Investigation of Urban Places in Seoul Digital Industrial Complex (G-Valley)

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Abstract. The National Industrial Complex was designated by the Korean government to strategically nurture the country's key industries. It is larger than a normal industrial quarter, playing a major role in boosting national economic development. In Korea, industrial complexes began to be created since the post-war period. During the period, the country experienced the worst economic condition with many problems. Facing the problems, factories for light industry started to be established, then the focus has shifted towards heavy chemical industry [1]. Seoul Digital Industrial Complex (G-Valley) was established through the development of small to large manufacturing factories such as clothing workshops. However, because of the rapidly industrializing areas out of Seoul, a number of old factories moved to other locations in the 1980s and 90s, and G-valley was replaced by venture groups and IT related companies. Since its establishment in the 1960s, physical infrastructure has been aged and some social problems have been raised. In this paper, we will investigate the problems of G-valley and seek the future solutions by analyzing the current situation based on its urban spaces. It is significant to look at the common problems and future visions not only of G-valley but also of the industrial complexes in other areas of Seoul and its metropolitan region.

Keywords: deteriorated industrial complex, national industrial complex, industrial structure acceleration

1. Introduction
G-valley is an industrial complex that has been developed in the 1960s and changed due to the changing industrial structure and aging environment. As a solution to these problems, G-valley is attempting to build a multi-purpose facility (called Knowledge Industrial Center) for improving the working environment of high-tech industries. It is a decent solution to tear down the old factory and rebuild buildings to accommodate more businesses and people. However, in order to solve problems and continuously activate industrial complexes, it is necessary to think about urban space in relation to current issues.

The G-valley consists of a total of three complexes over Gasan-dong and Guro-dong. The authors decided to focus on the 3rd complex because the oldest buildings remain with heterogeneous industrial structure. Compared to that, the 1st and 2nd complexes are smaller than the 3rd complex, and most of the existing factories have been replaced by new knowledge industrial centers.

This paper starts with the question: what can be urban space solutions suitable for the current G-valley’s state? Therefore, the purpose of paper is to propose a new perspective on G-valley by analyzing the most pressing issues.
2. Methods
First, the authors described the problems through the literature review and analysis of urban space in the site. After that, the authors presented a potential solution. The site analysis involved the location, the industrial structure, policies and issues.

3. Discussion

3.1 Location

Seoul Digital Complex is located in the southwest part of Seoul. The size of the complex is about 1,922,261 m². There are 9,670 companies and 151,813 employees [2]. Among them, the 3rd complex is the largest part with the size of 1,131,000 m² and is located to the left of the complex, facing the western highway and Anyang Stream on the left side. The western highway is the main road that mitigates and transports traffic in the south-western region of Seoul. It also has a very busy traffic volume of 110,600 cars per day on average. Anyang Stream is a tributary of the Han River. Bicycle roads are well developed and its traffic is high. The opposite side of Anyang Stream is the city of Gwangmyeong and is mostly a residential area.

3.2 Industrial Structure

Until the late 1990s, the complex was mostly occupied by textile apparel, simple machinery, and electrical and electronic companies. However, in December 2000, the name of the complex changed from Guro Industrial Complex to Seoul Digital Industrial Complex, and the transition from the labor-intensive manufacturing industry to the advanced industrial complex centered on venture, R & D, and advanced information and knowledge industry began. Therefore, the number of related industries has increased, and it has become an urban high-tech industrial complex with a focus on knowledge-based service industries.
3.3 Related Policy and Issues
3.3.1 Western Underground Road Tunnel Project

In 2015, Seoul city decided to launch a western underground road tunnel project. 10.33km of the western highway will be buried underground, and the upper part will be constructed with general roads and parks (figure 3). The road is scheduled for opening in 2020[3]. The goal of the project is to reduce the traffic congestion by dispersing about 50,000 cars per day, and to improve the living environment by changing the upper part into an environmental-friendly space.

![Western Underground Road Tunnel Project Diagram](image)

**Figure 3.** Before and After the completion of Western Underground Road Tunnel Project
3.3.2 Structural enhancement of G-valley

Structural enhancement project is to promote the attractiveness of enterprises and enhance the competitiveness of tenant companies by strengthening corporate support services, and maintaining and repairing public infrastructure of the industrial complex[4]. Examples of the project include public spaces, sports facilities and welfare facilities, and conducting cultural events for companies.

3.3.3 Government’s support for start-up

Nowadays, an important trend in Korean government’s economic policies is about promoting start-up businesses. Therefore, the government initial budget for supporting start-ups amount to about 729 million US dollars this year. They support start-up funds, run start-up centers, and provide workspaces to run the company. And IT-oriented start-ups are being expanded.

3.4 Problems

I would like to summarize the problems of the complex based on the above points. Currently, G-Valley has complicated problems that cannot be solved within the limited land and financial capital. Two major problems are observed as follows.

3.4.1 Old or missing infrastructure

Most of the buildings on the site are 20-30 years old, and most of them are manufacturing factories (Figure 4). Compared to the working population, the infrastructure is not enough, showing the lack of supportive facilities such as green spaces, nurseries and public health centers (Figure 5). The amount of open space seems to be sufficient due to the existence of public space in front of the knowledge industrial centers, but areas with old factories have few open spaces.

The lack of transport infrastructure is also a problem (Figure 6). Large parcels that are partitioned to build factories in the past are now difficult to access by cars, and the traffic volume is not dispersed, causing a traffic congestion. The access road between the western highway and the site is well-known for severe traffic congestion. It is very serious that there are problems in the infrastructure, and improvement is inevitable.

![Figure 4. Deterioration of Buildings](image1)

![Figure 5. Location of green space and supporting facilities](image2)

![Figure 6. Traffic](image3)
3.4.2 Hollowing-out of workers

More than half of the consumer population of Gasan-dong and Guro-dong are G-valley commuters (Figure 7). In other words, G-valley is strongly influential on the vitality of a local commercial area. The real problem is that commuters get off after work and leave on holidays. This result in the hollowing out of the populations and serves as a big obstacle to local commercial economy. Therefore, G-Valley is expected to play a major role beyond the industrial use towards revitalizing the surrounding area.

Figure 7. Consumer in Gasan, Guro dong
Figure 8. Get in and out of Gasan Digital Complex Station [5]

4. Conclusion

A solution for the complex is proposed as follows.

- As the western highway will be buried underground, additional available/developable sites will be obtained.
- Supply deficient public infrastructure to the area and create a new program.
- Do road maintenance with the implementation of the underground project of western highway.

4.1 Traffic problem solving

The entry of the western highway has a tangled ramp. Because of the underground project, it will become unnecessary. The entry ramp will be removed and replaced by another road (figure 9). In addition, 300-400 m large parcels will be divided and bypass roads will be created (figure 10).

Figure 9. The entry ramp
Figure 10. Dividing large parcels
4.2 Infrastructure supplement

Supportive facilities such as worker welfare centers and sports facilities will be inhabited in a newly obtained area. Also, the lack of green spaces, which was one of the major problems in G-valley, can be solved through building a connection with the Anyang Stream.

4.3 The Young Start-up incubation

A business center, a community place, and a dormitory, etc. that can induce young start-up entrepreneurs will be established in a newly obtained area.

The western highway is located on the boundary between the Anyang Stream and the site, and the upper space will become an important urban space after the completion of the underground project. In the site, the waterfront offers a very special experience for walking and sitting. The waterfront can play a role in improving the pleasant working environment and the quality of life. In addition, since the road is owned by the government, the upper space formulated after the project will also be publicly owned and used. This will enable the G-valley to do business that is affordable and benefit the public. Taken together, the underground project of western highway proposes a great opportunity for the new vision of the G-valley. The newly obtained area will be a 'public space' and is able to contain urban infrastructure and programs beyond the limits of the development.

G-valley, which is in a difficult situation to redevelop, also has tried hard to solve these problems. However, if G-valley has many opportunities to change in a short period of time like our suggestion (figure11), we anticipate that G-valley will be able to establish a new identity. We also think that the situation that G-valley is experiencing is a common problem that other urban areas are also experiencing, so the suggestions of this paper can provide useful information for other industrial complexes’ restoration and maintenance in urban areas.

![Figure 11. Conceptualization of the solution](image-url)
5. References
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