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District Unit Plan in Seoul as a New Approach for Urban Form and Density Control

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Abstract
Korea economy has been experienced rapid industrialization since 1960s. Rapid industrialization accelerated the high utilization of land and concentration of population to urban area. According to these phenomena, estate land to build various buildings, especially for housing was not enough and the density of buildings in urban area naturally was increased higher.

To overcome those highly density urban congestion, Ministry of Construction and Transportation of Korea replaced the previous "urban design" method to District Unit Plan (DUP) for the purpose of more effective use of land resource, control the misusing and disordered land use of urban area. DUP as a new type of limited urban planning method has two sides of difference from the concept of urban design in terms of (1) meaning of partial plan for certain comparative small district to the urban planning which covers whole city area, and (2) this DUP open proposal system by the citizen (or residents) themselves. But, during last two years time, architects, developers, and residents who target benefit from their development implementation have experienced wide and deep difficulties and disappointments due to previous regulation what so called Level of Subdividing Work of Residential Zones which is focused to strongly control on the residential density by building height limitation and total floor/land ratio.

This research would like to contribute to analyzing as a better tool for the direction of urban spatial form through discussing and exchanging opinions. Especially introduce actually applied cases and analysis that can show some issues and misunderstanding of DUP implementation for improving urban form and easier understanding of Seoul City.

Keywords: District Unit Plan (DUP), urban form, density control, subdividing work of residential zones, urban design

1. Introduction
1.1. Background and Purpose of Research
With more than 10 million inhabitants, a figure representing about a quarter of the nation's total population, Seoul is a bustling metropolis with one of the highest population densities in the world. Heavily damaged by the Korean War, the city was rebuilt into a modern urban center and Korean economy experienced rapid industrialization since 1960s.

With rapid industrialization and economic development, high utilization of land and concentration of population to urban area was accelerated. According to the National Statistical Office, between 1960 and 1970, Seoul's population more than doubled its size, from 2.4 million to 5.5 million people, with over 50 percent of the population being recent migrants from rural areas.

According to these phenomena, estate land to build various buildings, especially for housing was not enough and the density of buildings in urban area gradually increased higher.

To overcome those highly dense urban circumstances, Ministry of Construction and Transportation of Korea replaced the previous "urban design" method to District Unit Plan (DUP) for the purpose of more effective use of land resource, controlling the misuse and disordered land use of urban area. As a plan to control land-use effectively, the 'District Detailed Planning' and 'Urban Design' has appeared around 1980, after that these two systems were integrated to 'District Unit Planning' in July 2000 to make up for the weak points of the previous systems.

Based on the law 'Urban Planning Act' the objective of 'District Unit Planning' is to rationalize and actualize land-use, to advance urban function and beauty, and to assure good environment. Especially, managing density for use of land is issue that 'District Unit Planning' emphasizes on. Compared to the past 'District Detailed Planning' and 'Urban Design', the 'District Unit Planning' reduced the FAR (floor area ratio) drastically to control urban population. According to this regulation, the housing development became a major issue recently. For example, an area over 10,000 m² needs to obligatorily establish a
'District Unit Plan', to restrain indiscreet development without planning.

However, the regulations face lots of objections due to the reason that it can give developments troubles, and infringe private property rights. In addition to public resentments about equity by declining adjustment of the FAR on the 'District Detailed Planning' are presented. Although incentives have been used as a solution for this problem it has been degraded as a tool by the regulation of 'District Unit Planning' to fulfill the FAR irrelevant to the original purpose.

Consequently, the organization of the logical and realistic standards for making FAR on 'District Unit Planning' is demanded for rational land use. The 'standards FAR' used by the 'District Unit Planning' have been applied uniformly 'Zoning system'. This is causing resistance among the residents continuously, and is criticized that this follows the past 'Zoning System'.

Table 1-1 Density Control Policy in Seoul

<table>
<thead>
<tr>
<th>Density control policy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horizontal density control</td>
</tr>
<tr>
<td>Green belt, Building to land ratio,</td>
</tr>
<tr>
<td>Vertical density control</td>
</tr>
<tr>
<td>Height limitation, Floor area ratio</td>
</tr>
</tbody>
</table>

Based on these backgrounds, this study scrutinized 'District Unit Planning' –first tried policy of developed country but was not easily accepted- that was applied in residential area. Understanding of DUP system as well as recognition of real problem will be useful for residents and they can be excellent tool and guide for advanced urban space form.

2. Case of DUP

2.1. Planned Area (291-1 and surrounding lots: 15,316 m²)

1) Building Condition by Building Use.

The buildings within targeted district mainly were consisted of dwelling use. 13 units (35.2%) of single detached, and 17 units (45.9%) of multi-family dwelling have constructed the area. The rest of 7 units (18.9%) of dwelling are used for neighborhood facilities. However, some areas of the district are composed of commercial and residential facilities.²

Table 2-1 Buildings by Uses

<table>
<thead>
<tr>
<th>Description</th>
<th>Total</th>
<th>Single Detached</th>
<th>Multi family units</th>
<th>Neigh. Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. Of Buildings</td>
<td>37</td>
<td>13</td>
<td>17</td>
<td>7</td>
</tr>
<tr>
<td>Percentage (%)</td>
<td>100</td>
<td>35.2</td>
<td>45.9</td>
<td>18.9</td>
</tr>
</tbody>
</table>

Drawing 1:Map of Site and Vicinity Area

2) Heights and Density

- Height

Three types of height were shown as follows: 17 units (45.9%) of 3 and 4 stories multi-family dwelling, and another 17 units (45.9%) of below 2 stories-single detached and commercial use, only 3 units (8.2%) of 5~7 stories use for neighborhood facilities.

- Density

Built-up area ratio (ground floor area/lot area) and total floor area ratio (total floor area/lot area) compose of each lot size by the building types is shown below [Table 2-2].

Table 2-2 Density of Buildings / Area

<table>
<thead>
<tr>
<th>Description</th>
<th>Single Detached</th>
<th>Multifamily dwellings</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building/Lot Ratio(%)</td>
<td>50.56</td>
<td>59.71</td>
<td>44.69</td>
</tr>
<tr>
<td>Total Floor area Ratio(%)</td>
<td>58.57</td>
<td>188.35</td>
<td>149.53</td>
</tr>
</tbody>
</table>

2) Ages of Buildings

The following [Table 2-3 ] shows age group of buildings. Minimum age of buildings for reconstruction requires more than 20 years.

Table 2-3 Ages of Buildings

<table>
<thead>
<tr>
<th>Description</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. Of Buildings</td>
<td>37</td>
</tr>
<tr>
<td>Percentage (%)</td>
<td>100</td>
</tr>
</tbody>
</table>

3) Existing Condition of Vicinity Area
The following Drawing 2 shows existing condition in vicinity area.

![Drawing 2 Vicinity Conditions of Site Area.](image)

2.2. Differences of Planning Direction Between Residents and City Government Officials.
The opinion between residents of DUP proposal and Seoul City government regarding subject site for DUP has some confictions as following [Table2-4].

<table>
<thead>
<tr>
<th>Description</th>
<th>Residents group</th>
<th>City government</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rebuilt up of multifamily housing</td>
<td>Whole block don’t allowed by DUP including single detached houses</td>
<td>Except single detached units from multi-family housing is not allowed</td>
</tr>
<tr>
<td>Level of land use</td>
<td>The 3rd level more than 15 stories of 1st general residential area. For balance of neighboring high-rise apartment</td>
<td>Confirmed by Manual of residential leveling work as 2nd level of 1st general (below 12 stories) residential area based on urban facilities capacity and environment</td>
</tr>
</tbody>
</table>

Table 2-4 Different Requirement of Each side.

2.3. Original District Unit Plan of Proposed Site
1) Concept of Planning Approach
DUP Plan according to the revised urban planning law in Korea is proposing the adequate developing density under the consideration of capacity of micro and macro urban infrastructure (roads, water supply and sewerage, etc.). Simultaneously, the urban renewal processing and planning in the neighborhood area requires the consideration of adequate floor area ratio, height of residential buildings, and environmental factors.

2) Density Plan
The ground floor ratio is allowed 60 percent, comparing with the lot area. But the DUP of this area targets 25 percent of ground floor ratio to maximize the non built up area for providing more open spaces to residents and reserving open green stripes for future development activities of related lots especially for securing enough width of roads. See [Drawing 3].

![Drawing 3 Site plan of targeted District](image)

- Standard FAR(Floor Area Ratio): 200%
- Allowable FAR(Floor Area Ratio): 233%
- Limit of maximum FAR: 240%
- Limits of building heights: 19 floors - highest 12 floors - average

2.4. Revised District Unit Plan
1) Concept of Planning Approach
Same to the original proposal above.
2) Density Plan
Density plan basically is similar as original plan but the total floor ratio comparing with the site area has revised. The site plan also has changed to reflect the new ratio within the site. See [Drawing 4]

2.5. Major Changes of Planning Proposal.
1) Effects to Solve Site Issues Related
- Location Condition: Building types of neighboring blocks were designed and permitted higher than 20 stories- balance and harmony of building height need to be considered.
- Land Use Aspects: Lower density level by the land use level map is not allowed effective land use- wide and comprehensive land use plan is required especially in connection with renewal program of adjacent blocks and detailed land use function.
- Transportation; secured entrances, road connection, narrow corridors make very poor safety of home to school flow for boys and girls-prepare main and sub entrance, minimize vehicles passing through the site, and secure pedestrian safety in plan.
- Buildings; most of buildings in the site has passed more or less 20 years which makes poor urban view- low and old residential buildings planned and designed
- Sky line ; Shin-sa Dong, Hanshin, Hyundai, Life city apartments have minimum 15 stories height- keep the height level by considering overall local skyline.

2) View and Skyline of Shin-sa Dong Area
The Drawing 5, 6, 7 are showing three directional view and skyline by graphic manual.

2.6. Summary of Plan
Partially mentioned sections, DUP contents can be briefly summarized as following【Table2-5】.

Table2-5 DUP of Shin-sa Dong.

<table>
<thead>
<tr>
<th>Description</th>
<th>Planning standard by regulations</th>
<th>Planning Aspects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boundary</td>
<td>connection, harmony neighboring urban renewal area in the future</td>
<td>Size ; 15 ; 316.7 m²/p -public spaces expended road area donated</td>
</tr>
<tr>
<td>Function</td>
<td>Improvement of residential environment</td>
<td>- Apartment type dwelling and neighboring facilities</td>
</tr>
<tr>
<td>Ground Floor Ratio</td>
<td>More Open Space needs for green and recreational outdoor spaces</td>
<td>- Below 40% of Ground floor ratio</td>
</tr>
<tr>
<td>Total Floor Ratio</td>
<td>Unit type and number of unit</td>
<td>Standard FAR below 200%</td>
</tr>
<tr>
<td>-------------------</td>
<td>------------------------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td></td>
<td>• consider other site condition</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Heights</th>
<th>• View and skyline consider adjacent blocks</th>
<th>Highest, below 18 stories average 17 stones</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Limit Line of Building</th>
<th>• View opening of roads &amp; more open space</th>
<th>West road of site: 4m</th>
<th>North road of site: 4m</th>
<th>South &amp; East road: 2m</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Enough distance w/facing buildings</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Public Use of Land</th>
<th>• From setback of building line enable open stripe of land for public use</th>
<th>Land size: 1,277.24 m² (8.34%)</th>
<th>Pocket park: 253.42 m²</th>
<th>Pedestrian path: 1,023.82 m²</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Mixed Use Route</th>
<th>• Connection axis south &amp; north</th>
<th>North – south road connection; Minimum width: 6m</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Public Pedestrian route</th>
<th>• Connection between main road and opposite road of site</th>
<th>4m width: 1023.82 m²</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Entrance for vehicles</th>
<th>Simultaneous entrance &amp; exit available; south &amp; north entrance</th>
<th>Minimum 6m width</th>
</tr>
</thead>
</table>

3. Problems of “Density Control”
3.1. One Side Development Plan, which cannot Reflect Specific Local Condition
Each of block or local area has it’s own circumstance and residents’ requirement. But, the land use leveling work seemed not to reflect inside of residents’ living. The regulation excessively emphasized height, FAR, ground floor ratio, etc. which are very sensitive to the residents who are the members of developing association of each site. The result from this one side strict operation will produce similar type of dwelling buildings which only replace demolished old and low reliable residential areas.

3.2. Decide too Much FAR Comparing with Municipal Government
As an unexpected result of DUP, residents who will be the members of redevelopment project in their residential district are expecting much returns from the redevelopment project operation. From the standing point of macro view, the municipal government who is in charge of plan filtering has not prepared to provide free advise of the long term development for these residents.

The worse situation comes from verbal evaluation by the residents through comparison with other municipal government's achievement. These movements are not allowing fair decision based on planning guidelines. More detailed data concerned existing condition of each area need to be collected and analyzed for adequate future plan.

3.3. Adequate Direction is Demanded Due to Unnecessary Controlling Tool
Some of the specific areas needed limited exception from the same application of DUP rules such as limit of buildings, financial supporting, limit of business category, etc. The unified application of rules and regulations is not allowable to these areas under the specific conditions and environment.

4. Functional Problems of Citizen Participation
The most important function of DUP is the availability of citizen participation in urban planning process. The way of DUP proposal has two approaches. The one can be proposed by mayor of city or municipality, another by residents themselves. Although this good citizen participation function, it always faces some difficulties that look slight but hold whole process of DUP. These situations usually based on the following reasons.

4.1. Local Government Side
Lack of experiences concerned DUP process and understanding. However, residents' demands are always adequate level. These are always conflicting elements between land use (density) control body and citizens' desire through DUP.

4.2. Urban Planning Committee
Usually, the member of urban planning committee cannot fully understand existing condition of submitted proposal area and meaning of rule by DUP and Urban Planning Law.

4.3. Implementing Committee for DUP Operation
These groups of residents really do not want to understand the meaning of DUP. Their first and
important concerns are development profits from project operation.

5. Conclusion & Recommendation

5.1. Conclusion

The DUP is seeking for detailed and rational land use, promoting urban function and street view, and improving environment for better future life. The DUP scheme comes from the combination of previous Urban Detailed Plan and Urban Design by Urban Planning Law of Korea. Although DUP are proposed from the previous schemes but actual application cannot accept flexibility of fitting and solution issues due to very simple controlling tool, except planning policy.

The recommendable actual approach has to include careful consideration of local conditions and environment. And the reason of control of land use at certain district has to be fully discussed with all concerned parties for sharing of feeling. The detailed planning approaches may be accepted by the all concerned parties, especially by the residents.

5.2. Recommendations

Based upon the above analysis, several important points of recommendation were summarized as followings:

1) The goal of urban rearranging or renewal should be concrete by each neighboring area. The most adequate goal can be established through the participation of all concerned parties including local residents for detail research and analysis.

2) The overall urban management scheme needs to be controlled with consideration of local specific conditions. If it is necessary, unequal urban spatial management including mass control of buildings should consider local situation.

3) The total urban space system should come from both sides: the one is control power and the other citizen's volunteer ship with matching and creation of urban shape view, and infrastructure.

4) The role of committee concerned needs enough flexibility. But, reflection of local situation should be understood by the committee members. Most complains come from residents, basically started from the feeling of unfair treatment, comparing with the precious successful cases. The balanced consideration and decision-making process are required.

References

1. Institute of Korea Urban Design, District Unit Plan-Understand of System and Plan Establishment Method, 2001