meeting. However, they failed to secure this before the start of the studio class due to delays in the approval procedures.

Furthermore, the chosen location in Seongnam-Dong, which included the welfare center and surrounding street spaces, was public. This meant the welfare center staff, who managed the site, were actively involved in the project. In Sunae-3-Dong, however, the roads inside the targeted apartment complex were private assets shared by the residents. The library management team, who were willing to participate, lacked representativeness for the entire residential community.

According to the theory of innovation diffusion, adopters are categorized based on their innovativeness. However, it seems that the negotiation process in the two candidate areas was influenced not only by innovativeness but also by various other adopter characteristics. This implies a complex interplay of factors—such as the adopters' representativeness, expertise, and the nature of the spaces where the innovations were to be applied (public vs. private ownership)—were in play. In Seongnam-dong, the welfare center director, who had authority, quickly decided to participate in the project. Conversely, in Sunae-3-Dong, the decision to participate was made at the group level, which appeared to result in a more time-consuming process.

The Influence of an Opinion Leader's Interpersonal Network

In implementing the trash separation collection stand project, which demanded the use of public spaces (streets) and the active engagement of residents, we discovered that an opinion leader's role was pivotal in driving the diffusion of innovation. Specifically, we encountered challenges in persuading two critical groups—government officials who managed and held legal authority over the public streets, and the residents who utilized these spaces. These groups typically exhibited resistance to change. To overcome this, we initially provided a thorough explanation of the project to a community leader, the head of Seongnam-Dong, who had fostered long-standing relationships with both the residents and the welfare center. This strategy enabled him to comprehend and empathize with the project. Leveraging his influence, we successfully persuaded the government officials, who were attuned to residents' concerns, hence facilitating the project's progression without conflict (Figure 12).

External Effects Observed in the Trash Separation Collection Stand Project

At the beginning of the observation period, residents were using the designated trash separation collection stand appropriately. However, when someone discarded a broken chair a few meters away from this stand instead of within it, others began dumping their trash next to the chair as well. It was only when students relocated the discarded chair to the properly installed trash separation collection stand that residents resumed its correct use.

According to the diffusion theory, the adoption of innovations is influenced not just by the innovativeness of individual adopters or the attributes of the innovation itself. The acceptance by other adopters also plays a significant role. This creates an externality effect, where the actions of one party directly impact the decisions and behaviors of others [9,38].

Improving the streetscape through the use of trash separation collection stand shares common ground with communication-related innovations such as telephones, emails, and faxes, often mentioned in studies on innovation diffusion regarding external effects [23]—their impact is minimal unless a large number participate. This can be associated with the "Broken Windows" effect proposed by Kelling and Wilson in relation to urban space management [39].

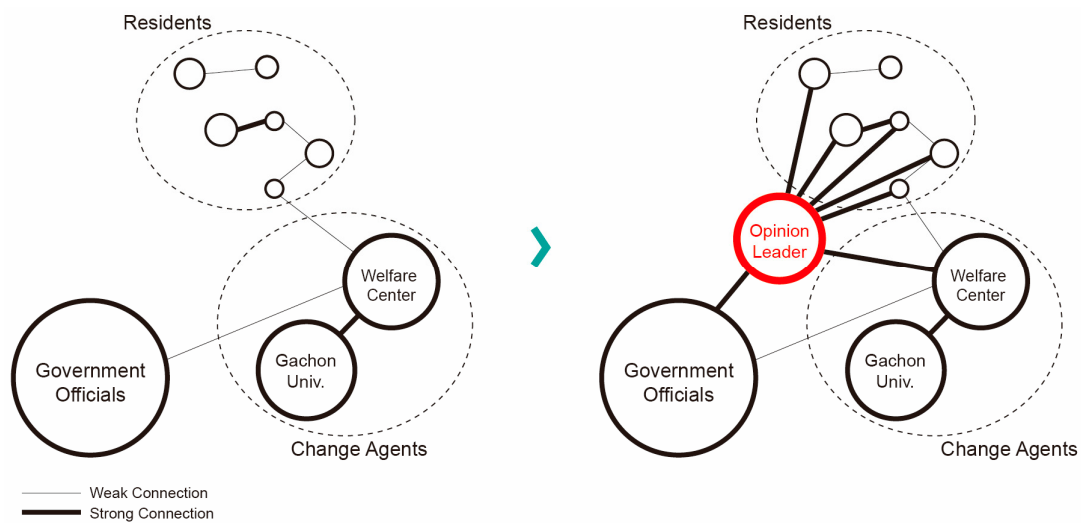


Figure 12. Leveraging an opinion leader's network for relationship building.

4.2.3. Summary of the Analysis

With respect to the five attributes of innovation that affect its diffusion, trialability and observability were naturally exhibited in the three Seongnam-Dong projects, as they align with the core traits of the tactical urbanism project. Furthermore, simplicity was consistently applied to the three projects through the universally conducted design charrette. However, relative advantages and compatibility differed based on the specific content of each project (Table 1). Essentially, trialability and observability can be viewed as inherent attributes in all tactical urbanism projects, and simplicity can likely be enhanced in most of these projects through close interaction between the change agent and adopters, like a design charrette. Conversely, relative advantage and compatibility might vary depending on the specific details of individual tactics.

Table 1. Summary of the case analysis (○: applicable, -: not applicable).

Sub-Projects	Innovation Perspective					Adopter Perspective		
	Relative Advantages	Compatibility	Simplicity	Trialability	Observability	Innovativeness	Influence of an Opinion Leader	Externality Effect
(1) Main Entrance Improvement	○	○	○	○	○	○	-	-
(2) Changeable Pallet Benches	-	-	○	○	○	○	-	-
(3) Trash Separation Collection Place	-	○	○	○	○	○	○	○

From the perspective of the adopter, we noticed the crucial influence of an opinion leader and external effects, particularly in the trash separation collection stand project, which involved the participation of diverse groups including residents, retailers, and government officials (Table 1).

5. Discussion

This case study demonstrates that the innovation–diffusion theory provides a robust theoretical framework for examining and evaluating tactical urbanism projects. It has been confirmed that evaluating tactics based on Rogers' five attributes of innovation can contribute to the successful implementation of these tactics [2,9]. For instance, the main entrance improvement project, which had evident benefits, was more readily accepted by senior citizens and welfare center staff compared to the other two projects. This illustrates that the perception of 'relative advantage' of an innovation influences its acceptance. In addition, this case study observed the influence of actor-related factors in the innovation–

diffusion process, such as the innovativeness of adopters, the role of the opinion leader, and the external effects of others' adoption, all detailed in Section 2.2.2. For instance, the site selection process, as described in Section 4.2.2—Issues Associated with the Adopters' Innovativeness, showed that differences in innovativeness among actors at two candidate project sites influenced their decisions about participating in the studio. Furthermore, the trash collection stand project, detailed in Section 4.2.2—The Influence of an Opinion Leader's Interpersonal Network, highlights the crucial role of the community leader, acting as an opinion leader, in persuading public officials and residents to adopt the innovation.

Another key insight from this case study is that the application of the innovation diffusion theory can contribute not just at the planning stage, but also during execution. This applies to standard urban design projects, but particularly to tactical urbanism projects, where flexibility is paramount. Indeed, when initial plans faced obstacles in the studio process, solutions were effectively found based on the innovation diffusion theory. A notable example involves increasing user understanding of the flexible pallet bench's purpose through explanatory notes. This approach enhanced the compatibility of these unfamiliar types of benches with users' typical environmental perceptions. In turn, this led to an increase in the benches' usage, as detailed in Section 2.2.1. This indicates that tactical urbanism's innovation attributes can dynamically respond to circumstances encountered during implementation.

Furthermore, this case study carries the following implications: Though tactics were analyzed individually based on the five attributes of innovation, it should be recognized that these attributes are fundamentally interconnected. For instance, the perceived relative advantage influences the adoption of an innovation. Thus, if a complex or hard-to-assess innovation is simplified and made easily understandable through visual materials (thereby enhancing simplicity), it can improve the adopter's perception of its relative advantages, consequently facilitating its diffusion, as described in Section 4.2.1—Simplifying Complex Ideas through Visualization.

Overall, this case study's results illustrate that elements highlighted in innovation–diffusion theory, such as innovation attributes and actors' characteristics, serve as effective criteria for evaluating the success of tactics and provide guidance on their effective implementation.

6. Conclusions

As discussed in the literature review in Section 2.1, the philosophical foundation of tactical urbanism is closely related to established planning theories, such as incrementalism and transactive planning. However, this paper argues for the necessity of an instrumental theory to enhance the implementation of tactical urbanism and illustrates the potential of the innovation–diffusion theory for this purpose.

In essence, tactical urbanism, encapsulated by the motto 'Short-term action for long-term change,' aims not only for localized environmental improvements through individual projects but also for overall urban environmental enhancement through the diffusion of innovations from each project. Consequently, the innovation diffusion theory, which elucidates how new ideas propagate, can serve as an instrumental framework in achieving tactical urbanism's foundational goals.

While this study has various implications as discussed above, as an exploratory and qualitative analysis, it does have limitations. Firstly, although the studio project was designed with the analysis in mind, it was carried out as part of the actual course, not solely for research. Furthermore, given tactical urbanism's need for situational responses, the project had to flexibly accommodate variables emerging on-site. Therefore, many events included in the analysis were not pre-designed, making it challenging to strictly control external variables, and a systematic post-analysis of responsively occurring events was included. Future studies are expected to consider these aspects in advance.

The next issue is that of the theoretical foundation for case analysis. That is, besides the innovation–diffusion theory used as the foundation for this study, other theories explaining human behavior, including behavioral economic theories such as nudge theory [40], can

also help analyze and improve tactical urbanism. Further research based on these other behavior-related theories is needed.

Finally, this study did not explore the educational impacts of tactical urbanism, a topic that merits systematic future research. Unlike traditional studios, tactical urbanism allows for direct user engagement and real-time feedback, helping students to bridge theory and practice effectively. Kevin Lynch highlighted the importance of user empathy as a vital quality for proficient urban designers [41]. By promoting close interactions with users, tactical urbanism studios can cultivate such empathy, highlighting the necessity for future research into its pedagogical benefits.

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Notes

- ¹ Mike Lydon first coined the term “Tactical Urbanism” in 2010. 26. Melnyk, V., Engagement Through Art, in All-Inclusive Engagement in Architecture. 2020, Routledge. pp. 172–182.
- ² A ‘Dong’ is the lowest level of local administrative division in Korea.
- ³ The Seongnam City Community Center is an organization that operates under the direct management system of the city of Seongnam. It performs the function of a helper connecting the administration and the village, such as policy development related to the community building, development and distribution of various educational programs, establishment of internal and external cooperation system, and promotion (<https://maul.seongnam.go.kr/main/index.php> accessed on 20 March 2023.).
- ⁴ Seongnam-Dong is a commercial district located in the old downtown area of the City of Seongnam.
- ⁵ Sunae3-Dong is a residential neighborhood located in the Bundang New Town area of the City of Seongnam.

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