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북한 北韓,

A 21st-century Socialist Country
with Economic Transition

Focuses
Train Stations
As a Catalyst for Future Development

Seonhye Sonny Sin

NORTH KOREA
Democratic People's Republic of Korea

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The University of Texas at Austin
School of Architecture
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Democratic People's Republic of Korea

SPECIAL THANKS TO
FAMILIES, FRIENDS, AND FACULTY
AT THE UNIVERSITY OF TEXAS AT AUSTIN
FOR ALL THE SUPPORT AND GUIDANCE

ESPECIALLY TO DEAN ALMY AND BARBARA HOIDN

THANK YOU

NORTH KOREA

Democratic People's Republic of Korea

Foreword_PATRIA OBSCURA

For much of the world, North Korea is an enigma. What those of us in the west think we know about the country has largely been assimilated through the constructs of political propaganda and myth. The dissemination of information is carefully controlled through the lens of a nationalized media. There is little geographic data on the urban conditions within the country available to outsiders, or its citizens. Even in NASA's well-known composite mapping, Earth's City Lights, North Korea is dark. Undertaking any form of deep analysis is difficult, as information emanating from the country is limited. Viewed from outside, the country stands as dictatorial, militaristic, and exploitative.

North Korea is a country whose resources have been appropriated by a hereditary political elite, with scarce provisions remaining for the sustenance of the population at large. The period between the mid-1990s and the mid-2000s, in particular, was marked by severe famine and widespread starvation. North Korea is one of the world's least open economies with strict authoritarian control of the mechanisms of production and distribution. The country suffers from enduring economic difficulties, largely due to extensive spending on its military, which includes the development of advanced weapon systems. This situation has severely constrained the resources needed to adequately sustain the civilian population.[1]

It is within this context that the mappings represented within this publication attempt to illuminate structural and spatial conditions present in the country: the importance of rail transit to trade relationships with China (86.3%) and Russia, the problematic distribution of energy (19 of the 24 million citizens live without electricity), sites of agricultural and industrial production, and settlement patterns, whose morphologies reflect socialist ideology as codified in functionalist planning. This is nevertheless an optimistic project, one that anticipates the potential impact that a change in the governmental policy of improving standards of living may have on the country. In spite of the austerity that has historically characterized the government's centralized approach to the distribution of resources, if this change is to be more than rhetorical, then a new form of economic stimulus is necessary. This study is proposed as an undertaking that projects a social transformation based upon evolution, not revolution, of political agency in the country. It projects a layer of relaxed trade that is based upon the emergence of a newly robust micro-market economy intended to operate as a local informal interchange mechanism. Once activated through programmatic augmentation, the infrastructural opportunities of the rail network are exploited to catalyze new market opportunities that are distributed throughout the country.

The location of resources within the country are identified and documented diagrammatically. These configurations are then strategically assessed, and the information is juxtaposed against the national system of infrastructure to document the potential of the distribution system. These relationships are then reconceptualized at the scale of the entire country. The resultant analysis postulates a new mechanism, "H-City" through which the existing transportation network may be exploited, with the prospect for a modification of how the distribution of production, and the consumption of products, is reorganized across the country. This reconsidered network becomes the generator of new macro and microeconomic potential, exploiting the interface between the rail network, sites of production, and settlement sites. Once activated, a new post-socialist project emerges, one based on the transformative potential of local situations. This system is thereby given a new agency, distributed throughout the country at critical locations. The resultant social and economic benefit occurs beneath the nationally controlled distribution system and opens up the potential for local markets to generate a new capital system based on the interchange of goods and services. This is a form of micro-capitalism that is intended to cultivate the individual initiatives of the population and to immunize it against the program of forced austerity currently enacted by the central government.

The research and documentation presented in this publication is a product of advanced thesis work undertaken in the Graduate Program in Urban Design at The University of Texas at Austin, School of Architecture. The work is positioned as an activist projection of the country, viewed from the south, that through rigorous representational processes, proposes a new framework through which North Korea may reorganize its territory and manage its resources with more sustainable and resilient consequences for its citizens.

[1] The World Factbook, Central Intelligence Agency.

Dean J. Almy III, RA, FFUD

Fellow of the Sinclair Black Chair in the Architecture of Urbanism
Director, Graduate Program in Urban Design

Introduction

North Korea is one of the unique countries around the world. At first, it was developed under socialist ideas. Later, the views combined with totalitarianism. These ideas make the country special, and its isolation from other countries makes it more unprecedented. However, the world's most hidden country has begun to make a different move. Kim Jong-un started a dialogue with the South Korean government in 2016, breaking a decade-long severance between the two countries. Of course, there are both doubtful and positive responses to this change. However, this opens the possibility of a different future of North Korea.

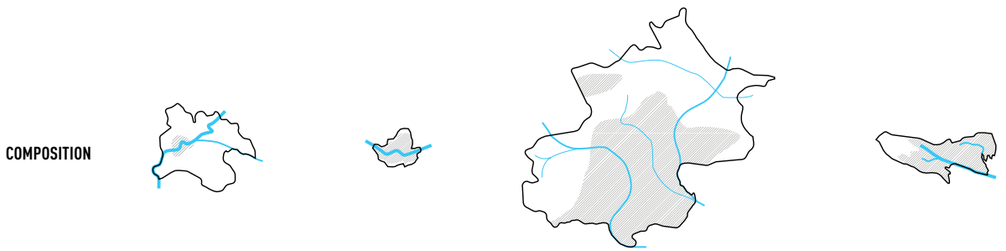
The primary purpose of this book is to make people aware of the potential of the country and see the necessity for further research. North Korea is suffering from lots of urban problems such as food and energy shortages. Still, they have the potential to be a sustainable country with proper national planning strategies. The first step for the future is to research and prepare in advance. However, there is a huge research gap between the years 2007 and 2016 due to political reasons—the research and information on North Korea had barely been updated during this period. Even South Korea was shocked when a documentary in 2015 showed Pyongyang full of high-rise buildings, which is not typical for the city people used to know. This can be another starting point to prepare for a possible future.

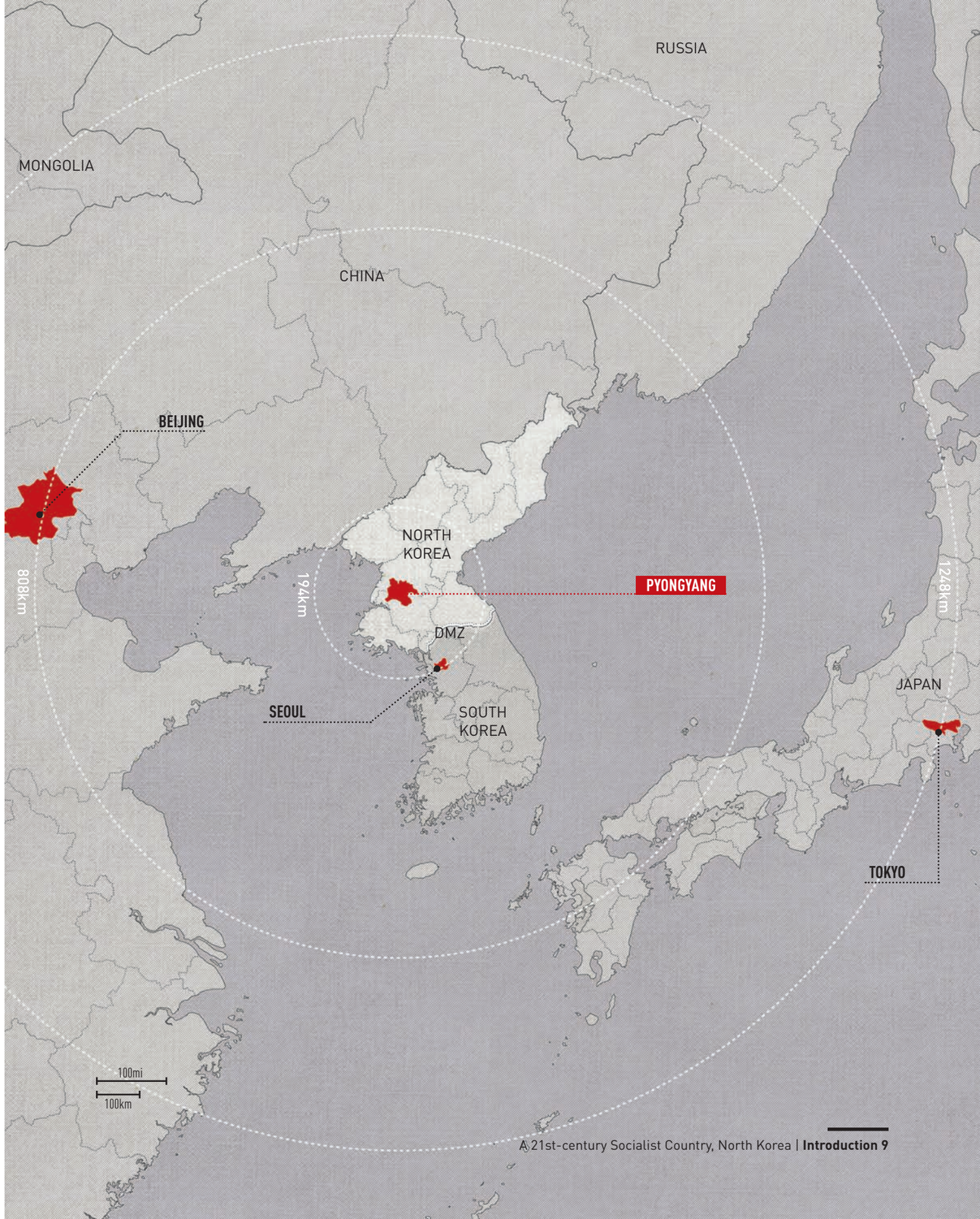
This book is not assuming Korean unification but only economic transition, which has already begun in North Korea. By looking into socialist countries that transitioned into post-socialist countries, this book points out the ideal economic transition scenario and focuses on how to make this country sustainable.

NORTH KOREA
(DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA)

CAPITAL_ PYONGYANG
AREA_ 123,138 SQKM
URBANIZATION RATE_ 61%
POPULATION_ 24,897,000
GROWTH RATE OF GDP_ 3.9%
- 2016

INTRODUCTION_COMPARISON OF PYONGYANG TO OTHER EAST-ASIAN CAPITALS





1 Socialized North Korea

01

The transition from a socialist city to a post-socialist city causes lots of changes in the economy, politics, and even in the urban structure. North Korea needs to prepare for the future in advance to prevent the typical issues that follow when transitioning to a post-socialist city, such as imprudent development, expansion of a central business district, suburbanization, and residential segregation.

Socialized Countries and Their Transitions

From the start to the transition to a post-socialist country

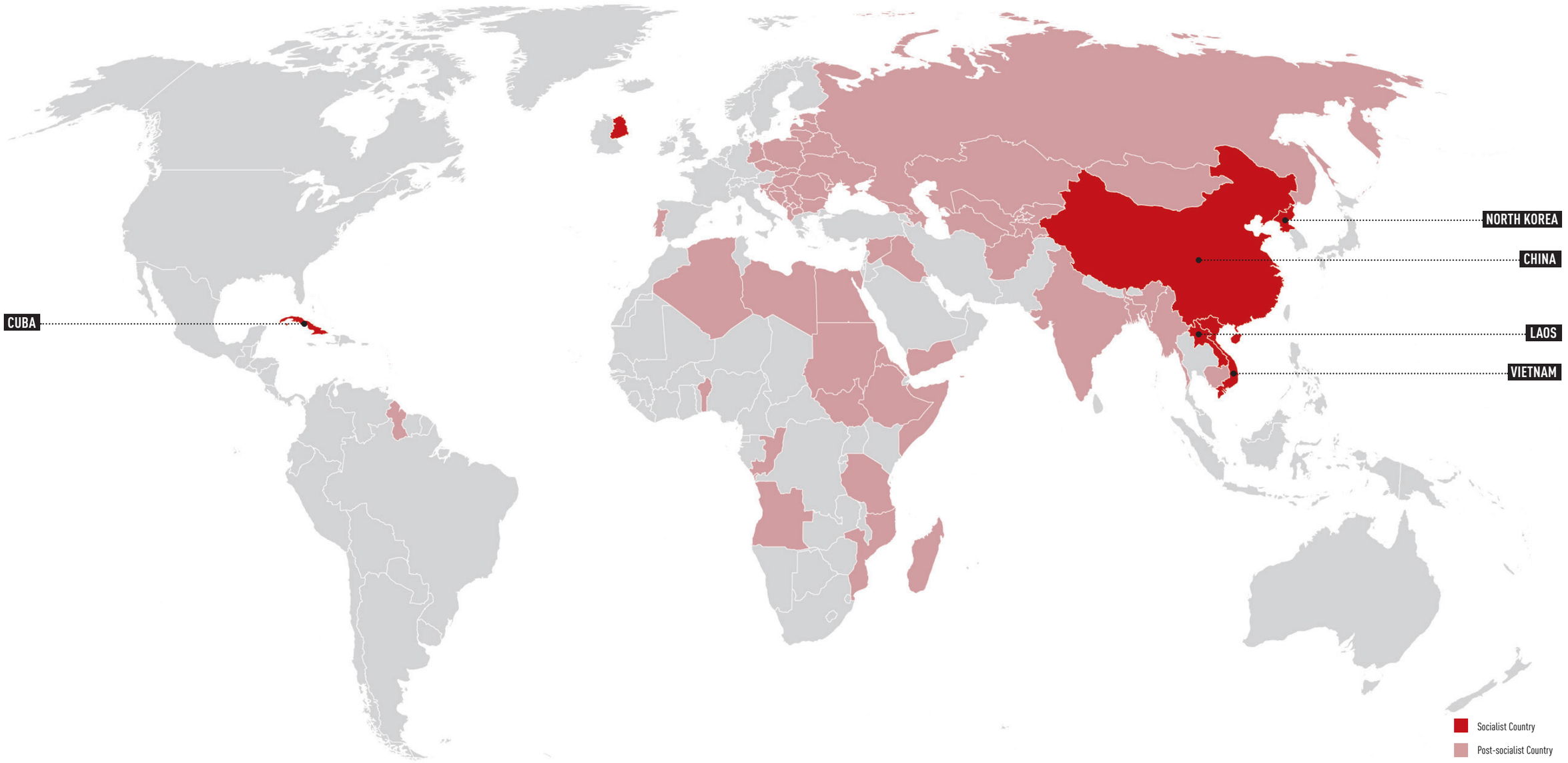
The definition of "socialist country" is simply a country that was developed under socialist ideals. However, there are no actual cities we can define as a socialist city, only a socialized city as R.A. French asserted. The word socialism was first used in 1827 by Robert Owen and his companies. This concept was established as an opposition to capitalism. At that time, many cities were becoming more significant with technological development. These developments made people gather to cities and thus this concentration of people in one place created lots of urban problems. Therefore, socialists insisted that there be balance in urban and suburban areas. Their main ideas were for balance and equality. Unlike other political or social ideas, socialism tried to solve problems by planning their cities. However, these ideas often failed. Most socialist countries have shifted their plans of action and have become post-socialist countries.

At "post-socialist" country is simply a socialist country that has gone through an economic transition, sometimes happened with political transition too. The transition starts within the non-physical systems and expands into the actual urban structure. The most important part here is, as we can see from past post-socialist cities, they went through several obstacles. Historically, we can divide them into two types according to this process. One is the gradualist approach and the other is the big-bang approach. If North Korea decided to take economic transition, and they didn't prepare, the capital input could be a stimulus to urban development like China, but it may mean they lose the character of a socialist country, as East Berlin did.

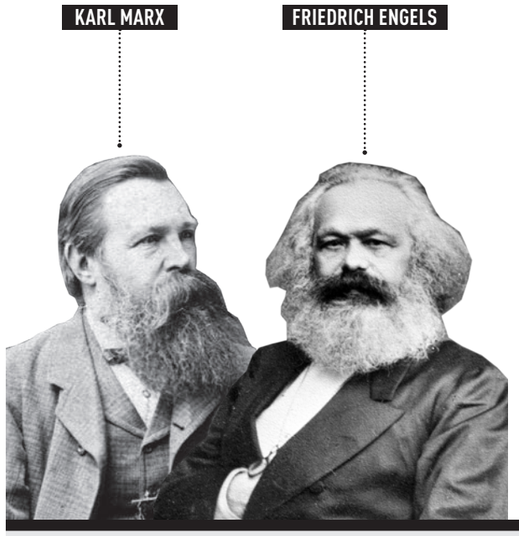
Furthermore, this transition for North Korea is already happening. After the death of Kim Il-sung, their first dictator, the food production dropped significantly and 330,000 people died by famine. In order to solve this problem, in 2002 the government established a market economy. Now, there are around 400 official markets in North Korea, as well as uncountable illegal markets referred to as Jangmadangs.

As described, this transition is happening already and those markets play the most important role in the current North Korean economy. However, to go through an economic transition, there are more elements to look into.

SOCIALIST COUNTRIES_EXISTING SOCIALIST COUNTRIES AND POST-SOCIALIST COUNTRIES



SOCIALIST CONCEPTS_WITH THE TIMELINE



1847

PRINCIPLES OF COMMUNISM

Socialism started as a counter effect of urbanism. As history depicts, the idea had developed within the Soviet Union, until its dissolution in 1990. One interesting fact is that urban planning is part of socialism's main strategy.

In the nineteenth century Karl Marx and Friedrich Engels defined five urban planning strategies. They believed that every urban issue that arose was due to density, so the first strategy was for an anti-metropolitan. The second was for an anti-urban regeneration, which ended up not being helpful in improving urban-housing quality based on their opinions. The third main strategy was to combine city and agricultural land. They thought imprudent developments were another issue that came with high density, so they argued that the city should be developed under plans. And lastly, they believed in centralized control and regulation by a government. According to their ideas, governments should possess all the land and control all production in order to enforce regulations.

1882

LINEAR CITY

Based on those ideas, three foundational theories formed concerning socialist-city planning. The first theory was born from Vladimir Lenin. The second theory was the Linear City concept. And the third theory was the Garden City concept, established by Ebenezer Howard.

Vladimir Lenin put Marx and Engels's principles into practice using six strategies: First, housing should be separated from factories to protect the residential district. Second, the landscape should surround factories to block pollution. Third, to reduce commuting time and energy, all amenities should be placed evenly. Forth, the city center should be an educational space for socialism surrounded by cultural buildings. Fifth, governments should encourage public transportation instead of personal vehicles. Last, a land-use plan should be based on socialist ideology or technical concern.

1898

GARDEN CITIES OF TOMORROW

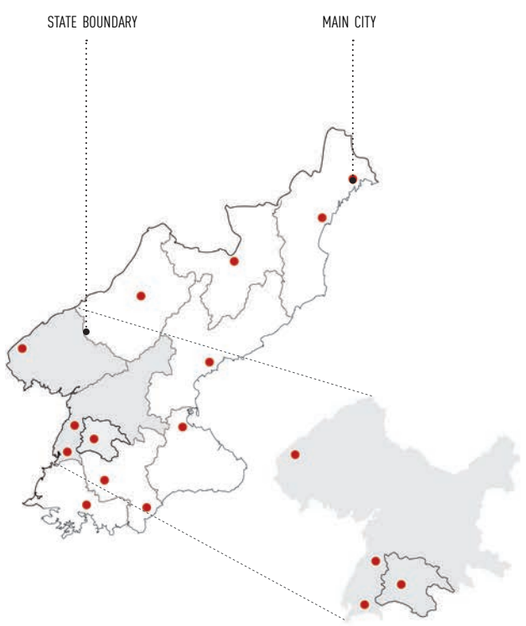
The Linear City theory was about how a city can be expanded. There have been multiple practitioners who have pushed for a Linear City, including Milutin and Le Corbusier. The main idea there is the same. Along with a major transit corridor, a city is expanded parallel. The purpose is to maintain spatial equality. With the Linear City theory, every house would have a similar distance to transportation, industries, and amenities.

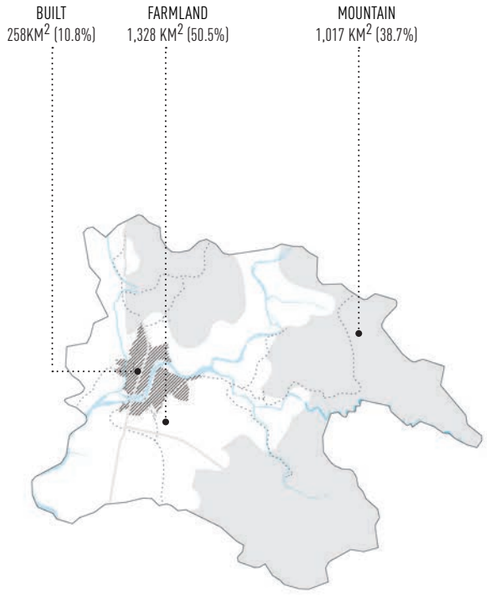
The combination of agriculture in a city was inspired by Ebenezer Howard's Garden City plan. This theory was about finding another way that a city can be expanded. If a city grows over the population of 58,000, it should create satellite cities with only 32,000 people in each. Those cities would then be connected with train tracks and roads. Moreover, each city would be surrounded by a green belt which blocks further expansion.

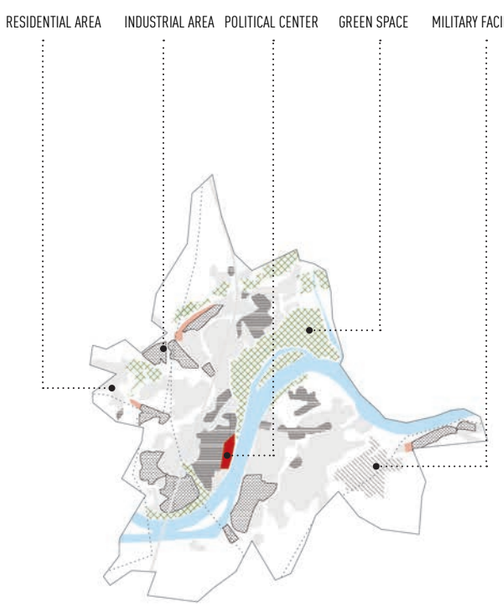
1905

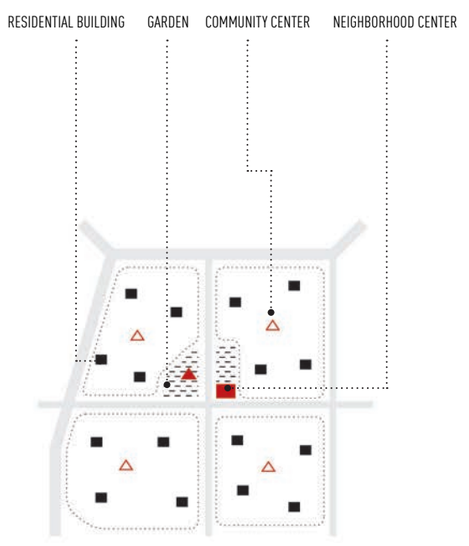
MARXISM AND LENINISM

8 PRINCIPLES OF SOCIALIST DEVELOPMENT_IN NORTH KOREA









NATIONAL / STATE SCALE

01 BALANCED DEVELOPMENT

Every states in North Korea have at least one main city and the government has tried to distribute them evenly otherwise unbalanced developments occur and bring about an unequal social structure.

02 SELF-SUSTAINED STATE

Each state was planned to be self-sustaining. Not only is it part of the socialist-planning strategy but is also meant to prepare for wartime, so that if one state gets attacked, others can survive.

CITY SCALE: PYONGYANG

03 LIMITED CITY GROWTH

To avoid metropolitans, controlling city size is essential. Socialists suggest surrounding a city with a vast landscape to limit city growth.

04 LANDSCAPE IN THE CITY

Landscape in the socialist city has an important role, not only on the outskirts but inside of the city. The green area is to prevent urban problems that occur from density and provides space to breathe and rest.

CITY CENTER SCALE: PYONGYANG

05 STRICT LAND-USE PLAN

The land-use plan of Pyongyang was set in the 1950s and has continued. Based on their regulations, one building should have only one program, and the zoning plan decides it.

06 THE FUNCTION OF CENTER

In most city centers, there is a Central Business District with the highest density. However, in a socialist city, the central area is for educational and public purposes with lower density levels, such as a museum or library.

NEIGHBORHOOD SCALE: MICRO-DISTRICT

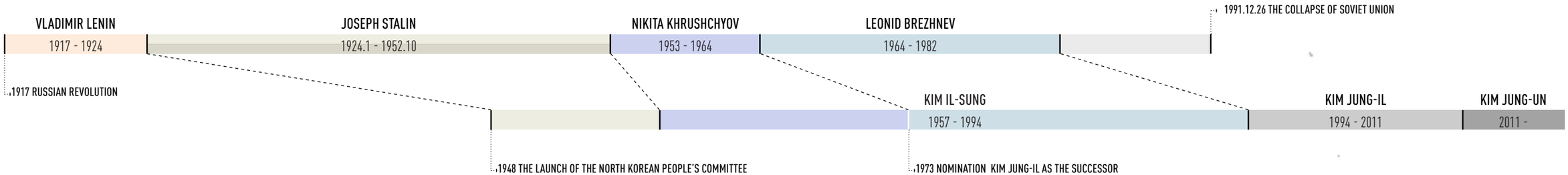
07 EQUAL DISTRIBUTION

Every socialist strategy is related to equality. It is applied to the neighborhood scale as well. Every program is distributed evenly following the neighborhood unit concept called a micro-district.

08 LIMITED JOURNEY TO WORK

Socialist practicioners insist that the workplace should be within walking distance. By using the micro-district concept, they put a garden, workspace, and retails together.

SOCIALIST CONCEPTS TIMELINE AND THE CHRACTERISTICS_IN NORTH KOREA



DOM KOMMUNA

- Acceptance of Modernism
- Utopian housing proposed by Russian avant-gardes
- Architecture as a socially condensed period
- New mass housing by OSA

COMMUNALKA

- Sharing communal spaces in housing
- Multi generations share a old house
- Small space and a lack of privacy

STALINKA

- Residential district: Kvartal
- Monumental architecture
- A high-end urban house with stairs

KHRUSHCHEVKA

- Micro district
- Pre-fab building
- Standardization, Mass production
- Narrow and homogeneous indoor space

POST-KHRUSHCHEVKA

- Aesthetic improvement
- Diversity in housing
- Various pre-fab building

ECONOMIC TRANSITION_THE TYPICAL PROCESS OF ECONOMIC TRANSITION

CURRENT STATE OF NORTH KOREA

Traditional Socialist Economy	Reformed Socialism Economy	Market Socialism Economy
As a planned and centered economy, it is under the govenment controls	Reformed Socialism Economy is the first step to solve the problem of the inefficient planned economy but still resect market economy but only increase efficiency.	By admitting the limit of a centralized and planned economy, the government makes black markets to an official and coexists of the market and planned economy.

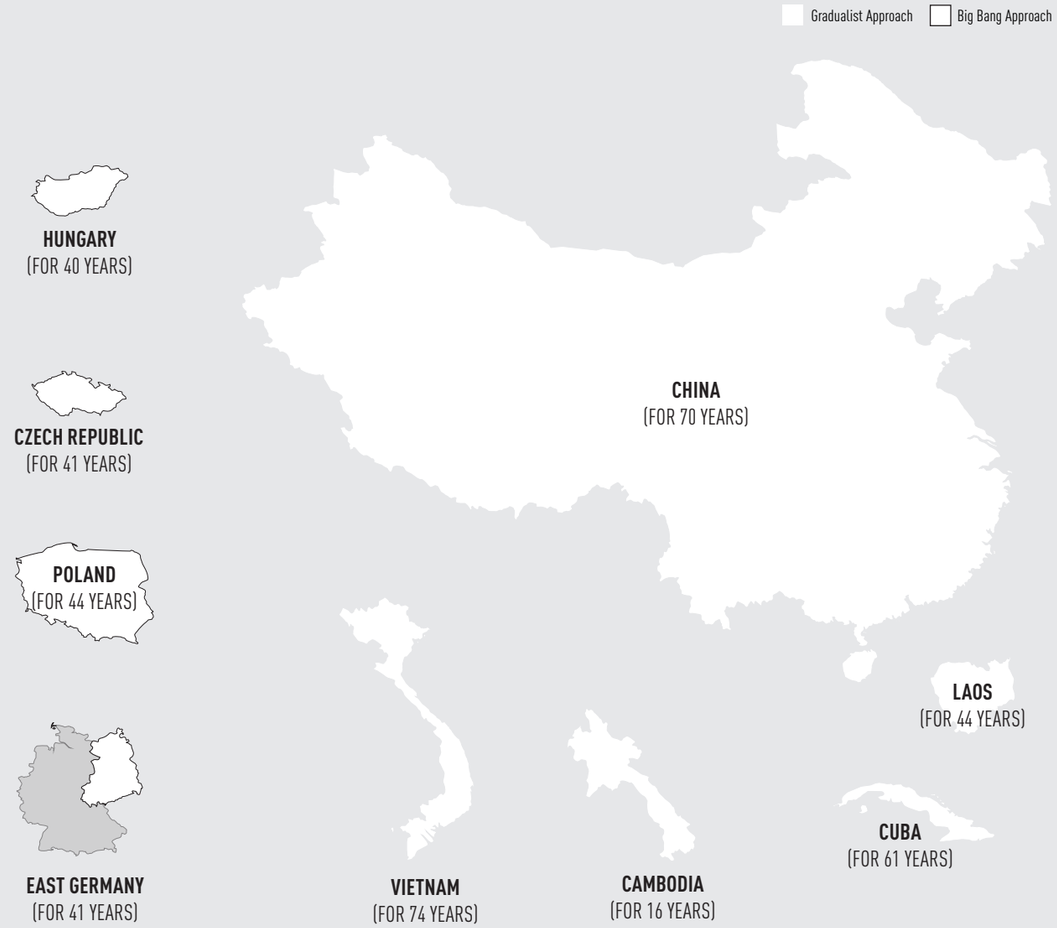
Economic Transition	Influence to Various Area	Impact on Urban Structure
Gradualist Approach Big Bang Approach	Population Industry Energy System Housing Market ...	Imprudent development Expansion of Central Business District Suburbanization Residential segregation

LIST OF ECONOMIC TRANSITION COUNTRIES (34 countries)

1 Bosnia And Herzegovina
2 Croatia
3 Macedonia
4 Slovenia
5 Montenegro
6 Serbia
7 Estonia
8 Lithuania
9 Latvia
10 Armenia
11 Azerbaijan
12 Belarus
13 Georgia
14 Kazakhstan
15 Kyrgyz Republic
16 Moldova
17 Russian Federation
18 Tajikistan
19 Turkmenistan
20 Ukraine
21 Uzbekistan
22 Czech Republic
23 Slovak Republic
24 Albania
25 Bulgaria
26 Hungary
27 Poland
28 Romania
29 China
30 Cambodia
31 Laos
32 Myanmar
33 Mongolia
34 Vietnam

Transition Countries in Asia

_GRADUALIST AND BIG BANG APPROACHES



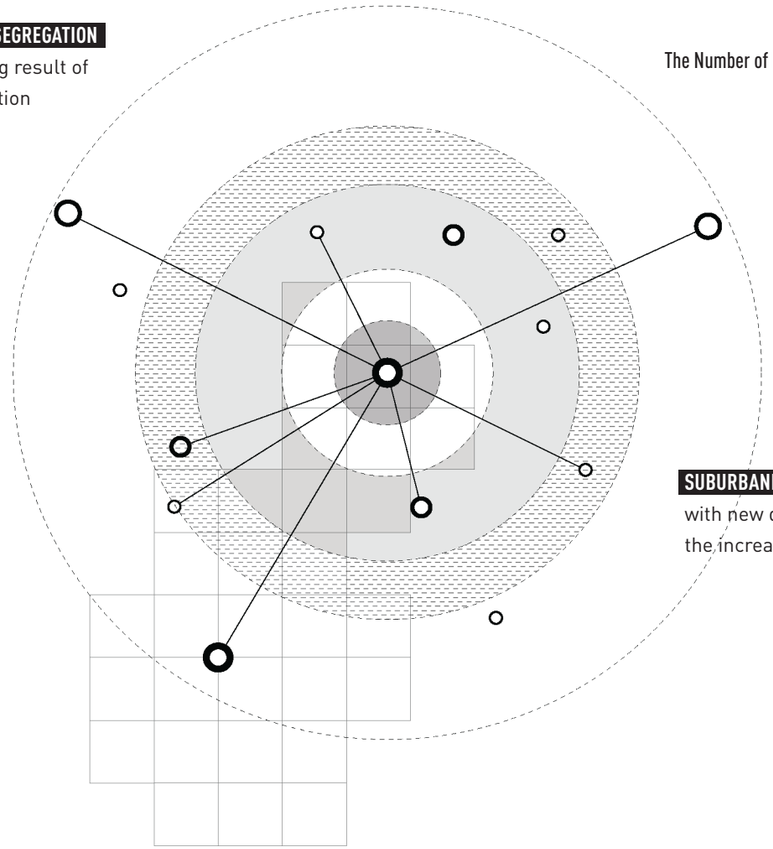
There are two types of economic transition. One is called a big-bang approach, which means an unexpected shift, for example: the countries after the collapse of the Soviet Union. Because those countries did not have time to prepare for this sudden change, the impact affected all areas such as population, industry, energy systems, and the housing market, even the urban structure of these countries. On the other hand, a gradualist approach is usually relevant to transitioning countries in Asia. They become a socialist country late or last longer than countries with big bang approach. That means they had more time to prepare for their economic transition. That way, they were able to shift their systems gradually.

CHANGES IN 10 YEAR AFTER THE TRANSITION

1,217,000 People
Moved From East Berlin to West Berlin

5 % Increase
The Number of Housing in East Berlin

RESIDENTIAL SEGREGATION
as a following result of suburbanization

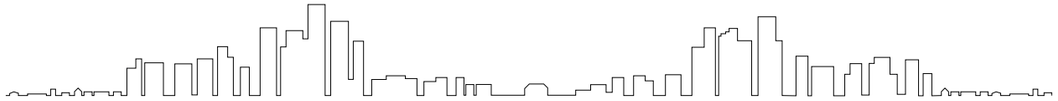


SUBURBANIZATION
with new developments and the increase of car ownership

IMPRUDENT DEVELOPMENT
with uncontrolled investments especially foreign capital

EXPANSION OF CBD
replacing the political center of socialist cities such as museum and library

SOCIALIST CITY



MONUMENTAL AND EDUCATIONAL PURPOSE

CAPITALIST CITY

CENTRAL BUSINESS DISTRICT

Economic transition does not affect the economy only, it largely affects urban structures. There are four main changes that past post-socialist countries have suffered.

01 IMPRUDENT DEVELOPMENT
When the economic transition occurs, lots of investments will come in, especially lots of foreign investments, which bring a positive effect on economic growth. This sudden input is accompanied by imprudent development. This uncontrolled development can ruin the existing urban structure and character.

02 SUBURBANIZATION
Investors are looking for more comfortable land to develop. In that case, the area within the city is not ideal, where it's already fully developed. Therefore, they look at other areas like the outskirts of the city. New stores and housing is built in those areas, and people start to move farther out. This tendency causes suburbanization, which leads to inner-city decline.

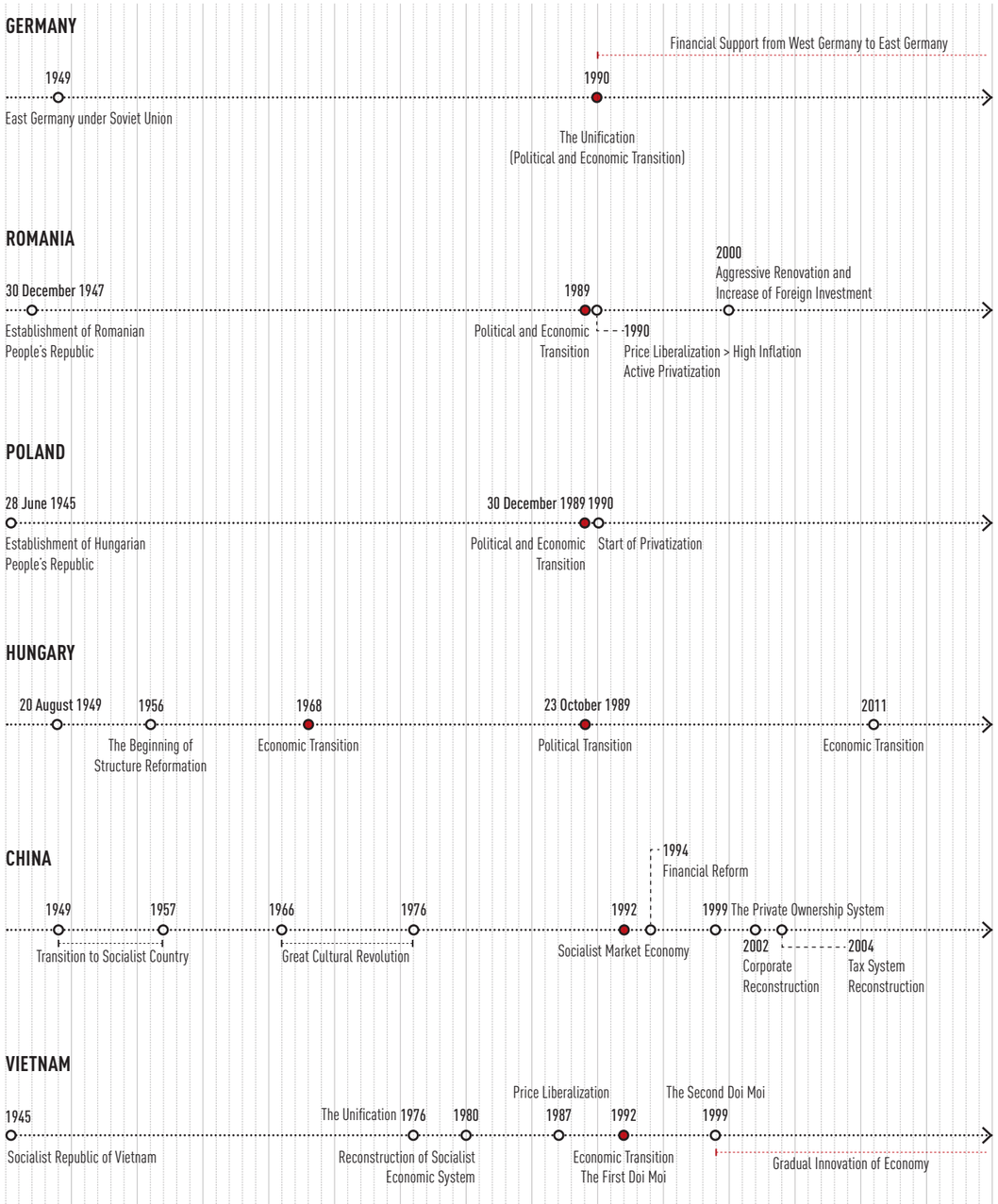
03 RESIDENTIAL SEGREGATION
Residential segregation is the following result of suburbanization. After an economic transition, people start to get their own cars and commute long distances. Moreover, since people start moving to bigger cities, the problem of lack of housing becomes worse. As a result, lots of cheap housing is built in the suburbs, further causing residential segregation.

04 EXPANSION OF CENTRAL BUSINESS DISTRICT
The center of a socialist city is for political education and the public, and would include huge squares. Therefore, this area is another attractive area for developers. If economic transition happens without proper preparation, these areas would be new central business districts and expand even further. The public buildings like museums and libraries would be overtaken by businesses and lose their primary intention.

조선민주주의

인민공화국만세!

LEARNING FROM EXISTING POST-SOCIALIST COUNTRIES_THE PROCESS OF TRANSITION



_THE FORM AND THE CHARACTERISTICS OF TRANSITION

	The Form of Transition	Political and Economic Characteristics
Russian (Russia)	Confrontation of Dominating Elites (Conservative and Progressive) v Soviet Dismantlement v Association of Radical Elites and Economic Oligarchy (Collapse of Conservatives)	Etacratism Patrimonial-ism and Capitalism
East European (Romania)	Potential Confrontation of Dominating Elites (Unshaped Progressive Group) v Regional Mass Upheavals, Internal Power Struggle v Preservation of Dominating Elites (Elimination of Specific Faction)	Authoritarianism + Populism Looting Capitalism
Mid-east European (Poland, Hungary)	Political Compromise of Progressive Elites and Anti-elites Groups (Isolation of Conservative Group) v Partial Replacement of Political Elites Preservation of Technical and Business Elites	Formal Democracy + Populism Transnational Capitalism
Chinese (China, Vietnam)	Political Compromise of Conservative and Progressive Elites v Gradual Economic Transition (Maintenance of Political Hard-line) v Internal Unite of Dominating Elites and the Continuation of the Political System	One-party Dictatorship + Corporatism Bureaucratic Capitalism
Cuban (Cuba)	Potential Confrontation of Dominating Elites (Unshaped Progressive Group) v The Anti-reform Tendency of the Leader v Internal Unite of Dominating Elites and the Continuation of the Political System	One-party Dictatorship State Capitalism with Foreign Capital

Source: Choi and Lee (2009), p.18

COMPARISON BASED ON ECONOMIC TYPOLOGY

	Political Transition	Government Intervention	Privatization	Gentrification Speed	Current GDP (2018)	
North Korea (Present)	N	High	-	-	19,000M (Estimated)	
South Korea	N	Low	Low	High	1,720,890M	
Russia	Y (1991)	High	High	-	1,657,553M	Big Bang Approach
Germany	Y (1990)	Mid	High	High	3,996,759M	
Hungary	Y (1989)	Low	High	Mid	15,573M	
Poland	Y (1989)	High	High	-	585,782M	
Czech Republic	Y (1990)	High	Mid	-	244,105M	
Romania	Y (1989)	Mid	High	-		
China	N	High	Low	-	13,608,151M	Gradualist Approach
Cambodia	N	-	Low	-	24,571M	
Laos	N	Mid	Low	-	18,130M	
Vietnam	N	High	Mid	-	244,948M	
Cuba	N	High	Low	Low	87,130M	

Source: Pedret, A. (2018). *Pyongyang 2050 Spatial Futures.* Seoul, South Korea: Damdi

The first lesson North Korea can heed from past post-socialist countries is to prepare and apply for the transition step by step. Most previously European socialist countries went through a sudden economic transition and had to deal with the effects later. Their shifts were simultaneous with the political transition. The sudden change made it more difficult for their governments to control the changes and they suffered from significant scale privatizations and fast gentrification. Learning from European transitions, Asian socialist countries approach to the transition differently. Usually, these Asian countries shift without political transition, so they have a more stable government to control the situation. Historically, they have controlled the timing and the size of privatization, giving them space to adjust to the transition gradually, making the impact smaller. The ideal scenario for the North Korean government will be similar to China's or Vietnam's transition.

THE INDICATORS OF ECONOMIC GROWTH

	All Countries		Low-income Countries		**Transition Countries**	
Method of Estimating	Fixation	System GMM	Fixation	System GMM	Fixation	System GMM
Human Capital	+	+			+	
Local Investment	+	+	+	+	+	+
Share of Exports	+		+	+		
Infrastructure	+	+				+
Inflation Rate	-				-	-
Foreign Direct Investment				+	+	+
Condition of the System	+	+	+			
Large Scale Privatization						
Small Scale Privatization						+
Corporate Reconstruction						+
Price Liberalization						
Trade / Foreign Exchange System					+	+
Competition Policy						

+ : Positive - : Negative

Fixation Estimating

System Generalized Method of Moments (System GMM) Estimating

: Two ways to estimate the effect of indicators on the economic

Source: *Determinants of Economic Growth in Transition Economies: Their Implications for North Korea* Hyung-Gon Jeong, Byung-Yeon Kim, Jae Wan Lee, Ho-Kyung Bang, and Yi Kyung Hong

The indicators of economic growth are different based on the economic structure of countries. The table above shows the indexes of all nations, low-income countries, and economically-transitioning countries with two types of estimating the effects: the fixation and system GMM. This is because North Korea has the characteristics of both a transitioning country and an underdeveloped country. Based on the table, local investment and foreign investment bring positive effects on economic growth, unlike the inflation rate which has negative effects.

In the case of transition countries, the economy grows with small-scale privatization, corporate reconstruction, and trade/foreign exchange system. As a result, the transition should happen, not only changing the economy but the structural rebuilding.

02

The transition in North Korea is already happening. To prevent the same mistakes that past post-socialist cities suffered, this is the time in which North Korea needs to prepare for the future.

Transition in North Korea

The current state of North Korea and future economic transition scenario

Based on the research found in Hyung-Gon Jeong's article in the Seoul Journal of Economics (2013), "Initial Conditions, Economic Performance, and Reform Prospects in North Korea," the possibility that North Korea can arrive at an unfortunate situation, much like Azerbaijan and Kyrgyzstan, is high without an economic transition. That means the change is required, not elective for this country.

Even though the transition has also already begun in North Korea as of 2002, they have been using the market economy to complement its unstable distribution system. However, the government is worried about the expansion of the market economy. They want to control of this. As a result, they have been repeating the acceptance and suppression of the market economy since then.

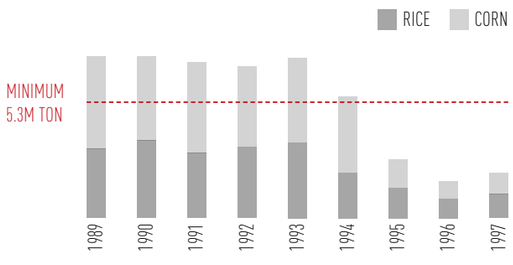
Based on past post-socialist countries, the North Korean economic transition should occur through a gradual process, with significant government intervention, small scale privatization, and high foreign investment, infrastructural improvement, and trade/foreign exchange systems. These strategies are for lowering gentrification speed and minimizing the impacts on the urban structures.

This scenario of economic transition in North Korea can be determined in three stages. The first stage would be by starting to open the market and reforming the economic structure. In this stage, the country opens the domestic market in a limited way, approves illegal markets, and diversifies its ownership system. The second stage would be to intensify the rebuilding that happened in the first stage. Finally, the third stage would be the final preparation for economic transition, by expanding the shift to others such as social and political areas. Through those stages, the government can change the socialist economy to market economy gradually.

ECONOMIC TRANSITION IN NORTH KOREA_TRANSITION OF THE ECONOMIC LAW

1948
The Formation of North Korean Government

1990S
After death of Kim Il-sung
Food production dropped significantly
330,000 people died by famine



2002
Partially accepts marketization by law
- Allow companies market activities
- Allow private commercial
- Open public markets in cities

2003
Establish 300 general markets

2007
Suspend market activities to control marketization

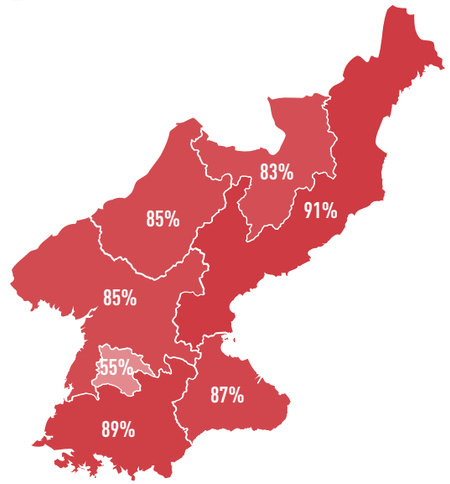
> Intensify famine

2012
Extend from some factories and farms to all agriculture, distribution industries

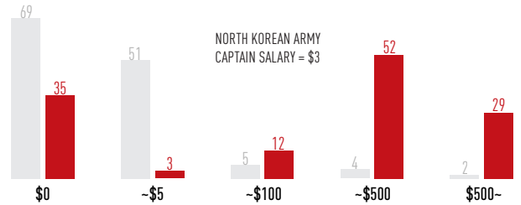
KIM JUNG-UN
Suspend all markets

Connivance
- small commercials on the ground floor of residential building
- Public-private development in housing

PARTICIPATION OF MARKET ECONOMY
_Based on regions



OFFICIAL INCOME AND IN-OFFICIAL INCOME FROM MARKETS
(2013, 133 North Korean defectors)



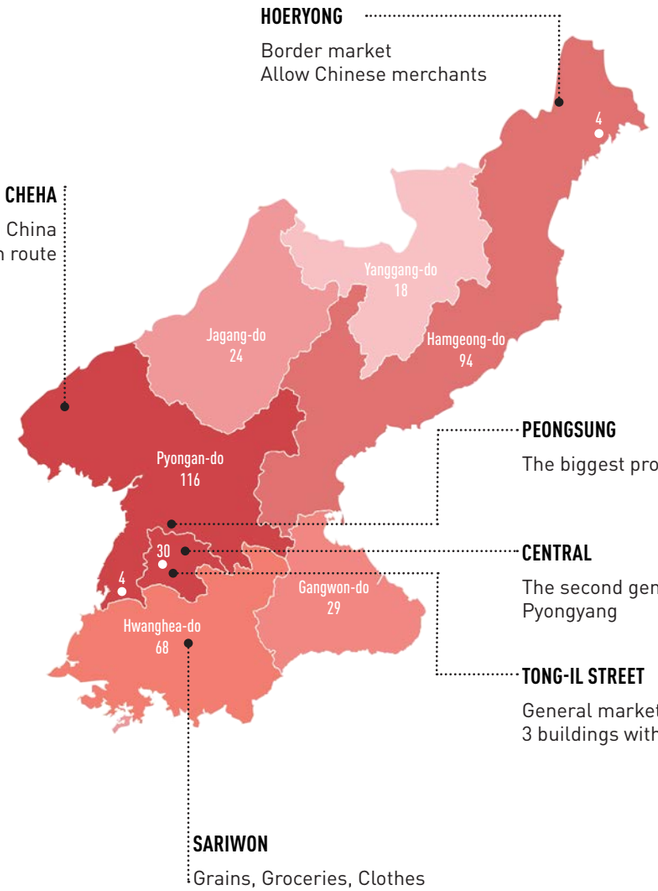
MOST PROFITABLE OCCUPATION (Unit: %)

CURRENCY USE IN IN-OFFICIAL MARKETS
(Unit: %)

PERCENTAGE OF TRADE EXPERIENCE IN MARKET
(Unit: %)

The North Korean government is based on a socialist economic system that distributes all production equally. However, after the death of Kim Il-sung, their first dictator, they suffered from a severe famine. The government realized that to solve this situation, they need a market economy, so they partially accepted one in 2002. Furthermore, they built 300 public markets throughout the country. However, they wanted to control the markets, so they suspended it again in 2007, which directly intensified famine in North Korea. As a result, they extended the market economy in 2012. The marketization is out of control now. The government cannot manage it, which means the economic transition is already taking place in North Korea, and it is time for them to prepare for the future that marketization will bring.

MAIN MARKETS OF NORTH KOREA_NUMBER OF MARKETS AND MAIN LOCATIONS



HOERYONG

Border market
Allow Chinese merchants

CHEHA

Imports from China
National distribution route

PEONGSUNG

The biggest product distribution center

CENTRAL

The second general market in Pyongyang

TONG-IL STREET

General market started in 2003
3 buildings with parking lots

SARIWON

Grains, Groceries, Clothes

_TYPOLOGY OF NORTH KOREAN COMMERCE

DEPARTMENT STORE_

There are less than 20 department stores in North Korea for the reason that this kind of retailer is considered to pander to the upper class who want luxury products. These department store buildings usually facilitate shops, storage space, offices, conference rooms, and restaurants.

RETAIL/STREET VENDER_

Street venders have small snacks or drinks. In the past, government was running retails directly but now individuals can occupy with some rents.

GENERAL MARKET_Official Market

This is indoor market which has started in 2003 under the government control. The merchants pay rent to the government and mostly carry groceries and primary products. The closer to the entrance, the rent is more expensive.

JANGMADANG_Illegal Market

This has started naturally in 1990 to maintain a livelihood and held in streets, alleys, or private houses paying a little rent for the owner. It is outnumbered by official markets and getting larger and increases. Usually it starts on outskirts of cities, extends to the riverside or yards inside the city, and becomes part of the city.

SCENARIO OF ECONOMIC TRANSITION_GRADUAL TRANSITION

	Economic Transition	Radical/Gradual Transition	Government Intervention	Privatization	Foreign Investment
North Korea (Future)	Y	Gradual Transition	High	Small Scale	High

Land Ownership	Infrastructure	Trade / Foreign Exchange System	Gentrification Speed	Impact on Urban Structure
Land Leasing	High	High	Low	Minimum

STAGE 01 START TO OPEN THE MARKET AND REFORM THE ECONOMIC STRUCTURE

OPEN DOMESTIC MARKET IN A LIMITED WAY

Trade with other countries should be part of the initial plan. It is necessary to encourage foreign direct investment, which brought positive effects on economic growth in past transitioning countries. To start this in a limited way, the North Korean government would determine special economic zones to expose themselves. This process is not only about the geographical location but about all the limitations to minimize the intervention to the local economy. It is reasonable to decide the economic zones based on existing big cities.

APPROVAL OF ILLEGAL MARKET

Approval of illegal markets is the another primary first step. With the illegal markets, all transactions are bound to be unlawful, and this illegal transaction leads to corruption in bureaucratic society, which parasites the markets and seeks private interests. Therefore, it is necessary to expose those markets. Furthermore, those existing markets can be solid foundations for economic transition.

DIVERSIFICATION OF OWNERSHIP SYSTEM

Support for private ownership is the next step in making markets meaningful, strengthened, and activating economic transactions. It can start from the agricultural industry, which is currently a dominant part of the North Korean economy and expand to others like the Chinese model did. The Chinese government determined industries to apply new ownership systems, took time to adjust, based on the result, improved their strategies, and expanded to other areas.

STAGE 02 INTENSIFY

INTENSIFY ALL ECONOMIC CHANGES

After the changes in stage 01 get settled, the next step is intensifying all of them, which is expanding the number of industries opened to foreign investment and private ownership systems, and with existing markets, there will be many more new markets. These changes will be catalysts of their declining economy and lives, and the changes will be accelerated through time. At this stage, the government would evaluate their policies, develop, and apply more actively.

STAGE 03 FINAL PREPARATION FOR ECONOMIC TRANSITION

STABILIZATION AND EXPANSION

When stage 02 is completed, it is time to prepare for economic transition, which is stabilization. They need to digest all the economic changes and prepare for the completion of economic transition. After that, they can widen the transformation into other parts of the country, such as infrastructure and society.

RECONSTRUCTION OF SOCIAL SYSTEM

In this stage, the government needs to reconstruct its systems aside from the economy. Now that they have a properly working economy, they can look at social networks such as education and health.

DECENTRALIZATION OF POLITICAL POWER

The political climate in North Korea is the most challenging obstacle, although the needs for change are evident. However, they still need to decentralize the political power to a certain level as part of the transition.

2 New National Planning, H-city

01

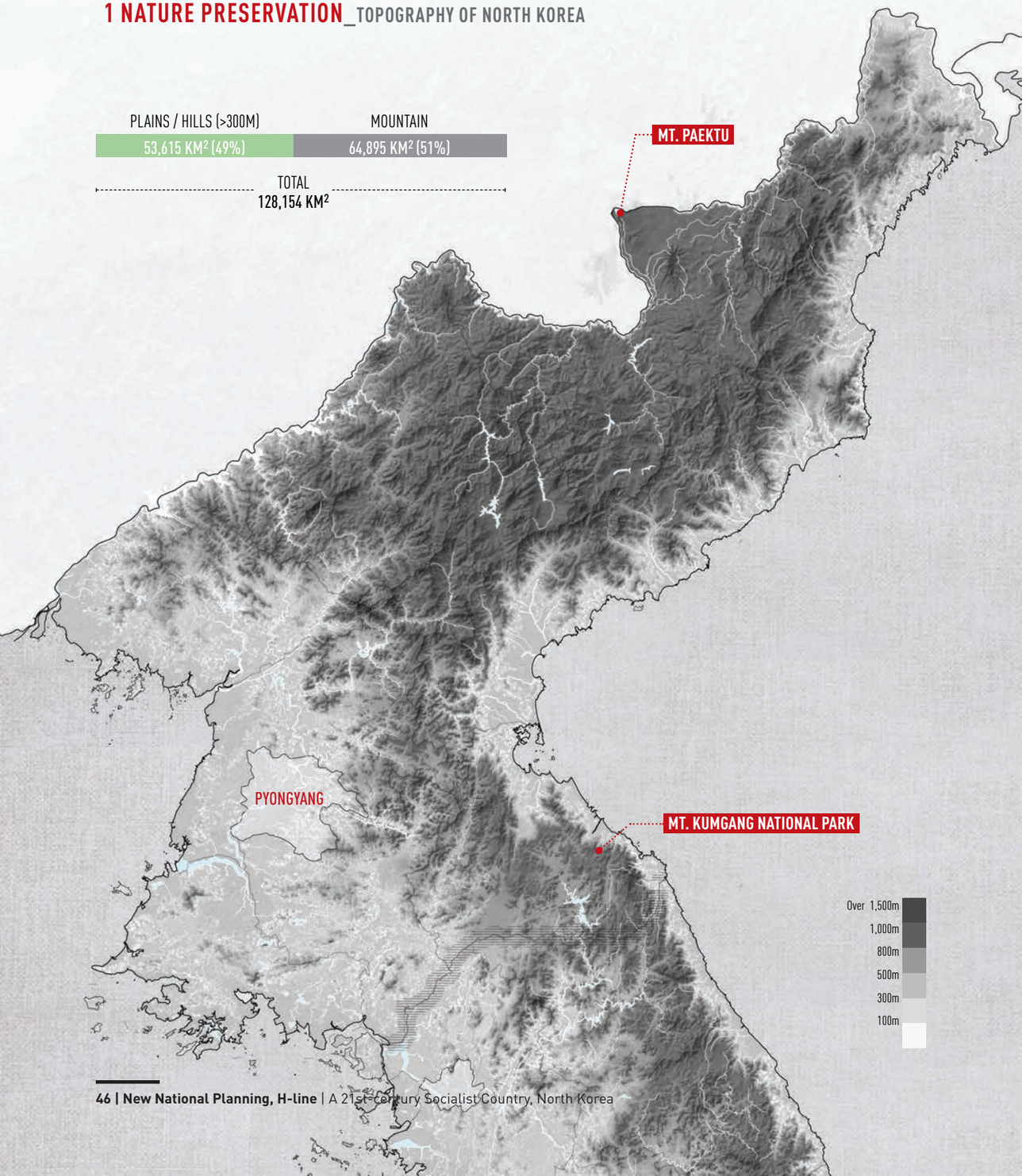
1 Nature Preservation
2 Water
3 Energy
4 Food
5 Mobility
6 Housing
7 Trade to the world
8 Industrialization
9 Economy

9 Urban Challenges

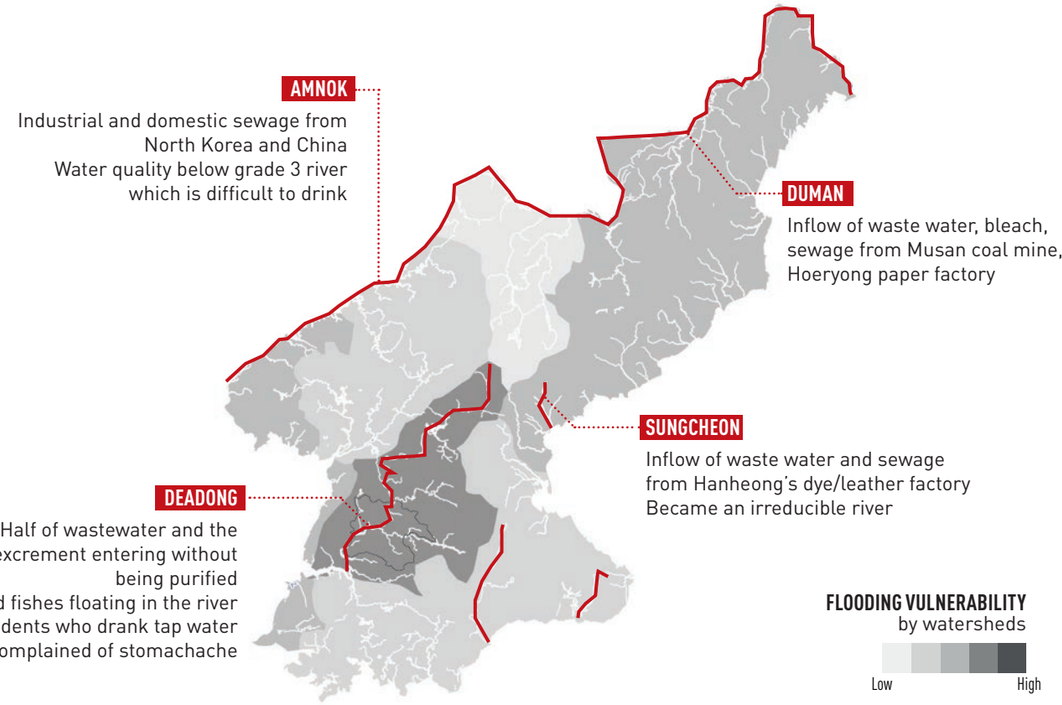
That North Korea is suffering from

It is hard to say whether North Korea is functioning properly as a country. There are nine urban challenges that make the country dysfunctional.
First, North Korea 50% of North Korea is made up of mountains. That means more than half of their land is not easily developed.
Along those mountain lines, there are lots of rivers, however, because most of the precipitation is narrowed to the summer season, they have drought and flooding issues.
Therefore, water infrastructure is mandatory in this country, but most of their systems are aged.
Also, the most prominent use of water is hydroelectric, but it's not sufficient enough to serve the entire population because of the deterioration of their facilities.
Lots of other issues, such as insufficient public transportation, come from this shortage of energy.
Furthermore, food production is not enough either, mainly, in alpine regions. One interesting fact is that they have enough grain with imports from China, but the balance of nutrition is collapsed.
Even their mobility system does not working correctly. People use the train for long journeys, but in day-to-day life, the bike is the number one mode of transportation in North Korean. They have other options like subways or streetcars, but these often stop running.
North Koreans mostly live in rows of house or detached houses, but only 70-80% of them even have a home, and the stability of these houses cannot even be guaranteed.
Most houses are built at a rapid pace for domestic, and international propaganda use, so these structures are not stable. If considering these facts, the housing shortage problem is more severe than the current working number.
North Korea is currently trading with a minimal amount of countries, and mostly for mineral fuel. Their primary trading system is located along train tracks. The industry here is still based on primary and secondary sectors. Their economy has not gotten better with time.
The failure of their economic system is the focal point for all of the challenges. It becomes more apparent when we compare it to South Korea.

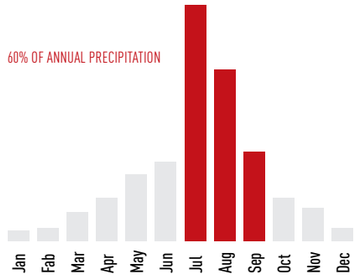
1 NATURE PRESERVATION_TOPOGRAPHY OF NORTH KOREA



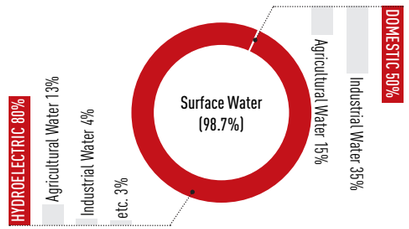
2 WATER_THE QUALITY AND THE WATER CONSUMPTION OF MAIN RIVERS



PRECIPITATION by month

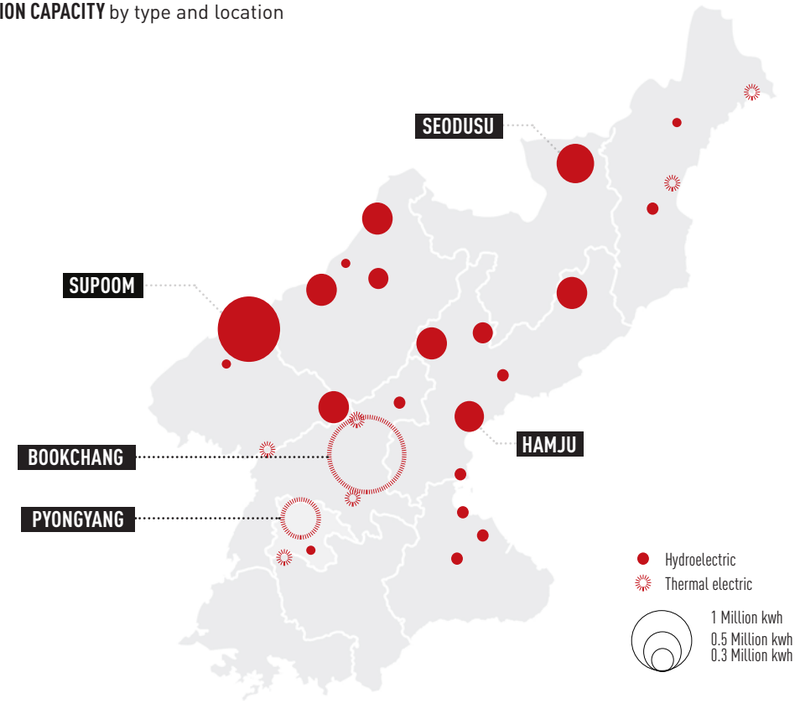


WATER RESOURCES STRUCTURE and the utilization

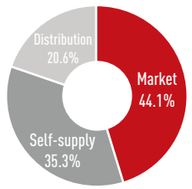


3 ENERGY_THE SUPPLY AND USE

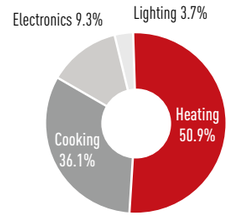
GENERATION CAPACITY by type and location



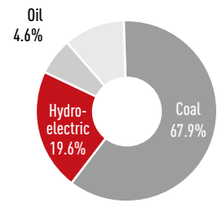
ENERGY SUPPLY WAY by ratio



DOMESTIC ENERGY USE by ratio

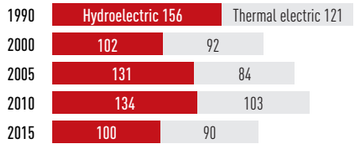


ENERGY SOURCE by ratio



ENERGY OUTPUT from 1990 to 2014

ELECTRIC ENERGY in billion kwh

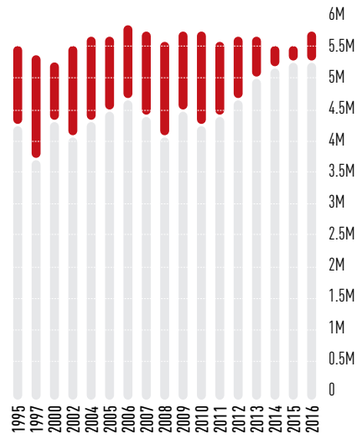


4 FOOD_THE PRODUCTION AND SHORTAGE

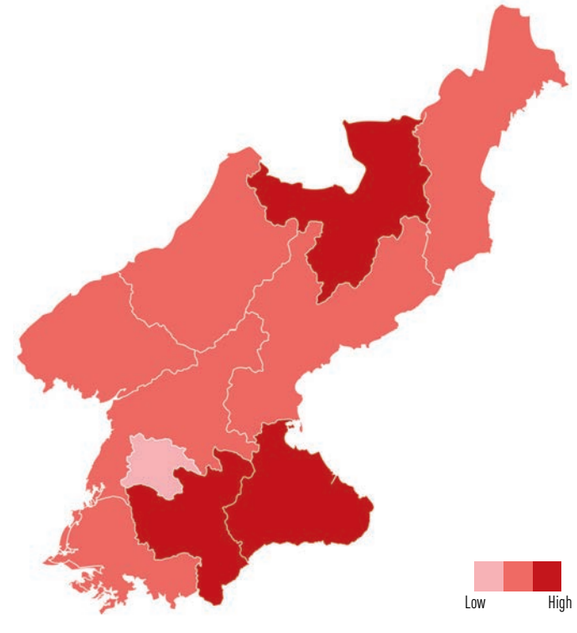
DAILY FOOD SUPPLY by rank

Rank	Supply	Recipient
1	900g	Harmful Occupation
2	800g	Coal Miner
3	700g	General Ocupation
4	600g	College Student, Patient
5	500g	Middle School Student
6	400g	Elementary School Student
7	300g	Eldery, Kindergartener
8	200g	2-4 year olds, Prisoner
9	100g	Younger than 1 years old

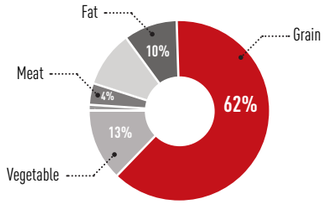
FOOD PRODUCTION by month

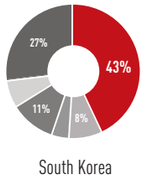


NUTRITION DIFICIENCY LEVEL by regions



SOURCE OF NUTRITION compared to South Korea

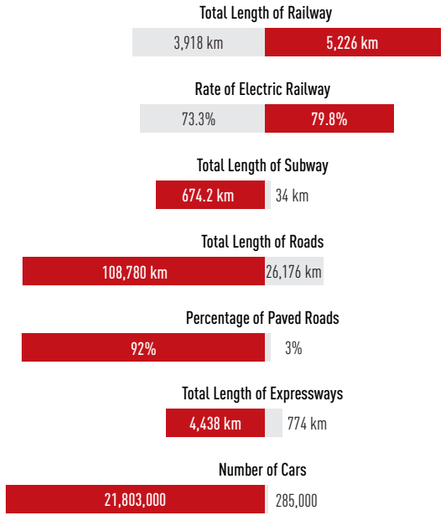




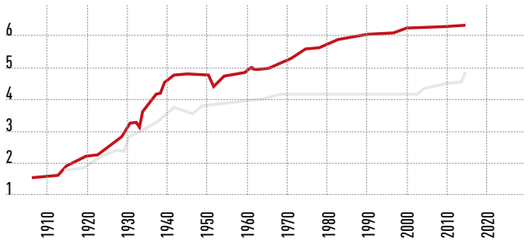
The lack of food production in North Korea began in the 1980s. They failed to develop their own agricultural administration, called Juche Nongbub. Because of the collective farming that comes with socialism, production is at a decline. Even in the 1980s, the average amount of production was only 4.15 million tons, which is two million less than the minimum requirement. This made the North Korean government decide to reduce rations from 700g to 546g per person (22% reduction). After 1990, most other socialist countries like the USSR stopped supporting North Korea, and this made their situation worse.

5 MOBILITY_THE TYPOLOGIES

SOUTH KOREA | NORTH KOREA



TOTAL LENGTH OF RAILWAY 1910-2015 in 1,000km



TYPOLOGIES OF TRANSPORTATION in North Korea

TRAIN

The most common for long distance journey
International train connected to China and Russia

SUBWAY

Only in Pyongyang, the capital
Utilization by Pyongyang citizen and Tourist

STREET CAR

Only in Pyongyang, Using rails
Using electrical wires in rural area

BUS

Cross-country bus in 6 cities in North Korea
40 routes in Pyongyang

SERVI-CAR

The second common public transportation
Run by military or administry of North Korea

TAXI

Only in Pyongyang, Double-shift system
The fare from $2

CAR

Only the executive members

BIKE

The most common transportation method
No.1 property for North Korean

In comparing North Korea to South Korea, there are only two elements worth looking at: the total length of the railway and the rate of an electric railway. Except for those two elements, every other statistic concerning mobility is much lower in North Korea. Because of their energy shortage, most of trains, subways, and streetcars are not operating correctly. Therefore, the most common transportation for a North Korean is a bike. The servi-car is another by-product of governmental dysfunction.

_ROADS AND RAILWAY NETWORK

6 HOUSING_THE CONSTRUCTION AND SHORTAGE

333-666 people/ha
Population Density

67-135 units/ha
Housing Density

70-80 %
Housing Penetration

1M Housing
New Housing Construction Needed

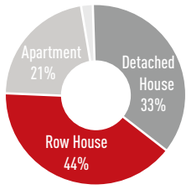
24,897,000
Population in 2016

5,887,471
Total Number of Household

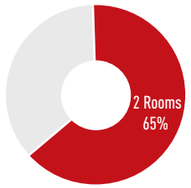
4.22 people
Average Number of Family Member

2M-3M Housing
Old Housing Need to be Improved

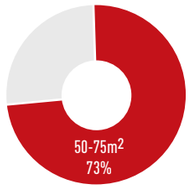
HOUSE TYPOLOGY by ratio



NUMBER OF ROOM in a house



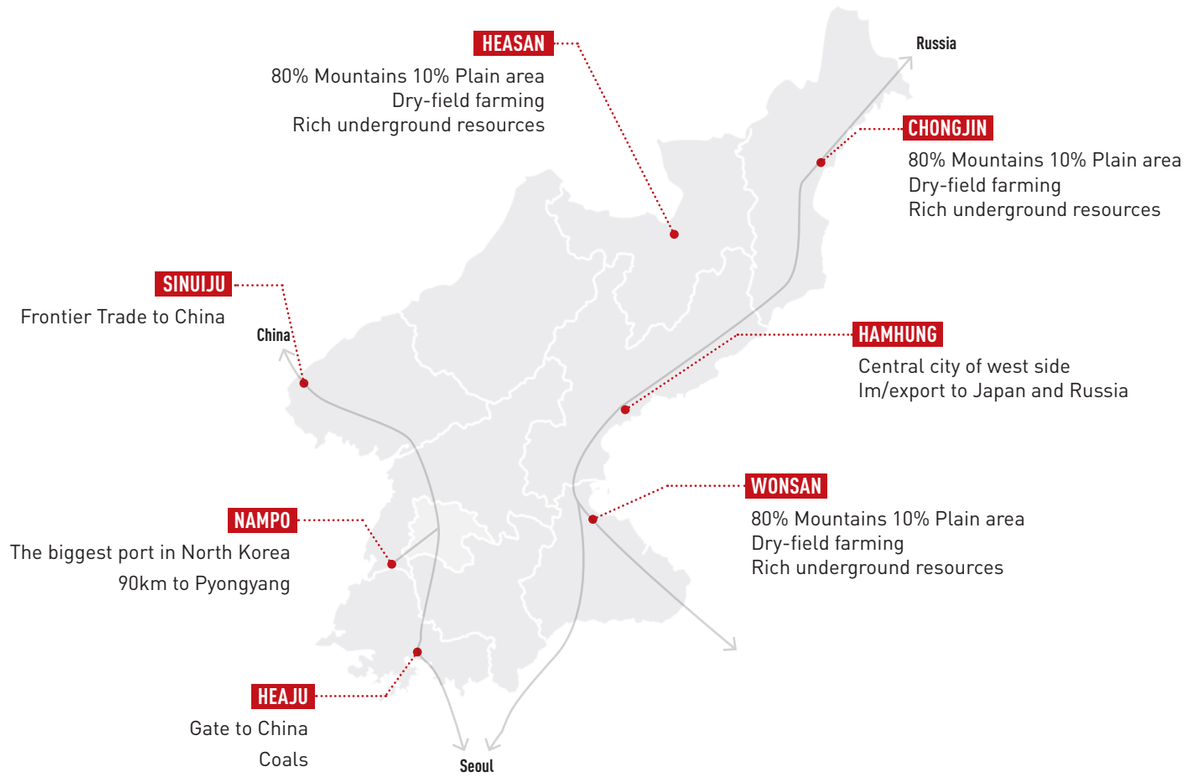
SIZE OF HOUSE in North Korea



HOUSING CONSTRUCTION through time

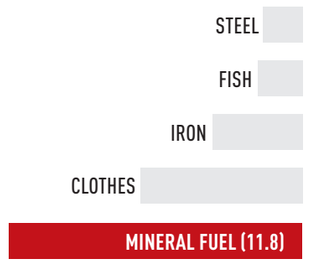
Time	Project	The number of housing built		
Kim Il-sung	1954 – 1956 Post-war reconstruction plan 1957 – 1960 5-year plan	771,700	18.6%	
	1961 – 1969 The first 7-year plan	800,000	19.2%	(37.8%)
	1971 – 1976 6-year plan	886,000	21.3%	(59.1%)
	1978 – 1984 The second 7-year plan	750,000 - 1,050,000	25.3%	(84.4$)
	1987 – 1993 The third 7-year plan	290,000 - 340,000	8.1%	(92.5%)
Kim Jung-il	Unknown	300,000	3.75%	(96.25%)
Kim Jung-un	Unknown	300,000	3.75%	(100%)
Total		3,797,500 – 4,147,500	100%	

7 TRADE TO WORLD_MAIN TRADING CITIES IN NORTH KOREA

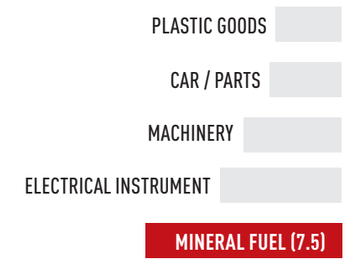


THE TOTAL EXPORTS (2008-2017)

THE MAJOR EXPORTS (2015, Billion $)

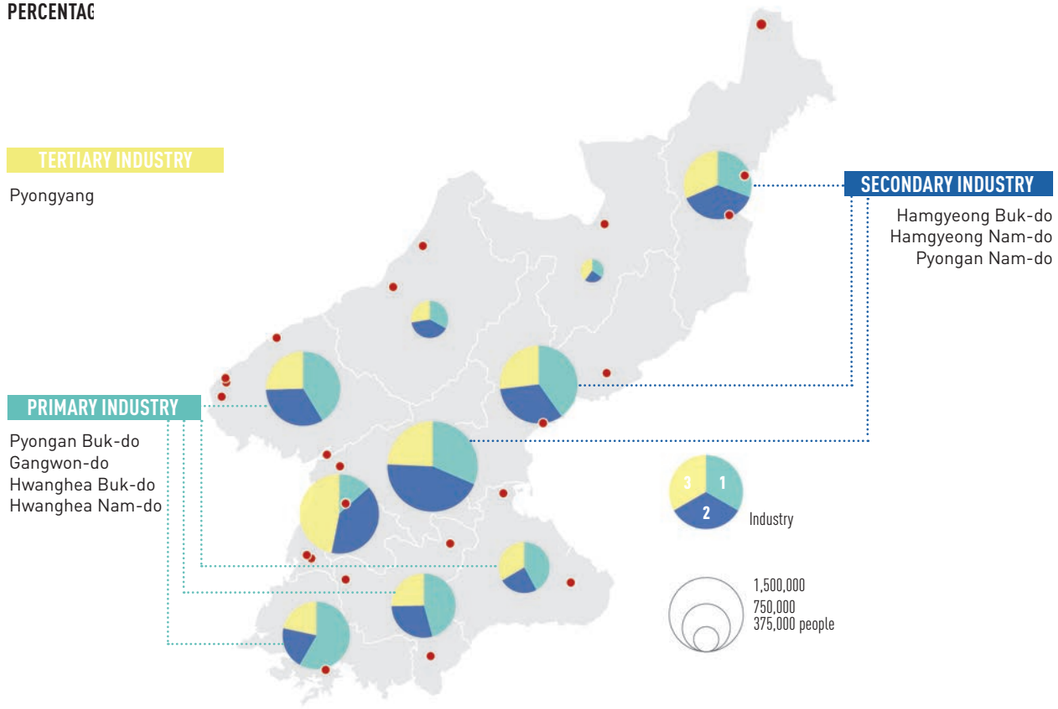


THE MAJOR IMPORTS (2015, Billion $)

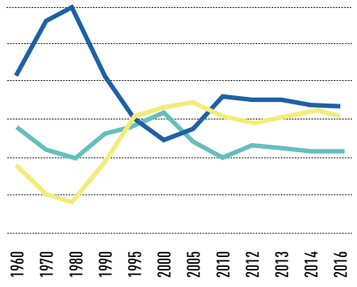


8 INDUSTRIALIZATION_THE STRUCTURE

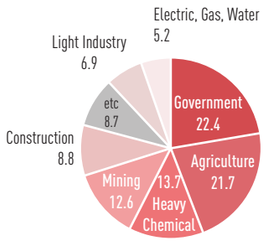
PERCENTAG



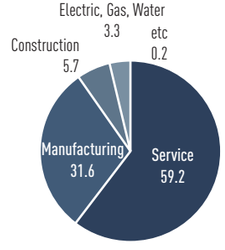
THE MAJOR IMPORTS (2015, Billion $)



INDUSTRY STRUCTURE North Korea



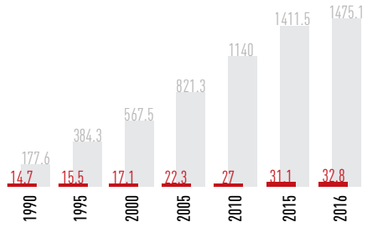
INDUSTRY STRUCTURE South Korea



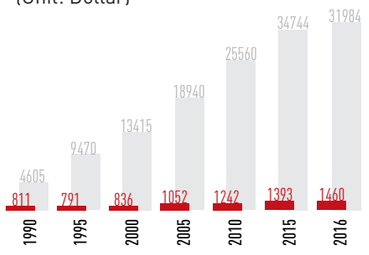
9 ECONOMY_MARKETIZATION AND LOCAL ECONOMY

North Korean government is controling markets and local economy by limiting physical spaces.

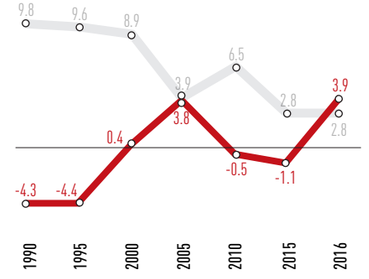
GROSS NATIONAL INCOME
(Unit: Billion Dollar)



PER CAPITA GROSS INCOME
(Unit: Dollar)



ECONOMIC GROWTH RATE (Unit: %)



02

From its beginning, North Korea has not been suitable for socialist planning strategies. Korea was historically under one whole system. Based on the landscape, each municipality has uniqueness and complement each other.

Regional Planning in North Korea

The Failure of Socialist National Planning

The Korean peninsula had been treated as one system historically. Korea is a small country, so it is apparent that it needs different national planning strategies from other big countries. Under the one network, each region had concentrated its characteristics to strengthen it.

However, after the ceasefire agreement between the South and North Korea, each side had been modernized differently. South Korea stuck to the historical strategy, but North Korea did not. This country was developed with socialist planning strategies. One of the main ideas was to make each state self-sustaining, which was not suitable for a small country like North Korea. Because of this strategy, each state did not trade with each other. This planning tears apart the nation into pieces. Therefore, the new national plan for North Korea should be to make the country one system again.

The H-city plan uses the train lines to connect the whole country, the foundation for the project. Notably, the main transit corridor shaped like an H has lots of potentials. This line goes from South Korea to China, Russia, and European countries. It can be a significant trade route if North Korea decides to open their country.

The H-line will be a catalyst for future developments, and this development will attract lots of people. This tendency changes the population distribution and urbanization of North Korea. Both of them will be concentrated along the H-line and will form H-city.

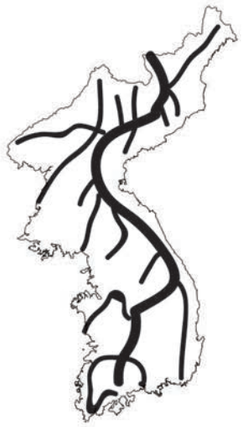
To support transit, industries, and developments, a sustainable energy source is crucial. One of the most efficient options is a wind farm, using the characteristics of a country that has lots of mountains.

Efficient food production and distribution is another crucial matter in this nation. If the government promotes alpine agriculture along the transit line, they have enough land to feed their population.

Finally, they are in need of a new industrial system. This strategy is to prepare for the future in considering existing assets in the country; Keeping primary industries, building stable secondary sectors, and introducing tertiary sectors.

KOREAN PENINSULA_REGIONAL CHARACTERISTICS

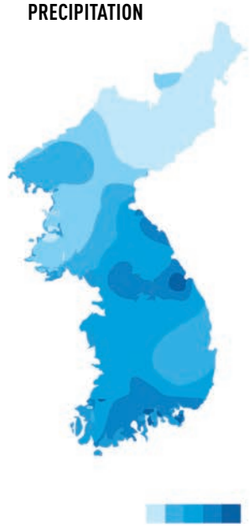
MOUNTAIN LINES



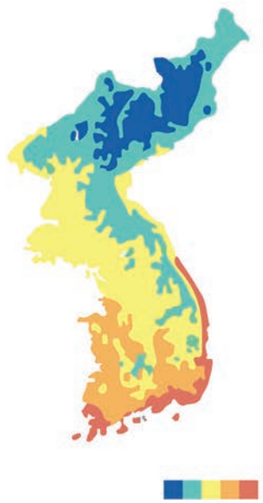
TOPOGRAPHY

RIVERS

PRECIPITATION



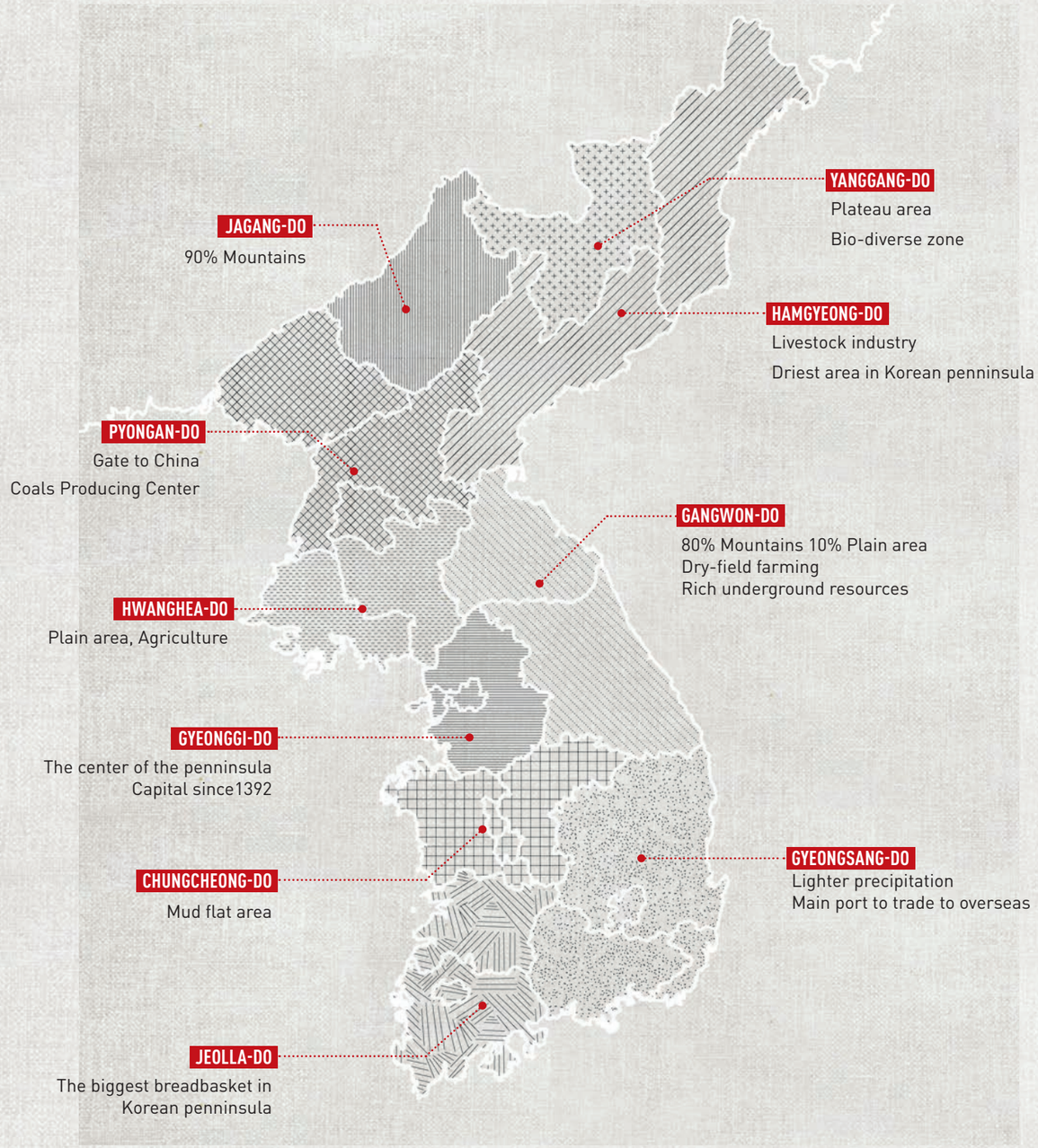
CLIMATE



SOILS

Historically, the Korean peninsula works as one mega region. As a smaller country, this strategy was for surviving. Only when each regions work together, can the country work properly, because each municipality has different specialties based on its location and landscape.

_9 MUNICIPALITIES AND ITS CHARACTERISTICS

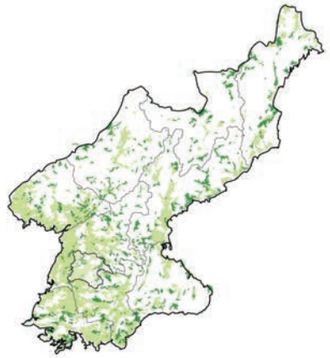


EXISTING NATIONAL STRUCTURE_REGIONAL CHARACTERISTICS

TRAIN LINES

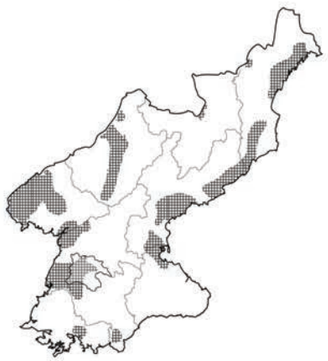
URBANIZED AREA

AGRICULTURE / GRASSLAND



ENERGY

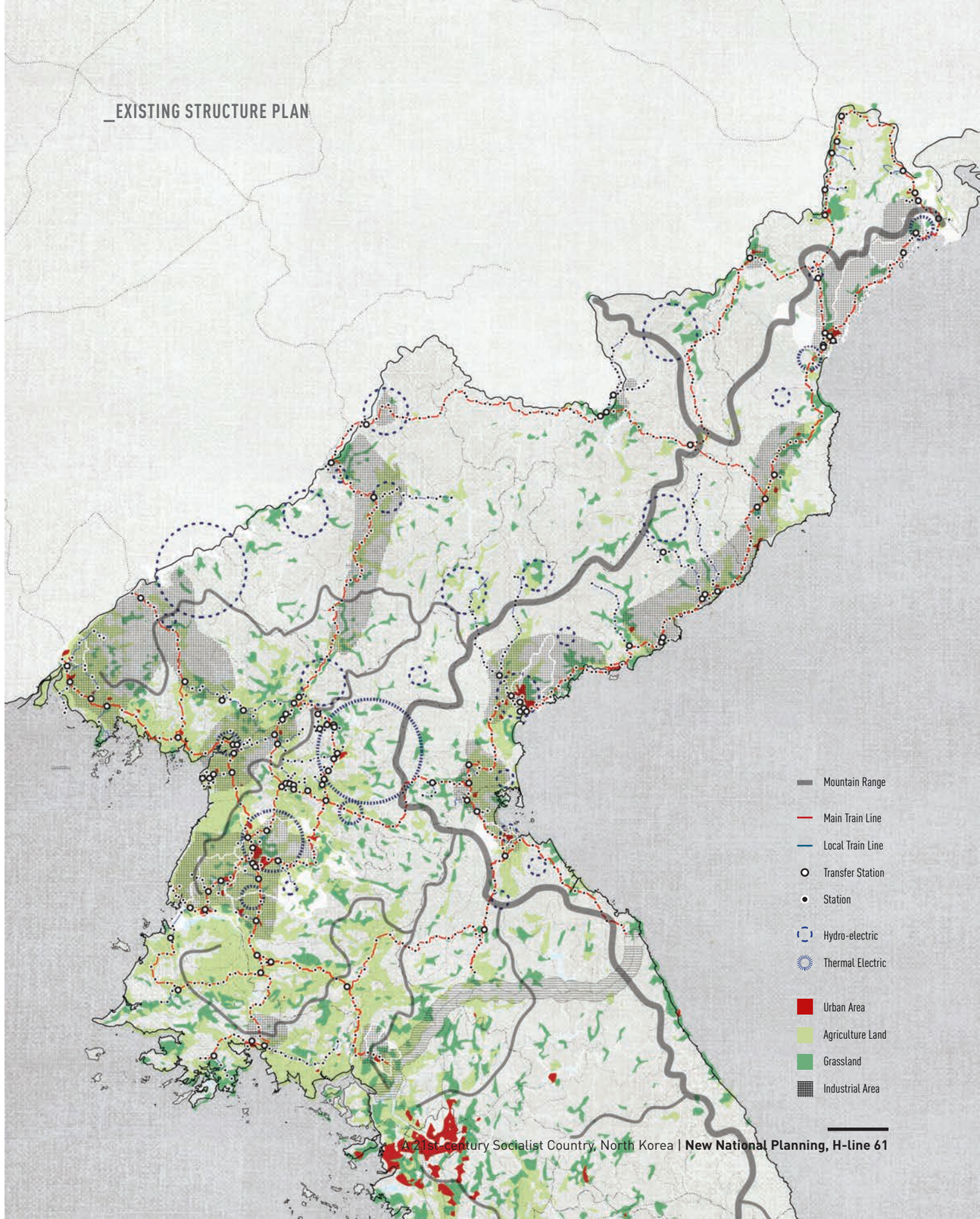
INDUSTRIAL AREA



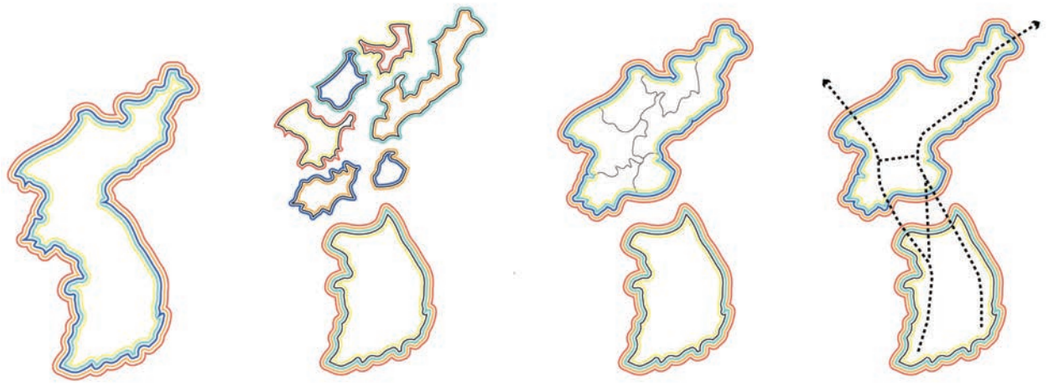
8 MAIN CITIES

After the separation of North and South Korea, North Korea started to develop their country according to socialist ideas. For instance, each municipality tried to be self-sufficient, they even discouraged trading one another. Most goods were scattered under the guise of even distribution as part of socialist planning but also to prepare for potential wartime—so that if one municipality is attacked, the others would survive. However, these strategies were not suitable for a small country like North Korea. As a result, the country has broken into pieces, and no municipalities have functioned correctly. The failure of national planning is one of the reasons for the unsustainability of this country.

_EXISTING STRUCTURE PLAN



FUTURE DEVELOPMENT SCENARIO_BACK TO ONE WHOLE COUNTRY



-1950

In the past, the Korean peninsula was under one system. It enforced the characteristics of each region to survive as a small country. Each municipality had its role in the country. For instance, the southern side, like Jeolla-do, is the leading rice production area, and the northern side is full of mineral resources.

1950 - PRESENT

After the Armistice Agreement between North and South Korea, the north was developed under socialism, and the south under capitalism. As a result, the north split the country into pieces, but the south did not. This decision has affected their countries more than expected.

MAKE AS A ONE SYSTEM

FUTURE STAGE 01

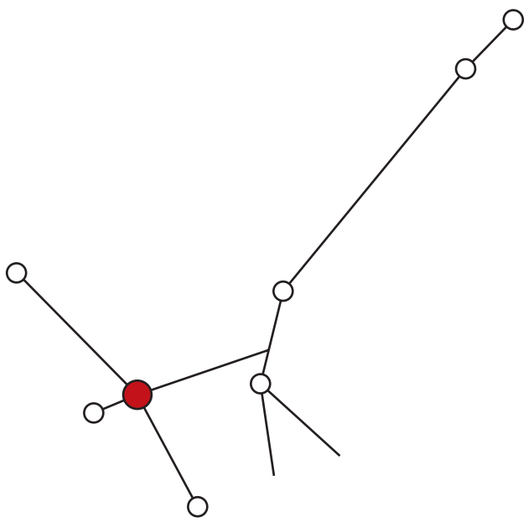
The first step toward future development is making national plans to revert North Korea back to one system again. The new national strategies should be based on enhancing current assets such as the four economic hubs in North Korea.

FUTURE DEVELOPMENT

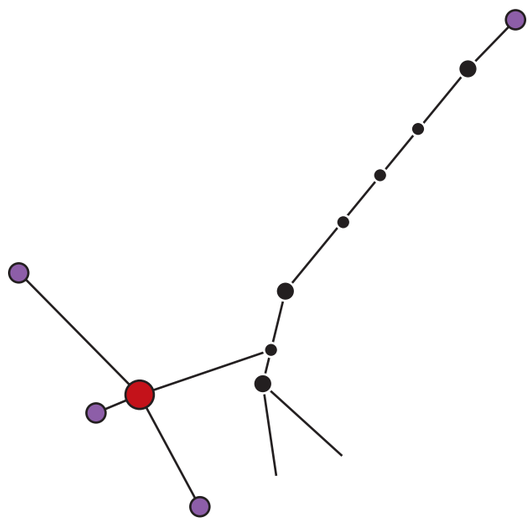
FUTURE STAGE 02

The second stage is stitching the country by transit lines. The h-shape train corridor connects the Korean peninsula to Europe and will be the catalyst for future developments with the four economic hubs. This transportation is the base structure for the new national planning called H-city.

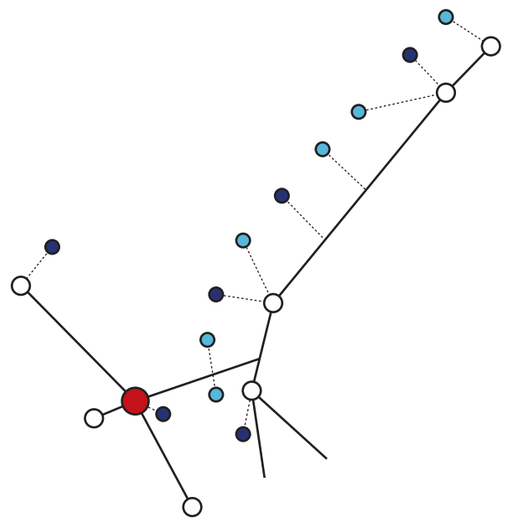
_FOUR ECONOMIC HUBS IN NORTH KOREA



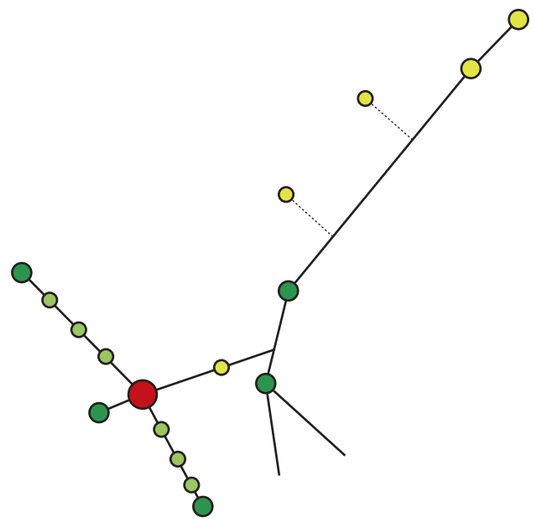
MAIN CITIES WITH H-LINE



INDUSTRIAL SYSTEM

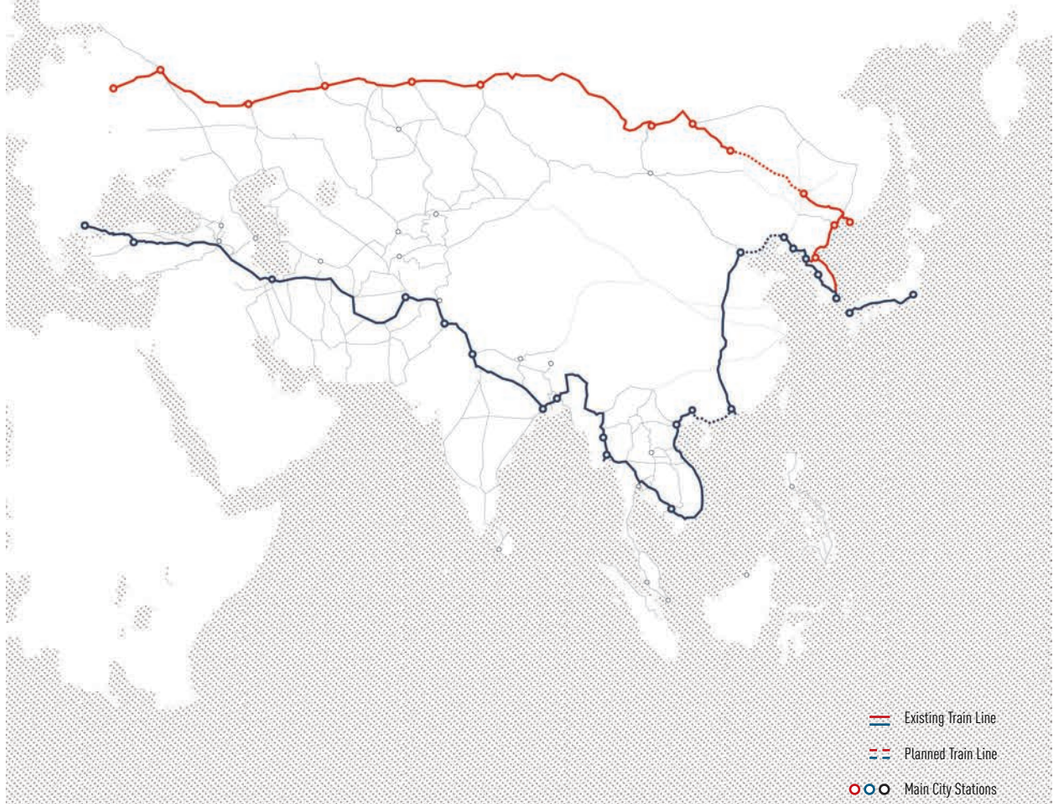


ENERGY SYSTEM



FOOD PRODUCTION SYSTEM

NEW TRANSPORTATION STRUCTURE_H-LINE TRAIN SYSTEM

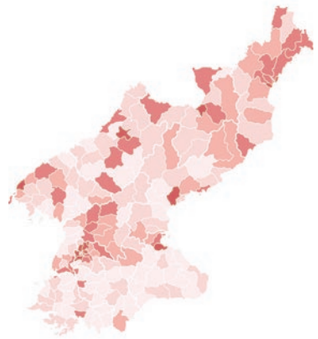


The train system is the key to future national planning in North Korea. This corridor is connecting from the end of South Korea to Russia, China, and European countries.
The H-line is made up of the two vertical train lines along the North Korean coastline and one line connecting the two in the middle.

This H-line is stitching four economic hubs with eight main cities in the country; Pyongyang, Nampo, Sinuiju, Geasung, Rason, Chongjin, Hamhung, and Wonsan. Because of the connection to Seoul, which is the capital of South Korea, and China the west part of H-line would have lots of potential to be stronger.

This transit corridor is a fundamental framework of H-city and a catalyst for future developments in constructing a megaregion.

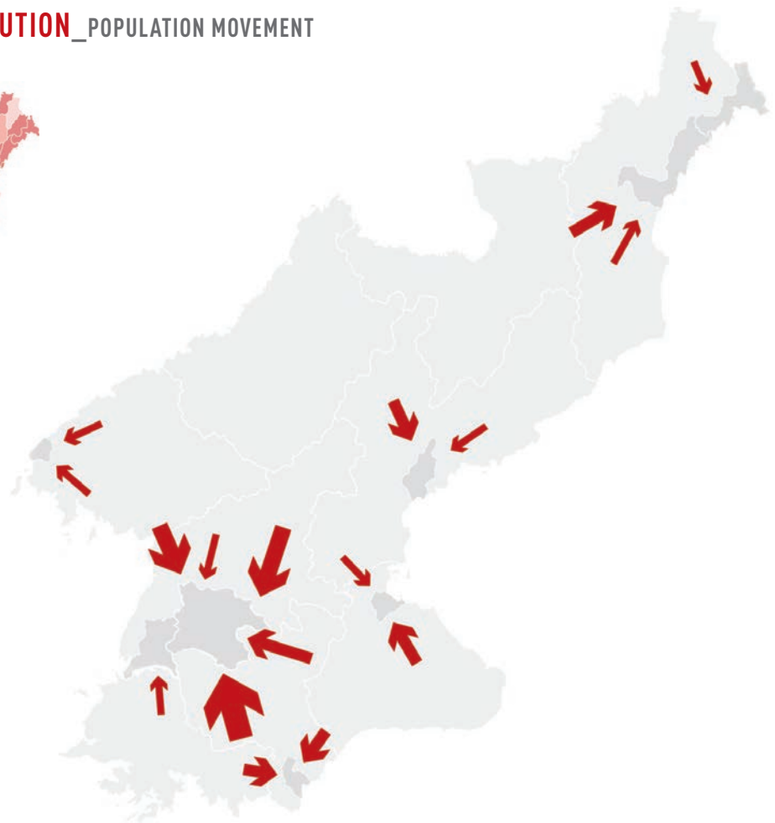
POPULATION DISTRIBUTION_POPULATION MOVEMENT



CURRENT URBANIZED AREA

25,367,910

Current Population in North Korea



82.9 % in 2010

Urbanization level in South Korea

60.2 % in 2010

Urbanization level in North Korea

PREDICTED POPULATION MOVEMENT AFTER ECONOMIC TRANSITION

26,495,618 by 2040

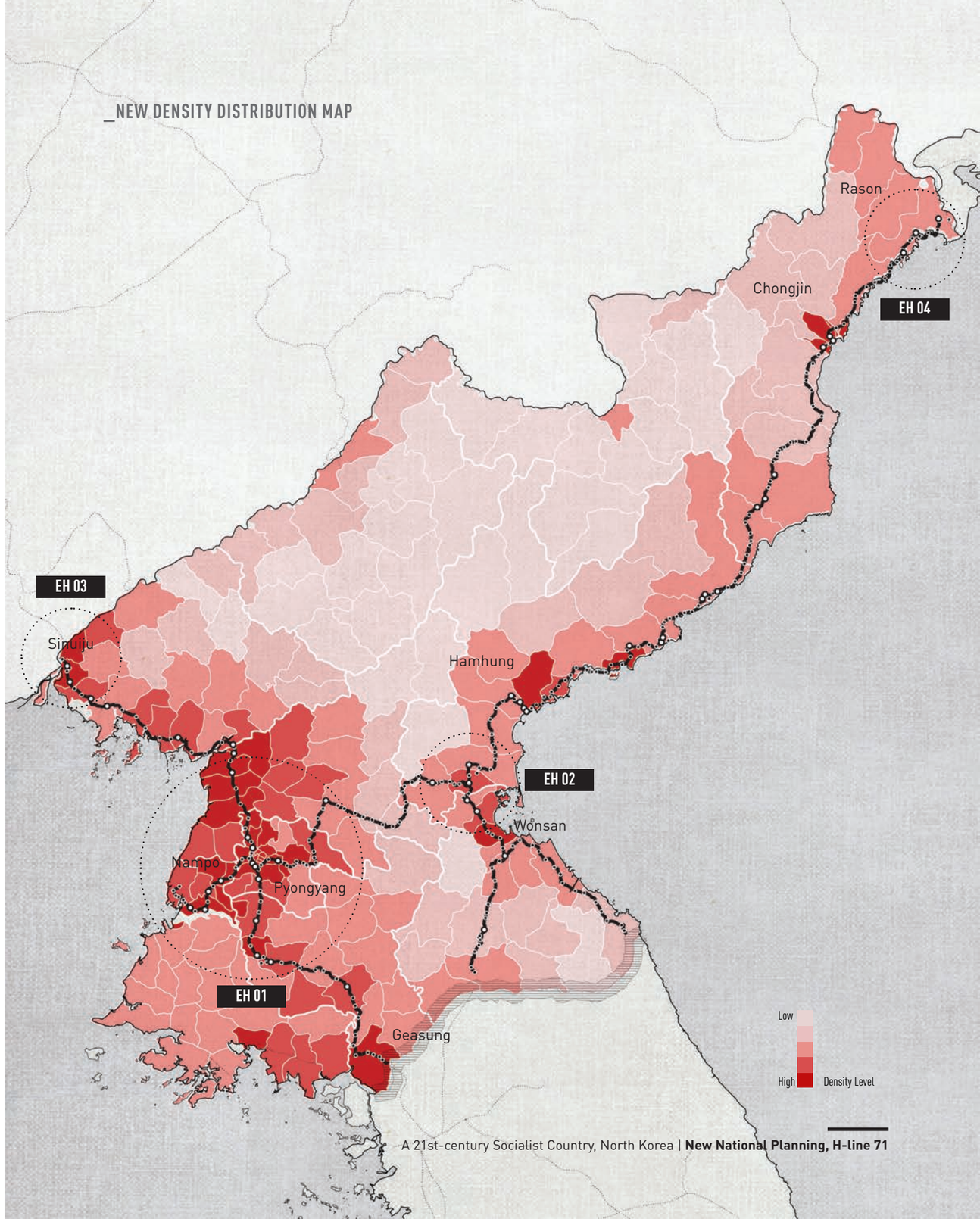
Predicted Population in North Korea

After their economic transition, the H-line will start to be activated, and lots of people will move looking for jobs within the country or even from outside. This change will affect the population distribution of North Korea entirely. The predicted population of the country is 26,495,618 by 2040, which is not much different than the number in 2012, which was 24,589,122. However, this number will be concentrated along the H-line, especially toward the western part of H-city.

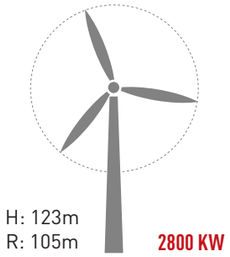
This change will affect urbanization too. The urbanization level of South Korea is 82.9%, which is 22.7% higher than North Korea. If this country is urbanized more, the area will be along H-line, too, like the population movement.

Based on the assumptions, the new density map is built.

_NEW DENSITY DISTRIBUTION MAP

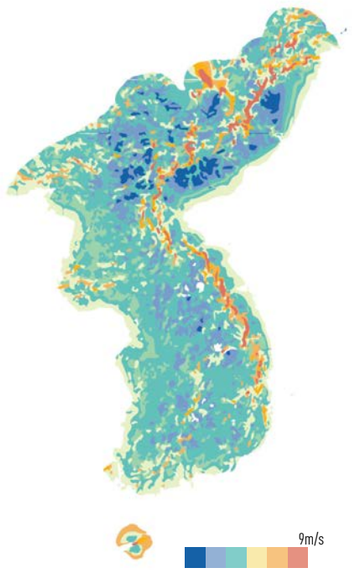


NEW ENERGY RESOURCE_WIND FARM

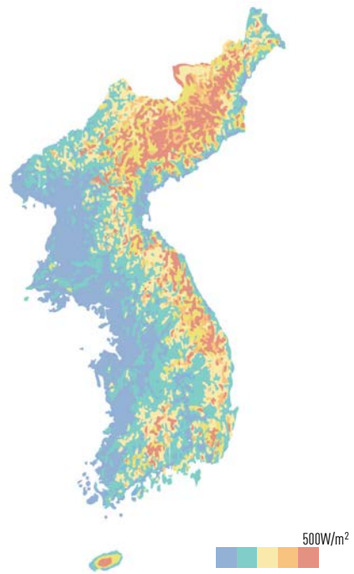


2800 KW

WIND SPEED



WIND DENSITY



5,000,000 KW by 2044
Green Energy Future Plan in North Korea

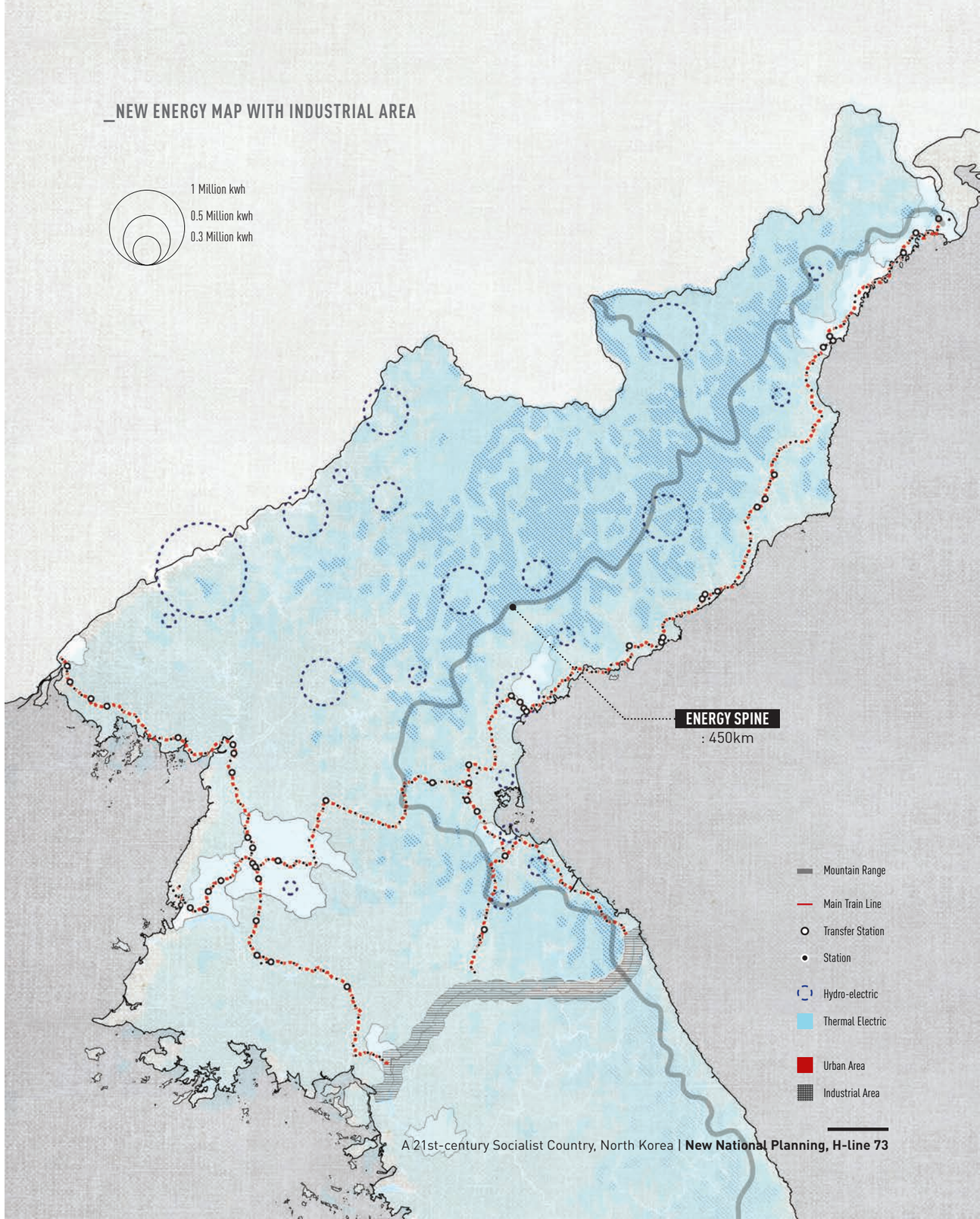
1,785 Wind Power Plants
To Achieve 5,000,000 KW

150 m
Minimum Interval

270 km
For 1,785 Wind Power Plants

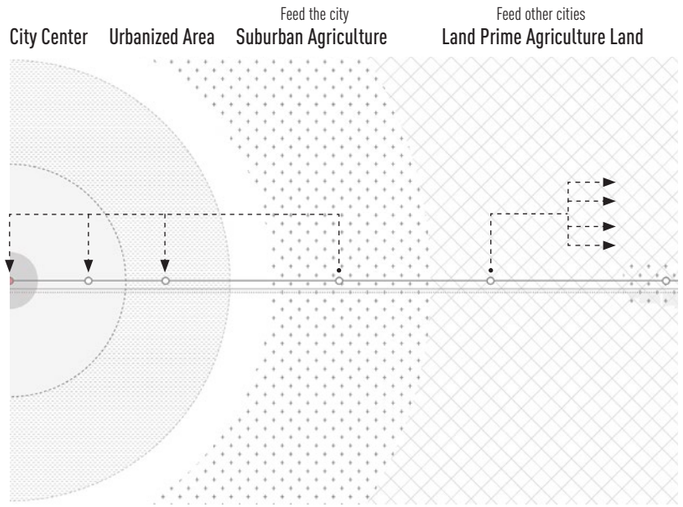
This country is suffering from an energy shortage, and even they are using coal mostly, which is not sustainable. Therefore, it is necessary to provide a stable supply of energy systems. Among various green energy options, the most suitable and realistic choice is a wind farm.
Furthermore, according to the wind speed and density map, the areas along the mountain range are appropriate for wind farms.
Is this energy spine enough to serve the country? Based on the Green Energy Future Plan done by the North Korean government, they are planning to generate 5,000,000 kW by 2044. This number means there will be 1,785 wind power plants, requiring 270km. The energy spine is 450km in length which is longer than 270km. This energy can be delivered directly to the east side of H-city through local train lines.
North Korea needs financial support for initial installation, but the combination of a hydro-electric power plant and wind farm can be a sustainable energy source.

_NEW ENERGY MAP WITH INDUSTRIAL AREA



NEW FOOD SYSTEM_ALPINE AGRICULTURE

FOOD DISTRIBUTION SYSTEM



2,300 Calories
For a Person per Day

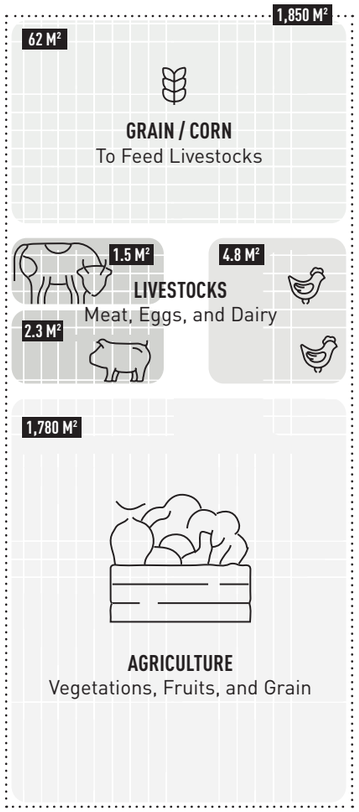
1,850 m²
Land Needed per a person

TO FEED A PERSON

5,537,900 Ha
New Productive Land in NK

29,934,595 People
Can be Feeded with 4,103,600 ha

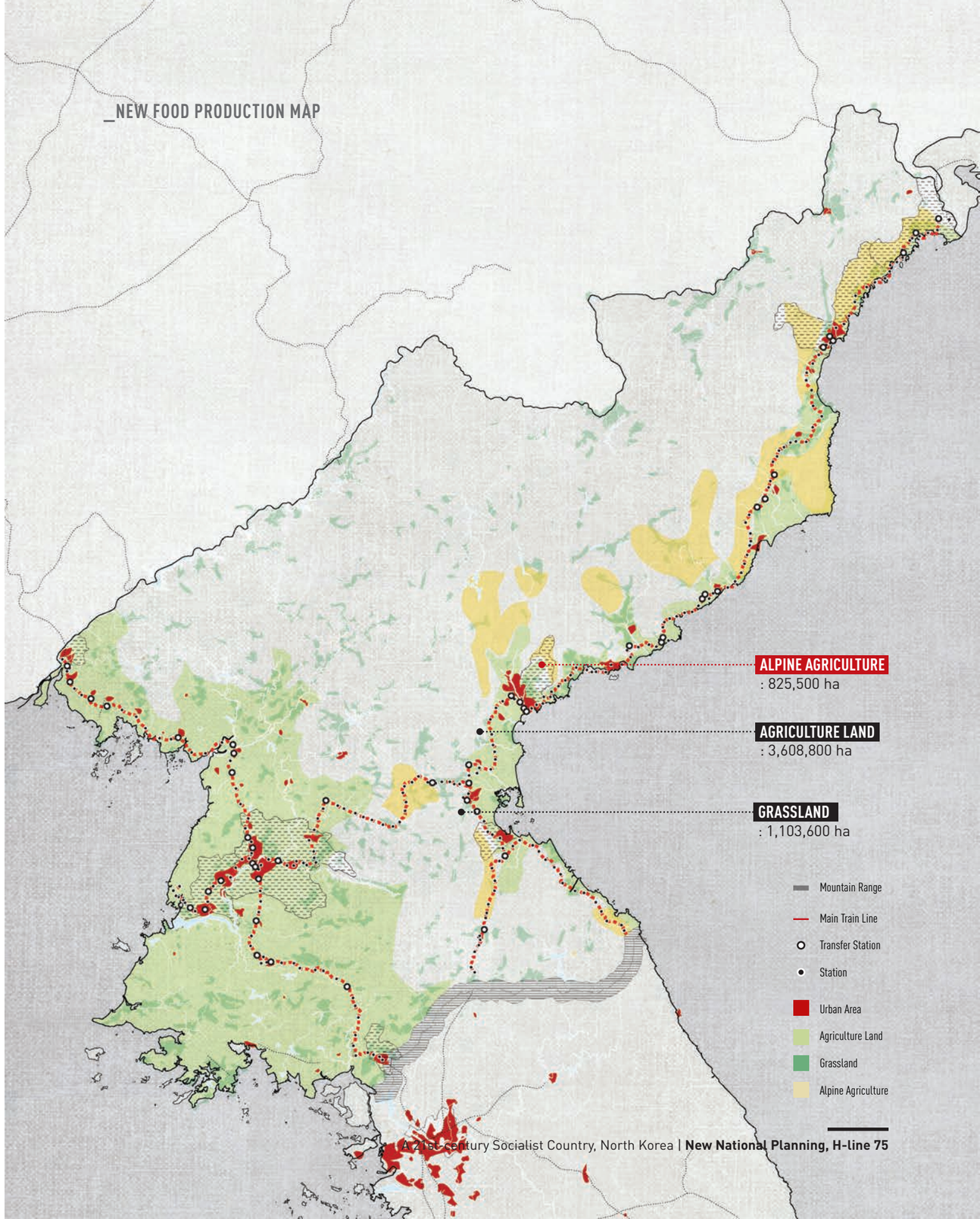
MINIMUM LAND TO FEED ONE PERSON



There are two big strategies for food production in North Korea. One is increasing efficiency in existing agriculture and grassland, and the other is introducing alpine agriculture. Fifty-one percent of North Korea is covered by mountains, but they do not need to make all the mountain areas agriculture hubs, just accessible for H-line and local train lines. This alpine area allows for 825,500 ha of potential agricultural land.

The minimum land requirement to feed just one person is 1,850 sqm and the overall productive land area in North Korea is 5,537,900 ha with existing and new alpine agriculture land. This area can feed 29,934,595 people, which is more than the predicted population in 2040. Furthermore, to increase the efficiency of the food distribution system, encouraging suburban areas to feed the city and concentrating on the prime agriculture land for production can solve the food shortage in the country.

_NEW FOOD PRODUCTION MAP



NEW INDUSTRIAL STRUCTURE_

PRIMARY INDUSTRY	SECONDARY INDUSTRY	TERTIARY INDUSTRY
Farming Forestry Mining Fishing	Light Industry Heavy Industry	Education Finance Business Entertainment Professional Service

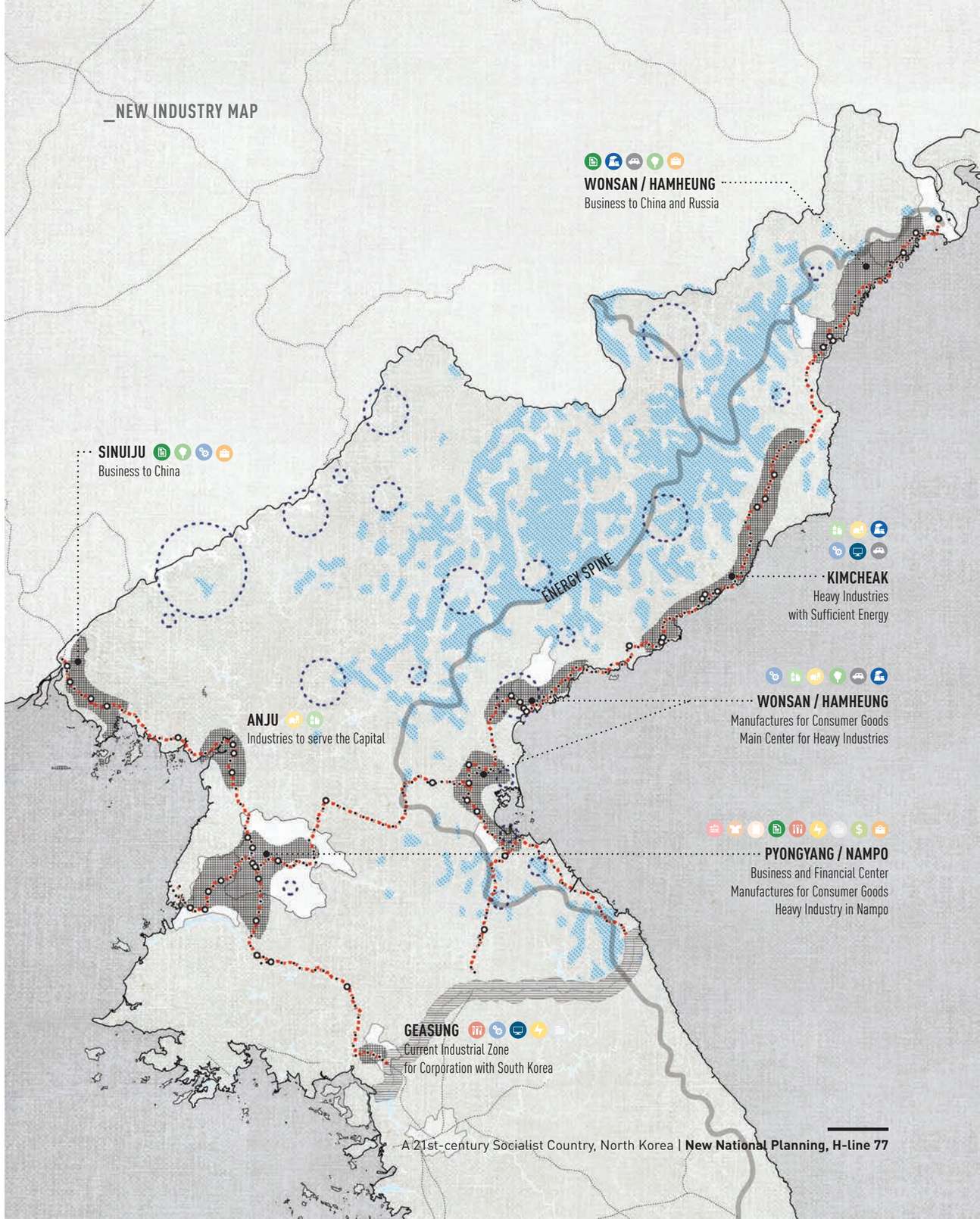
Light Industry	Food	Clothes	Leather	Timber/Pulp	Publication
Market	-	X	0	X	-
Un-experienced Labor	0	-	-	0	X
Experienced Labor	X	X	X	X	X
Railway / Road	0	0	0	0	-
Port	X	X	-	0	X
Energy	X	0	0	X	X
Industrial Water	0	0	X	X	X
Resource	X	X	X	-	X

0 : High
- : Medium
X : Low

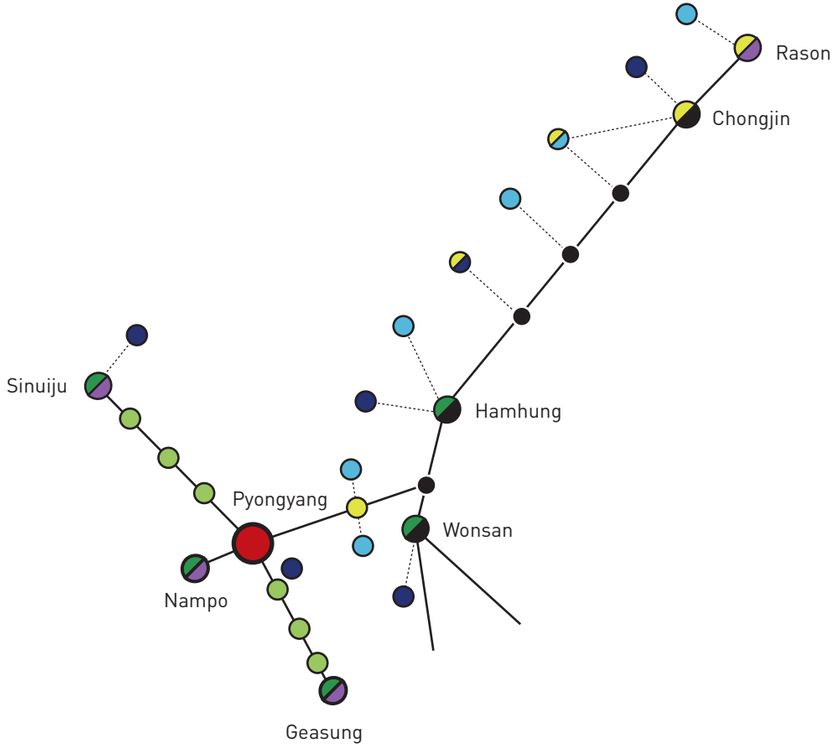
Heavy Industry	Chemistry	Rubber/Plastic	Glass/Cement	Steel/Metal	Mechanic	Computer	Electric	Automobile
Market	X	X	X	X	X	X	X	X
Un-experienced Labor	X	X	X	0	X	X	X	-
Experienced Labor	0	X	X	X	X	X	-	0
Railway / Road	X	X	-	0	0	0	0	-
Port	X	X	-	-	X	X	X	-
Energy	0	0	0	-	-	-	-	0
Industrial Water	0	0	X	-	X	X	X	0
Resource	X	-	-	-	X	X	X	0

The industry structure in North Korea is is their primary concentration, and tertiary is just being established and concentrated in the Pyongyang area. Therefore, the strategy here is to encourage secondary industries based on existing conditions and new national planning and locating centers for important tertiary sectors such as finance and business. The distribution of these industries is based on the table above. The criteria are about how each factor is essential for each sector. Pyongyang is the center of tertiary industries in North Korea. It is a core of business and finance. Furthermore, because of the accessibility to energy, most of the heavy industries are concentrated on the eastern side of H-city. Currently, Geasung is an exclusive industrial zone to corporate with South Korea. This city can be a real center of technical exchange between two Koreas.

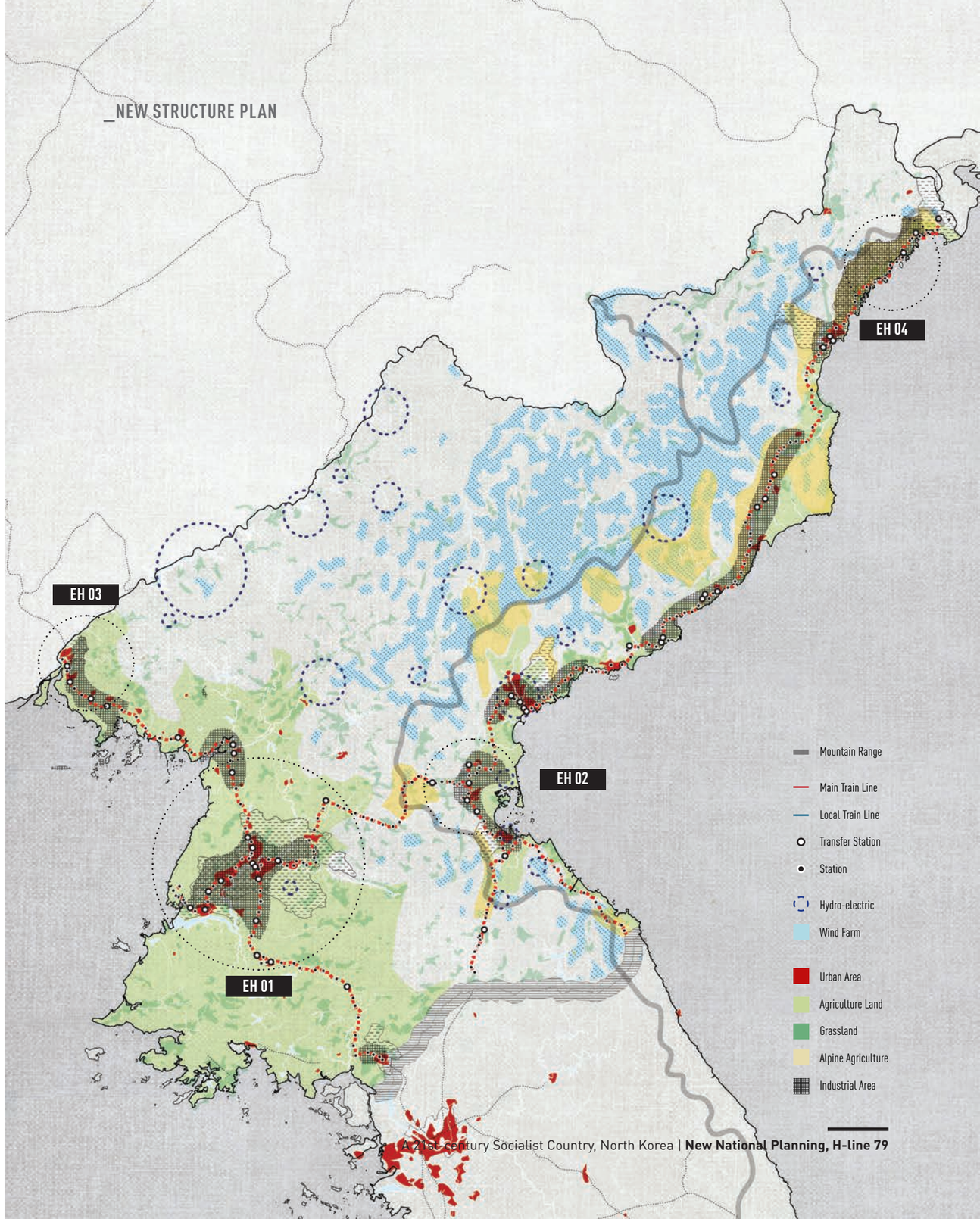
_NEW INDUSTRY MAP



NEW NATIONAL STRUCTURE_REGIONAL CHARACTERISTICS

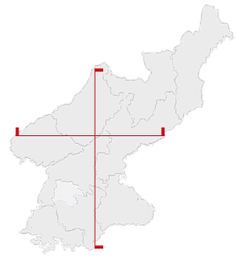


_NEW STRUCTURE PLAN

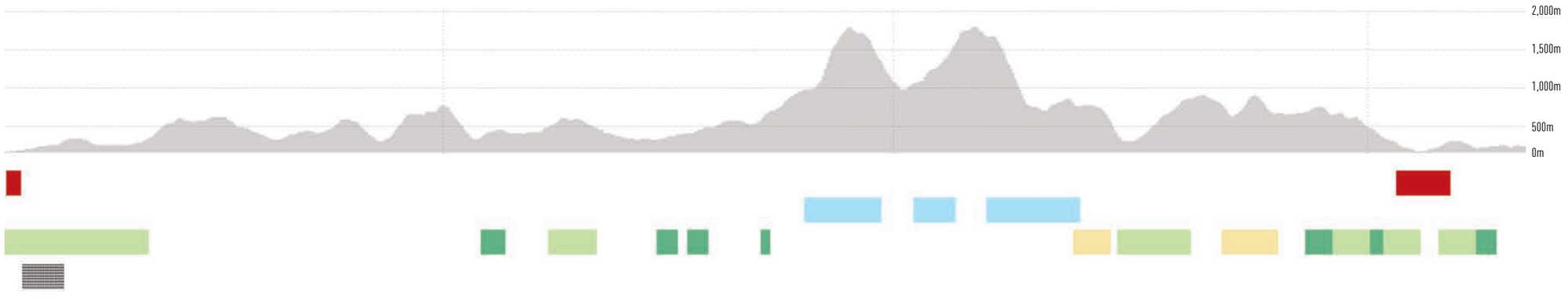


SECTIONS_WITH H-CITY PLANNING

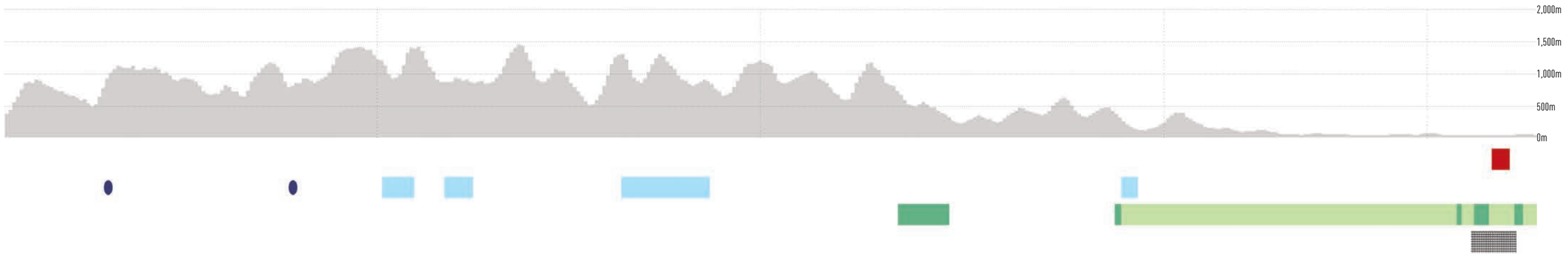
Urban Area
Agriculture Land
Grassland
Alpine Agriculture
Industrial Area
Hydro-electric
Wind Farm



A-A' SECTION (2008-2017)

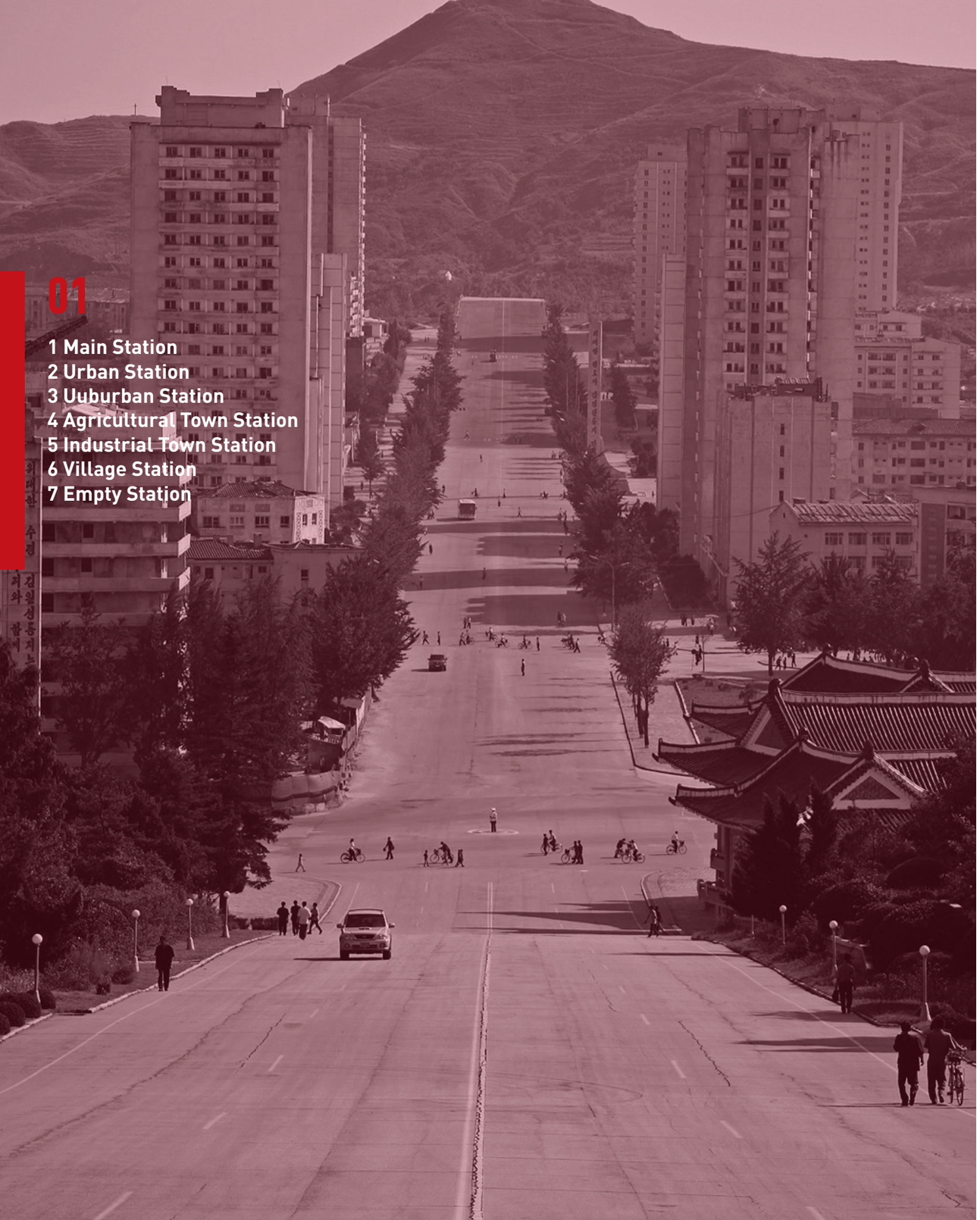


B-B' SECTION (2008-2017)



3

H-city and the H-stations



01

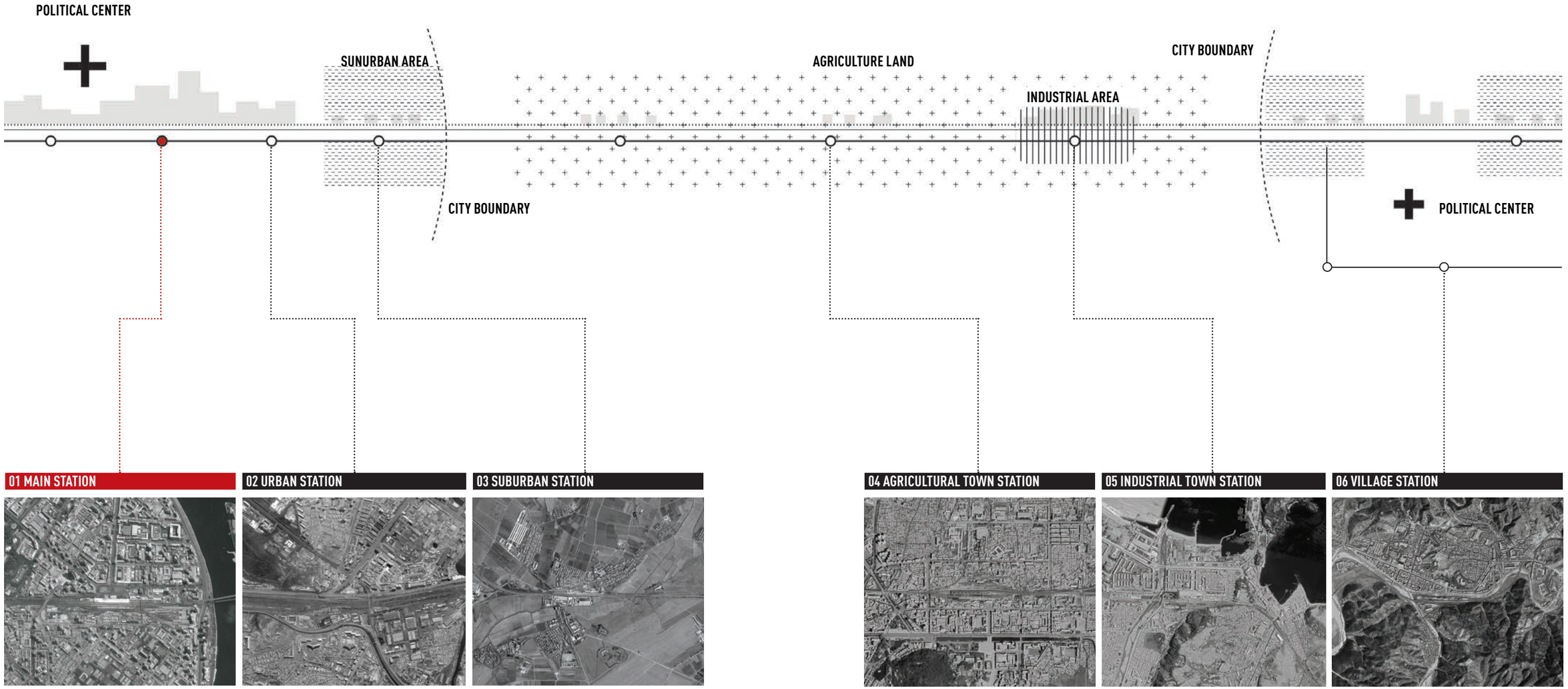
1 Main Station
2 Urban Station
3 Uuburban Station
4 Agricultural Town Station
5 Industrial Town Station
6 Village Station
7 Empty Station

H-city and the Stations

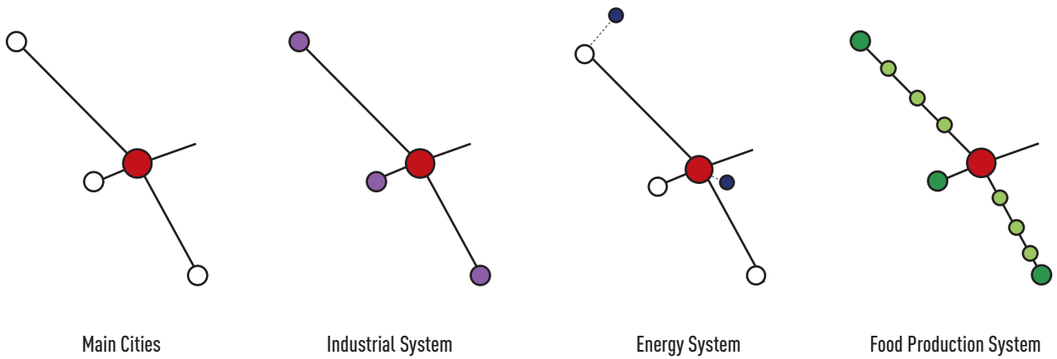
The composition of H-line

Along H-line, there are six types of train stations excluding empty stations where there is nothing around. These include the central station, urban station, suburban station, agricultural town station, industrial town station, and village station. These types are based on the new national planning and determined by the station and the location of their urban context.
There are 7 main stations, 21 urban stations, 31 suburban stations, 41 agricultural town stations, 21 industrial town station, 113 village stations, and 18 empty stations along H-line.
The east side of the line is the central part connecting North Korea to South Korea and China. The main stations on this side are Sinuiju, Pyongyang, and Geasung. Pyongyang is the center of the country. In every part of the economy, this city will be the core. In the case of Sinuiju, it is a gateway to China actively exchanging goods and people. Geasung has lots of potential to receive technical help from South Korea. The south can be beneficial with labor, and the north can gain the skills needed.
The west side of the H-line is an extended linear area between the mountains and the ocean. It is a combination of energy, industries, and some amount of productive land. The heavy industries and ports along H-line bring jobs and incomes to the country.
The middle part is not only the connection between the two sides of transit corridors but also the closest area to enjoy the mountains from the cities and connects the two main ports in the country.

TYPOLOGIES OF TRAIN STATION_IN H-CITY



WEST PART OF H-CITY_WITH MAIN STATIONS



Main Cities | Industrial System | Energy System | Food Production System

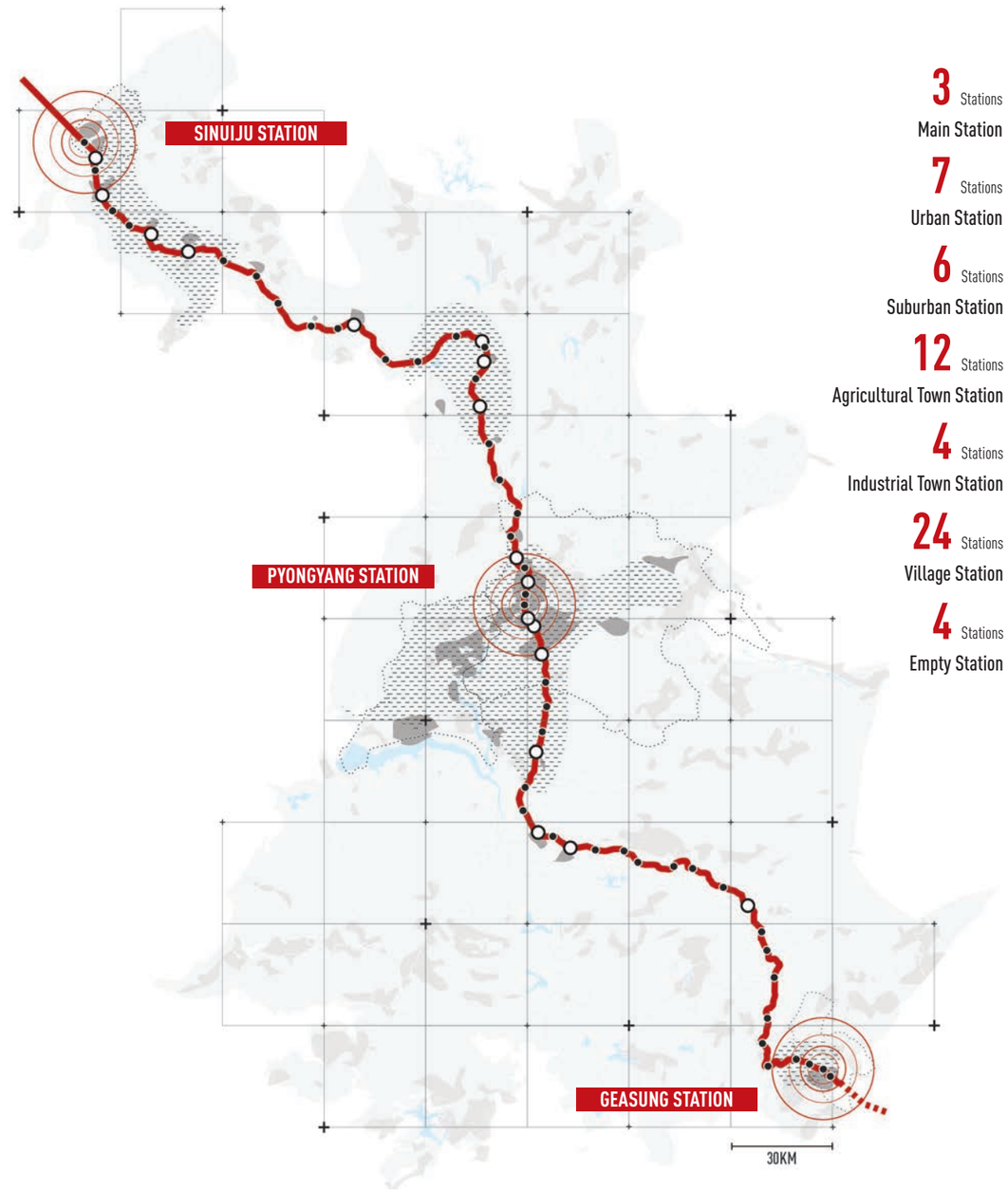
M: MAIN STATION **U**: URBAN STATION **S**: SUBURBAN STATION **A**: AGRICULTURAL TOWN STATION **I**: INDUSTRIAL TOWN STATION **V**: VILLAGE STATION **E**: EMPTY STATION

CATALOGUE OF STATIONS

STATION	M	U	S	A	I	V	E
Gang-an		v					
Sinuiju Cheongnyeon	v						
Nam-sinuiju		v					
Rakwon		v					
Yongchon				v			
Yongju						v	
Neajung						v	
Yeomju				v			
Dongrim							
Chonggang						v	
Sonchon				v			
Roha						v	
Kwaksan				v			
Hadan						v	
Jeongju Cheongnyeon				v			
Goeup						v	
Unam						v	
Unjeon				v			
Meangjungri						v	
Chongcheongang							v
Sinanju						v	

STATION	M	U	S	A	I	V	E
Deakyo							v
Munduck					v		
Sukcheon					v		
Eopa						v	
Suck-am					v		
Sun-an					v		
Galli					v		
San-um					v		
Seopo			v				
Pyongyang Classification			v				
Western Pyongyang			v				
Pyongyang	v						
Deadonggang			v			v	
Ryeokpo					v		
Chunghwa					v		
Hukgyo						v	
Gandong							v
Hwangju					v		
Chimchon						v	
Jungbangri						v	
Sariwon					v		

STATION	M	U	S	A	I	V	E
Eastern Sariwon				v			
Bongsan					v		
Chong-gea						v	
Hongsu						v	
Munmu						v	
Sohung						v	
Sinmak				v			
Mulgea						v	
Pyongsan				v			
Teabeaksansung							v
Hanpo						v	
Kumchon				v			
Geajung						v	
Yeohyun						v	
Keeping						v	
Geasung	v						
Sonha		v					
Bongdong						v	
Panmun					v		



3 Stations
Main Station

7 Stations
Urban Station

6 Stations
Suburban Station

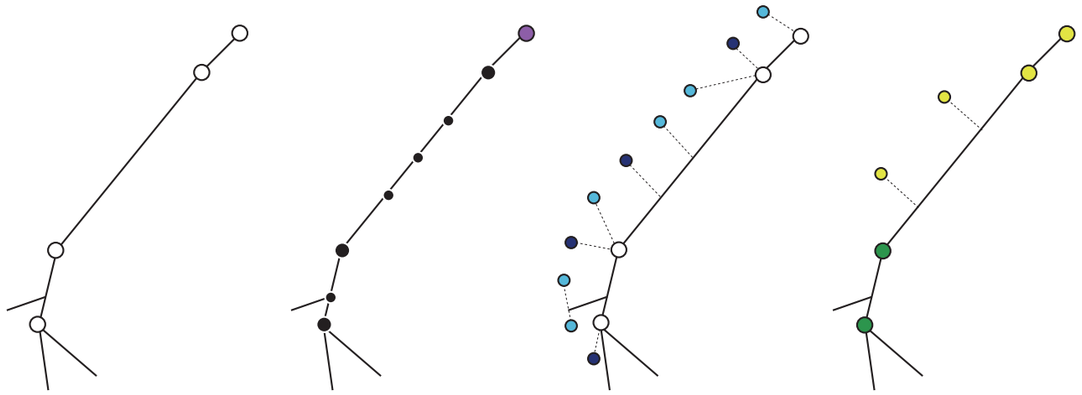
12 Stations
Agricultural Town Station

4 Stations
Industrial Town Station

24 Stations
Village Station

4 Stations
Empty Station

EAST PART OF H-CITY_WITH MAIN STATIONS



Main Cities | Industrial System | Energy System | Food Production System

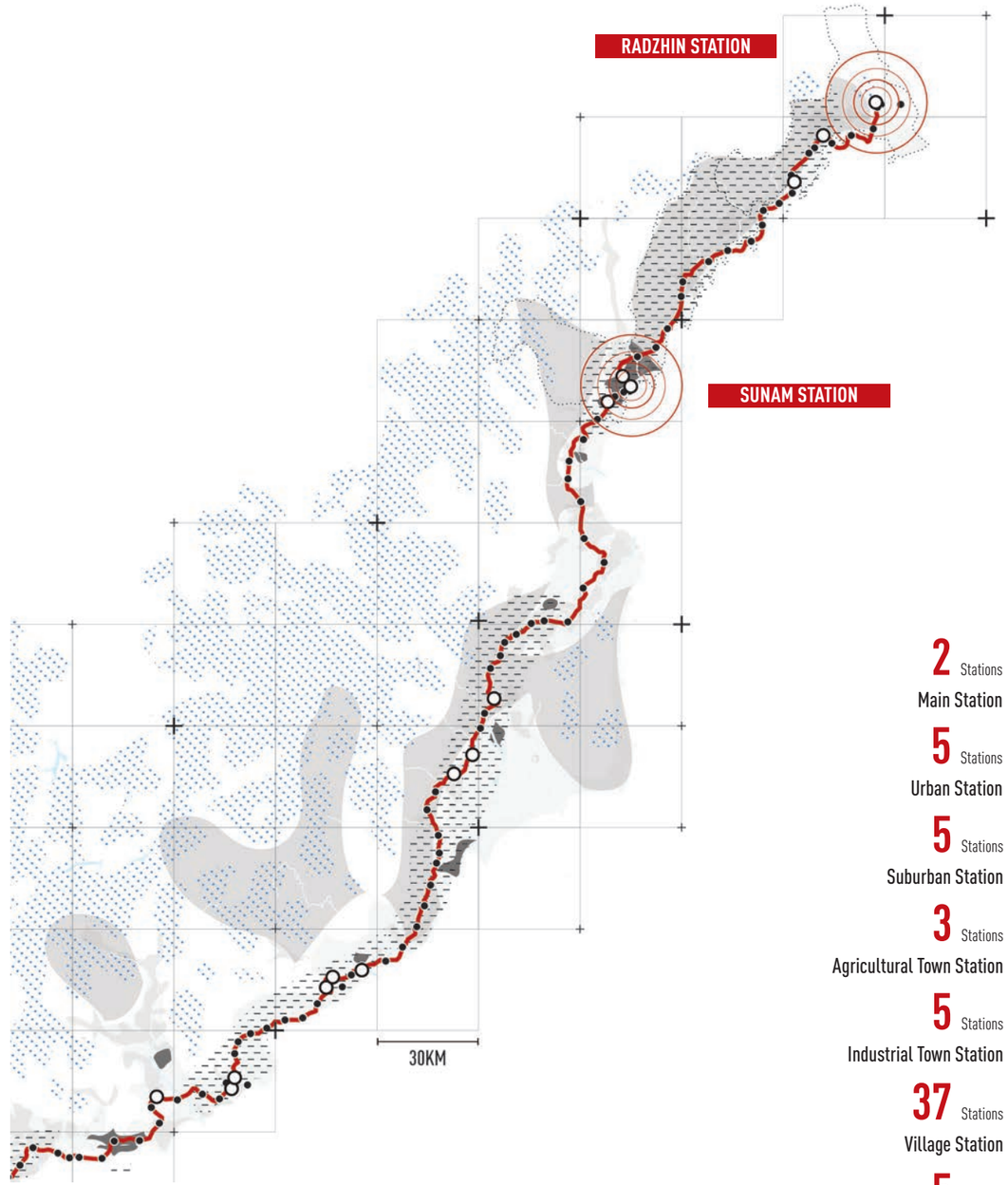
M: MAIN STATION **U**: URBAN STATION **S**: SUBURBAN STATION **A**: AGRICULTURAL TOWN STATION **I**: INDUSTRIAL TOWN STATION **V**: VILLAGE STATION **E**: EMPTY STATION

CATALOGUE OF STATIONS

STATION	M	U	S	A	I	V	E
Tumangang						v	
Guryeongpo							v
Ungsang						v	
Eastern Sonbong			v				
Sonbong			v				
Kwangok		v			v		
Rajin	v						
Myongho							v
Huchang						v	
Bangjin						v	
Northern Raksan						v	
Gwanhea						v	
Same						v	
Buga						v	
Sagu							v
Injin						v	
Songwon						v	
Geumbaui			v				
Chong-am		v					
Chongjin		v					
Sunam	v						

STATION	M	U	S	A	I	V	E
Songpyong		v			v		
Southern Gangduck		v					
Ranam			v				
Sungam			v				
Seanggiryeong						v	
Kyongsong				v			
Ryonghyun						v	
Orang				v			
Odeajin						v	
Bongang						v	
Jomaksan						v	
Gekdong						v	
Samhyang				v			
Ryongdong						v	
Sangryongban						v	
Ryongban						v	
Neapo							v
Myongcheon						v	
Onsupyong						v	
Geumsong						v	
Gilju					v		

STATION	M	U	S	A	I	V	E
Rodong						v	
Wonpyong						v	
Upduck						v	
Songsang						v	
Changbong						v	
Haksung					v		
Kinchaek					v		
Ssangryong						v	
Manchun						v	
Ilsin						v	
Ryongdea						v	
Yeoheajin						v	
Munam							v
Tanchon				v			
Obongri						v	
Sindanchon						v	
Kiam						v	
Gokgu						v	
Ssangam						v	



2 Stations
Main Station

5 Stations
Urban Station

5 Stations
Suburban Station

3 Stations
Agricultural Town Station

5 Stations
Industrial Town Station

37 Stations
Village Station

5 Stations
Empty Station

EAST PART OF H-CITY_WITH MAIN STATIONS

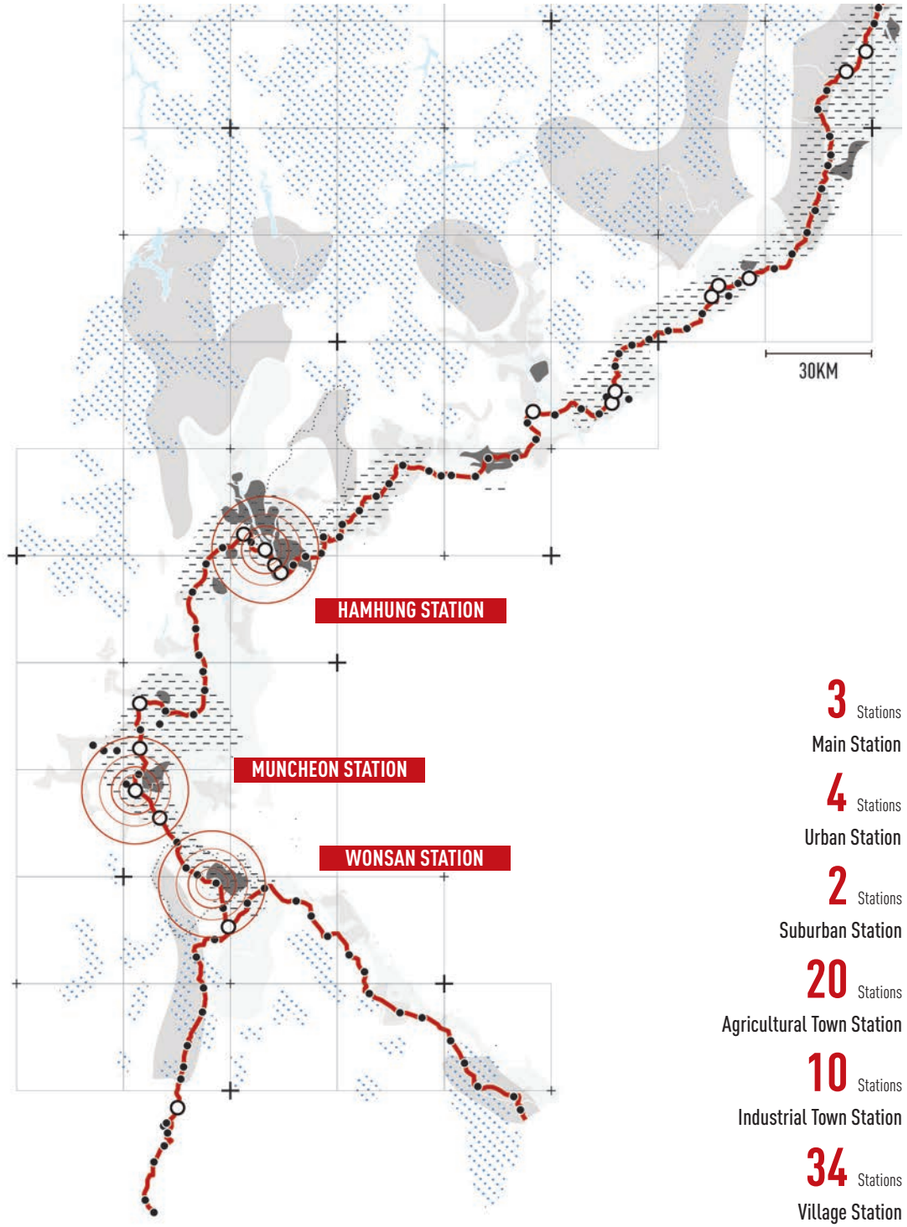
M: MAIN STATION **U**: URBAN STATION **S**: SUBURBAN STATION **A**: AGRICULTURAL TOWN STATION **I**: INDUSTRIAL TOWN STATION **V**: VILLAGE STATION **E**: EMPTY STATION

CATALOGUE OF STATIONS

STATION	M	U	S	A	I	V	E
Riwon				v			
Songdan						v	
Yumbun							v
Jeongsan						v	
Rahong					v		
Gunja						v	
Geosan						v	
Keongan						v	
Sinbukcheong						v	
Sokhu				v			
Kangsanri						v	
Yanghwa				v			
Sinpo					v		
Yukteadong				v			
Pungeo						v	
Jungho						v	
Unpo						v	
Kyeongpo						v	
Hongwon				v			
Ryong-un						v	
Samho						v	
Rasan							v
Seapori						v	
Ryeoho					v		
Sinjung							v
Major						v	
Seoho		v					
Hongnam		v					
Janghonh			v				
Hamhung Classification		v					
Hamhung	v						
Juseo							v
Hamju				v			
Chongpyong				v			

STATION	M	U	S	A	I	V	E
Puphyong						v	
Sinsang				v			
Munbong							v
Wangjang						v	
Pompho						v	
Inhung				v			
Kumya				v			
Hyunhong						v	
Kowon				v			
Jeontan					v		
Ryongdam						v	
Okpyong						v	
Muncheon	v						
Dukwon			v				
Wonsan	v						
Galma		v					
Beahwa					v		
Anyone					v		
Namsan						v	
Gwangmyeong					v		
Ryongjiwon						v	
Kosan				v			
Nakcheon						v	
Sambang						v	
Sepo Cheong-nyeon				v			
Sungsan						v	
Gumbulang						v	
Rimok						v	
Bokgea						v	
Pyonggang				v			
Ogye						v	
Sangum							v

STATION	M	U	S	A	I	V	E
Dongjungho				v			
Myonggo						v	
Geombonggang						v	
Sijungho				v			
Tongchon				v	v		
Donghea				v			
Ryeomsung						v	
Dupo				v	v		
Gosung				v	v		
Geomgangsan Cheongnyeon						V	
Gamho							v



3 Stations
Main Station

4 Stations
Urban Station

2 Stations
Suburban Station

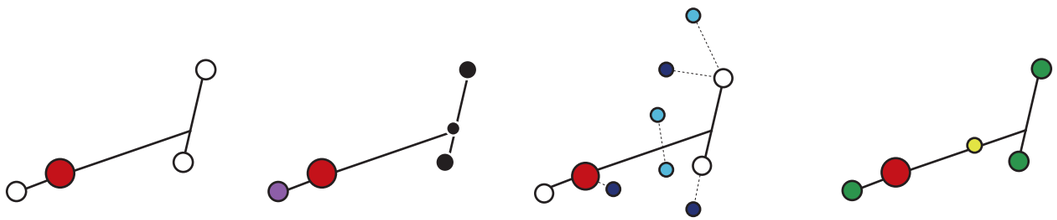
20 Stations
Agricultural Town Station

10 Stations
Industrial Town Station

34 Stations
Village Station

7 Stations
Empty Station

MIDDLE PART OF H-CITY_WITH MAIN STATIONS



Main Cities | Industrial System | Energy System | Food Production System

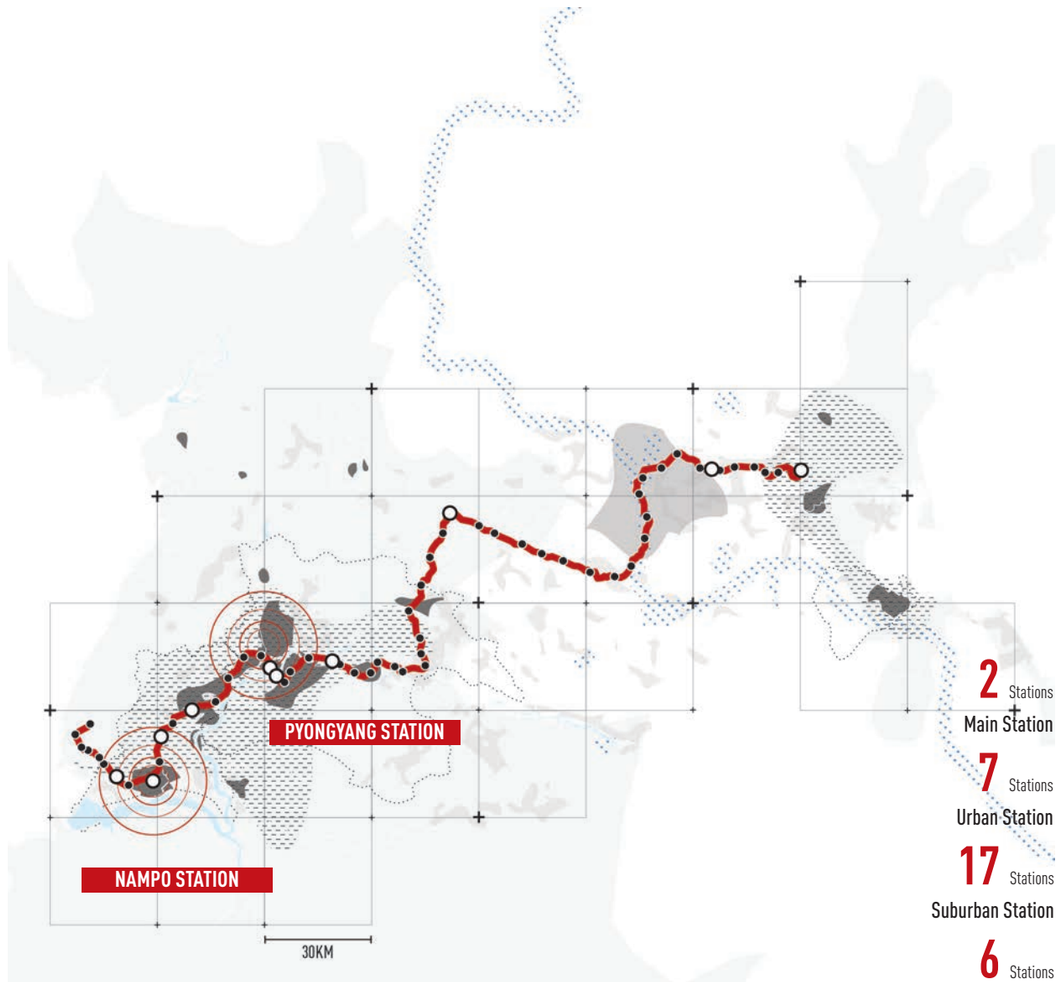
M: MAIN STATION **U**: URBAN STATION **S**: SUBURBAN STATION **A**: AGRICULTURAL TOWN STATION **I**: INDUSTRIAL TOWN STATION **V**: VILLAGE STATION **E**: EMPTY STATION

CATALOGUE OF STATIONS

STATION	M	U	S	A	I	V	E
Onchon				v			
Guisung				V			
Rosang						v	
Hwado				V			
Western Gwangryang				V			
Eastern Gwangryang				V			
Sinryeongri			v				
Dukdong			v				
Sinnampo		v					
Nampo	v						
Galchon			v				
Ryonggang			v				
Ganseo			v		v		
Gangson			v		v		
Deapyong			v				
Chilgol		v					
Potonggang		v					
Pyongyang	v						
Deadonggang		v					
Eastern Pyongyang		v					
Songsin		v					

STATION	M	U	S	A	I	V	E
Mirim		v					
Chongryong			v				
Ripsungri			v				
Seonghori			v		v		
Mandalri			v				
Hwachon			v				
Songga			v				
Samdeong			v				
Heoksuk			v				
Sukreum			v				
Gangdong			v				
Beakwon						v	
Sungchon						v	
Samduk						v	
Sinsungchon						v	
Geoheung						v	
Changrim						v	
Sinyang						v	
Anpyong						v	
Jisu							v
Yangduk				v			

STATION	M	U	S	A	I	V	E
Neadong							v
Suktang Onchon						v	
Geocha						v	
Chonyul						v	
Ungok						v	
Yoduk						v	
Toryong						v	
Munpyong						v	
Sungnea						v	
Dunjeon						v	
Palhong						v	
Chukjeon						v	
Midun						v	
Banghwa					I		



2 Stations
Main Station

7 Stations
Urban Station

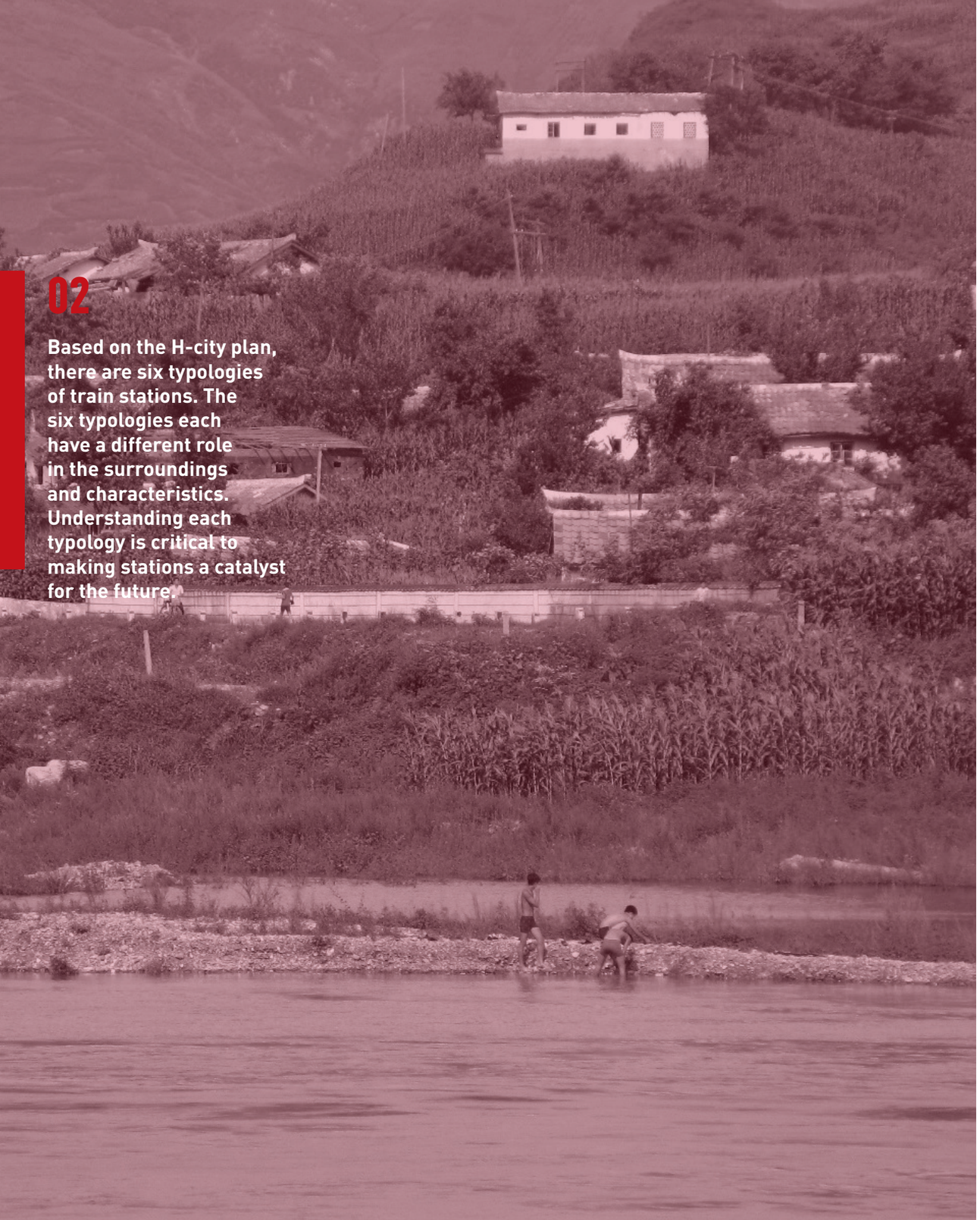
17 Stations
Suburban Station

6 Stations
Agricultural Town Station

4 Stations
Industrial Town Station

21 Stations
Village Station

2 Stations
Empty Station



02

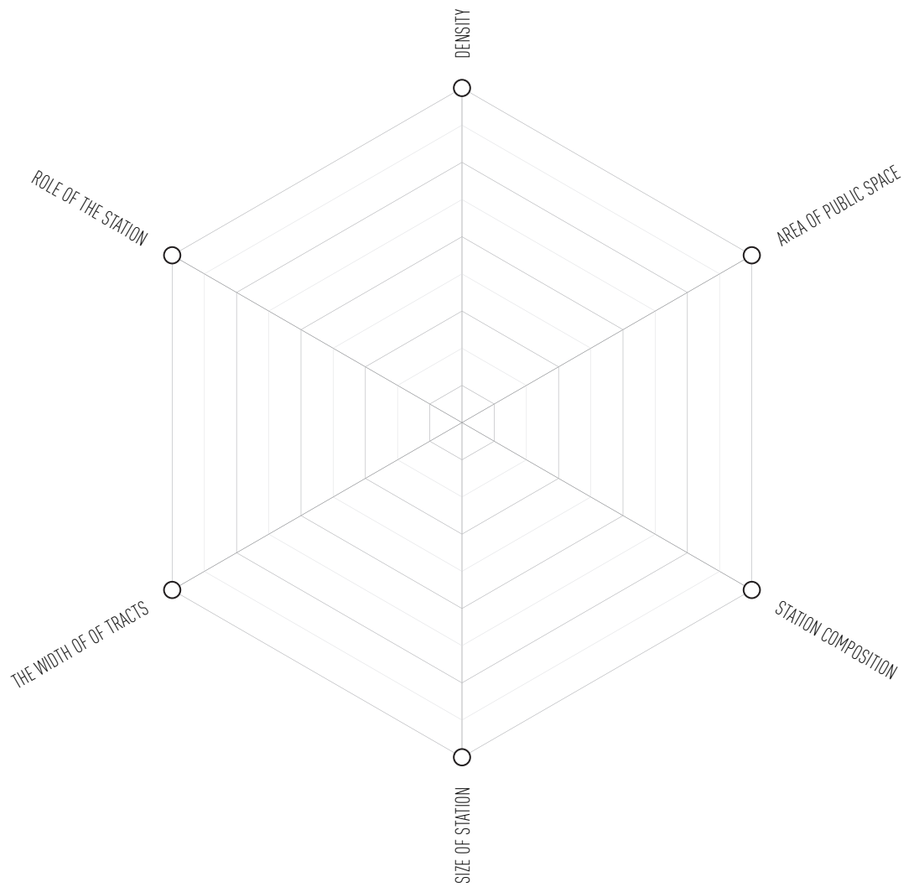
Based on the H-city plan, there are six typologies of train stations. The six typologies each have a different role in the surroundings and characteristics. Understanding each typology is critical to making stations a catalyst for the future.

The Typologies of H-stations

The characteristics of the six typologies

The six typologies of the stations in H-line have different characteristics. The hexagon with six primary elements shows these visually. Each one has six criteria to explain their features. The factors about the stations themselves are the size, composition of the station, and the width of the train tracks. Other factors that describe their urban features are the surrounding density, the area of public space, and the role of the station within a city.
The main station is geometrically and symbolically the core of the city and the country. It has the most significant number in station size and composition but not in the width of the train tracks. In the case of urban factors, it has the highest number in all three elements. The urban station is a sub-center of a city. It is following after or before the main station. It has a less representative role but more daily life related. Because the main station is too busy to handle distribution, this typology is taking over partially, causing it to have the most extensive train track area.
The suburban station is located in productive land within the jurisdiction of a city. That means it is in the city area but not urbanized. Therefore, most of the numbers are small.
The fourth and fifth typologies are the agricultural and industrial town stations. They have similar features except for the density and the role of the station. It is the center of smaller cities, but each one is concentrated in agriculture or industries.
The last one is the village station. This type is located in a rural area with the lowest density. The train is the only public space and public transportation in the town.

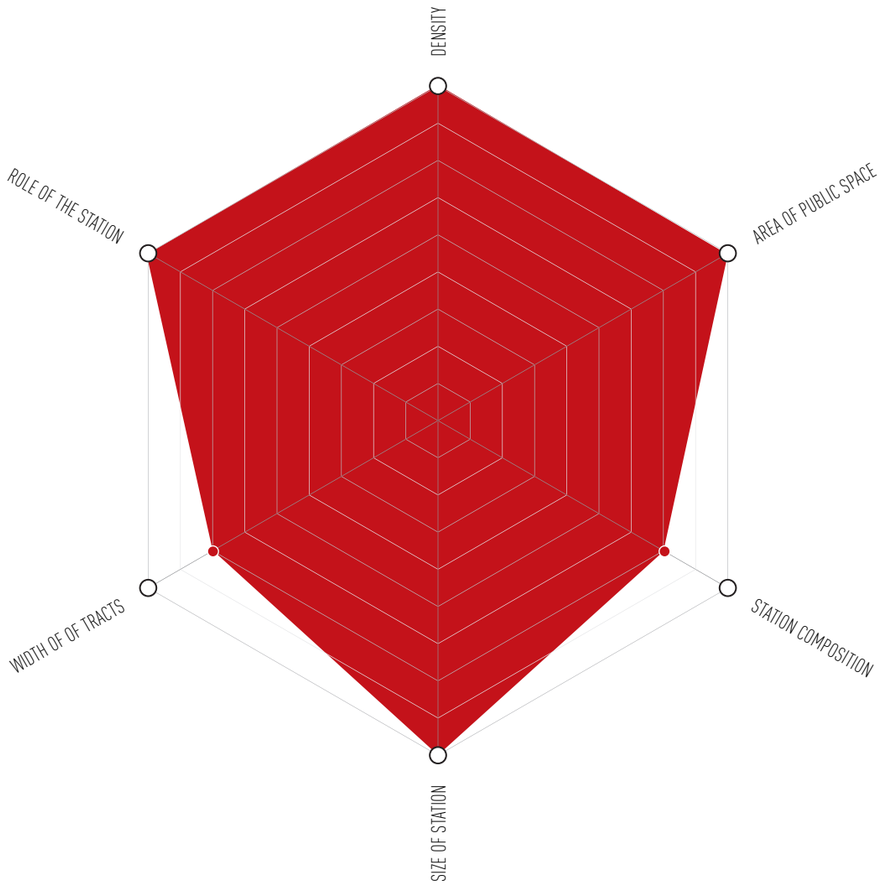
INTRODUCTION_THE MATRIX FOR THE TRAIN STATIONS



The hexagon represents six essential elements that determine the characteristics of the stations, and each factor has its own rating system. The first one indicates density rated from 0 to 4.5, which means the floor-area ratio. The next one is the area of public space, or whether a station has it or not. The third presents how many elements the station has in its composition, such as a concealed platform or a connection to other public transportation. The fourth provides the size of these stations. The fifth is the width of tracks, which further indicates out how many tracks there are. The last describes the role of the station in the surrounding area; this role can be presented as a town center or special destination area for vacations.

	DENSITY Floor Area Ratio	**AREA OF PUBLIC SPACE** Acres	**STATION COMPOSITION**	**SIZE OF STATION** Acres	**THE WIDTH OF TRACKS** Meters / Feet	**ROLE OF STATION**
Extreme	4.5	10	All-in-one Building	5.0		City Center
	4		Connected Other Public Transportation	1.0	80m (260ft)	
High	3.5	1	Public Space	0.5		Town Center
	3.0		Protected Connection over Train Tracks	0.1	60m (195ft)	
	2.5		Attached Other Programs	0.08		Special Destination
Medium	2.0		Station Building	0.06	40m (130ft)	
	1.5		Covered Paltform	0.04		Neighborhood Center
Low	1.0		Platform	0.02	20m (65ft)	
	0.5		Train Tracks	0.01	10m (30ft)	Transportation
	0	0	Nothing	0	0	Nothing

01 MAIN STATION_THE CHARACTERISTICS WITH THE MATRIX



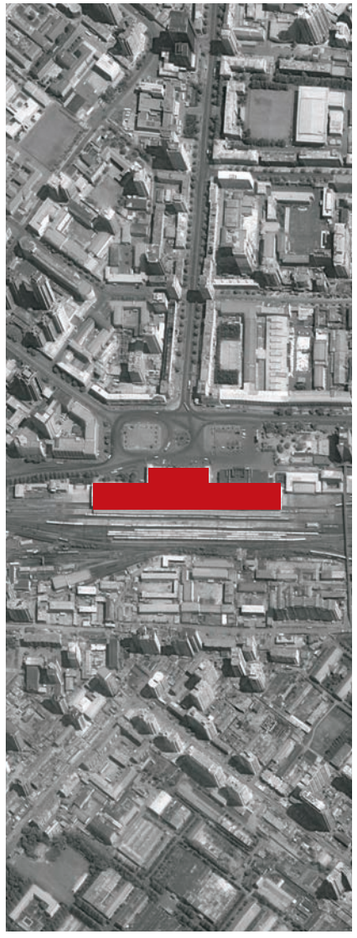
The main stations are the central train stations in a big city. This is a gateway to enter a city from outside, therefore, its role in the country is significant. It should be have the highest density in North Korea. This type usually has an iconic or symbolic elevation attached to substantial public spaces.

The size of the station is more significant than any other and is tied to other programs such as commercial or civic. However, the width of the train tracks here would not be the largest because this station is not a center for industrial or transit movement that requires heavy train traffic.

There are only eight stations in this category along H-line, which means they should remain as an iconic or symbolic station as they can represent the country or the cities.

_PYONGYANG STATION

01 MAIN STATION_SAMPLES

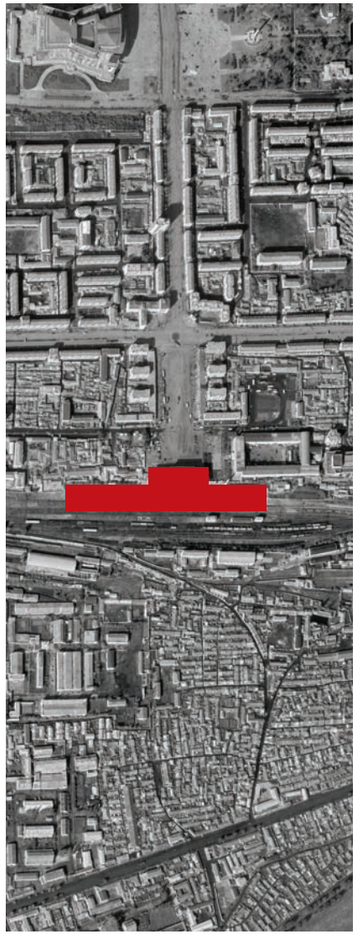


PYONGYANG STATION

DENSITY	EXTREME
AREA OF PUBLIC SPACE	8.5 ACRES
STATION COMPOSITION	10 ELEMENTS
SIZE OF STATION	5 ACRES
WIDTH OF TRACTS	115 M (377FT)
ROLE OF STATION	CITY CENTER

SINUIJU STATION

DENSITY	EXTREME
AREA OF PUBLIC SPACE	14 ACRES
STATION COMPOSITION	9 ELEMENTS
SIZE OF STATION	5.7 ACRES
WIDTH OF TRACTS	77 M (250FT)
ROLE OF STATION	CITY CENTER

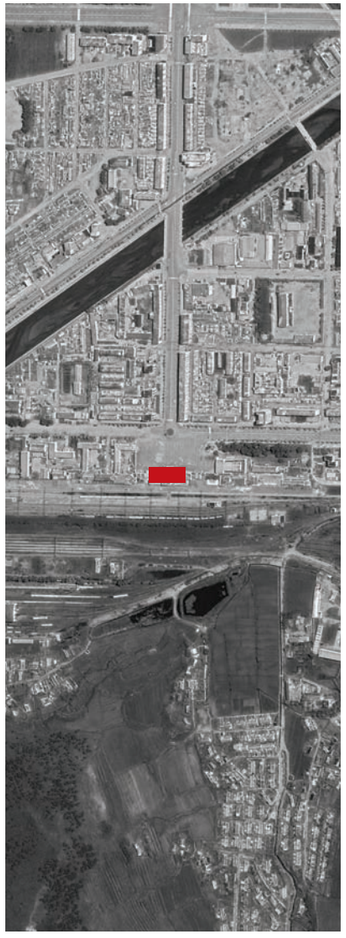


CHUNGJIN STATION

DENSITY	EXTREME
AREA OF PUBLIC SPACE	6.5 ACRES
STATION COMPOSITION	8 ELEMENTS
SIZE OF STATION	4.5 ACRES
WIDTH OF TRACTS	86 M (280FT)
ROLE OF STATION	CITY CENTER

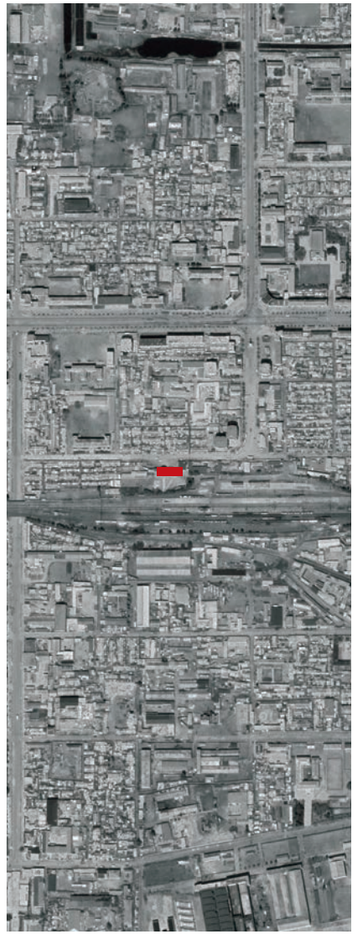
NAMPO STATION

DENSITY	HIGH
AREA OF PUBLIC SPACE	9.7 ACRES
STATION COMPOSITION	8 ELEMENTS
SIZE OF STATION	0.4 ACRES
WIDTH OF TRACTS	77 M (250FT)
ROLE OF STATION	CITY CENTER



RAJIN STATION

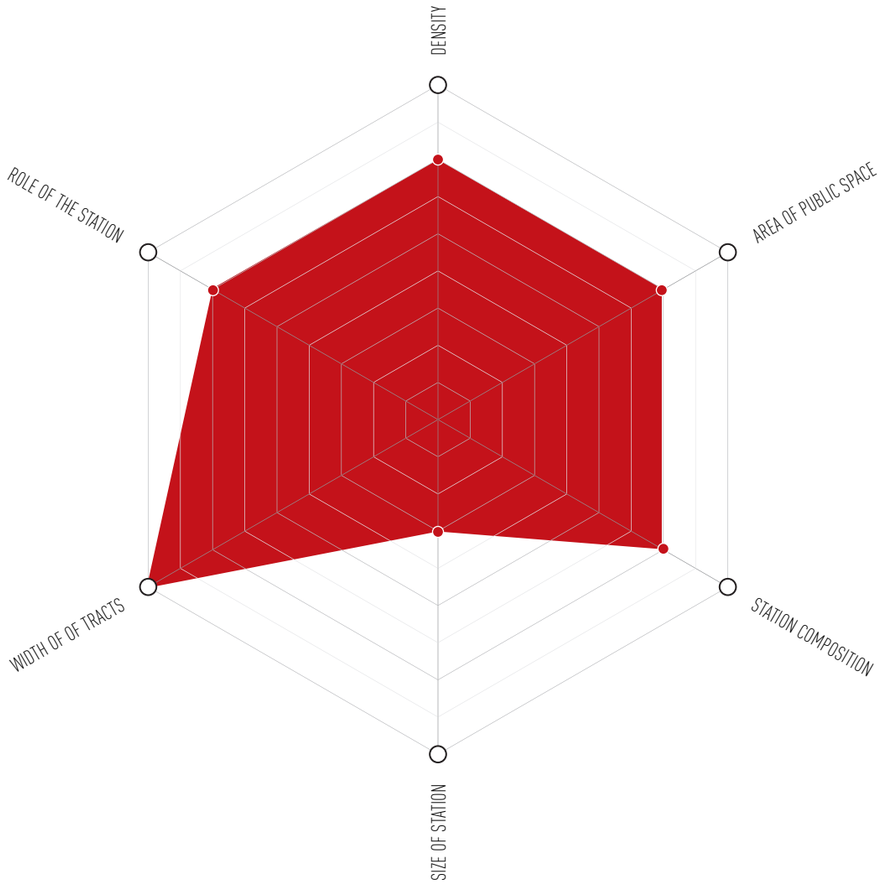
DENSITY	HIGH
AREA OF PUBLIC SPACE	3.15 ACRES
STATION COMPOSITION	8 ELEMENTS
SIZE OF STATION	0.6 ACRES
WIDTH OF TRACTS	54 M (176FT)
ROLE OF STATION	CITY CENTER



SUNAM STATION

DENSITY	MEDIUM
AREA OF PUBLIC SPACE	1.5 ACRES
STATION COMPOSITION	8 ELEMENTS
SIZE OF STATION	0.15 ACRES
WIDTH OF TRACTS	80 M (260FT)
ROLE OF STATION	CITY CENTER

02 URBAN STATION_THE CHARACTERISTICS WITH THE MATRIX



The urban stations are located within the jurisdiction of a big city and surrounded by a relatively higher density. Usually, they come before or after the main station, acting as a subcenter for a city or sometimes located along the edge of an urbanized area. It has public space in front of the station and is smaller than that of the main stations, but the composition is similar. The urban station typology has smaller station sizes but with more train tracks serving the surrounding industries. If the main stations are seen as gateways to cities, then the urban stations would act as centers for the daily lives of citizens, providing lots of jobs in factories.
Therefore, this type is more tied to the citizen who is commuting and spending time around the stations.

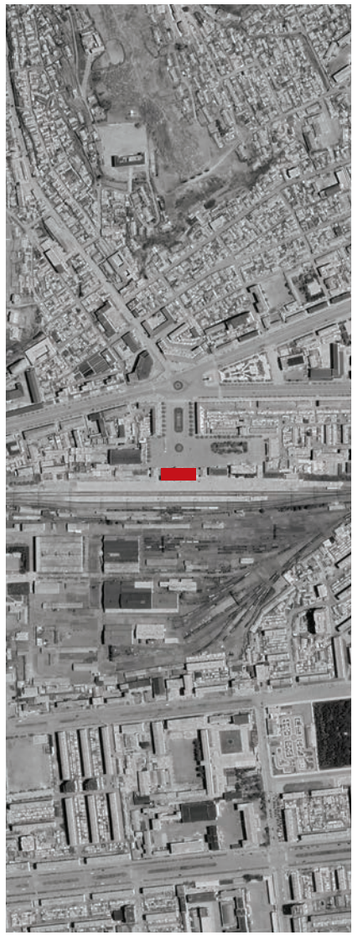
GALMA STATION

GALMA STATION

DENSITY	MEDIUM
AREA OF PUBLIC SPACE	0.7 ACRES
STATION COMPOSITION	8 ELEMENTS
SIZE OF STATION	0.1 ACRES
WIDTH OF TRACTS	145 M (475FT)
ROLE OF STATION	TOWN CENTER

DEADONGGANG STATION

DENSITY	MEDEUM
AREA OF PUBLIC SPACE	0.7 ACRES
STATION COMPOSITION	5 ELEMENTS
SIZE OF STATION	0.2 ACRES
WIDTH OF TRACTS	105 M (340FT)
ROLE OF STATION	TOWN CENTER



CHONGJIN STATION

DENSITY	MEDIUM
AREA OF PUBLIC SPACE	3.8 ACRES
STATION COMPOSITION	8 ELEMENTS
SIZE OF STATION	0.45 ACRES
WIDTH OF TRACTS	145 M (475FT)
ROLE OF STATION	TOWN CENTER

WESTERN PYONGYANG STATION

DENSITY	EXTREME
AREA OF PUBLIC SPACE	6.8 ACRES
STATION COMPOSITION	8 ELEMENTS
SIZE OF STATION	0.5 ACRES
WIDTH OF TRACTS	120 M (390FT)
ROLE OF STATION	TOWN CENTER

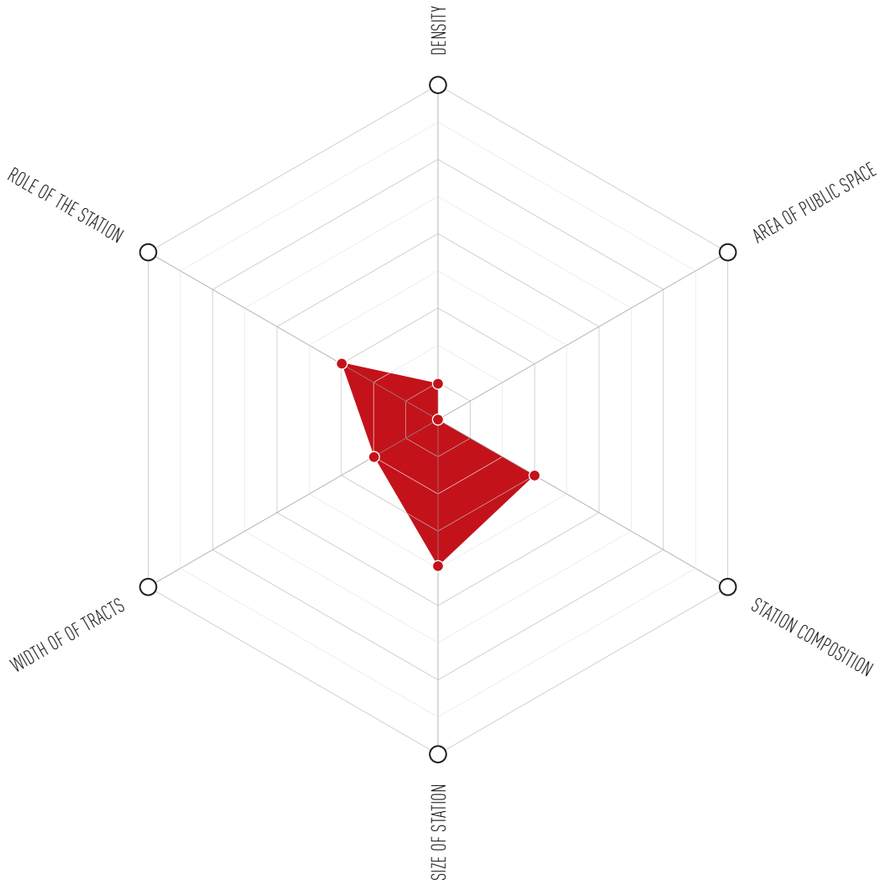
HAMHUNG CLASSIFICATION STATION

DENSITY	MEDIUM
AREA OF PUBLIC SPACE	0 ACRES
STATION COMPOSITION	5 ELEMENTS
SIZE OF STATION	0.23 ACRES
WIDTH OF TRACTS	220M (720FT)
ROLE OF STATION	TOWN CENTER

GANG-AN STATION

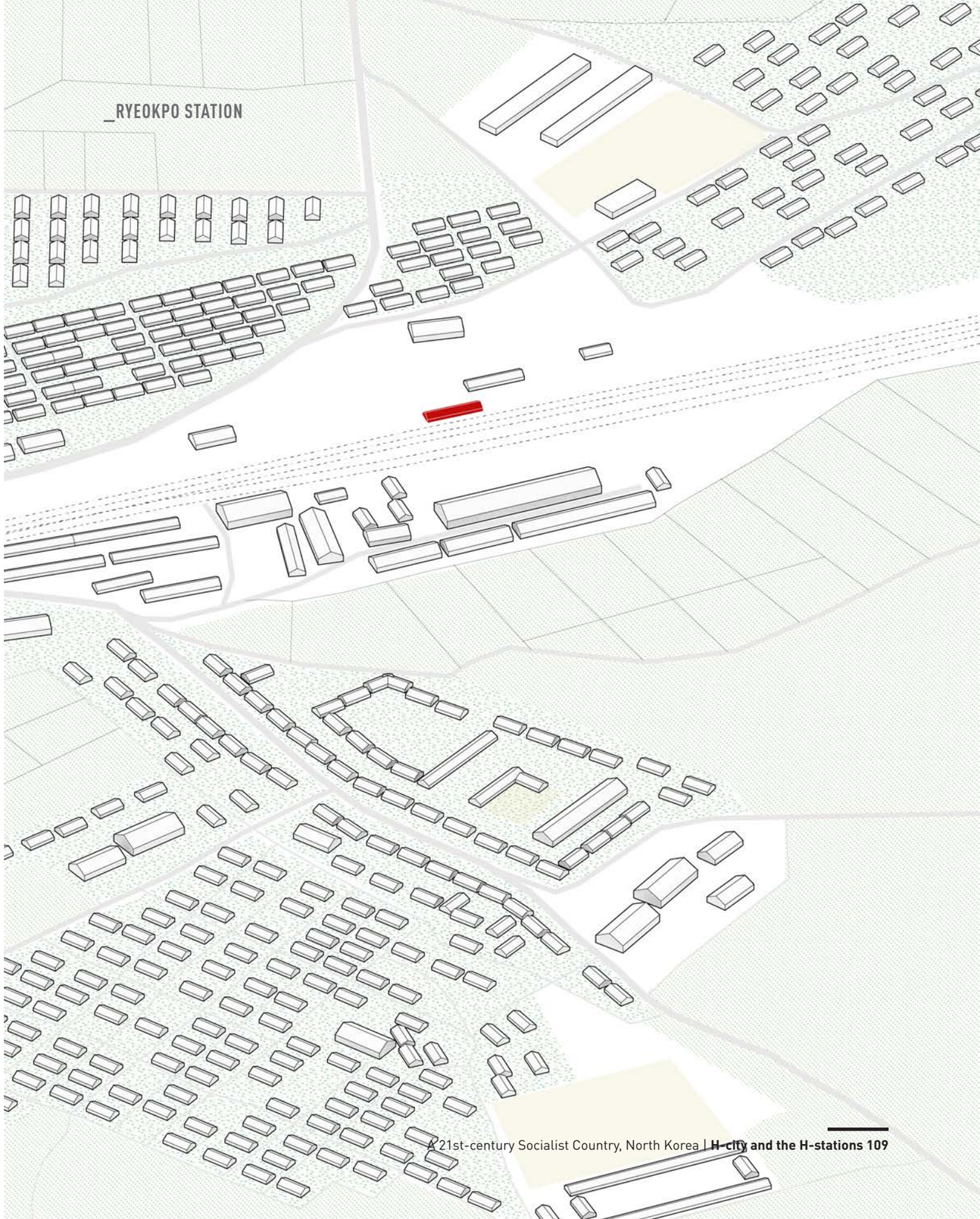
DENSITY	MEDEUM
AREA OF PUBLIC SPACE	0 ACRES
STATION COMPOSITION	5 ELEMENTS
SIZE OF STATION	0.16 ACRES
WIDTH OF TRACTS	67 M (220FT)
ROLE OF STATION	TOWN CENTER

03 SUBURBAN STATION_THE CHARACTERISTICS WITH THE MATRIX



The suburban stations are located within a jurisdiction of a big city but outside of the urbanized area. This area is the center for food production that provides for its city, which is why it is surrounded by a lower density population and productive land. It does not have a public space attached, but this area is a neighborhood center. The composition of these stations is more straightforward than the previous two, which means it only has the station, open platform, train tracks, and connection to other public transportation.

Therefore, this type needs to be focused on food production and distribution, providing a central area for the neighborhood to gather and spend time together.



03 SUBURBAN STATION_SAMPLES

RYEOKPO STATION

DENSITY	LOW
AREA OF PUBLIC SPACE	0 ACRES
STATION COMPOSITION	3 ELEMENTS
SIZE OF STATION	0.09 ACRES
WIDTH OF TRACTS	30 M (100FT)
ROLE OF STATION	NEIGHBORHOOD CENTER

DUKDONG STATION

DENSITY	LOW
AREA OF PUBLIC SPACE	0 ACRES
STATION COMPOSITION	3 ELEMENTS
SIZE OF STATION	0.05 ACRES
WIDTH OF TRACTS	15 M (50FT)
ROLE OF STATION	NEIGHBORHOOD CENTER

OGYE STATION

DENSITY	LOW
AREA OF PUBLIC SPACE	0 ACRES
STATION COMPOSITION	3 ELEMENTS
SIZE OF STATION	0.08 ACRES
WIDTH OF TRACTS	15 M (50FT)
ROLE OF STATION	NEIGHBORHOOD CENTER

GALLI STATION

DENSITY	LOW
AREA OF PUBLIC SPACE	2.3 ACRES
STATION COMPOSITION	5 ELEMENTS
SIZE OF STATION	0.25 ACRES
WIDTH OF TRACTS	115 M (370FT)
ROLE OF STATION	NEIGHBORHOOD CENTER

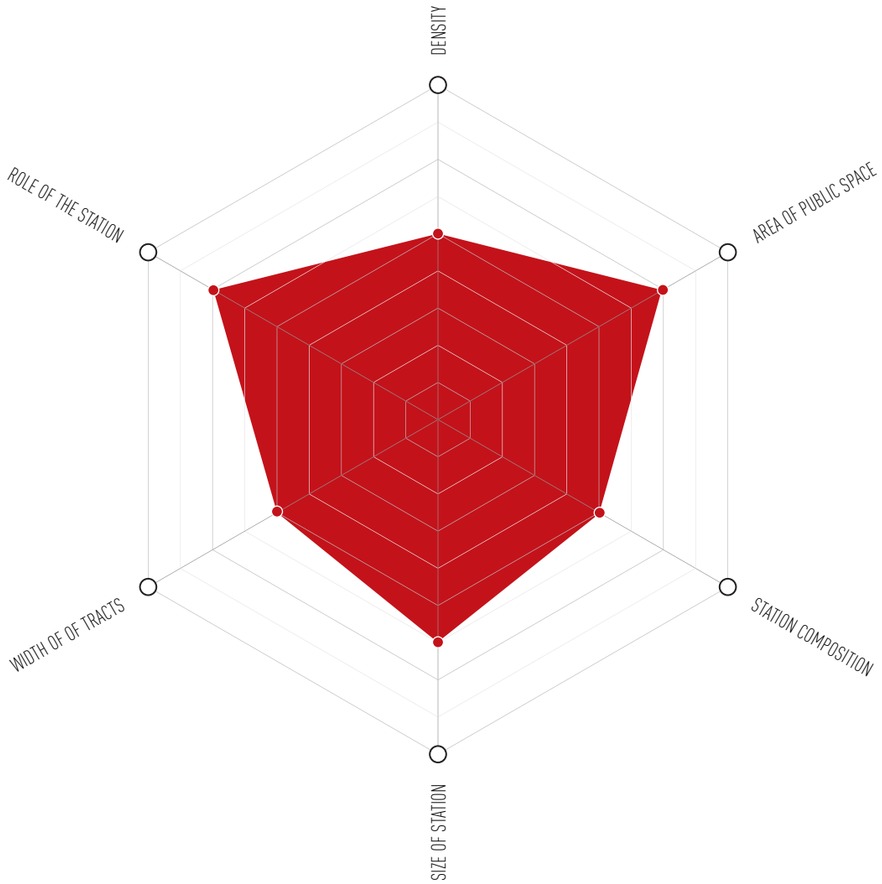
SINRYEONGRI STATION

DENSITY	LOW
AREA OF PUBLIC SPACE	0 ACRES
STATION COMPOSITION	3 ELEMENTS
SIZE OF STATION	0.05 ACRES
WIDTH OF TRACTS	20 M (65FT)
ROLE OF STATION	NEIGHBORHOOD CENTER

SONHA STATION

DENSITY	LOW
AREA OF PUBLIC SPACE	0 ACRES
STATION COMPOSITION	2 ELEMENTS
SIZE OF STATION	0.08 ACRES
WIDTH OF TRACTS	22 M (73FT)
ROLE OF STATION	NEIGHBORHOOD CENTER

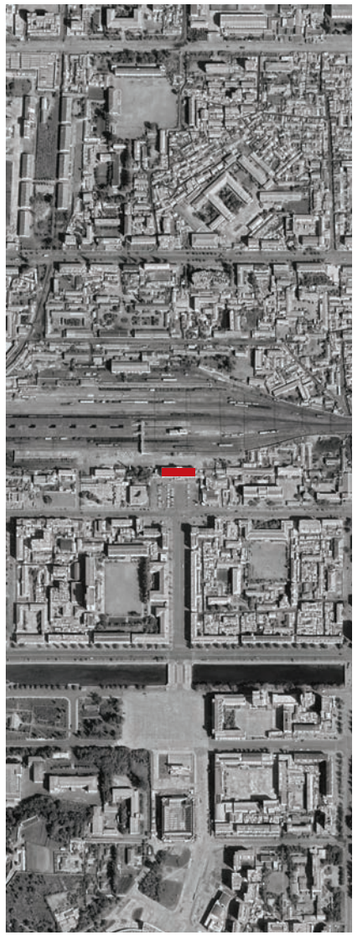
04 AGRICULTURAL TOWN STATION_THE CHARACTERISTICS WITH THE MATRIX



The agricultural town stations are the central stations for the smaller agrarian cities. They are the core for food production in North Korea located in the west-south side of the country. The station is surrounded by a high to medium density, but most of the parts in the city contain lower density. This type is attached to public space in front and has a medium size of the station and train tracks. However, this area will have heavy train traffic during the harvesting season. The station is composed of train tracks, station building, public space, open platform, and connection to another public transit. Agricultural town station has both side of main station and urban station typology. It is a center for the city, and at the same time, it is for the daily life of the citizens.

_SINMAK STATION

04 AGRICULTURAL TOWN STATION_SAMPLES



SARIWON STATION

DENSITY	HIGH
AREA OF PUBLIC SPACE	1.7 ACRES
STATION COMPOSITION	6 ELEMENTS
SIZE OF STATION	0.2 ACRES
WIDTH OF TRACTS	120 M (400FT)
ROLE OF STATION	CITY CENTER

SINMAK STATION

DENSITY	HIGH
AREA OF PUBLIC SPACE	1.7 ACRES
STATION COMPOSITION	6 ELEMENTS
SIZE OF STATION	0.2 ACRES
WIDTH OF TRACTS	40 M (130FT)
ROLE OF STATION	TOWN CENTER

PYONGSAN STATION

DENSITY	MEDIUM
AREA OF PUBLIC SPACE	1.3 ACRES
STATION COMPOSITION	4 ELEMENTS
SIZE OF STATION	0.2 ACRES
WIDTH OF TRACTS	50 M (165FT)
ROLE OF STATION	TOWN CENTER

SUKCHEON STATION

DENSITY	MEDIUM
AREA OF PUBLIC SPACE	1.6 ACRES
STATION COMPOSITION	4 ELEMENTS
SIZE OF STATION	0.2 ACRES
WIDTH OF TRACTS	40 M (130FT)
ROLE OF STATION	TOWN CENTER

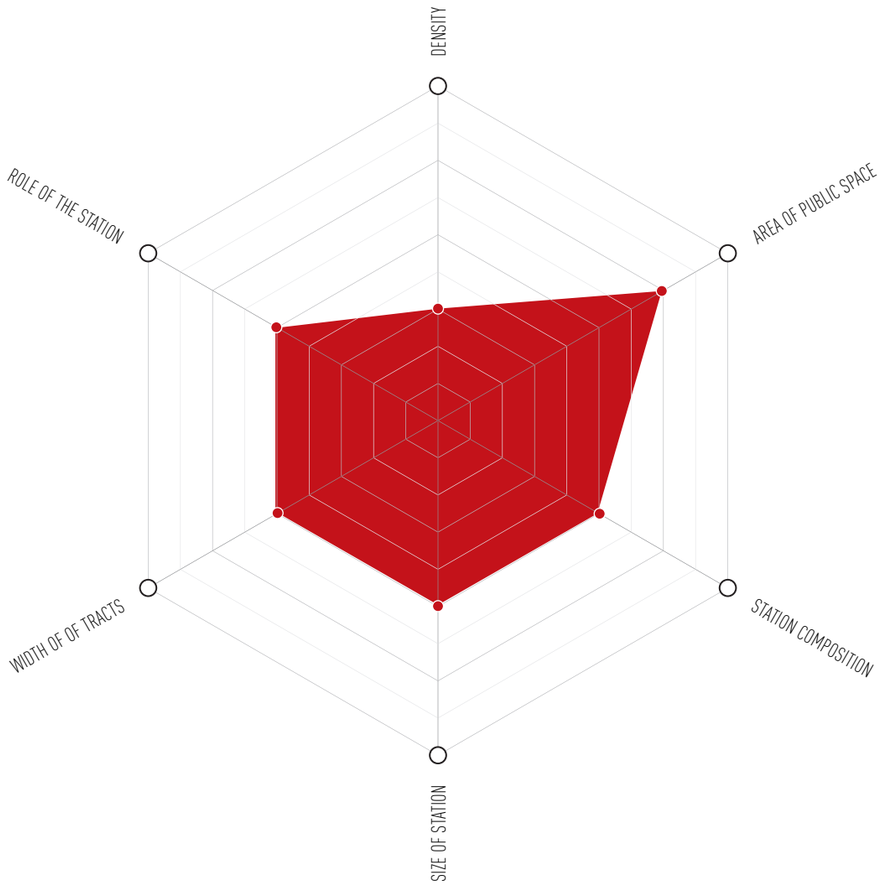
TANCHON STATION

DENSITY	MEDIUM
AREA OF PUBLIC SPACE	1.4 ACRES
STATION COMPOSITION	5 ELEMENTS
SIZE OF STATION	0.3 ACRES
WIDTH OF TRACTS	92 M (300FT)
ROLE OF STATION	TOWN CENTER

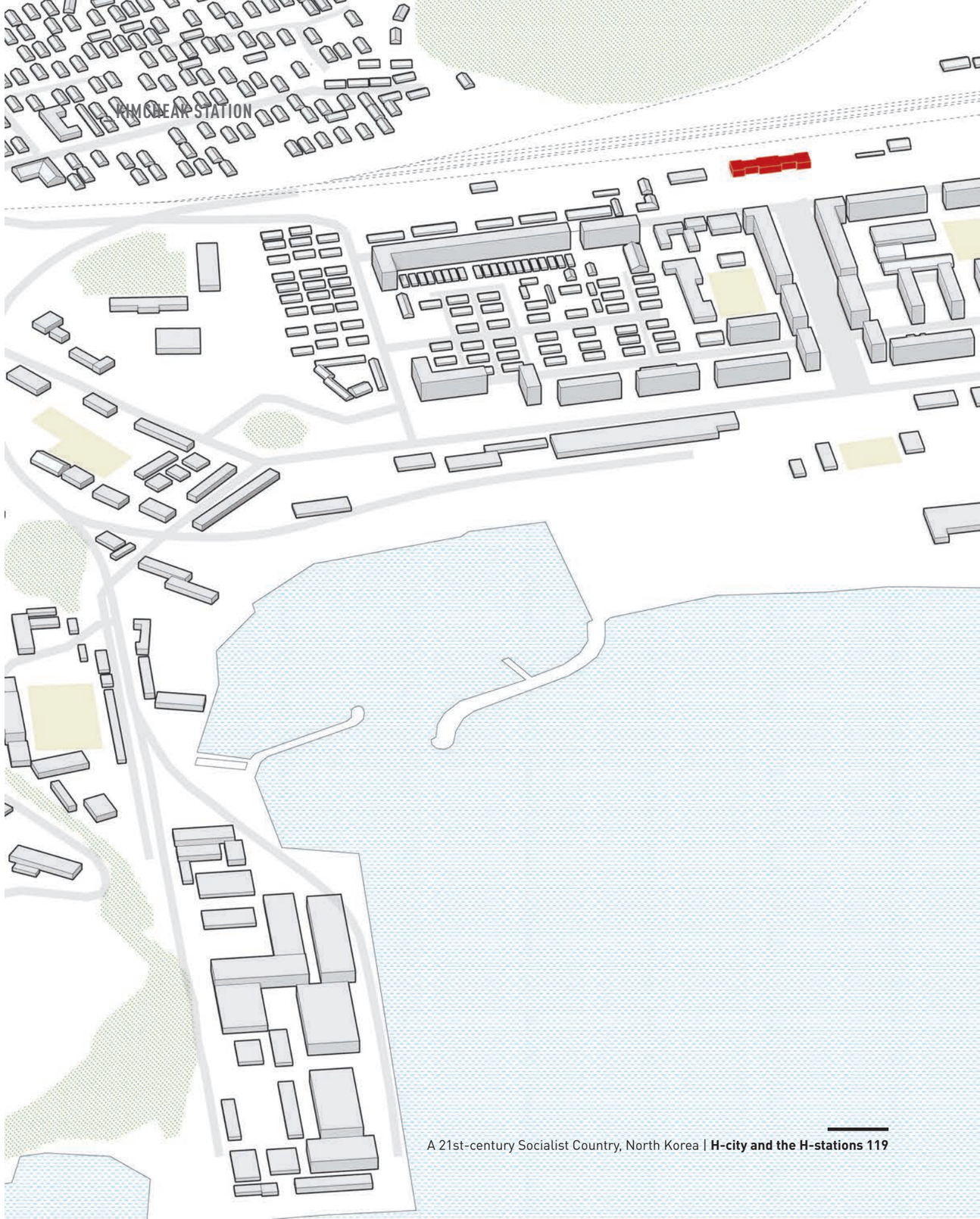
JEONGJU CHEONGNYEON STATION

DENSITY	MEDIUM
AREA OF PUBLIC SPACE	2.1 ACRES
STATION COMPOSITION	5 ELEMENTS
SIZE OF STATION	0.2 ACRES
WIDTH OF TRACTS	125 M (415FT)
ROLE OF STATION	TOWN CENTER

05 INDUSTRIAL TOWN STATION _THE CHARACTERISTICS WITH THE MATRIX



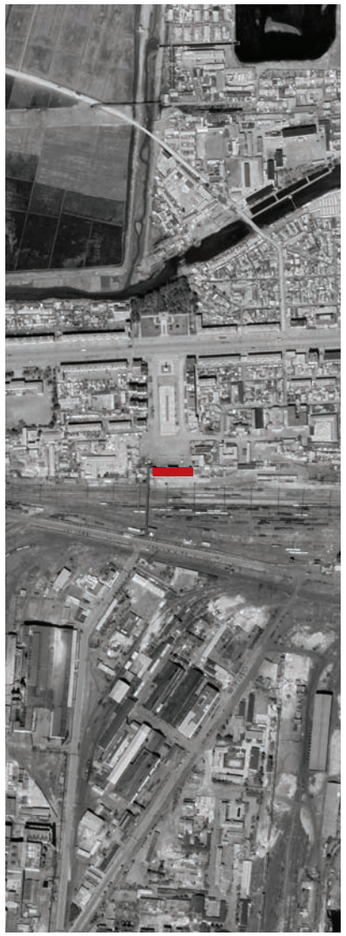
The industrial town stations are similar to the agricultural one but focused on industry, not agriculture. There is not a big difference in the composition, size, train tracks, and role of the station, it is mostly just a little smaller in dimensions. However, the surrounding is not similar. Even though there are high-density buildings around the station, the city is more spread out than an agricultural town because of all the vast factories. The industries require big spaces and broader roads. This station's tracks are of medium width because there are other transit options for distribution shipments. Therefore, this typology is a combination of industrial functions and a city center.



05 INDUSTRIAL TOWN STATION _SAMPLES

KIMCHEAK STATION

DENSITY	HIGH
AREA OF PUBLIC SPACE	5.1 ACRES
STATION COMPOSITION	5 ELEMENTS
SIZE OF STATION	0.2 ACRES
WIDTH OF TRACTS	100 M (325FT)
ROLE OF STATION	CITY CENTER



SONGPYEONG STATION

DENSITY	HIGH
AREA OF PUBLIC SPACE	3.8 ACRES
STATION COMPOSITION	5 ELEMENTS
SIZE OF STATION	0.3 ACRES
WIDTH OF TRACTS	115 M (375FT)
ROLE OF STATION	TOWN CENTER

SINPO STATION

DENSITY	MEDIUM
AREA OF PUBLIC SPACE	1.3 ACRES
STATION COMPOSITION	4 ELEMENTS
SIZE OF STATION	0.15 ACRES
WIDTH OF TRACTS	27 M (90FT)
ROLE OF STATION	TOWN CENTER

PANMUN STATION

DENSITY	MEDIUM
AREA OF PUBLIC SPACE	0.7 ACRES
STATION COMPOSITION	4 ELEMENTS
SIZE OF STATION	0.4 ACRES
WIDTH OF TRACTS	50 M (165FT)
ROLE OF STATION	SPECIAL DESTINATION

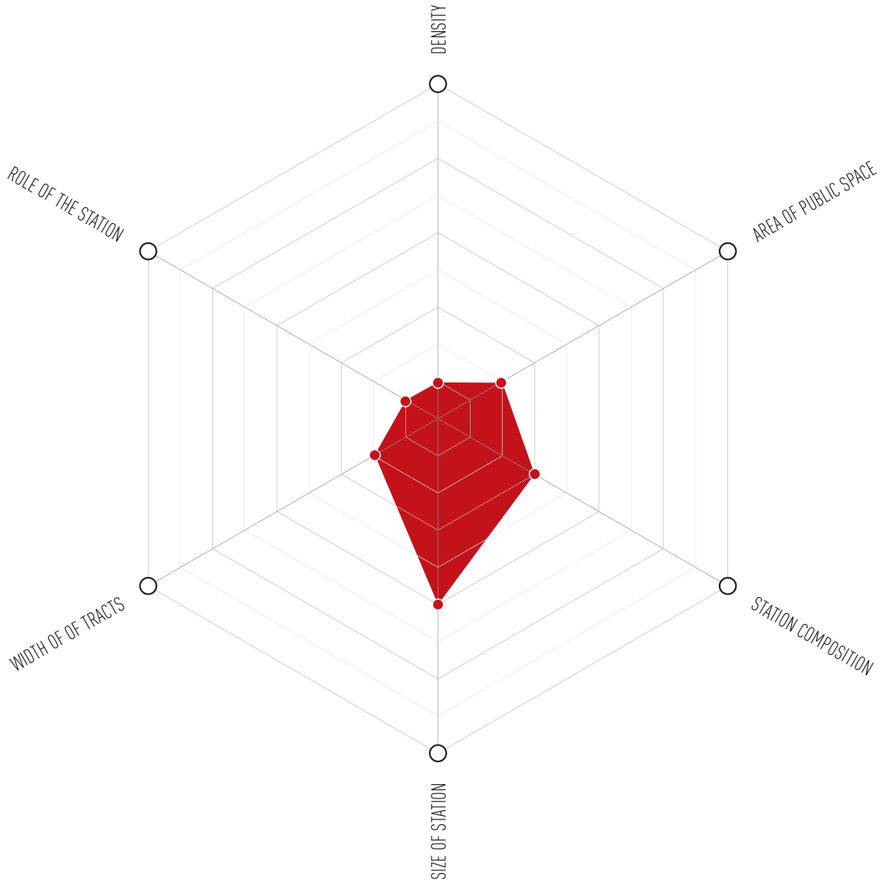
MUNCHEON STATION

DENSITY	HIGH
AREA OF PUBLIC SPACE	1.2 ACRES
STATION COMPOSITION	4 ELEMENTS
SIZE OF STATION	0.15 ACRES
WIDTH OF TRACTS	38 M (125FT)
ROLE OF STATION	CITY CENTER

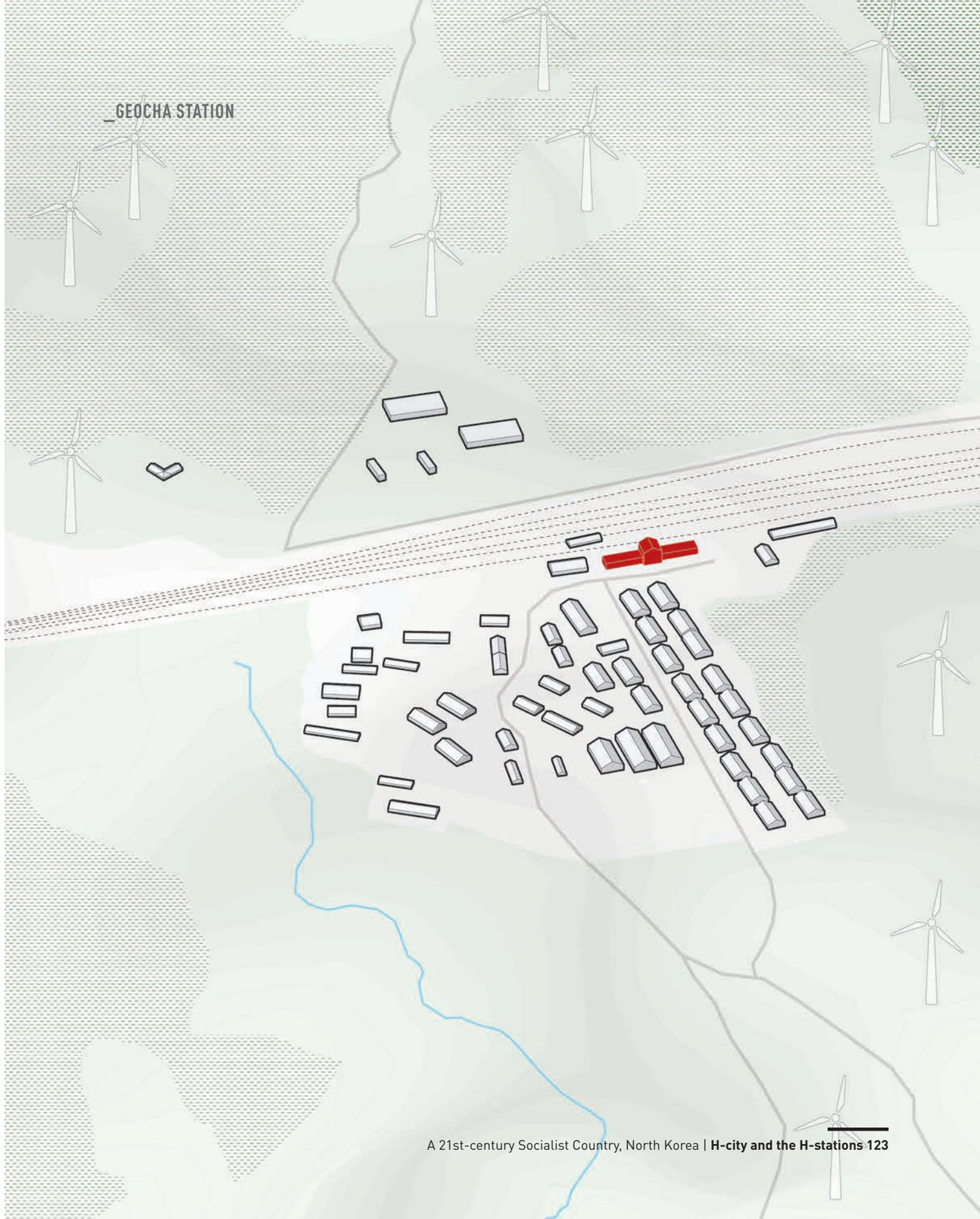
KWANGOK STATION

DENSITY	LOW
AREA OF PUBLIC SPACE	0 ACRES
STATION COMPOSITION	2 ELEMENTS
SIZE OF STATION	0.05 ACRES
WIDTH OF TRACTS	20 M (65FT)
ROLE OF STATION	NEIGHBORHOOD CENTER

06 VILLAGE STATION _THE CHARACTERISTICS WITH THE MATRIX



The village stations are located in rural areas, that is why the population density is the lowest. The composition of these stations is minimum, which means only train tracks, an open platform, and a station building. However, the size of the station is not the smallest in comparison because the North Korean government standardizes these structures.
There are several unique stations in this typology called special destinations. These are areas for vacationing, so even it is a small village, the users of the station would vary throughout a year. Therefore, in this type, the building itself can be a community space for the village and sometimes for visitors.



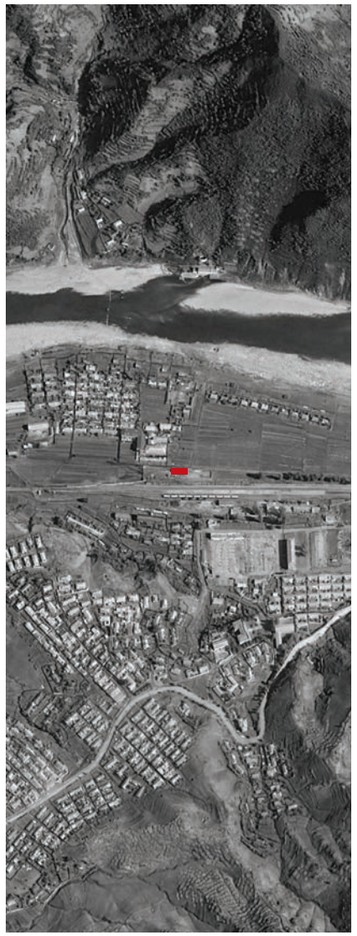
06 VILLAGE STATION _SAMPLES

YANGDEOK STATION

DENSITY	HIGH
AREA OF PUBLIC SPACE	5.1 ACRES
STATION COMPOSITION	5 ELEMENTS
SIZE OF STATION	0.2 ACRES
WIDTH OF TRACTS	100 M (325FT)
ROLE OF STATION	CITY CENTER

CHONGGANG STATION

DENSITY	LOW
AREA OF PUBLIC SPACE	0 ACRES
STATION COMPOSITION	3 ELEMENTS
SIZE OF STATION	0.1 ACRES
WIDTH OF TRACTS	35 M (115FT)
ROLE OF STATION	NEIGHBORHOOD CENTER



CHANGRIM STATION

DENSITY	LOW
AREA OF PUBLIC SPACE	0 ACRES
STATION COMPOSITION	3 ELEMENTS
SIZE OF STATION	0.05 ACRES
WIDTH OF TRACTS	30 M (97FT)
ROLE OF STATION	NEIGHBORHOOD CENTER

YEOHYUN STATION

DENSITY	LOW
AREA OF PUBLIC SPACE	0.15 ACRES
STATION COMPOSITION	3 ELEMENTS
SIZE OF STATION	0.07 ACRES
WIDTH OF TRACTS	6 M (20FT)
ROLE OF STATION	NEIGHBORHOOD CENTER

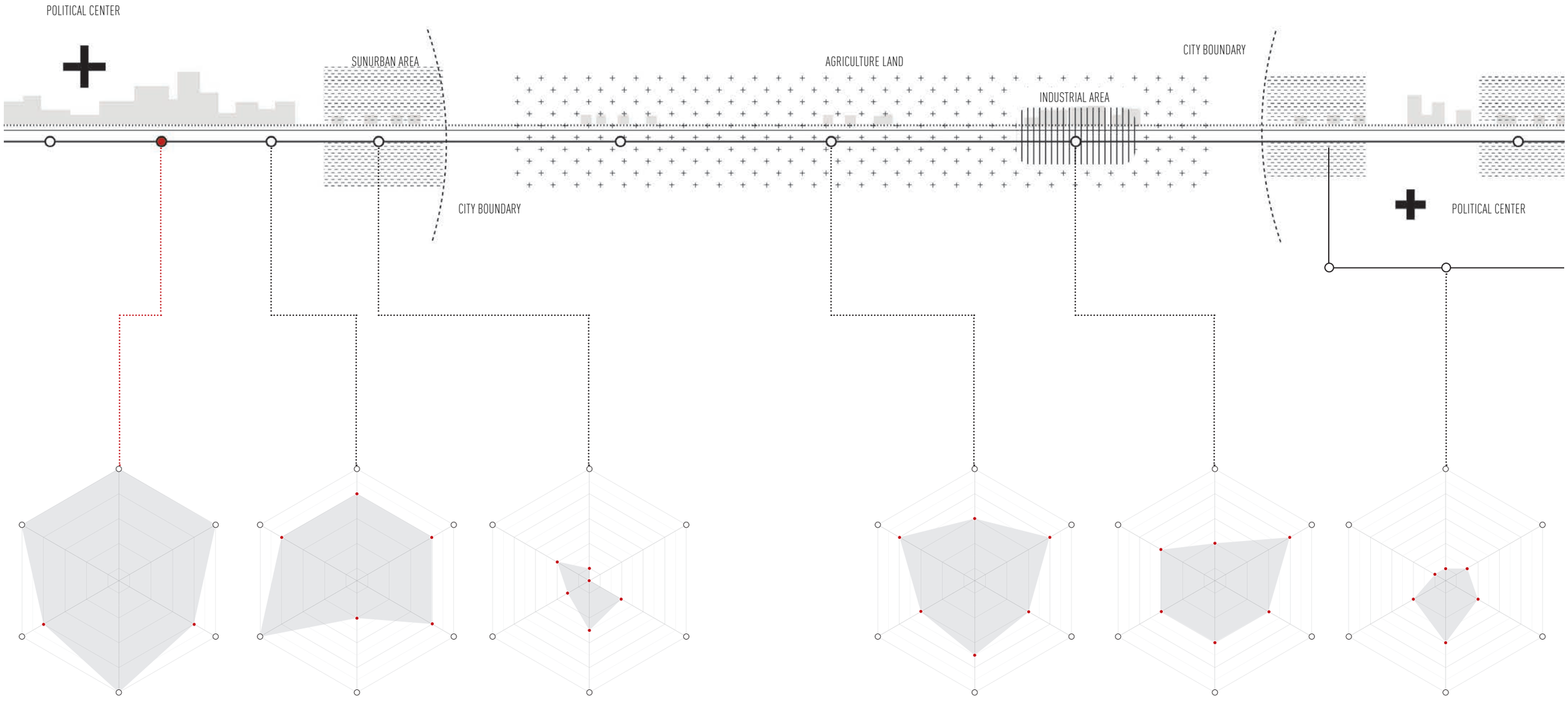
GWANHEA STATION

DENSITY	LOW
AREA OF PUBLIC SPACE	0 ACRES
STATION COMPOSITION	3 ELEMENTS
SIZE OF STATION	0.1 ACRES
WIDTH OF TRACTS	17 M (57FT)
ROLE OF STATION	TRANSPORTATION

GEOMGANGSAN STATION

DENSITY	LOW
AREA OF PUBLIC SPACE	0.9 ACRES
STATION COMPOSITION	5 ELEMENTS
SIZE OF STATION	0.4 ACRES
WIDTH OF TRACTS	20 M (66FT)
ROLE OF STATION	SPECIAL DESTINATION

CONCLUSION _6 TYPOLOGIES AND H-LINE



H-stations as a Catalyst

4

01\
Stations as the Foundation of a City

02\
H-stations as the Catalyst fo

01

Historically, a city has a close relationship with the transportation network, which North Korean cities have lost the connection.

Stations as the Foundation of a City

Historic Relationship Between Stations and Urban Structure

Transportation is the system connecting each element of a city, the main system and in close relationship to an urban structure. As transit technologies have developed, cities have grown along the corridors. However, it was not the case for North Korea. The economy was not their spatial center but politics, which makes an awkward relationship between transit and urban structure.
It is more clear to see in the case of Pyongyang. The distribution of programs does not have any hierarchy. It is even hard to distinguish the centers.
The stations would be central areas for all the activities not only for daily life but for the economy. The primary goal is bringing back the station as a center for daily life. Moreover, the stations need to work as economic hubs by providing economic infrastructure around the stations.

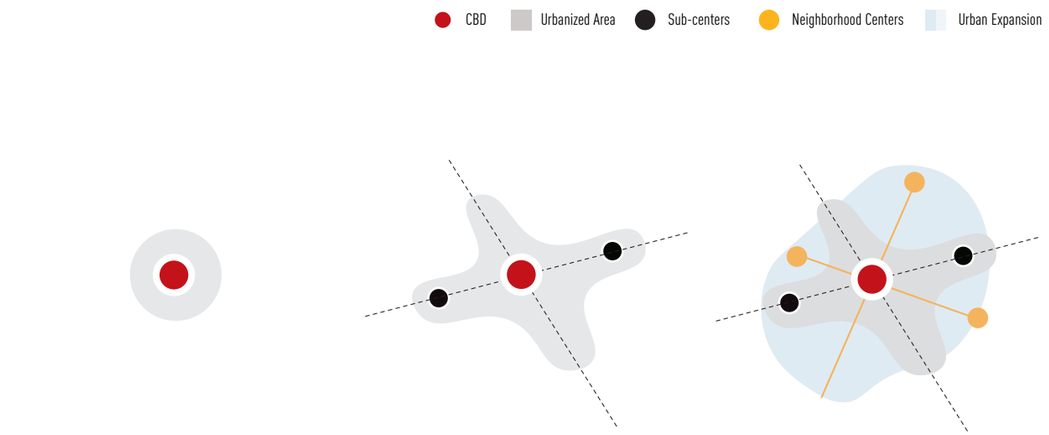
STATIONS AS FOUNDATION OF A CITY_CONNECTING VARIOUS PARTS OF A CITY

TRANSIT LINE AND A CITY

Trains have been connected each part of a city and becoming a founation in urban structure.

THE HISTORIC ROLE OF STATIONS_WITHIN A CITY

URBAN STRUCTURE by transportation



01 CARRIAGES

When a city improves their transportation system, the effects expand into their urban structure—the urban structure here meaning the distribution of density and the location of economic hubs within the city.

02 TRAINS

During the era when the carriage was the main source of transportation, the size of a city was much smaller and had only one center, due to the limitations of carriages.
After the invention of trains, cities started to grow and diversify. Sub-centers showed up along the transit lines.

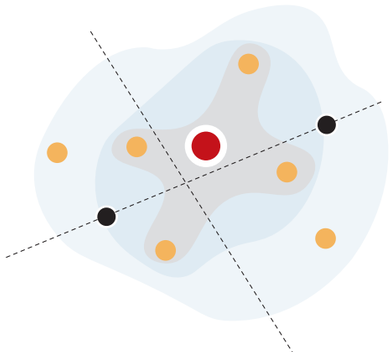
03 AUTOMOBILES

Automobiles then had a significant impact on urban structures.
Cities expanded from their prior transportation systems; still, city centers were located in transit corridors.

04 HIGH-SPEED TRANSPORTATION

Cities become much larger with high-speed transportation because people can reach farther distances in shorter time. However, cities are still maintaining historical central areas.
In the case of North Korea, it's a different story though: the country is still in the train era, moving towards automobiles their urban structure is quite exceptional considering.
Because of the Korean War, their historical centers were destroyed, and their political center was rebuilt regardless of the development of their transit system. Moreover, since the government discouraged the trades in making self-sustained states, their stations have kept moving away from central areas.
The separation of transportation and economic hubs makes the systems of this country more inefficient.

TYPICAL URBAN STRUCTURE in North Korea



SEPARATION OF TRANSPORTATION AND ECONOMIC HUBS

EXISTING URBAN STRUCTURE_IN PYONGYANG

The public programs in Pyongyang look like they're equally distributed. There are positive sides to this urban structure, such as for public services as it increases their accessibility. However, this only works with a good transportation system. If their transportation system doesn't work well, the public services render inefficient because these services are located in urbanized areas, which means it's only accessible to people already in the city. The structures aimed for equality, but are lacking.

Train Tracks
Primary Road
Secondary Road
Train Station

Green Area
River
Urbanized Area

Education
Industry
Culture
Monument
Office
Hospital
Department Store
Market

02

Each station typology has a different economic infrastructure providing different meanings and spaces to people. Based on the strategies, the new H-stations are suggested.

H-stations as the Catalyst for Future Development

To Bring Life Back to Stations

The main goal is bringing life back to these stations; four main factors in doing this are: making the station area vibrant; land use, transportation, commercial activity, and public space.

Buildings with multiple functions are one of the core needs, but it is currently illegal in countries that have strict land-use plans like North Korea. Merely adding one more layer for land use can make it better, notably by applying the strategy only to specific areas the North Korean government wants to develop, which is an excellent way to control their developments and capitals.

Transportation is not only for people but also for products. An efficient distribution system is as essential as excellent public transportation.

If H-stations are the catalyst for future development, legalized commercial activity will be the trigger. This will expand the existing markets and add lots of new markets.

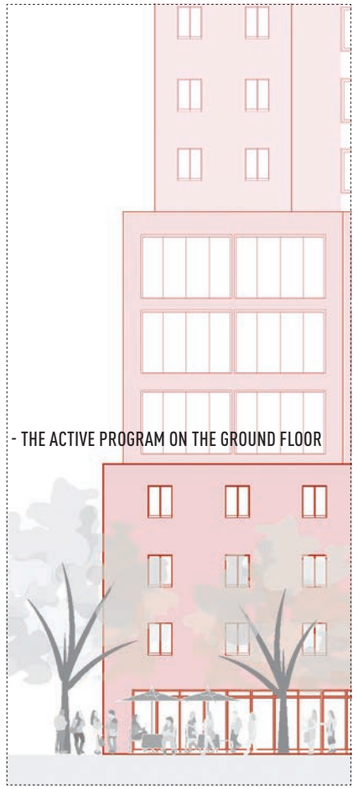
The last factor in rebuilding the stations is the addition of public spaces.

These four factors have two main strategies, and each approach has several sub-elements. The combination of each element is different based on the typology of stations.

This chapter focuses on how the four approaches are applied to each typology and how the combination makes these station areas vibrant.

01 LAND USE

- LAYERING LAND USE IN STATION ZONE

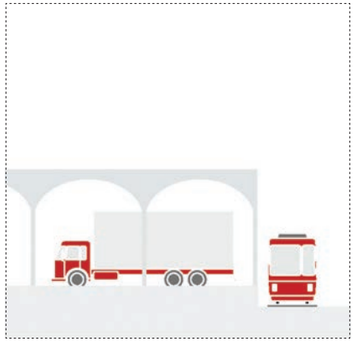


- THE ACTIVE PROGRAM ON THE GROUND FLOOR

02 TRANSPORTATION

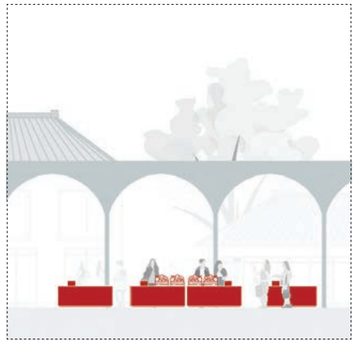
- VARIOUS OTHER TRANSPORTATIONS

- EFFICIENT DISTRIBUTION OF PRODUCT



03 COMMERCIAL ACTIVITY

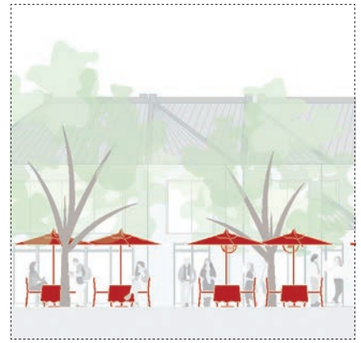
- LEGALIZED MARKET AREA



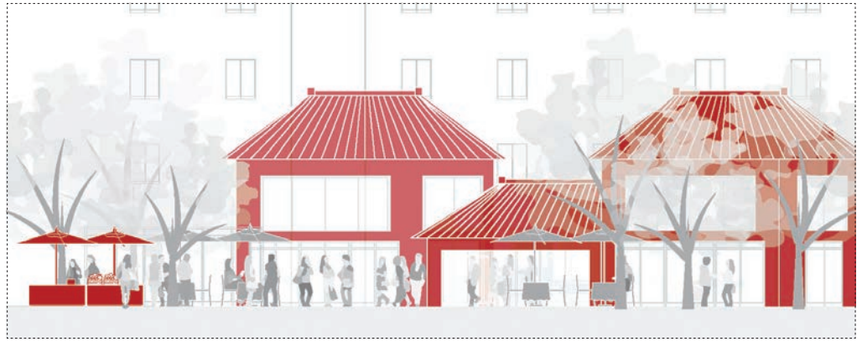
- STRIP OF RETAILS

04 PUBLIC SPACE

- APPROPRIATE OUTDOOR SEATING AND GREENERY



- SCALED-DOWN PUBLIC SPACE



To achieve the goal of making North Korean stations public centers, there are eight strategies to consider. The four sectors clarified are land use, transportation, commercial activity, and public scape.
North Korea has rigorous land use, even making the ground floor of a building for retail use is illegal. Layering land use is crucial for vibrancy, therefore, by designating the station area as a particular zone, the buildings can become mixed-use, and then naturally capital will be concentrated to the station zone.
The second is the transportation of goods and people. For people, these stations are the cores of the public transportation system, but for the case of goods, using the train system as a primary resource for delivery, the backside of the station becomes a hub, sparking center efficiency.
After their strategized economic transition, this legalized commercial activity will affect urban spaces. North Koreans will participate rendering these areas as more vibrant sectors. Therefore, the structure to promote this activity is an essential strategy.
The last factor for public space and surprisingly, North Korean cities already have enough open spaces within their cities, albeit too exposed and over-scaled. North Koreans currently feel like they are being monitored in these wide-open areas, so these spaces should be refurbished with seating, activity stations, and landscape, or other essentials to fill the public spaces.

01 Land use		02 Transportation	
Layering Land Use in 'Station Zone'	The Program on the Ground Floor	Various Other Transportations	Efficient Distribution of Product
COMMERCIAL	WINDOW	TRAIN / SUBWAY	TRAIN
RESIDENTIAL	DISPLAY	STREET CAR	TRAILER
AGRICULTURAL	OUTDOOR SEATING	BUS	TRUCKS
INDUSTRIAL		CAR	MORTERCYCLE
INFRASTRUCTURE		BIKE	BIKE

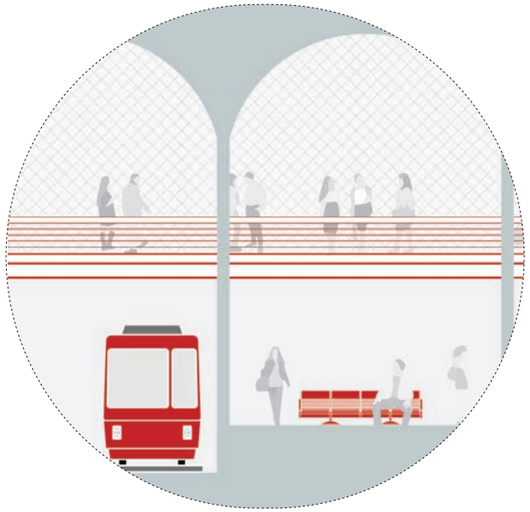
03 Commercial Activity		04 Public Space	
Legalized Market Area	Strip of Retails	Appropriate Street Furniture and Tree	Scale Downed Public Space
WHOLESALE MARKET		TREE	SMALL SCALE BUILDING
FARMERS MARKET		OUTDOOR SEATING	FOOD TRUCK
GENERAL MARKET		BENCH	STREET VENDER
RETAIL		LIGHTING	MONUMENT
		PAVED SIDEWALK	TREE

There are eight strategic elements to help achieve these goals, based on the typology of the train stations, the combination of factors changed, and some core necessities specific to each station (such as bike transportation).

The land-use factor is straightforward: the main programs in North Korea, except political or governmental, are commercial, residential, agricultural, industrial, and infrastructural (such as a dock or train tracks). With mixed-use programs, the ground floor is more important than other stories for the purpose of pedestrian transactions. The windows, window displays, and especially outdoor seating are vital elements needed.
The transportation factor is based on the existing options in North Korea: from train to bike, each one represents a hierarchy in the system. There are two types of spaces for commercial activity: one is existing markets, which are illegal currently. The other is for new retails for shaping a new commercial strip. Because these stations are the centers for transportation, these commercial elements should be aspects of the stations as well, because people will naturally gather at stations.
The main agenda for rebuilding public space is breaking down a massive open space into pieces by using various elements. First, small buildings or street vendors are divided into smaller-scale retailers. After that, the spaces should be filled with greenery and seating, establishing a more humanized space. Those elements will fill out the gap between the massive buildings, the square, and the people.

LAND USE

Attached retails and office area
Highest density in the city
Mixed-use building with retails, offices, and housings



TRANSPORTATION

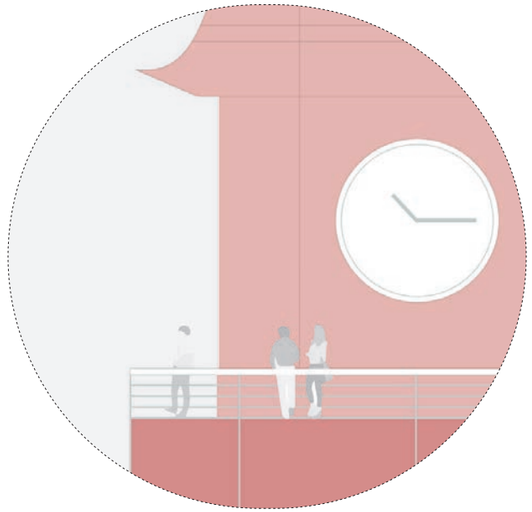
Close connection to public transportation system to each parts of the city

The main station is the most significant type of station. It is surrounded by the highest-density population and is the largest in size. After their economic transition, this area should be the busiest in North Korea.

After the area surrounding the main station is designated as a "station zone," the ground floor within the building will become a space for restaurants and retails, attracting tourists and pedestrians using the station. Furthermore, because of the convenience of transit, more businesses will settle around these main stations. The main station would have more functions than just simply used for transportation. It would be a multi-functional space. The main station would a center for the transportation of people rather than goods. There would be more purpose for pedestrian traffic than for industrial or distribution purposes. As the main hub station for all public transportation, people would be able take a subway, streetcar, or bus after exiting the train.

COMMERCIAL ACTIVITY

Symbolic facade showing the identity of the city
Attached retails and office area
Place for tourists



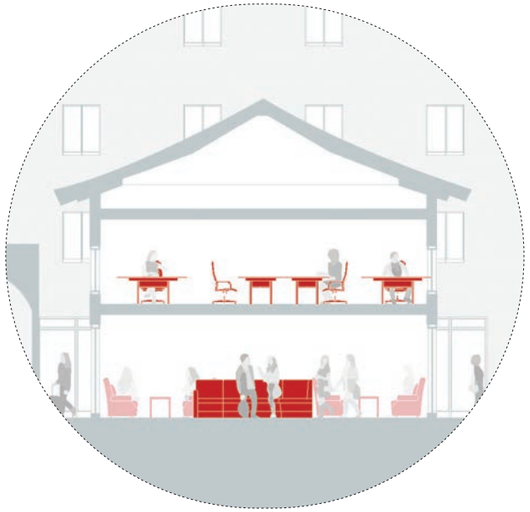
PUBLIC SPACE

Symbolic facade showing the identity of the city
Place for tourists

The vast square would, at this point, been rebuilt as an active public space with various commercial uses. There would be shopping areas as well as restaurants or cafes. Street vendors would start to fill up space, and the addition of greenery would add to the aesthetic and comfort of the space.

The station itself would be a tourist spot. The uniqueness of design would further attract pedestrian traffic who would be able to see the cityscape from the station.

MAIN STATION_THE LIFE AROUND MAIN STATION



LAND USE

2-3 stories station with Retails attached
Medium Density Mixed-use Buildings
Renovated the First Floor to Office or Housing

TRANSPORTATION

Central station for distribution of goods and industries in the city
Close connection to public transportation to Each Neighborhoods

The urban station type is within a sub-center of a city before or following the main station or central station of smaller towns. Therefore, the size of this station type is smaller than the main station, but the surrounding population is still pretty high. This station is more for the residents than visitors.
This area would have mixed-use buildings but not as radical as the main station. The change would be smaller and slower due to the station's nature and size, so it should have simple, functional spaces.
In the case of transportation, unlike the main stations, it would be the central hub for industrial and distribution purposes. It would have fuller train tracks than the main station since it would be dealing with additional functions that the main station would not be able to handle due to higher pedestrian

COMMERCIAL ACTIVITY

Commercials focused on daily life
Places for after work and weekends

PUBLIC SPACE

The center for daily life

traffic. Of course, it would have close connections to other public transportations, connecting each neighborhood.
Existing markets are usually located around urban stations, so these existing markets would grow and affect much of the surrounding, however, these markets would be for daily necessities, not luxury products. Therefore, the scale of each retailer would be small and focused on something people can do after work or during weekends.
Naturally, the public space alongside urban stations would be similar to commercial areas. Along with the markets, there would be greenery and public seating next to pedestrian roads, making the space more dynamic and lively.


BUS

TRANSPORTATION

Smaller Scale of Public Transportation
Distribution of food production

COMMERCIAL ACTIVITY

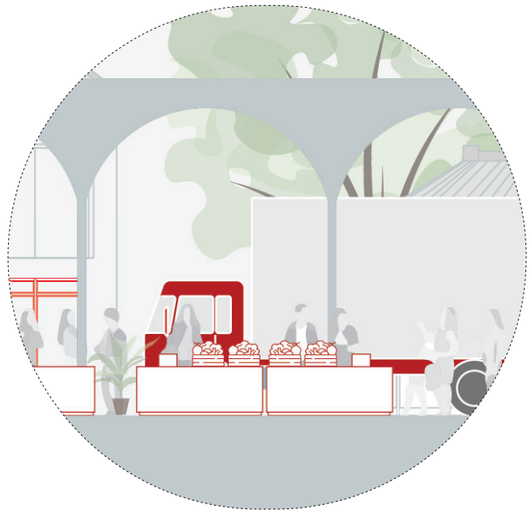
Several small retails around the station

PUBLIC SPACE

Small scale public space for the residents

The suburban station type is the byproduct of socialist planning, to prevent the growth of a city. These stations are located within the jurisdiction of a big city, however, the density and characteristics are similar to the rural area station types. This area is for food production in its town.
The surrounding area does not have a high enough density to need mixed-use and because of that, this area quickly becomes a target for developers, incurring suburbanization. Therefore, it is essential to control the developments by these stations.
The primary user of these stations is the residents and the food products. There would be spaces and infrastructure for food distribution mainly using trains and some vehicles. Due to the smaller population, public transportation is on a smaller scale with fewer options.
The commercial activities are of two extremes: one is small trade within the village, and the other is with all other cities, which need the product of the town. The small retailers and offices are located around the station. With the small center, there would be a smaller-scale public space for residents where they can take rest and gather.

SUBURBAN STATION_THE LIFE AROUND SUBURBAN STATION

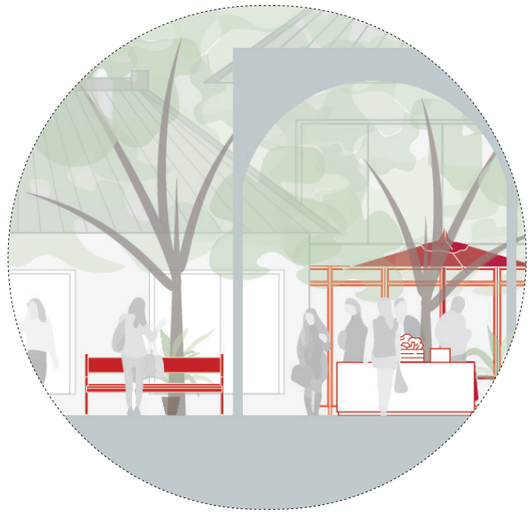


LAND USE

Mideum density mixed-use surrounding buildingd and the station

TRANSPORTATION

Distribution system for food production in wholesale, retail, and personal scale



COMMERCIAL ACTIVITY

Commercial activities in various scale from wholesale to smaller scale such as farmers market

PUBLIC SPACE

Market space as a public and social space

The agricultural town station type is located in the middle of productive land. Most agricultural industries are concentrated in these areas and the stations would be hubs for the trade and distribution. The surroundings would have medium density in population and the station would be the central station for these towns. The food industry is the main focus for these towns, so, these station zones would include a combination of retailers for the community and places for food markets. With the station, the market area is the catalyst, making it vibrant.
There are spaces designated within the distribution system for each commercial scale. For instance, some of the products would go directly to the train, others would go to trailers or trucks for individual retailers. That means the products come from the outskirts of towns to the stations and then to each part of the country.
This active commercial activity affects local business as they coexist and can positively effect each other.
In the case of public space, the market has historically been an important social space in Korea. The market is a public space itself and this function affects the surrounding and broadens it.

AGRICULTURAL TOWN STATION_THE LIFE AROUND AGRICULTURAL TOWN STATION

LAND USE

Higher density mixed-use around station but lower density in the outskirt of the town

TRANSPORTATION

Heavy industrial use and the public transportation in a smaller scale

COMMERCIAL ACTIVITY

Mainly for the residents and partially for business and tourists

PUBLIC SPACE

Spaces for daily life and scale-downed with smaller buildings or street vendors

The industrial town station type has similar characteristics to the agricultural town station, except the distribution of density and program. In this town, there is a higher density in the station and factories, but not the market area.
The transportation in this town is for delivering the source materials for the industries and then the final product to other cities or other countries. These sectors are various throughout the country based on the assets that are has. For instance, the industries on the left side of H-line focus on heavy industries with sufficient energy sources. The most common use of public transportation would be the bus or streetcar in these industrial towns. This is because the economy here is not active enough to support the subway. The commercial activity and public spaces are similar to that of the urban station type. They are mostly for residents and there are few places for business and tourists. The open space in front of the station is scaled down with smaller buildings, street vendors, and greenery.


BUS

TRANSPORTATION

Personal car, motorcycle, or bike is the most common

COMMERCIAL ACTIVITY

The station itself becomes community center which has little retails inside

PUBLIC SPACE

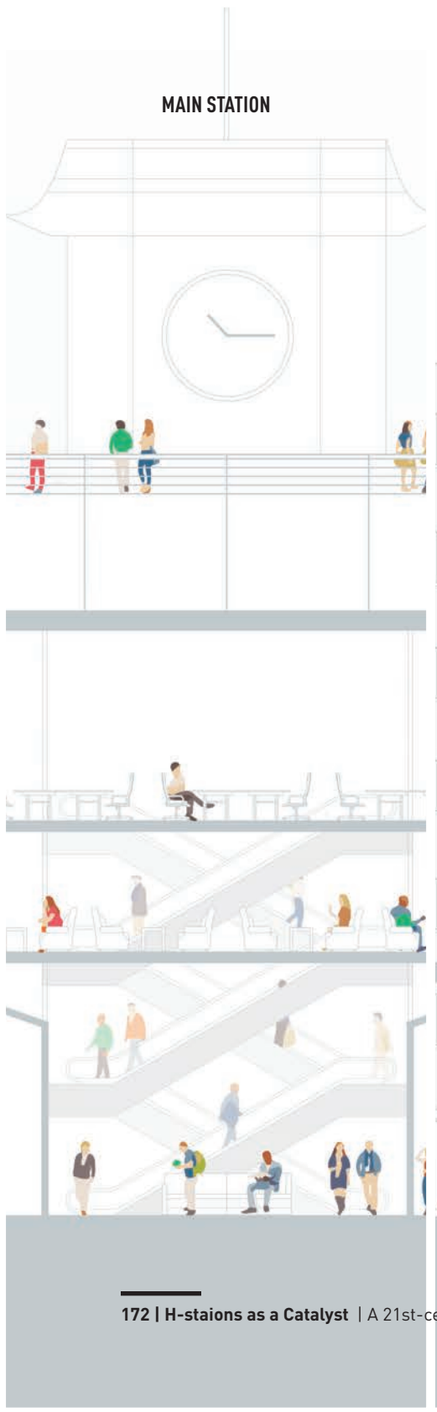
Small pavilion close to the station as a outdoor gathering space in this town

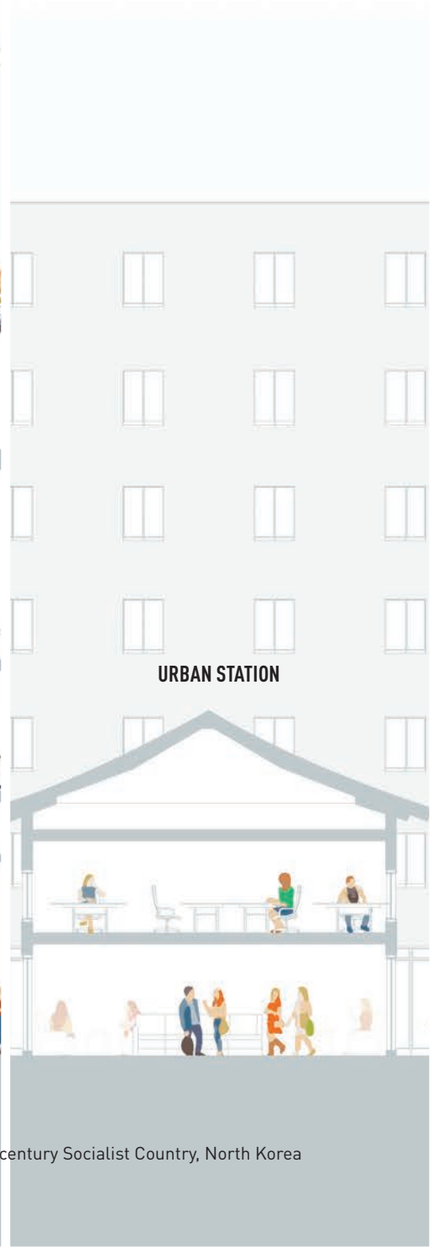
The village station type is located in rural areas. Almost 50 percent of H-stations are under this category type. The densities here are the lowest, which means there is no need for mixed-use buildings.

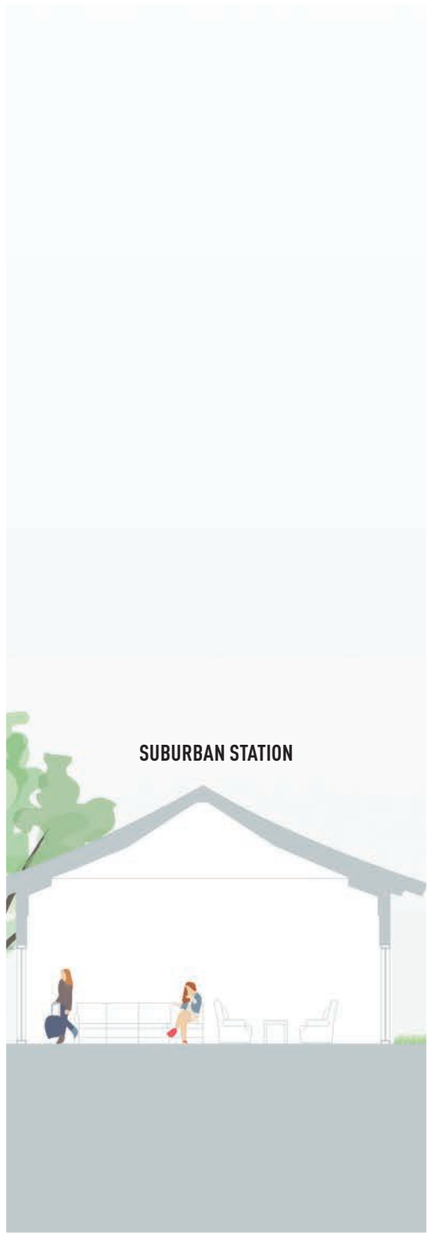
However, still, the station zone is the center of the village. The difference is the station is the community center here, not the surroundings. Therefore, commercial activities are concentrated here.

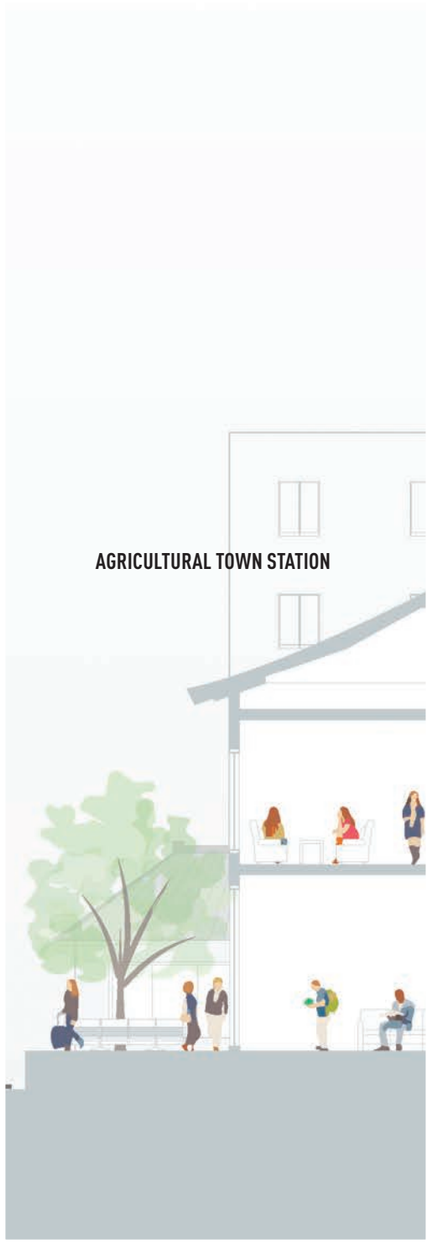
In the case of public space, due to the density, there is vast outdoor space. But putting a pavilion or exercise facility, this area can be well used.

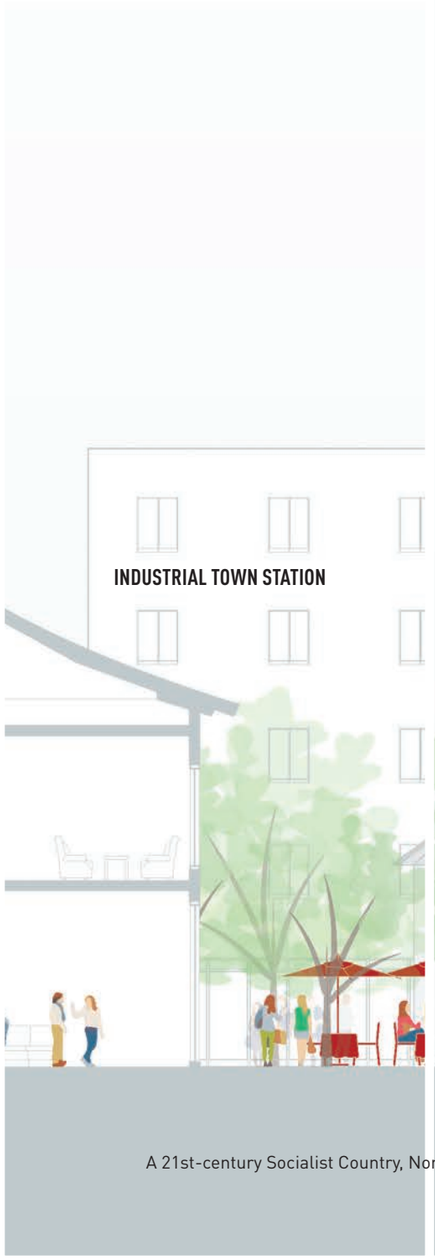
VILLAGE STATION_THE LIFE AROUND VILLAGE STATION

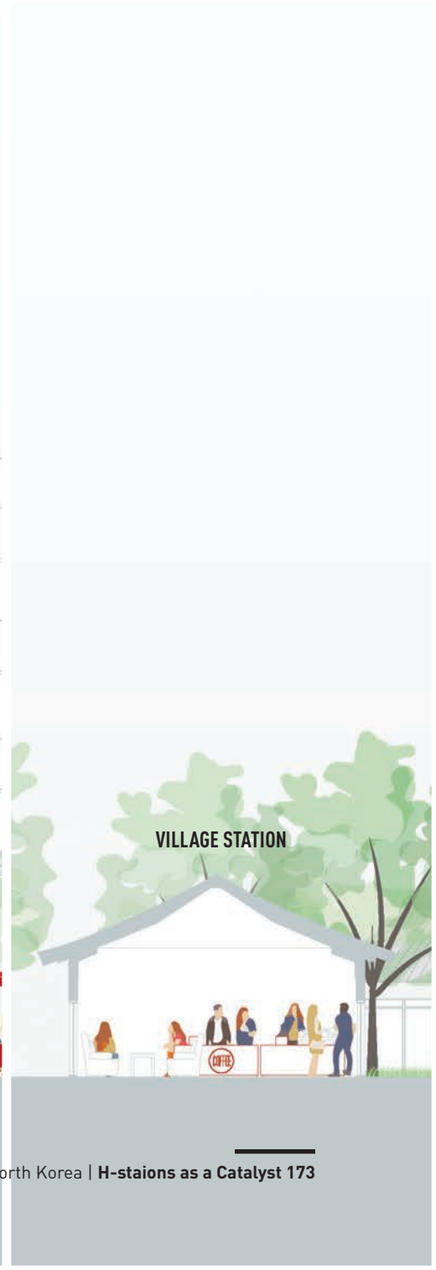

MAIN STATION


URBAN STATION


SUBURBAN STATION


AGRICULTURAL TOWN STATION


INDUSTRIAL TOWN STATION


VILLAGE STATION

Outro

As mentioned in the introduction, the two primary purposes of the book are to focus on the potential North Korea has for development and arguing the necessity for further research. No one knows what North Korea's future development will look like, however, this country has suffered from various problems and now faces an inevitable moment of change. Moreover, if this change occurs, it will affect the surrounding countries, especially South Korea. To control these effects we need to keep an eye on North Korea.

This book was written imagining the future of North Korea as a sustainable country but at the same time looking at the pressing issues that the country has. Hopefully, through this book, people can experience both sides, reality and vision.

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