

Productive  
Pyongyang ● A Research on its Recent  
Urban Transformation



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City in Transition: Ryomyong Street

There has been a significant level of urban and infrastructure development in the DPRK over the past six years. This includes the construction of new streets in Pyongyang to new thematic zones in other parts of the country—Tourism Zone in Wonsan, Research Zone in Unjong Park, Gateway City in Sinuiju, etc. In addition to new construction, there has been a significant amount of urban regeneration, including the rehabilitation of Taedong River. Apart from physical development, the planning departments are drafting a city-wide sustainable and regeneration plan.

The increased interest in development has led Choson Exchange to conduct several design and urban policy workshops over the past four years. These workshops exposed selected North Korean policy makers to an integrated approach—combining economic and physical planning—towards policy making. Building on Choson Exchange’s training program and on-the-ground interactions, this urban economic research was carried out to track Pyongyang’s urban transformation over the past few years in a data-driven and quantitative way. It aims to establish an understanding of the socio-economic value of these development, and the correlation between space and business activities. More importantly, this research aims to assist policy planners and potential foreign investors to understand the key projects for Pyongyang’s future development.

**Research findings have been generated through the following methods:**

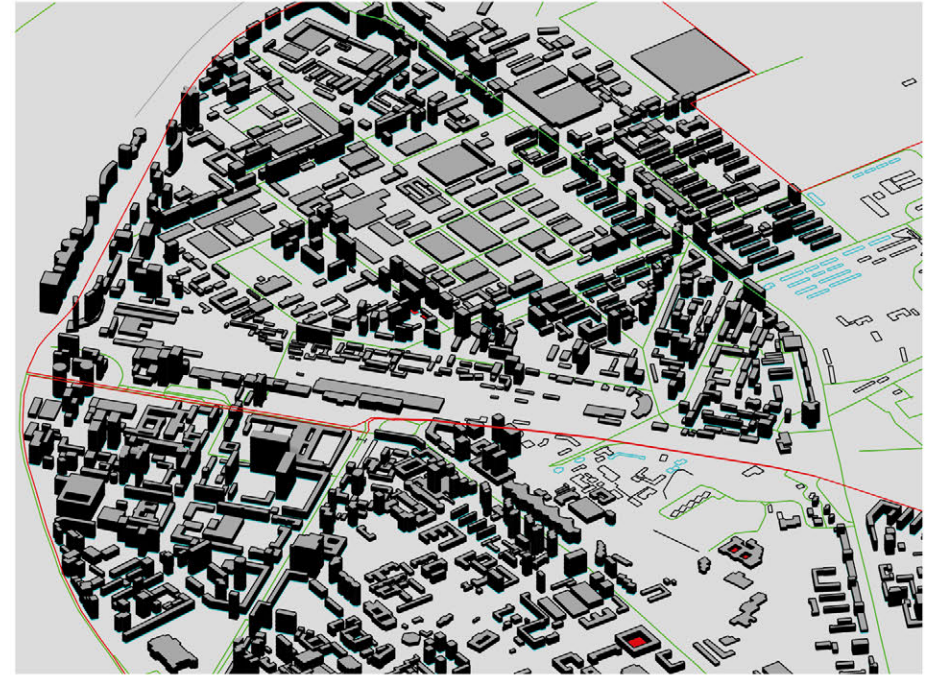
- Local interactions through Choson Exchange training program
- Constructing a digital Pyongyang Map, Cartographic mapping and data simulation
- Questionnaire interviews with local stakeholders

The Choson Exchange training programs provide an opportunity to understand current urban development projects and directions in Pyongyang, while exposing participants to best practices in development. Various local and overseas training programs have been conducted over the years, including the most recent real estate focused workshop in Pyongyang and the Future Cities Summit in China and Hong Kong in August 2018.

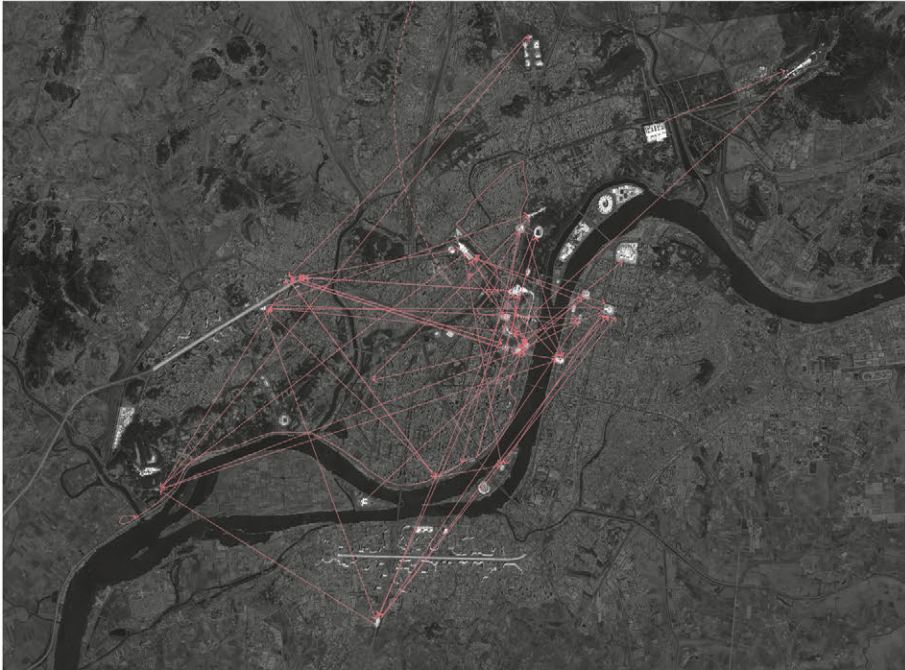
The cartographic mapping used information from GIS (Global Information System) and aerial maps to analyse and draw conclusions from the following factors: plot ratio, proximity to transportation nodes, social amenities, commercial spaces, public spaces, etc. In addition, a simulation which measures urban connectivity was also used in the cartographic analysis. Given the incomplete data available online, a digital Pyongyang map, building upon existing available information, was created in order to run the various analysis.



Aerial view of Pyongyang



Building digital 3D model map of Pyongyang



Mapping of main touristic routes and landmarks in Pyongyang

The questionnaire surveys and interview with local stakeholders offered an overview of the current strength of the urban environment in Pyongyang and its development priorities. Each questionnaire comprised of 38 factors relating to the following categories: transportation, energy & environment, educational infrastructure, convenience facilities, public spaces, production spaces and healthcare infrastructure. These factors and categories were selected after an extensive literature review of key factors that impacted the livelihood of Pyongyang residents. Participants were asked to rank 0 to 10 the current strength and development priorities respectively. In addition, they are to respond in relation to the city as a whole, the location of their home and their workplace. Approximately 60 local participants took part in the survey. The responses obtained from the questionnaires provided a series of indicators that support the cartographic analysis and ideas for key projects for future development.



Urban density of Pyongyang. Linear expansion along Taedong River.

There recent urban transformation in Pyongyang has been very significant and reported by various international media. New districts such as Mirae Scientist Street, Ryomyong Street and Changjon Street have been redefining the skyline of Pyongyang over the past six years.

2.1

**Evolution of Pyongyang's Urban Form**

Tracing the evolution of urban growth in Pyongyang, it has evolved from a model planned 'socialist city' to one that is developed in accordance to local political and economic context. In the immediate years after the end of the Korean War, the main task of the state was to provide adequate housing for its population in addition to building up its industrial production capabilities. Together with the assistance of financial and technical support from other member states of the communist bloc, Pyongyang was master planned in the mould of a model 'socialist city'.

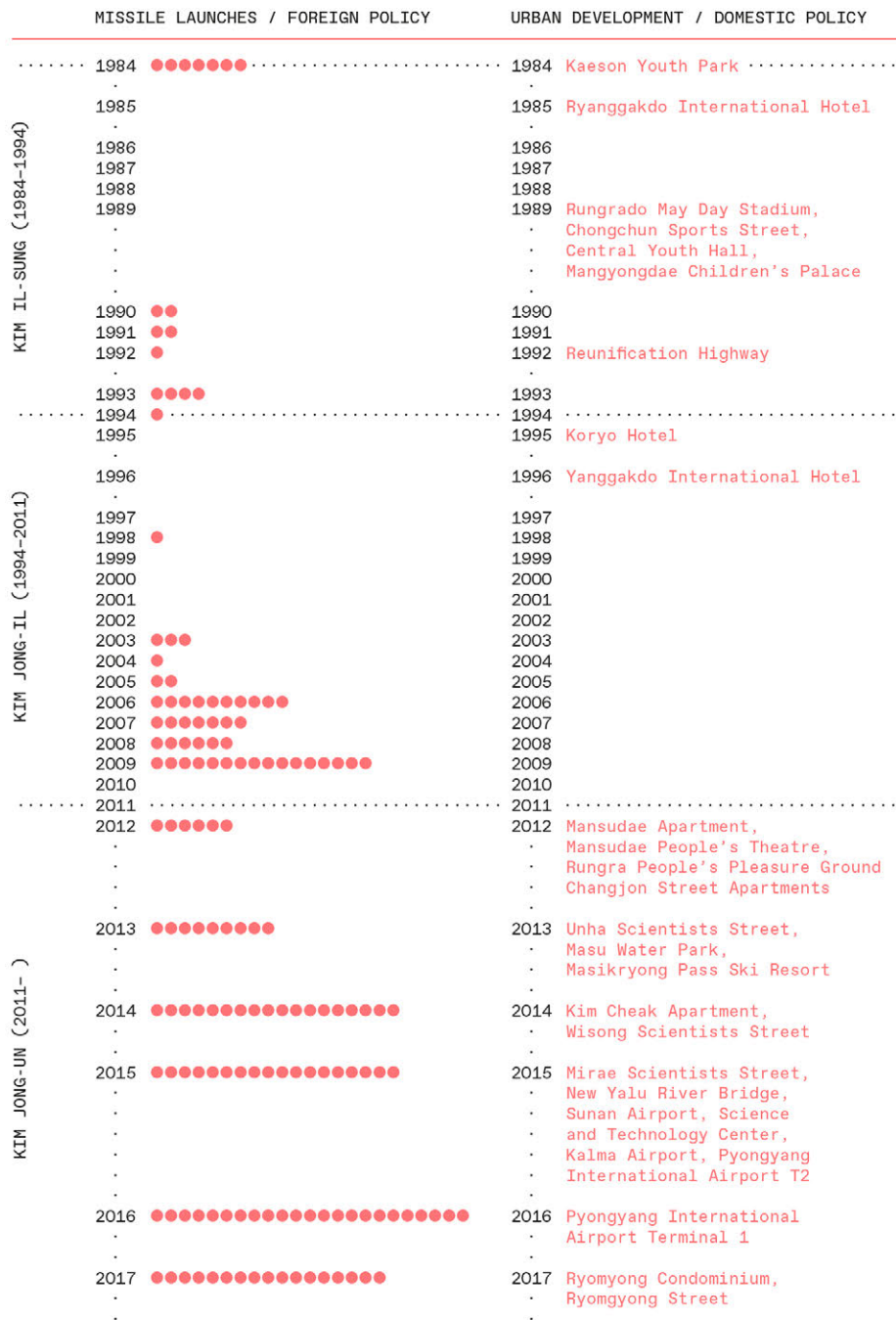
The 1953 master plan reveals the polycentric development of Pyongyang, characterised by a series of distributed districts, all of which are self-sufficient in their functions. Each district would have their own industrial facilities, public amenities and agricultural land. Within each district would be a large urban block, measuring 300m x 300m. Each urban block would also be self-sufficient, containing offices, light industries, kindergarten, schools, clinic and other amenities. Such a system of programmatic distribution is typical in other socialist cities.

However, the polycentric development was not fully developed and most of the urban areas are located within the city centre. The second major wave of urban transformation came in the 1980s, where key monuments and landmarks were distributed throughout the city and major boulevards were introduced to create monumental visual axis within the city. Gradually, the urban form of Pyongyang transformed from self-contained urban blocks to urban streets. This is particularly evident in the construction of Kwangbok Street and Tongil Street residential areas in 1989 and 1993 respectively. While it can be argued that the development of those two areas reflected expansion of Pyongyang beyond the city centre, these two areas do not follow the polycentric nature of the 1953 masterplan. The result is the creation of two large districts that are disconnected from the dense urban core.

2.2

**Byungjin: Urban Expansion as a Manifestation of Economic Development**

Urban expansion in Pyongyang halted after the mid-1990s humanitarian crisis and only began picking up in the mid-2000s. The rapid acceleration in urban development coincided with the start of Kim Jong Un's leadership. Byungjin — concurrently pursuing military and economic development—



An infographic showing the correlation between military and urban development from 1984 to 2017. Missile test data obtained from Centre for Strategic & International Studies as of July 2017.

is one of the central tenets of Chairman Kim's leadership. Tracking the evolution of military development and urban development from the 1980s to 2018, it is evident that there is a correlation between the accelerated military and urban development from 2012 onwards.

The infographic reveals Pyongyang's rapid urban growth is as a physical reflection of the leadership's domestic policy and a manifestation of the country's pursuit in economic development. With landmark projects sprouting out in Pyongyang, it paints an image of a developing country both domestically and internationally. In particular, construction of the new streets have been given equal importance to military development. Also, the rapid rate of construction has given rise to various terms such as 'ryomyong-speed', replacing the usual 'chollima-speed'. The construction of Ryomyong street, a street lined with 50 storey high-rise residential towers was completed within 16 months.

The completion of this street is more powerful than 100 nuclear warheads. ● Premier Pak Pong-ju, 2017

2.3 Fundamental shift from Formal Symbolism to Land Use Efficiency

Noted for their expressive forms and use of pastel colours, these newly constructed streets—Mirae Scientist Street and Ryomyong Street—have been widely covered by various international media. Apart from observing the iconic aesthetic of these new streets, it is important to note the fundamental



Mirae Street. Photo taken 2016.



Tonggil Street. Photo taken 2008.  
Comparing the difference between Mirae Street & Tonggil Street.

shift in the conception of these streets from formalistic symbolism to one that is based on land use efficiency.

Residential districts designed with long monumental vistas and boulevards have in place since the construction of Kwangbok Street and Tonggil Street. However, there is a fundamental difference between the streets built in the 1980s and present. For Kwangbok and Tonggil, the high-rise buildings are spaced relatively far apart to provide perspectival composition that accentuates the visual monumentality of the streetscape. Despite the presence of the high-rise buildings, the plot ratio when calculated is similar or even lower than the urban density in the city centre. This is a result of the socialist planning logic, where there isn't a land taxation system nor real estate value to ensure that the land use is more efficient and dense. In addition, the effect of dispersing high rise residential towers over a large area and having a major thoroughfare cutting through the urban block, decreases the walkability and pedestrian friendliness.

In contrast, high-rise residential towers along Mirae and Ryomyong Street have been laid out in a more compact manner with narrower spacing between each tower. In terms of streetscape, it creates a more concentrated boulevard visual axis as compared to its predecessors. In terms of urban density, they are 3 to 4 times as dense as Kwangbok and Tonggil Street. A plot ratio of 3.5 to 4.0 is very typical in dense urban centres in developed cities, and it deviates from the norm in Pyongyang. The basic unit of each district in Pyong-



Kwangbok Street District  
Plot Ratio: 0.44  
Built Area: 465ha  
Land Area: 1044ha



Pottonggang District  
Plot Ratio: 0.80  
Built Area: 914ha  
Land Area: 1131ha



Tonggil Street District  
Plot Ratio: 0.87  
Built Area: 726ha  
Land Area: 836ha



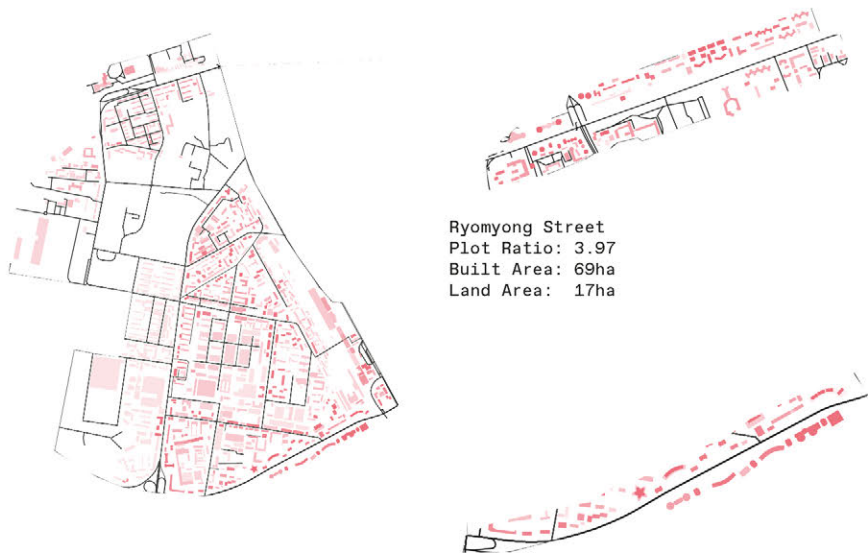
Taedong District  
Plot Ratio: 1.01  
Built Area: 995ha  
Land Area: 983ha



Ryomyong District  
Plot Ratio: 1.30  
Built Area: 636ha  
Land Area: 498ha



Central District  
Plot Ratio: 1.54  
Built Area: 1071ha  
Land Area: 695ha



Ryomyong Street  
 Plot Ratio: 3.97  
 Built Area: 69ha  
 Land Area: 17ha

Pyongchon District  
 Plot Ratio: 1.00  
 Built Area: 547ha  
 Land Area: 545ha

Mirae Street  
 Plot Ratio: 3.42  
 Built Area: 37ha  
 Land Area: 11ha

yang is comprised of around 4000 to 7500 residents with 2000 to 2400 apartment units within a land area of around 15 to 30 hectares. This is the equivalent of around 1.2 in terms of plot ratio. The high concentrated plot ratio of the new streets have also doubled the average plot ratio of the overall district where the streets are located in. This reveals the fundamental shift towards a more efficient and intensified land use in the city.

One can speculate that such a shift is attributed to better understanding on the importance of land use and the state's focus on experimenting with new urban forms and typologies. For example, sky gardens have been introduced at upper levels in the high-rise residential towers in Ryomyong Street. While sky gardens are increasingly popular in tropical cities, it is rarely seen in temperate cities. While it is debatable whether such gardens are suitable for Pyongyang's climate, it nonetheless demonstrate the state's interest in testing new ideas for the built environment.

To a large extent, Mirae and Ryomyong Street can be considered as pilot projects to test new forms of urban environments, that thrive on compactness and density, a deviation from its past urban model. Complementing the development of these major streets are urban infills within the existing urban blocks. Twenty to thirty storey apartment towers have been constructed over the past four years, increasing the housing stock in the city.



Observing the transformation of Mirae Street via Google earth aerial images. Left to Right: Mirae Street (2013), Mirae Street (2016)



Observing the transformation of Ryomyong Street via Google earth aerial images. Left to Right: Ryomyong Street (2015), Ryomyong Street (2017)

The current intensification of land use can potentially provide the justification for urban regeneration rather than urban expansion—building new districts away from the city centre. By focusing development within the existing urban fabric, it allows economic activities to flourish, reducing the distance travelled between home and work place. Three major urban projects for Pyongyang have been identified in Chapter 4, building upon the existing land intensification trend in the city.





3.1

**Physical Assets**

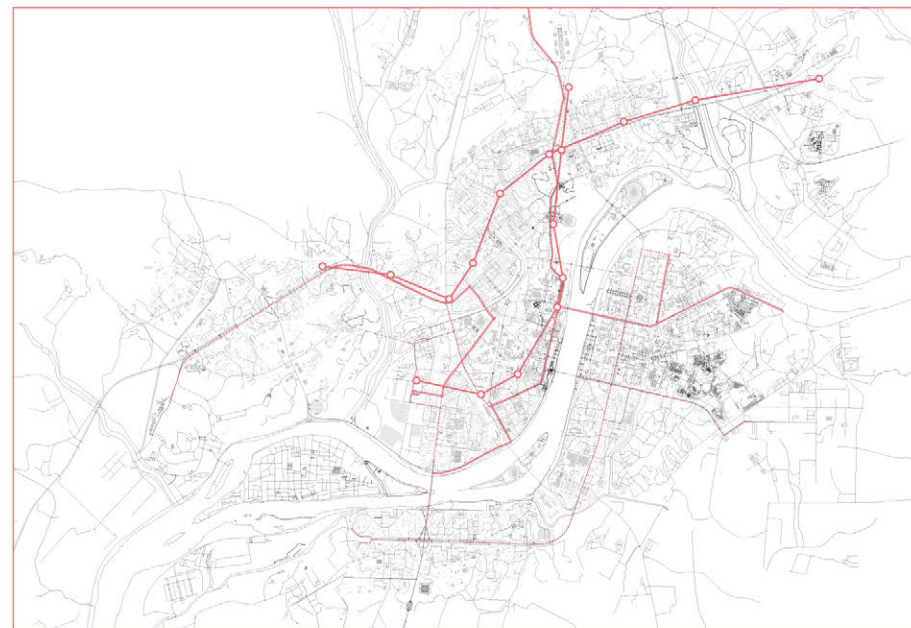
The cartographic analysis offer some key observations on the current strengths and weaknesses in the urban environment of Pyongyang.

Firstly, there is an even distribution of essential public facilities—including education, healthcare, commercial spaces—throughout the city embedded within the residential neighbourhoods. This is the legacy of the city’s planning policy and it also evident in the survey result.

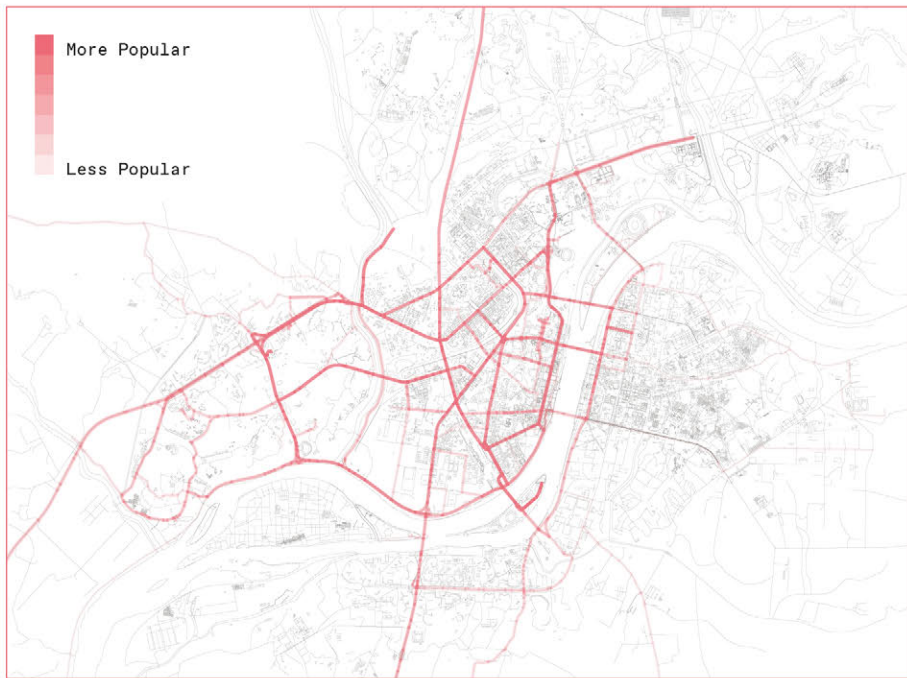
Second, the city is naturally divided along the Taedong River, with the western side of the river more connected than the east. This is evident in the public transportation map and the tourist routes. This is a result of the way residential districts have been developed over the years. In addition, given high construction costs, it is challenging for the metro system to be expanded to the eastern part of the river.

Third, the development of Kwangbok and Tongil Street residential area were conceived in isolation. The connectivity simulation reveals the lack of connectivity in those areas compared to the rest of the urban areas of Pyongyang.

The surveys provide a perceptual understanding of the current strengths of Pyongyang’s urban environment and areas which are important for future development. The survey is divided into three parts, in relation to the living area,



Pyongyang Public Transportation Lines  
 -○- Metro - - - Trolley Bus - - - Tram



Pyongyang Tourist Routes

working area and the city of Pyongyang as a whole.

For the living district, educational and healthcare facilities are perceived to be key components of excellence. Key areas of improvement include improving electricity supply, lowering pollution levels, providing more green spaces and educational facilities. These indicators point to the aspiration of a quality living environment that go beyond basic public facilities, with a focus on well-being.

For the working district, stable provision of electricity, presence of education and healthcare facilities are perceived to be key components of excellence. Similar to the living district, the perceived strength in the amount of education and healthcare facilities corresponds to the cartographic analysis that shows a relatively even distribution of such facilities throughout the city. The key areas of improvements correspond to the existing strengths. This reinforces the planning priorities of working districts in Pyongyang and they should be further enhanced.

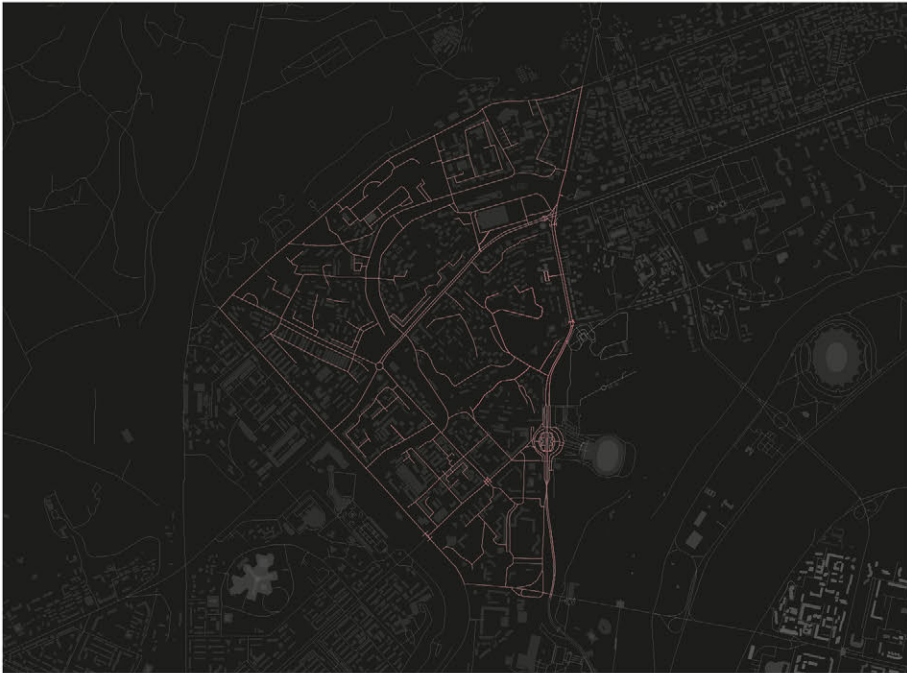
In relation to Pyongyang city as a whole, key area of excellence include good public transportation connectivity, the availability of commercial stores and restaurants, while the areas of improvement include the further enhancement of public transportation connectivity, improving environmental quality through reducing pollution and the use of sustainable equipment in the city.



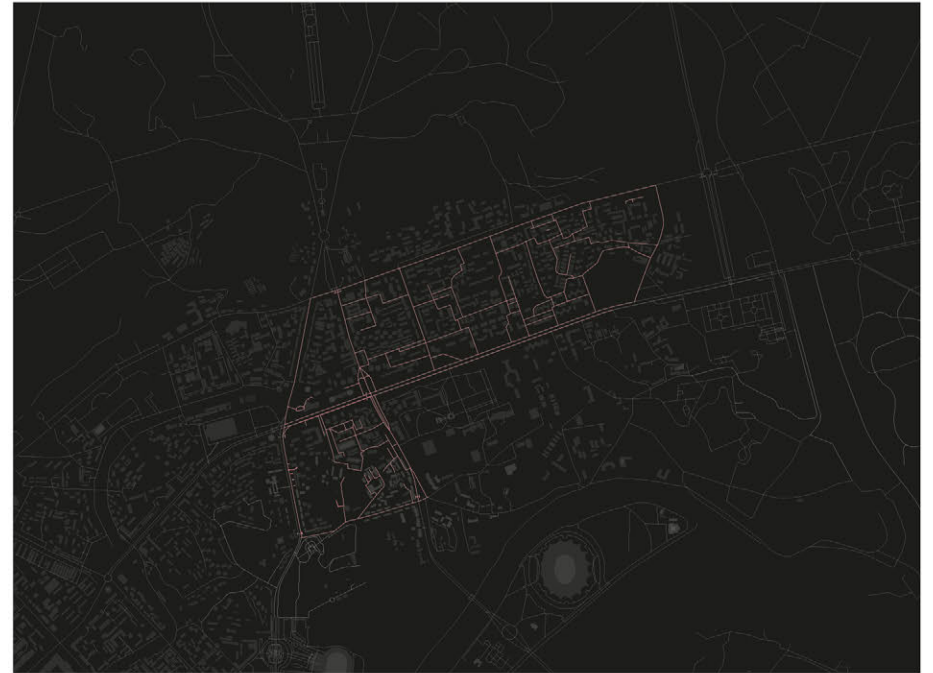
Connectivity Simulation: Central District



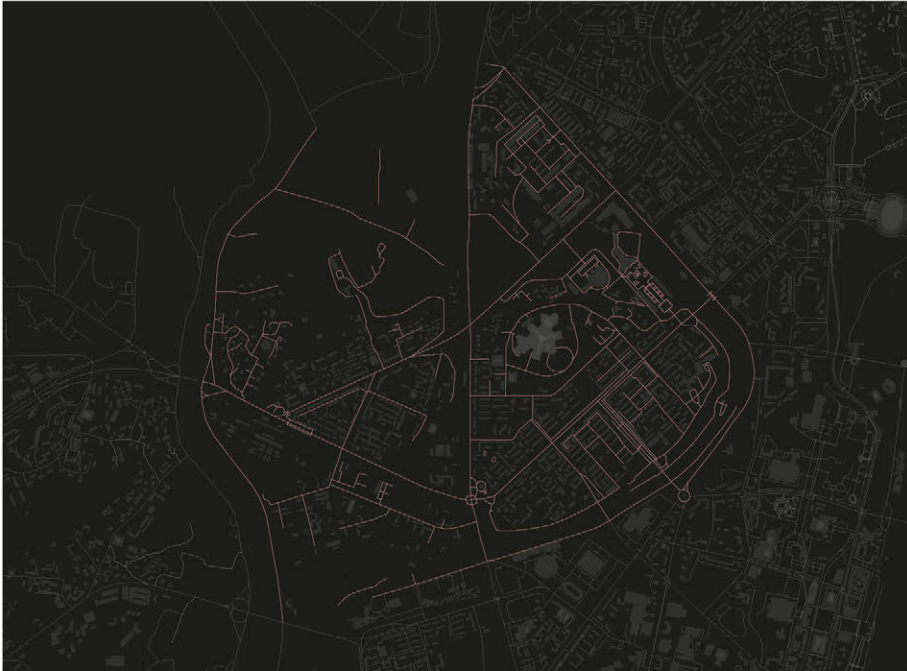
Connectivity Simulation: Kwangbok District



Connectivity Simulation: Moranbong District



Connectivity Simulation: Ryomyong District



Connectivity Simulation: Potonggang District



Connectivity Simulation: Ranggang District



Pyongyang Social, Commercial & Industrial Facilities

In summary, some major observations can be made in the survey results. First, agricultural fields and industrial areas are outlier categories that are perceived to be neither strong nor important for further development. This indicates a departure from the original socialist urban planning policy that emphasizes a good distribution of agricultural and industrial facilities within urban areas.

Second, there is a positive correlation between categories that are performing well and the need for further improvements. This is particularly clear in the good provision and distribution of educational and healthcare facilities throughout the city, a legacy of the urban planning logic of Pyongyang over the past decades.

Third, therefore it is not surprising that new residential street projects have been built in association with existing higher education facilities. Mirae Street apartments were built for educators at Kim Chaek University while Ryomyong Street for educators at Kim Il Sung University. Going beyond providing residential apartments in close proximity—5 minutes walking distance—to the respective universities, the next step would be to create a series of innovation nodes and clusters throughout the city—which would be further explained in the following chapter.

NO. SURVEY FACTORS (항목)

- TRANSPORTATION 교통
- 01 Public Transport (Metro) 지하철
- 02 Public Transport (Bus) 버스 [무궤도전차 및 궤도전차 포함]
- 03 Public Transport (Tram) 노면전차
- 04 Public Transport (Cycling Route) 자전거도로 & Bicycle 자전거
- 05 Road for private car (자가용을 사용할 시 도로의 상태 및 편리성)
- 06 Taxi Stands (택시 정류장)
- 07 Bus Interchange [장거리(다른 지역 및 도시)를 가기 위한 버스 터미널]
- 08 Car park (주차장)
- 09 Tourist Routes (관광코스) / Symbolic Spaces / Monuments (기념물) — 관광지
- 10 Pedestrian Permeability (접근성, 걸었을 시 목적지까지 이용할 수 있는 도로 숫자)
- 11 Recent Developments (최근 개발된 곳) — 최근 개발된 곳이나 근처 지역에 사는 것을 선호하는지

- ENERGY & ENVIRONMENT 에너지 & 환경
- 12 Electricity (전기)
- 13 Sustainable Equipments (태양광 발전 패널) — availability of solar panel [설명: 태양광 발전 패널 설치를 쉽게 할 수 있는지? 필요성과 중요성은 어느 정도인지? 현재 설치율은 어떠한지?]
- 14 Level of Pollution (오염정도) [설명: 현재 사는 지역의 오염정도와 쾌적한 환경에서 사는 것에 대한 중요도]

- EDUCATION INFRASTRUCTURE 교육 기반시설
- 15 Educational Facilities (Elementary, High School) (초·중·고등학교)
- 16 Educational Facilities (Universities) (대학) [설명: 자녀들의 교육을 위해 좋은 학교와 대학 근처에 사는 것에 대한 중요도]

- PUBLIC SPACES 공공시설
- 17 Sports Facilities (체육 시설)
- 18 Parks (공원)
- 19 Amusement Parks (오락시설)
- 20 Cultural Facilities (문화 시설) ex) 영화관, 공연장
- 21 Hills & mountains 등산할 수 있는 집 근처의 작은 동산이나 큰 산 및 숲
- 22 Water Landscape 호수나 강에 대한 접근성
- 23 Ecological Corridors 운동도하고 산책도 할 수 있는 여가를 즐길 수 있는 곳 (ex 대동강변)
- 24 Green Spaces (작은 잔디 밭이 있는 집 근처 장소, 작은 공원이나 잔디가 깔려있는 곳)
- 25 Plaza 광장 (사람들이 모이는 광장)

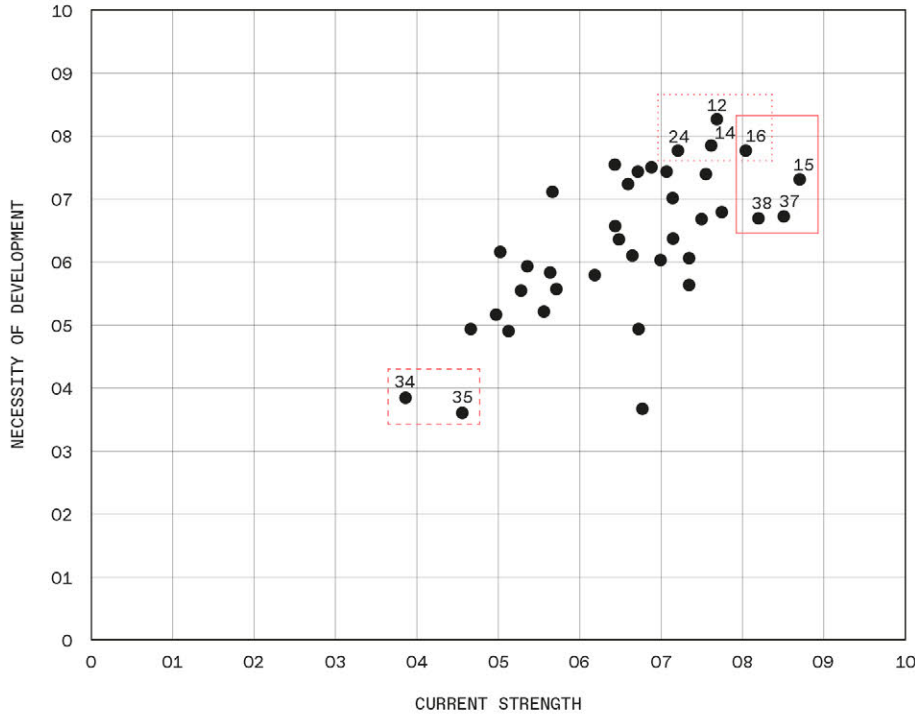
- CONVENIENT FACILITIES 편의시설
- 26 Restaurants (레스토랑)
- 27 Cafés (카페)
- 28 Hotels (호텔)
- 29 Department Stores (백화점)
- 30 Stores (상점)
- 31 Market (장마당)
- 32 Banks (은행)

- PRODUCTION SPACES 생산시설
- 33 Commercial Spaces (상업지역) 회사들이나 상점, 장마당이 위치해 있는 곳
- 34 Agricultural Fields (농업 지역) 논이나 밭이 위치해 있는 곳
- 35 Industrial Areas (산업지역) 공장이 위치해 있는 곳
- 36 Offices (사무실) 자신이 일하는 회사나 사무실

- HEALTHCARE INFRASTRUCTURE 의료 기반시설
- 37 Healthcare Facilities (Clinics) (1차 진료소)
- 38 Healthcare Facilities (Hospitals) (2, 3, 4차 병원)

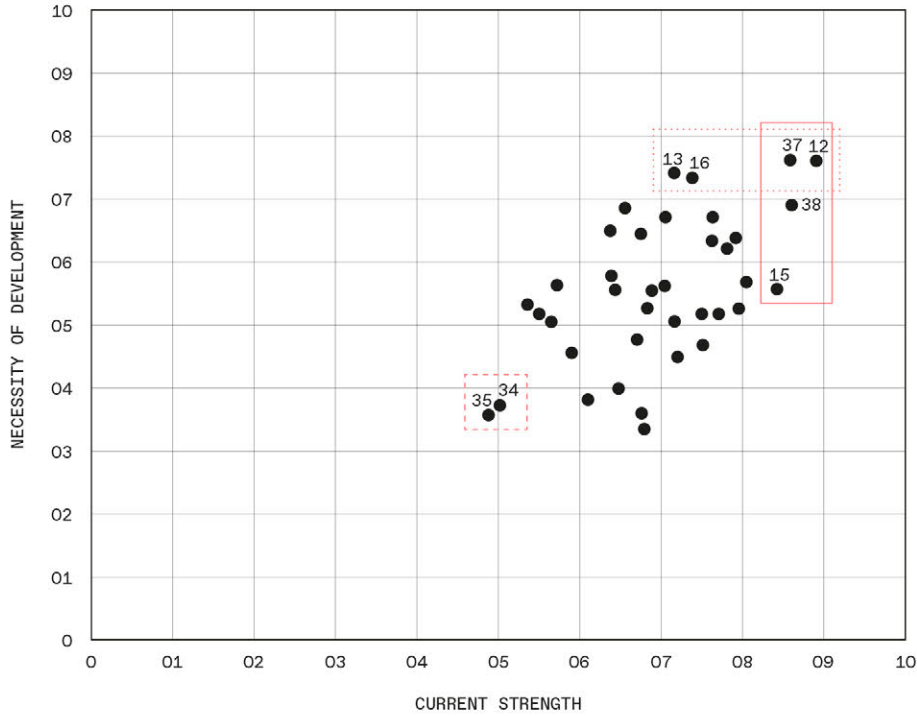
NECESSITY OF DEVELOPMENT  
 01 — 10 (개발 필요성/중요성)  
 CURRENT STRENGTH  
 01 — 10 (현재 수준/접근성/이용성)

Each survey comprises of 38 factors listed within 7 major categories: Transportation, Energy & Environment, Education Infrastructure, Public Spaces, Convenience Facilities, Production Spaces, Healthcare Infrastructure. Respondents will need to rank the current strength and the necessity of development for each of the factors.



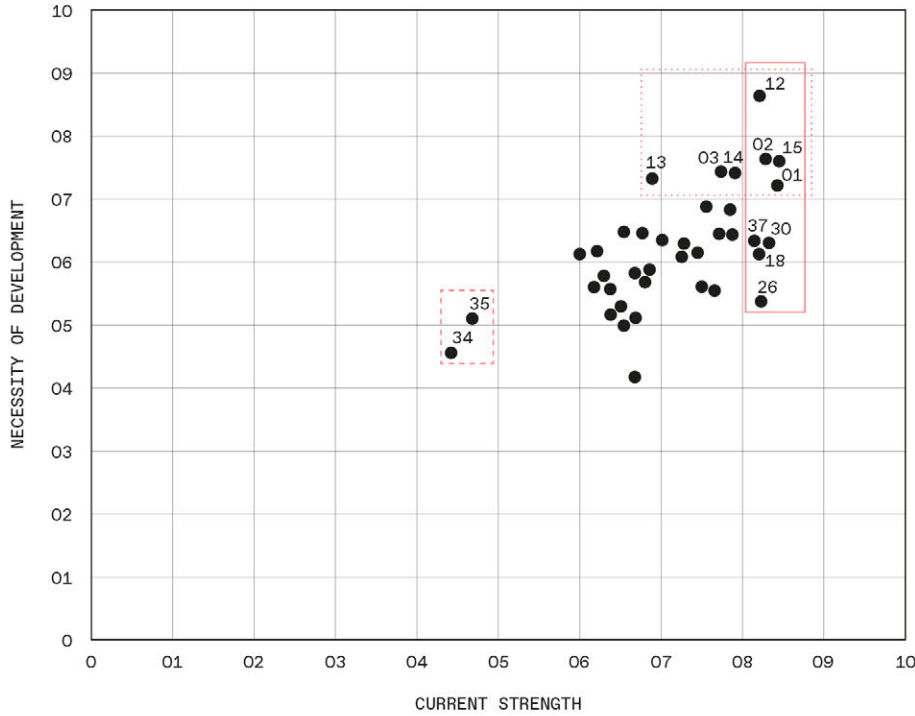
- Key Performing Categories
- 15 Educational Facilities (High School)
- 37 Healthcare Facilities (Clinics)
- 38 Healthcare Facilities (Hospitals)
- 16 Educational Facilities (Universities)
  
- ... Key Development Priorities
- 12 Electricity
- 14 Reducing Pollution
- 16 Educational Facilities (Universities)
- 24 Green Spaces
  
- Low Performing Categories & Low Development Priorities
- 34 Agricultural Fields
- 35 Industrial Areas

● TRANSPORTATION 교통		
01	Public Transport (Metro) 지하철	6.63 ··· 7.23
02	Public Transport (Bus) 버스 [무궤도전차 및 궤도전차 포함]	7.56 ··· 7.36
03	Public Transport (Tram) 노면전차	6.45 ··· 7.50
04	Public Transport (Cycling Route) 자전거도로 & Bicycle 자전거	7.00 ··· 6.00
05	Road for private car (자가용을 사용할 시 도로의 상태 및 편리성)	6.72 ··· 4.89
06	Taxi Stands (택시 정류장)	6.79 ··· 3.63
07	Bus Interchange [장거리(다른 지역 및 도시)를 가기 위한 버스 터미널]	5.30 ··· 5.50
08	Car park (주차장)	5.73 ··· 5.55
09	Tourist Routes (관광코스) / Symbolic Spaces / Monuments (기념물) — 관광지	5.38 ··· 5.89
● ENERGY & ENVIRONMENT 에너지 & 환경		
12	Electricity (전기)	7.71 ··· 8.19
13	Sustainable Equipments (태양광 발전 패널) — availability of solar panel [설명: 태양광 발전 패널 설치를 쉽게 할 수 있는지? 필요성과 중요성은 어느정도인지? 현재 설치율은 어떠한지?]	6.91 ··· 7.45
14	Level of Pollution (오염정도) [설명: 현재 사는 지역의 오염정도와 쾌적한 환경에서 사는 것에 대한 중요도]	7.66 ··· 7.85
● EDUCATION INFRASTRUCTURE 교육 기반시설		
15	Educational Facilities (Elementary, High School) (초·중·고등학교)	8.72 ··· 7.26
16	Educational Facilities (Universities) (대학) [설명: 자녀들의 교육을 위해 좋은 학교와 대학 근처에 사는 것에 대한 중요도]	8.06 ··· 7.74
● PUBLIC SPACES 공공시설		
17	Sports Facilities (체육 시설)	7.16 ··· 7.00
18	Parks (공원)	7.75 ··· 6.75
19	Amusement Parks (오락시설)	7.34 ··· 6.06
20	Cultural Facilities (문화 시설) ex) 영화관, 공연장	6.19 ··· 5.78
21	Hills & mountains 등산할 수 있는 집 근처의 작은 등산이나 큰 산 및 숲	5.04 ··· 6.12
22	Water Landscape 호수나 강에 대한 접근성	6.66 ··· 6.06
23	Ecological Corridors 운동도하고 산책도 할 수 있는 여가를 즐길 수 있는 곳 (ex 대동강변)	6.73 ··· 7.39
24	Green Spaces (작은 잔디 밭이 있는 집 근처 장소, 작은 공원이나 잔디가 깔려있는 곳)	7.23 ··· 7.71
25	Plaza 광장 (사람들이 모이는 광장)	5.14 ··· 4.89
● CONVENIENT FACILITIES 편의시설		
26	Restaurants (레스토랑)	7.38 ··· 5.60
27	Cafés (카페)	5.58 ··· 5.18
28	Hotels (호텔)	4.68 ··· 4.89
29	Department Stores (백화점)	5.68 ··· 7.05
30	Stores (상점)	7.09 ··· 7.39
31	Market (장마당)	7.53 ··· 6.67
32	Banks (은행)	5.66 ··· 5.78
● PRODUCTION SPACES 생산시설		
33	Commercial Spaces (상업지역) 회사들이나 상점, 장마당이 위치해 있는 곳	6.48 ··· 6.35
34	Agricultural Fields (농업 지역) 논이나 밭이 위치해 있는 곳	3.87 ··· 3.82
35	Industrial Areas (산업지역) 공장이 위치해 있는 곳	4.56 ··· 3.59
36	Offices (사무실) 자신이 일하는 회사나 사무실	5.00 ··· 5.12
● HEALTHCARE INFRASTRUCTURE 의료 기반시설		
37	Healthcare Facilities (Clinics) (1차 진료소)	8.53 ··· 6.70
38	Healthcare Facilities (Hospitals) (2, 3, 4차 병원)	8.23 ··· 6.65



- Key Performing Categories
- 12 Electricity
- 38 Healthcare Facilities (Hospitals)
- 37 Healthcare Facilities (Clinics)
- 16 Educational Facilities (High School)
- Key Development Priorities
- 12 Electricity
- 37 Healthcare Facilities (Clinics)
- 13 Sustainable Equipments
- 16 Educational Facilities (Universities)
- Low Performing Categories & Low Development Priorities
- 34 Agricultural Fields
- 35 Industrial Areas

● TRANSPORTATION 교통		
01	Public Transport (Metro) 지하철	7.53 ··· 4.64
02	Public Transport (Bus) 버스 [무궤도전차 및 궤도전차 포함]	8.06 ··· 5.64
03	Public Transport (Tram) 노면전차	6.42 ··· 5.67
04	Public Transport (Cycling Route) 자전거도로 & Bicycle 자전거	7.23 ··· 4.45
05	Road for private car (자가용을 사용할 시 도로의 상태 및 편리성)	6.78 ··· 3.53
06	Taxi Stands (택시 정류장)	6.81 ··· 3.30
07	Bus Interchange [장거리(다른 지역 및 도시)를 가기 위한 버스 터미널]	5.38 ··· 5.24
08	Car park (주차장)	6.48 ··· 3.95
09	Tourist Routes (관광코스) / Symbolic Spaces / Monuments (기념물) — 관광지	5.67 ··· 5.00
● ENERGY & ENVIRONMENT 에너지 & 환경		
12	Electricity (전기)	8.94 ··· 7.57
13	Sustainable Equipments (태양광 발전 패널) — availability of solar panel [설명: 태양광 발전 패널 설치를 쉽게 할 수 있는지? 필요성과 중요성은 어느정도인지? 현재 설치율은 어떠한지?]	7.19 ··· 7.36
14	Level of Pollution (오염정도) [설명: 현재 사는 지역의 오염정도와 쾌적한 환경에서 사는 것에 대한 중요도]	7.65 ··· 6.65
● EDUCATION INFRASTRUCTURE 교육 기반시설		
15	Educational Facilities (Elementary, High School) (초·중·고등학교)	8.45 ··· 5.53
16	Educational Facilities (Universities) (대학) [설명: 자녀들의 교육을 위해 좋은 학교와 대학 근처에 사는 것에 대한 중요도]	7.41 ··· 7.29
● PUBLIC SPACES 공공시설		
17	Sports Facilities (체육 시설)	7.06 ··· 6.67
18	Parks (공원)	7.97 ··· 5.21
19	Amusement Parks (오락시설)	6.43 ··· 5.56
20	Cultural Facilities (문화 시설) ex) 영화관, 공연장	6.84 ··· 5.21
21	Hills & mountains 등산할 수 있는 집 근처의 작은 동산이나 큰 산 및 숲	5.74 ··· 5.59
22	Water Landscape 호수나 강에 대한 접근성	6.94 ··· 5.50
23	Ecological Corridors 운동도하고 산책도 할 수 있는 여가를 즐길 수 있는 곳 (ex 대동강변)	7.87 ··· 6.25
24	Green Spaces (작은 잔디 밭이 있는 집 근처 장소, 작은 공원이나 잔디가 깔려있는 곳)	7.90 ··· 6.28
25	Plaza 광장 (사람들이 모이는 광장)	6.12 ··· 3.76
● CONVENIENT FACILITIES 편의시설		
26	Restaurants (레스토랑)	7.72 ··· 5.11
27	Cafés (카페)	5.92 ··· 4.50
28	Hotels (호텔)	5.52 ··· 5.11
29	Department Stores (백화점)	6.77 ··· 6.39
30	Stores (상점)	7.63 ··· 6.28
31	Market (장마당)	7.00 ··· 5.53
32	Banks (은행)	6.41 ··· 6.44
● PRODUCTION SPACES 생산시설		
33	Commercial Spaces (상업지역) 회사들이나 상점, 장마당이 위치해 있는 곳	6.56 ··· 6.80
34	Agricultural Fields (농업 지역) 논이나 밭이 위치해 있는 곳	5.00 ··· 3.64
35	Industrial Areas (산업지역) 공장이 위치해 있는 곳	4.95 ··· 3.57
36	Offices (사무실) 자신이 일하는 회사나 사무실	7.52 ··· 5.14
● HEALTHCARE INFRASTRUCTURE 의료 기반시설		
37	Healthcare Facilities (Clinics) (1차 진료소)	8.61 ··· 7.56
38	Healthcare Facilities (Hospitals) (2, 3, 4차 병원)	8.62 ··· 6.88



- Key Performing Categories
- 01 Public Transport (Metro)
- 15 Educational Facilities (High School)
- 02 Public Transport (Bus)
- 30 Stores
- 26 Restaurants
- 12 Electricity
- 18 Parks
- 37 Healthcare Facilities (Clinics)
- - - Key Development Priorities
- 12 Electricity
- 02 Public Transport (Bus)
- 15 Educational Facilities (High School)
- 03 Public Transport (Tram)
- 14 Reducing Pollution
- 13 Sustainable Equipments
- 01 Public Transport (Metro)
- · · Low Performing Categories & Low Development Priorities
- 34 Agricultural Fields
- 35 Industrial Areas

● TRANSPORTATION 교통		
01	Public Transport (Metro) 지하철	8.43 ··· 7.19
02	Public Transport (Bus) 버스 [무궤도전차 및 궤도전차 포함]	8.35 ··· 7.63
03	Public Transport (Tram) 노면전차	7.78 ··· 7.44
04	Public Transport (Cycling Route) 자전거도로 & Bicycle 자전거	6.70 ··· 5.81
05	Road for private car (자가용을 사용할 시 도로의 상태 및 편리성)	6.45 ··· 5.20
06	Taxi Stands (택시 정류장)	6.68 ··· 4.17
07	Bus Interchange [장거리(다른 지역 및 도시)를 가기 위한 버스 터미널]	6.22 ··· 6.14
08	Car park (주차장)	6.48 ··· 5.21
09	Tourist Routes (관광코스) / Symbolic Spaces / Monuments (기념물) — 관광지	6.78 ··· 6.47
● ENERGY & ENVIRONMENT 에너지 & 환경		
12	Electricity (전기)	8.22 ··· 8.63
13	Sustainable Equipments (태양광 발전 패널) — availability of solar panel [설명: 태양광 발전 패널 설치를 쉽게 할 수 있는지? 필요성과 중요성은 어느정도인지? 현재 설치율은 어떠한지?]	6.91 ··· 7.31
14	Level of Pollution (오염정도) [설명: 현재 사는 지역의 오염정도와 쾌적한 환경에서 사는 것에 대한 중요도]	7.91 ··· 7.40
● EDUCATION INFRASTRUCTURE 교육 기반시설		
15	Educational Facilities (Elementary, High School) (초·중·고등학교)	8.39 ··· 7.60
16	Educational Facilities (Universities) (대학) [설명: 자녀들의 교육을 위해 좋은 학교와 대학 근처에 사는 것에 대한 중요도]	7.57 ··· 6.93
● PUBLIC SPACES 공공시설		
17	Sports Facilities (체육 시설)	7.86 ··· 6.81
18	Parks (공원)	8.19 ··· 6.19
19	Amusement Parks (오락시설)	7.29 ··· 6.20
20	Cultural Facilities (문화 시설) ex) 영화관, 공연장	7.62 ··· 5.56
21	Hills & mountains 등산할 수 있는 집 근처의 작은 동산이나 큰 산 및 숲	6.00 ··· 6.13
22	Water Landscape 호수나 강에 대한 접근성	6.29 ··· 5.73
23	Ecological Corridors 운동도하고 산책도 할 수 있는 여가를 즐길 수 있는 곳 (ex 대동강변)	6.86 ··· 5.81
24	Green Spaces (작은 잔디 밭이 있는 집 근처 장소, 작은 공원이나 잔디가 깔려있는 곳)	7.45 ··· 6.13
25	Plaza 광장 (사람들이 모이는 광장)	6.68 ··· 5.07
● CONVENIENT FACILITIES 편의시설		
26	Restaurants (레스토랑)	8.24 ··· 5.36
27	Cafés (카페)	6.56 ··· 5.00
28	Hotels (호텔)	6.38 ··· 5.57
29	Department Stores (백화점)	7.05 ··· 6.33
30	Stores (상점)	8.29 ··· 6.29
31	Market (장마당)	7.52 ··· 5.57
32	Banks (은행)	6.81 ··· 5.77
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33	Commercial Spaces (상업지역) 회사들이나 상점, 장마당이 위치해 있는 곳	6.55 ··· 6.46
34	Agricultural Fields (농업 지역) 논이나 밭이 위치해 있는 곳	4.42 ··· 4.57
35	Industrial Areas (산업지역) 공장이 위치해 있는 곳	4.68 ··· 5.08
36	Offices (사무실) 자신이 일하는 회사나 사무실	6.20 ··· 5.62
● HEALTHCARE INFRASTRUCTURE 의료 기반시설		
37	Healthcare Facilities (Clinics) (1차 진료소)	8.14 ··· 6.29
38	Healthcare Facilities (Hospitals) (2, 3, 4차 병원)	7.86 ··· 6.43

### Human Capital: Institutional Strength, Design Capabilities & Training Programs

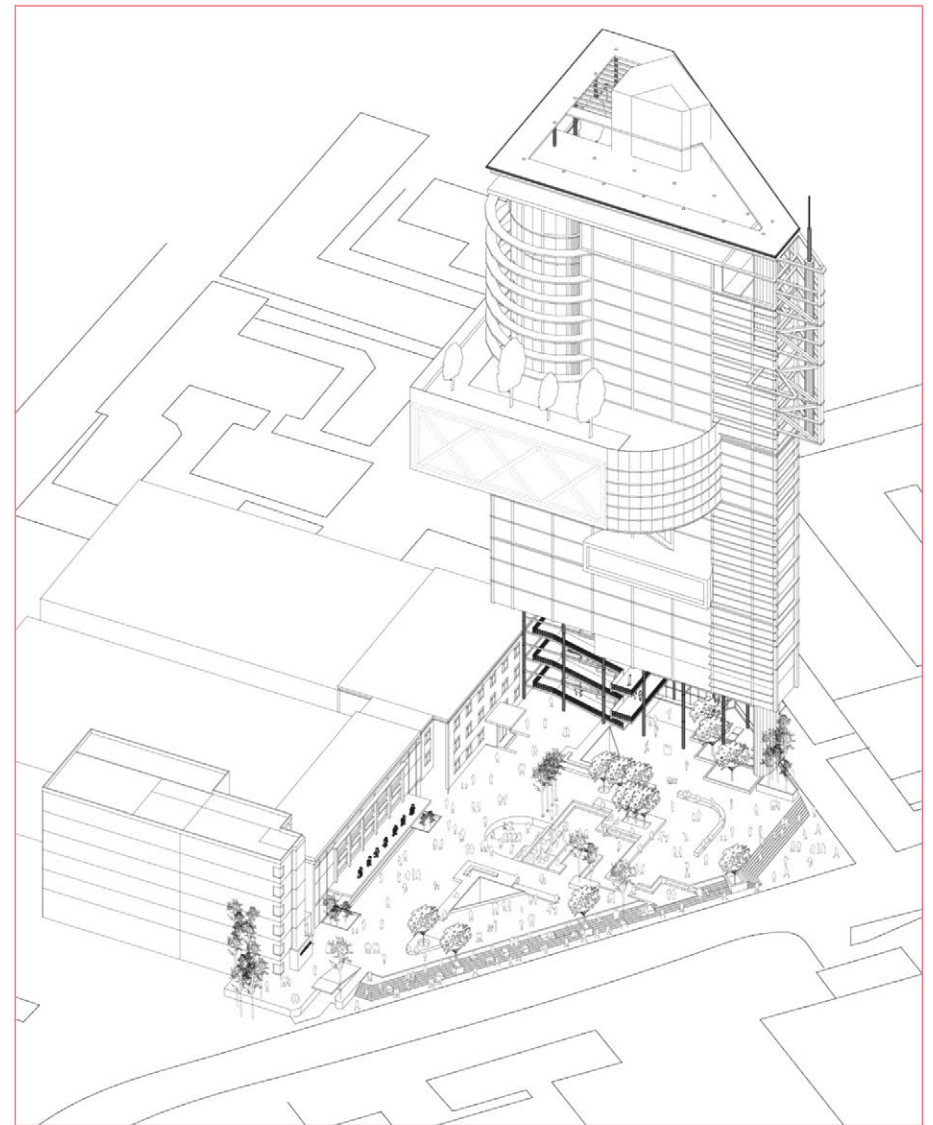
Apart from analysing the current strengths and weaknesses of the built environment, it is equally important to assess the institutional strength and design capabilities of DPRK policy makers and professionals in instituting positive transformation to the built environment.

Within the DPRK, design and planning is embedded within key state organs. The State Design Corporation (SDC) is an institution that is under the State Affairs Commission. This provides SDC with a significant decision making power to enact changes to the urban environment. The role of SDC is to ensure the design of significant new urban and architectural projects are in line with the overall socio-economic and political agenda of the state. In addition, various design institutions and research institutes also play an active role in shaping the built environment. At the policy planning level, various urban related institutions are developing a sustainability plan and guideline for Pyongyang. In addition, a conservation plan for the conservation of monumental streets is currently under consideration.

At the project delivery level, design institutions are capable in providing a full range of services, from urban, architecture, landscape to interior design. More importantly, they are equipping themselves with Building Information Modelling (BIM) capabilities through the setting up of BIM teams within the institution. BIM is a platform that offers smooth coordination between all the different consultants through various project stages, from design to construction. While BIM is increasingly embedded within construction processes in mature construction industries, it is relatively absent in emerging economies. Therefore, it is encouraging for design institutions in the DPRK to have BIM capabilities. However, it is important to note that while BIM capabilities exist within design institutions, it is unclear whether the capabilities have been transferred to construction teams, which are the true benefactors of BIM as it can improve site coordination, track progress and consequentially reduce hazards. If the capabilities are not transferred to the construction teams, a gap will exist between the design and construction phase of the project. The BIM capabilities can at best serve foreign firms looking to outsource their BIM modelling and scheduling work.

While design institutions have made great strides in improving their capabilities, further improvements can be made in integrating the planning, design and construction industries. This is particularly important for turning economic zones, such as Wonsan and Unjong Park, from a physical infrastructure to an ecosystem of tourism and entrepreneurship activities.

Since 2014, Choson Exchange has been conducting various training programs relating to real estate, urban planning and design. Through in-country workshops and overseas



Proposal for a mixed-use tower during a design workshop

study trips, these training programs aim to boost the capabilities of DPRK design professionals in translating the state's larger socio-economic objectives into a physical environment.

In 2014, Choson Exchange concluded an urban development and real estate workshop in Singapore and Vietnam in October 2014 for 10 North Koreans. The participants included policy makers from the Wonsan SEZ management team and other national planning bodies. The topics that include property rights in land development, market institutions for





2016 architectural design workshop



2018 presentation at the Future City Summit in Hong Kong

determining land prices, real estate development, urban infrastructure planning and design—were essential for the crafting of various planning policies. In particular, the clarification on foreign ownership of land in the 2016 Special Economic Zones regulations.

In August 2015 and August 2016, two architectural design workshops were conducted, focusing on the regeneration of a main thoroughfare and urban infill sites in central Pyongyang. The workshops provided an overview of the capabilities of the architecture and planning industry in the DPRK. Topics discussed included the sustainable rehabilitation of these existing sites.

More recently in August 2018, Choson Exchange brought three DPRK participants to the Future City Summit in Hong Kong and Guangzhou, where one of the leading urban planner in the DPRK presented on the importance of creating human-centered cities in the DPRK.

Moving forward, the real estate and urban planning sector continues to be an important area of focus for Choson Exchange. Cities in the DPRK play an important role in the overall economic development. In addition, there is also a significant interest in Singapore's urban planning and land use model following the US-DPRK Summit in Singapore in June 2018. Leveraging on the interest from DPRK partners, more training programs related to the built environment have been planned for the coming year.



Opportunity area for land intensification within Tongil Street District

In addition to the construction of new streets and districts, regeneration is likely to play an important role in the future development of Pyongyang. Based on our cartographic analysis and ground research, three key projects have been identified: Kwangbok—Tongil Regeneration, Southern Taedong District and Pyongyang Innovation Nodes.

#### 4.1

##### Kwangbok—Tongil Regeneration

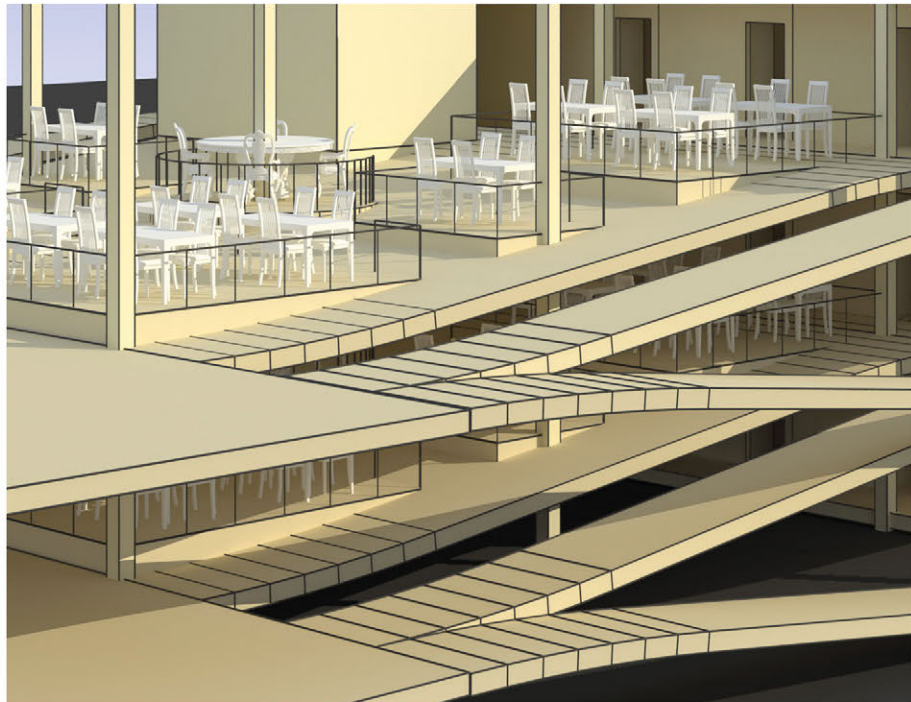
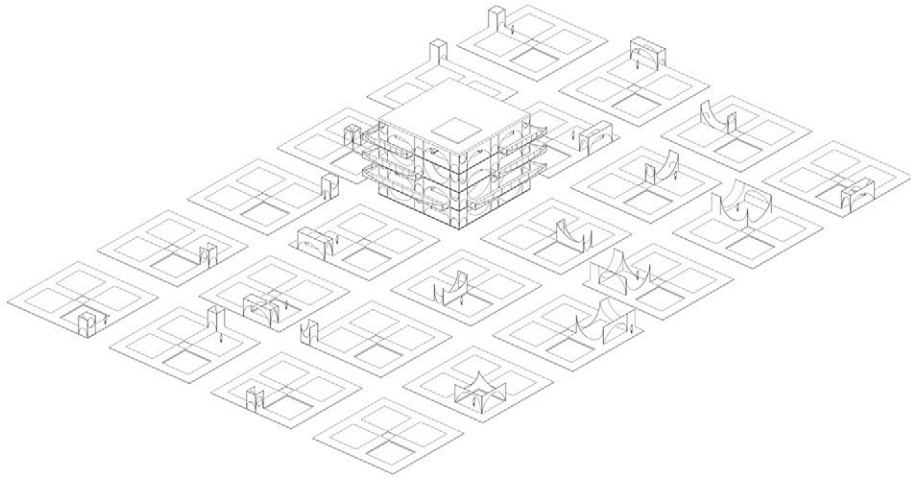
Built in the late 1980s and early 1990s, Kwangbok Street and Tongil Street were the first major urban expansions outside the city centre. Similar to other districts, they are designed as self-contained entities with their own set of industries, commercial and public facilities. In addition, the district is also defined by a monumental ten-lane boulevard with dedicated vehicular lanes, tram route, cycling and pedestrian path and flanked by monumental 30-storey residential slab blocks.

However, it is important to note that despite the monumental residential structure, the urban density is relatively similar to other parts of Pyongyang with a plot ratio hovering between 1.0 to 1.2. This means that in comparison to the more compact low-rise blocks in the centre of the city, the high-rise buildings in Kwangbok and Tongil are further spread out. This results in a less walkable environment. In addition, with the large boulevard dividing the district into two parts, it makes the urban block less pedestrian friendly and disconnected. Therefore, for any business activities that thrive on pedestrian circulation, these two districts pale in comparison to other more centrally located districts.

Adhering to the polycentric growth of socialist cities, Kwangbok and Tongil districts are separated from other parts of Pyongyang through a landscape of greenery. Connected only by a metro line for Kwangbok Street and buses for Tongil Street, both districts are relatively inaccessible. According to discussions with locals, the result is a flight of younger residents moving to more accessible parts of the city, leaving behind a greying population.

Therefore, the regeneration of these two iconic districts would be important for the growth of the city. Apart from improving public transportation connection, including increasing metro stations and bus lines to those districts, several other urban strategies can be introduced.

Within the urban blocks defined by the boundary of the main roads, urban density can be increased within the blocks, to provide a more compact urban and walkable environment. The increased usable floor area will also provide opportunities for the establishment of new businesses and other commercial and public facilities. Given the large spacing between the high-rise residential towers, there is ample space for land intensification without altering the overall character of the streetscape.



Proposal for a new collection of working spaces within a district

While the concept of conservation is relatively new for Pyongyang, which was entirely built from scratch after the Korean War, a city-wide conservation strategy is currently being studied by a local planning institution. The conservation strategy include the preservation of the character of monumental streets. It will be important to balance the need to preserve the street scape while adding urban density and porosity.

In addition, transversal connection across the wide boulevards can be provided to improve pedestrian connectivity and accessibility across the urban blocks. The design of the connection could potentially be designed as a landscaped over-ground or underground crossing that would not diminish the visual impact of the boulevards.

However, all these urban design strategies can only be possible if there is demand for new production and commercial spaces in these districts, rather than an artificial increase in the supply. Therefore, it will be crucial to design catalytic urban projects that could stimulate demand for spaces in these districts.

#### 4.2 South Taedonggang Loop

The South Taedonggang Loop (STL) is envisioned as a new urban centre that can potentially activate the southern part of Taedong River and the regeneration of Tongil Street district. The STL is a loop connecting Pyongchon-Kangan Street, Chungsong-dong Street, Ssuk-som and Yanggakdo via the Chungsung Bridge and Yanggak Bridge.

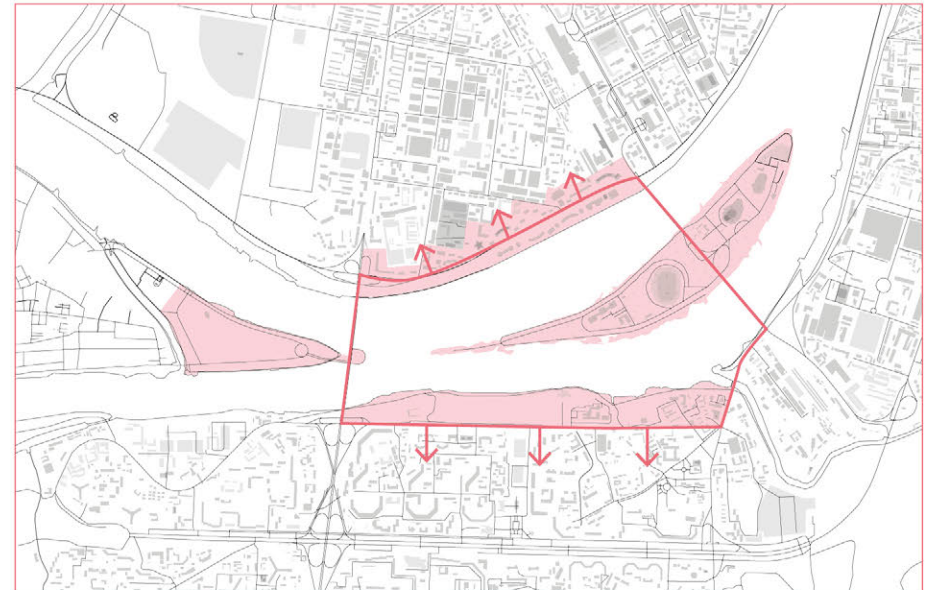


Diagram of a new urban centre: South Taedonggang Loop

There are several existing key landmarks within this 600 hectare area. Namely the Mirae Street Apartments, Yanggakdo Hotel for tourists, Sci-Tech Complex on Ssuk-som and Tongil Market. Tapping on the existing programmatic functions in the area, it would be strategic to densify development on the southern side of Taedong River.

There is a new paved road providing access to Tongil Market and a new commercial distribution centre. This road complements the existing access from the main Tongil Street. In addition, there is a 1km long stretch of by the river front of developable land. The depth of this land is 150m which is a suitable length for mixed-use commercial development.

[By encouraging the development of South Taedonggang Loop as a new urban centre, the increase urban activities could potentially activate the rest of the Tongil street district.](#)

#### 4.3

##### Pyongyang Innovation Nodes & Incubator Spaces

In addition to district-level regeneration, urban infills of different functions—ranging from production facilities, offices, public amenities—could be introduced to support the large-scale regeneration projects. Inherent to the planning logic of Pyongyang as a ‘socialist city’, spaces of production are typically embedded within the city’s masterplan. Each neighbourhood block is conceived as self-sufficient entities, comprising of light industrial factories, schools and other public amenities.

However, many of these new urban infills tend to focus largely on residential developments instead. Although the increase in the number of residential buildings reflect the rising demand of housing, complementing major developments along Ryomyong Street and Mirae Street, they are potentially mono-functional. It is critical to include other flexible building types and functions that support emerging economic activities of the city.

As mentioned in the chapter above, there is a strong emphasis in the provision and distribution of educational facilities throughout the city and new residential areas have been created for educations in the various universities. [Such a strategy can be further expanded to create research and innovation nodes and clusters where educators, researchers and entrepreneurs can work, live and research in close proximity.](#)

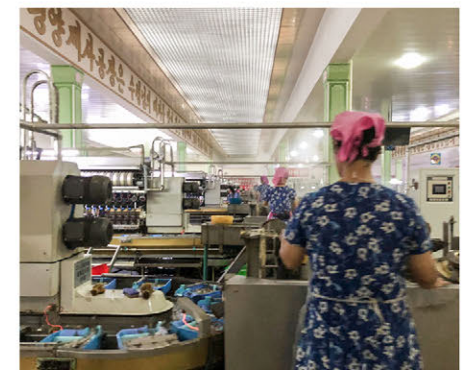
Building upon Choson Exchange’s entrepreneurship training program, the development of innovation nodes and incubator spaces aims to support an entrepreneurship ecosystem in Pyongyang. [Such spaces would formalise business networks and catalyse the development of new business ideas amongst local entrepreneurs.](#) In fact, the importance of a physical space in facilitating business networks has been tested out by one of our Women-in-Business workshop participants. A restaurant owner, implemented the idea of organizing networking dinners proposed by a workshop leader. Therefore, the incubator space aims to take this pilot

test further, where the space could be used to jump-start various projects.

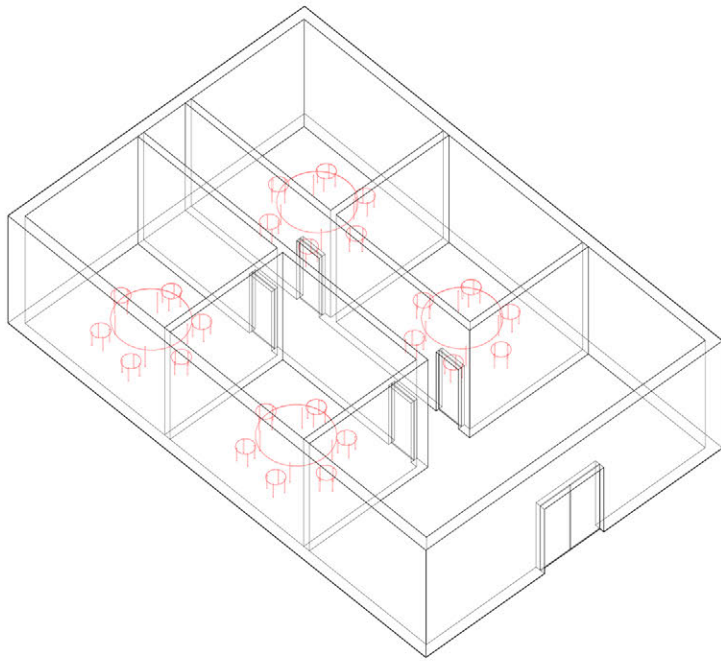
Conceived as the 6.12 Singapore Centre, as tribute to the landmark US-DPRK Summit on 12 June 2018 in Singapore, the incubation space will be located within an existing building. The flexible interior space can be designed to accommodate a wide variety of uses, including working spaces, business labs, presentation halls. In addition, the centre can also be adapted to other functions such as small exhibition spaces, cafés, among many other possibilities.

Through cartographic analysis, suitable locations and spaces for the 6.12 centre are currently being identified and assessed. Apart from costs, other key factors of consideration include proximity to metro stations, tram stops, childcare facilities and schools.

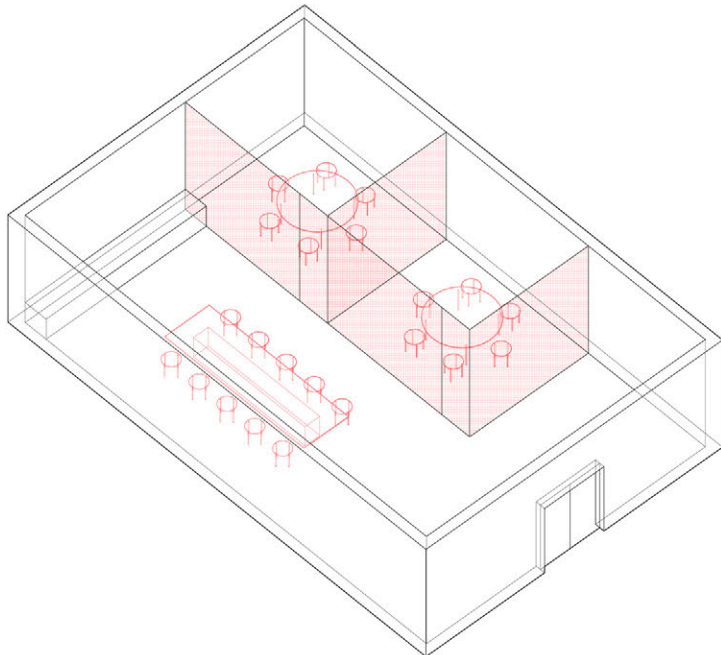
In order to encourage female participation in entrepreneurship activities, the location and design of the incubator space will be women-focused. Taking reference from existing state-run factories in the city which have in-built kindergarten and childcare facilities, we believe that the incubator space should also be close to these facilities.



Kim Jong Suk Pyongyang Textile Mill:  
A production facility integrated with dormitories, childcare and kindergarten



Typical hierarchical office spaces in Pyongyang



Proposed open working environment for incubator space

Secondly, facilities within the incubator space should be women-friendly. This includes the provision of non-smoking area, breastfeeding room, open work areas and transparent meeting rooms. The openness of the space is an important factor to reduce the 'official', 'domineering' and 'hierarchical' characteristics of typical offices in Pyongyang. In addition, the design of an integrated kitchen, dining area could potentially act as a 'salon space' which will allow networking dinner to take place on a larger scale.

Thirdly, we envision the incubator space as an entity that evolves over time through the co-creation and co-design role by resident women entrepreneurs. Design plays an important role in starting and operating a business. We have been conducting workshops for women on design thinking, branding and marketing.

## Research Team

### Researcher Lead

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December 2018

## Profile

Choson Exchange supports entrepreneurs and business-minded individuals in North Korea through workshops, internships, mentorships and scholarships inside and outside of the DPRK. Since 2010, Choson Exchange has trained over 2600 North Korean professionals and brought over hundred of them for overseas training programs.

Calvin Chua is the Head of Urban Innovation Program for Choson Exchange, leading training programs and research on real estate, urban and infrastructure development. An architect by training, Calvin runs the design firm Spatial Anatomy, and serves as an Adjunct Assistant Professor at the Singapore University of Technology and Design.

Choson Exchange

[www.chosonexchange.org](http://www.chosonexchange.org)

Research

Cartography

조선  
교류 | CHOSON  
EXCHANGE

SPATIALANATOMY

