vertical cities asia
yongsan, seoul
capstone/studio 2012    Taubman College
Credits

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introduction
“Everyone Ages” is the name for the 2012 Vertical Cities Asia competition, a theme that explores rapidly aging societies in Asia. The challenge is to house 100,000 people living and working in 1 km², almost half of which will be above age 65 by 2050. The competition asks planners and designers for a visionary paradigm to address the anticipated social, economic, and environmental challenges of a rapidly aging population. It requires research on and thoughtful integration of urban density, verticality, domesticity, work, food, infrastructure, nature, ecology, structure, and program.

The particular site is located in Yongsan-gu, an area within the Seoul’s Metropolitan City in South Korea. Plans for the site will consider sustainability, quality of life, technical innovation, relationship to context, and feasibility as part of their design solutions to a rapidly aging and highly dense area. They revisit concepts such as “active aging” and “aging in place” with forward-thinking, inclusive, and integrative design.
The human race is rapidly urbanising. By 2015, the UN predicts that 52% of all people - approximately 3.8 billion people - will live in cities. To support this transition, the city must evolve.

Where it once existed as a component of a regional landscape, the city must become the region. Where it once sought to dominate the native landscape, the city must learn to blend the built and the natural. Where it once relied on intellectual elite to inform its polices, the city must utilize the wisdom and energy of the crowd. In order to serve as the definitive vehicle for human habitation, cities must become living laboratories. In no place is this reality more tangible or more immediate than Asia.

Asia’s megacities are redefining what is possible. Their prosperity provides them the resources and cultural momentum to challenge norms and define a vision of the future for the entire globe.
Seoul: 20.5 M
Tokyo: 32.4 M
Shanghai: 16.6 M
Mumbai: 19.2 M
Jakarta: 18.9 M
plan for a rapidly aging population

design considerations and context

competition objective

The objective of the competition is to seek a holistic solution or a new urban paradigm for a rapidly growing Asian city, which also faces the issues of sustainability and quality of life of an increasingly aging population in Asian cities.

design considerations

The design should consider the following issues holistically and integratedly.

- **Sustainability:**
  The design should examine a closed loop paradigm, ecological and resilience attributes in their solution.

- **Quality of Life:**
  The consideration for inclusiveness and sense of community.

- **Technical Innovation:**
  The appropriate and innovative use of technology and technique.

- **Relationship to Context:**
  Sensitive consideration of the place, climate, and cultural context.

- **Feasibility:**
  The rigour of the research and criticality of design in addressing the issues.
Population projections present the challenge of urban and architectural innovation. In the 100,000 inh/km\(^2\), the residential component will make up 50% of the total built area. Source: www.nyc.gov, www.wikepedia.com
Seoul is...

- 6,000 years old
- A global center for technology and finance
- The second-largest metropolitan in the world with 23 million people
- An international destination for culture
... home to people of many generations
the competition site is...
... a regional transit hub

in Yongsan-gu, a district in Seoul located on the Han River
2.2 km², a large part occupied by unused rail yards

Regional Transportation Systems

The site is located in the heart of Seoul, where a number of transit modes intersect. The site is 1 hour and 15 minutes from Incheon International Airport and just 25 minutes from downtown Seoul.

The regional transportation lines in and out of the site come through Yongsan Station, which serves rail, bus, and subway transit. The 13 rail platforms alone see approximately 90,000 passengers each day.
Rail lines include:
- Jungong Line (commuter)
- Korean Train Express - KTX (high speed)
- Hanam Line (regional)
- Janghang Line (regional)
Existing Natural Systems

The site’s location among a number of other parks and right on the Han River presents a great opportunity to connect these systems.

- Yongsan Park currently exists; however, there are plans to expand and improve the park in 2016.
- The Han Riverfront Park also has plans for redevelopment; currently it exists only as a bike path and is accessible by water taxi.
... host to a number of existing and proposed sites

Regional Urban Context

Many of the existing and proposed conditions on and immediately surrounding the site have national and international significance that speaks to the heritage, prowess, and culture of Seoul.

Due to Seoul’s growth and presence in the global economy, the city aims to use part of the site for an International Business District (IBD). The winning proposal for the Yongsan IBD competition was 34 million built sq. ft, estimated to attract 140 million visitors, create 360,000 permanent jobs, and generate 67 trillion won in added value.
South Korean population by age group, 1950-2050

key
- elderly (65+)
- working age (20-64)
- youth (0-19)
- total population

source: South Korean Statistical Information Service
Today, there are 7 working age persons per elder. In 2050, there may be only 1 working age person per elder. By 2050, 1 of every 3 elderly could be without any public pension. As of 2004, 40% of elders were supported by family, versus 20% in 1980.

By 2050, 2 out of 5 South Koreans will be 65+. By 2050, there will be 3 elders for every child. By 2050, the number of elders 80+ will match the number of children under the age of 15.

30% of South Koreans will work in other sectors (e.g. farming, self-employment, short-term)

mandatory retirement age at 96% of medium/large firms
minimum age requirement for National Pension System eligibility
this groups makes up less than 4% of regular employees medium and large firms

considered nearly impossible to get a new job in a high-paying sector
In earlier periods of development, the natural world was conceptualized as a competitor, an entity that strived to undermine the success of human communities. With this mindset, humanity sought to develop tools capable of usurping nature and eliminating any of its unwanted attributes.

Today, humanity’s view is much different. By pursuing our own domination of nature, we ironically discovered the depths of our reliance on it. In reflection of this revelation what was once seen as competition is now conceptualized as an ongoing process of collaboration. For the purpose of city planning, this new dedication translates to a thorough review of not only the raw physiographic features which make up a site, but also the cultural concepts associated with them.

**climate**

Seoul is located in the northwestern portion of South Korea, not far from the Yellow Sea. Its climate is considered continental with hot, humid summers and cold, dry winters. The primary driver of the region’s climate is the annual monsoons. In the summer, warm, moist air from the Indian Ocean travels northeast across South Korea dropping substantial rain as its passes the nation’s mountainous interior. In the winter, conversely, cold, dry air from the Asian mainland travels west bringing with it a fine dusty sediment known as loess.¹

**topography**

In general, the Korean Peninsula is a mountainous region with substantial areas that are not considered arable. Located near the coastal plain, the elevation around Seoul is more gentle and rolling, but nonetheless punctuated with small ridges and steep slopes.
Seoul’s elevation ranges from 5 meters along the Han River to 265 m atop Mt. Namsan. Within the project site, however, elevations varies between 30 meters at its northeastern edge to 5 meters at the river’s edge. Across the site, slopes are mild with the existing grades highest at the north, west, and east perimeters and lowest in the center of the site and along the south border.

hydrology

The city of Seoul is situated along the banks of the Han River, Korea’s fourth longest system. At its headwaters in the peninsula’s rocky inland, the Han moves rapids and actively shapes the nearby terrain. By the time it reaches Seoul and the coastal plain much of this energy has been lost, and the Han assumes a very wide (up to one km) and very slow flowing character. During the seasonal mosoons, the Han River routinely leaves its banks and floods nearby areas. Photographs of the 1925 flood suggest that Yongsan station and the majority of the surrounding area is well within the traditional floodplain.

Historical maps of Seoul indicate that the project site was once traversed by a number of small streams. Over the course of Seoul’s development, however, these streams have seen since been buried.

ecosystems

Based on their proximity to the Han River, both Seoul and the site were likely dominated by wetlands prior to human settlement. Although few remnants of these habitats exist, migratory birds continue to use the corridor as a major passage.
introduction

natural history

topography

existing northeastern boundary section

existing water front section
existing countour lines
natural history
environmental risks factors

flooding

The intrusion of the Han into Seoul has created risk for its residents since the city was founded. Historically, the most significant sources of this flooding has been the summer monsoons. To respond to this regional development challenge, the South Korean government has constructed a series of dams along the length the Han.\textsuperscript{8}

With the metro area, Seoul's leadership complimented the national flood control measures but consolidating open areas along the Han into a continous flood buffer zone.\textsuperscript{9}

In June 2011, record setting floods proved this investment wise as the Han filled the buffer zone with minimal damage to private property. The photos at right illustrate how the system performed directly around the site. In both images it is important to note that segments of the highway system that follows the park were submerged.

In addition to problems with water entering the city, the rapid expansion of Seoul's area has also generated problems with drainage. Located at the bottom of a basin, Seoul's recieves runoff from not only its own impervious surfaces, but also neighboring areas. Under normal conditions, Seoul manages this runoff by storing it in its combined sewer system.\textsuperscript{10} During period of heavy rain, however, the capacity of the existing system is overwhelmed and runoff can generate substaintial loss of propety.\textsuperscript{11}

To alleviate existing problems of undersized infrastructure, as well as anticipate future climate change issues, in December 2011 Seoul Metropolitan Government released a policy paper identifying a precipitation rate of 10 cm per hour as the capacity standard for all proposed system renovations.\textsuperscript{12}
As is the case in most rivers near major cities, the Han serves as both the area’s primary source of drinking water and the region’s vehicle for waste water disposal.\textsuperscript{13} Over the past ten years, Seoul and the South Korean government have made substantial strides to reconcile this conflict by drastically improving the quality and safety of the area’s waste water treatment plants.\textsuperscript{14} Despite this investment, however, stormwater runoff and overflows from Seoul’s combined sewer system continue to generate widespread public concern. For households that have the means, it is not uncommon for this concern to lead to a complete reliance on bottled water.\textsuperscript{15}

Like many large cities, Seoul suffers from air pollution problems. Unlike many other asian cities, however, the dominant source of this pollution is not power production but the diesel engine.\textsuperscript{16} In 2005, Seoul Metropolitan Government responded to its air quality problem by establishing an aggressive emissions control program for private diesel automobiles and the city bus fleet. By 2009, the campaign installed emission control devices on 162,000 automobiles and replaced 86\% of the city’s bus fleet (6,508 vehicles) with compressed natural gas models.\textsuperscript{17} In 2006, the city built on this momentum by using popular ballots to establish “car-free” days on major and minor roadways.\textsuperscript{18}
natural history
urban ecology

introduction

crossing the Cheonggyecheon Restoration Project in downtown Seoul

source: www.wikipedia.org/wiki/Cheonggyecheon

Natural History References:
7. Author Unknown (1/10/2012) Bamseom Island In Han River to be added to Ramsar list. The Korea Times. retrieved from http://www.koreatimes.co.kr/www/news/nation/2012/01/117_102561.html on 3/1/2012
10. Inhyeok Park et al.(2010) Probability mass first flush evaluation for combined sewer discharges, Journal of Environmental Sciences, 22(6), Pages 915-922
11. Ibid
descending into the Yeouido Park wetland

silver grass in bloom in Haneul Park

source: Robert Koehler (www.rjkoehler.com)

source: www.thetravelworld.com

a view over Seokchon Lake

source: www.flikr.com

17. ibid
18. ibid
Transportation around Seoul and South Korea comes in a diversity of forms. Planes, trains, automobiles, taxis, buses, water taxis, subways, bikes, and walking are all available options to the residents of Seoul. Of course, some modes are more popular than others. Over 50 percent of travelers take public transportation in the form of buses and subways (see next page). Even with the high usage of public transportation, Seoul still faces problems with traffic congestion.

South Korea’s busiest international and domestic airports are located near Seoul. Incheon International Airport is 45 minutes from the Yongsan site. In 2011, it served over 34 million passengers, and has been ranked the best airport in the world the past seven consecutive years.¹

Gimpo International Airport served as South Korea’s main international airport until Incheon International Airport opened in 2001. Today, Gimpo mostly serves domestic air travel.²

¹ http://www.airport.kr/liacms/pageWork.ila?_scode=C1401010000
² http://www.theairdb.com/airport/GMP.html
transportation context
The Seoul Metropolitan Area boasts one of the most robust and well used subway systems in the world. Made up of lines from numerous public and private companies, the system has close to 300 stops and serves 5.6 million passengers daily.¹

Yongsan Station is one of Seoul’s most important inter-modal hubs, connecting three subway lines with standard and high-speed rail and bus routes. The station also houses the I’Park Mall and CVG Cinema and is connected to the Yongsan Electronics Market via elevated footbridge.²

² http://english.visitkorea.or.kr/enu/SI/SI_EN_3_1_1_1.jsp?cid=1357936
transportation context
While the site has great transportation opportunities in Yongsan Station, the rail infrastructure also forms a barrier running the length of the area.

Most of the site is also cut off from the Han River and waterfront park by a long series of housing slabs and a complex expressway system (see above section and images).
### building typologies

#### traditional, detached, and towers

<table>
<thead>
<tr>
<th>Study Area</th>
<th>200*200m</th>
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<tr>
<td><strong>DENSITY</strong></td>
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<td>Number of Floors</td>
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<td>Housing Units</td>
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<td>Persons Per Unit</td>
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<td>Inhabitants/Ha</td>
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<td>Coverage Area</td>
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<td>Site Coverage</td>
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<tr>
<td><strong>hanok housing</strong></td>
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<td>200*200m</td>
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<tr>
<td><strong>DENSITY</strong></td>
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<td>Site Coverage</td>
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<tr>
<td><strong>detached housing</strong></td>
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<td><strong>DENSITY</strong></td>
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</tr>
<tr>
<td>Number of Floors</td>
<td>20</td>
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<tr>
<td>Housing Units</td>
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<td>Persons Per Unit</td>
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<td>Inhabitants/Ha</td>
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<tr>
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<td>0.18ha</td>
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<tr>
<td>Site Coverage</td>
<td>4.5%</td>
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<tr>
<td><strong>highrise towers</strong></td>
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<tr>
<td>Study Area</td>
<td>200*200m</td>
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<tr>
<td><strong>DENSITY</strong></td>
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<tr>
<td>Number of Floors</td>
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</tr>
<tr>
<td>Housing Units</td>
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</tr>
<tr>
<td>Persons Per Unit</td>
<td></td>
</tr>
<tr>
<td>Inhabitants/Ha</td>
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<tr>
<td>Coverage Area</td>
<td></td>
</tr>
<tr>
<td>Site Coverage</td>
<td></td>
</tr>
</tbody>
</table>

A traditional housing typology in Korea, hanok has a system of enclosed courtyards and its residents are usually multigeneration families. Because of its capacity limitations, it can not be the major typology on the site.

Detached housing has the most significant site coverage rate because it has neither the hanok’s courtyard nor the tower’s grade level green space. Its housing capacity is larger than that of hanok housing, but it is still not big enough to meet the requirement of 100,000 people living and working in 1km².

Towers have the housing capacity to meet the density requirements on the site. Moreover, this typology has green open space on the ground level. Despite its “vertical sprawl” issue, towers should be the major housing typology on the site.
building typology context

hanok housing

detached housing

highrise towers
hanok city
a multigenerational home
Erin Guido - Alexandra Jendrusch - Jonathan Adams Moore - Justin Meyer - William Tardy
hanok city...
a home for all generations

unique identity: the new multigenerational home

accessible
- interconnected transit
- flexible streets
- the intermodal hub
- services network

healthy
- water
- energy
- waste management
- landscape
- urban ecology

social
- network of social spaces
- the parc
- the boardwalk
- the street marketplace
- the village square
- the parc promenade

tour of the home

building the home
- connecting to the region
- policy framework
- block studies
- site level implementation
- block level implementation
- vertical proximity requirement
- vertical community space ratio

graphic key
a home has a unique identity

the new multigenerational home

Hanok City combines the core qualities of Seoul’s culture with urban density, transit accessibility, ecological vitality, and livability. The people living and visiting Hanok City are in the heart of an international business network, a diverse ecosystem, and a historical city with cultural traditions that date back to 17 BC. This plan revisits the traditional understanding of family, the home, and agglomeration.

Beyond the advantages of Hanok City’s geographical location on the Han River and only 25 minutes from downtown Seoul, the site’s infrastructure and density present another set of advantages. The plan’s systems will not only accommodate a highly dense and rapidly aging population, but also support it, nurture it, and let it grow and change over time. Age-friendly design considerations are woven into the urban fabric to ensure that all of the opportunities in Hanok City can be utilized by every person, young and old.

Hanok City will serve as a model for vertical cities and aging populations around the world, showcasing a deep rooted culture and celebrating an exciting future.
Traditional South Korean family structure is changing:

Today, three and four-generation families living in one household is increasingly rare. According to the National Statistical Office in South Korea, the number of households increased 11.1% from 2001 to 2006 due to an increase in the number of single households. About 55 percent of the 15.8 million households in South Korea in 2006 were nuclear families, with only parents and children living together. Only 6.9 percent were three-generation families and only 0.1 percent of households were four-generation families.

What does this mean for life in South Korea?

The change in family structure in South Korea is not necessarily a negative thing; a 1996 research report by The Institute for Gerontological Studies of Korea stated that often the main reasons for multi generational co-residence was “practicality” rather than it being “natural”. Both young and old Koreans more often prefer independence from extended family when it comes to living arrangements. Even so, as more Koreans live in single apartments and separate from relatives, many of the positive aspects of multi generational living is lost. When young and old reside together, family members often provide care, emotional support, and a diverse social environment for each other. The elderly can interact and be entertained by younger generations. Children can learn from the experience and vast knowledge of their parents and grandparents. Relatives can help parents with household duties and childcare, and parents and other relatives can provide care and support for their elderly family members.

Hanok City brings the best aspects of multigenerational family life to the urban realm:

Because the traditional structure of the Korean home is changing, where a more globalized people prefer independence from their family, then the city will need to take on the role of the traditional home and facilitate a supportive and vibrant environment for multigenerational interaction. Hanok City is envisioned as this new multigenerational home, where people of all ages and backgrounds are constantly interacting, supporting, and learning from each other.

Hanok City represents a new design paradigm: leveraging the advantages of an extremely dense urban environment (an agglomeration of economies, peoples, and services) to create a vibrant, livable, and adaptive home for all generations.
Traditional South Korean family structure: multiple generations living and interacting in the same household.

The future of Yongsan: multiple generations living and interacting in the city in a variety of public and community spaces!

Typical urban cities: difficult or uncomfortable living environments, especially for the elderly and those with lesser mobility.

The future of Yongsan: age-friendly amenities and design to make a vibrant and attractive environment for all!
the new multigenerational home
accessible, healthy, and social

key characteristics of a multigenerational home:

• Part of a larger regional community; one that connects to the culture and resources around it.

• Accessible to all ages, incomes of people; one that enables mobility and the potential for interaction.

• Promotes the health of people and nature, while protecting them from threats to their wellbeing.

• Facilitates social interaction through a variety of open spaces, community spaces, recreational and entertainment venues.

• Adaptable to the changing needs of its residents.
a home is...

**accessible**

**goal:** a central and connected network

**components:** interconnected transit, complete and flexible streets, intermodal hub, services network

**healthy**

**goal:** environmental sustainability that lasts

**components:** water, energy, waste management, landscape, urban ecology

**social**

**goal:** flexible and vibrant social spaces

**components:** network of spaces, the parc, the boardwalk, the street marketplace, the village square, the parc promenade
An accessible home is one that is easy to get to, no matter your age, handicap or even what language you speak. Positioning the elderly at the center of its design, Hanok City is accessible to any one and everyone. The transportation plan reinvents the streets, manages congestion, expands open space, and makes more room for pedestrians and bicycles. The design encourages public transit use by incorporating bus rapid transit (BRT), light rail, and local buses frequently on local streets. These transit modes are affordable and easy to use with transportation technology and wayfinding strategies. Furthermore, the design incorporates access ramps and stairs together, creating a cohesive sense of movement.

The Intermodal Hub is the heart of Hanok City’s transportation network. It is a place where people are moving through all day, but it is also a reference point, where people can stay for awhile and shop, grab a bite to eat, sit and people-watch, and wait for a friend. The Hub brings together commuter, metropolitan, regional, and local lines into an integrated, transit-oriented development at the center of the an international business district.
goal: central and connected network

multimodal transportation system and major transit oriented development provides access to all city amenities and services

key characteristics

- Streets have large right of ways, with over 80% of space given to pedestrian, bike, and/or public transportation.

- All buildings that contain residential units are within a 5 minute walk from both a public transportation and an active transportation route (bike path or park path).

- All needed services are provided and dispersed throughout the site, especially those serving the elderly and families.

- All site areas and services are easily accessible by public transportation, with good connections and well-marked routes and vehicles.

- Public transportation is reliable and frequent, even at night, weekends, and holidays.

- The intermodal hub is central to the site and easily accessible by all public transportation routes, allowing visitors and residents to travel to and from Youngsan easily.

- Transport stops and stations are conveniently located, accessible, safe, clean, and have adequate lighting, seating and shelter.

- Parking and drop-off areas are safe and conveniently located close to other transportation options, and there are priority parking and drop-off areas for people with special needs.

- Complete and accessible information is provided to users about public transportation stops and schedules.
Mobility for all! Residents and visitors, including the elderly, young, active, and handicapped, can easily go anywhere on the site and beyond.

Large sidewalks to provide ample room for walkers, active storefronts and temporary uses like markets and pop-up galleries.

Pedestrian refuge areas and pedestrian bridges to provide safe and comfortable crossings on metropolitan roads.

Over 4,000 street trees provide a natural amenity on every street.

Bus rapid transportation provides efficient access to and from the site and the intermodal hub.

A regional highway is recessed in the ground, has a thick natural tree buffer, and has two major pedestrian bridges to connect users to the waterfront.

A connected system of bike-only paths are provided on every street.

A local bus system and light rail connect users throughout the site, to Yongsan Park, the intermodal hub, Downtown Seoul, and across the Han River.

Three main bridges for pedestrians, bikers, and lightrail to connect users over the train tracks and provide viewing platforms to watch high-speed trains.

Underground tunnels provide access for service vehicle and give through traffic an efficient means to move through site.

Visitor parking in key areas lets nonresidents leave their car and access the rest of the site on foot or by public transportation.
Hanok City transit infrastructure
Hanok City public transportation network
flexible streets
streets can change over time to include more active & public transportation

initial boulevard type
accessible

less motorized boulevard
The intermodal hub is vital to the accessibility of Hanok City. As an augmentation of the existing Yongsan Station, its minimalist and expansive design seeks to better guide residents, businessmen, visiting relatives, tourists, shoppers, night life enthusiasts, and other users of all ages to their destinations. It offers direct connections to the Boardwalk, the Parc, Yongsan Park, museums, libraries, international businesses, and shopping, as well as facilitates easy connections between modes of transportation.

Taking advantage of its central location and access to destination amenities in and around Hanok City, the intermodal hub will be an economic engine that drives development in Hanok City, in addition to being a prominent access point to Seoul and the rest of Korea.
Night view of the intermodal plaza
hanok city

the intermodal hub
a multi-layered station

east/west section, looking north
**YONGSAN INTERMODAL HUB**

<table>
<thead>
<tr>
<th>RIDERSHIP</th>
<th>2010</th>
<th>2050 (estimate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yongsan Pop</td>
<td>227,400</td>
<td>440,000 (94% increase)</td>
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<tr>
<td>National Rail</td>
<td>33,000 ppl/day</td>
<td>63,850</td>
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<td>Honam, Jungang, Jeolla, Gyeongbu</td>
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<tr>
<td>Local Rail/Subway</td>
<td>67,000 ppl/day</td>
<td>129,639</td>
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<td>Subway Line 1 K1</td>
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</table>

- Bus rapid transit stop
- Covered walk to station
- Access to yongsan park from elevated walkway
hanok city

the intermodal hub
a multi-layered station

north/south section, looking east
underground metropolitan road

pedestrian overpass

access to Sky Parc
In Hanok City all the services a community needs are at its fingertips. Unlike more traditional forms of development that support consolidation and segregation of land uses, Hanok City supports multiple programs simultaneously.

The result of this effort is a place of crossing paths and shared spaces. Regardless of their social status, residents of Hanok City are constantly exposed to a variety of lifestyles and perspectives. As the development matures, this constant process of discovery and interaction will provide powerful support for the evolution of Hanok City’s unique culture of collaboration.

The services found within Hanok City fall into three categories:

**Neighborhood services** are services with a small service population and small average area. Able to seamlessly integrate into a neighborhood, strong neighborhood services are a cornerstone in the development of any area’s quality of life.

**District services** are services whose assets attract users beyond their surrounding blocks. Capable of creating nodes of resident activity, district services often act as an anchor for their neighbors.

**Regional services** are services that are designed to serve metropolitan Seoul. As a result of this wide reach, regional services present substantial benefits (i.e. real estate development) and significant challenges (i.e. traffic modeling). Hanok City addresses these development issues but using regional services as a focal point for pedestrian circulation models, development phasing, and general urban design.
Urban Services Distribution Strategy

- **Health**
  - metropolitan hospital
  - district hospital
  - neighborhood clinic

- **Education**
  - continuing education
  - high schools
  - primary schools

- **Retail**
  - big box stores
  - hypermarkets

- **Emergency**
  - fire department stations
  - police stations

- **Civic**
  - libraries
  - fitness centers

Parc right of way

accessible
Focus Service Facility Types

**Fitness centers** in Hanok City are conceptualized as larger neighborhood facilities because of their ability to play two important roles. As health care facility they invigorate the process of aging. By acting as community center they also become nodes of multi-generational socialization and relationship building.

**Police stations** in Hanok City are one of the most well distributed service facilities. This decentralization is purposeful response to the density of the site. Rather than allowing governmental systems to grow beyond the scale of the citizen, Hanok City integrates policing into the neighborhood fabric, making it far more intimate.

**Metropolitan hospitals** are facilities designed to serve the Greater Seoul Metropolitan Area. To warrant this scale, Hanok City’s keystone medical facilities are conceptualized as centers for the treatment and studying of aging. In addition to providing world-class service, this investment could grow a new bio-tech market for Seoul.

**Hypermarkets** are retail facilities which provide both grocery and general household goods. Integrated into the “Village Square” block typology, hypermarkets in Hanok City become anchors for commercial development, keep public plazas busy, and make sure all residents have access to affordable, healthy food.

**Continuing education** centers are Hanok City’s flagship education facilities. Conceptualized as regional service providers, these adult focused schools would give working adults and elders throughout Seoul the skills they need to remain active in the workplace.

*references about services on page a-106*
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A good home supports the health and wellbeing of its residents and protects against threats to its citizens. To support the health of its residents and combat global climate change, Hanok City protects its natural features and incorporates many sustainable technologies, including biogas reactors and pneumatic waste collection, that minimize the City’s impact on the environment. In its sustainability endeavor, Hanok City also recognizes the necessity of an informed, engaged, and impassioned public. To champion this cause, Hanok City assures that every sustainable development initiative includes programs that operate at the scale of the individual. Creating a forum for residents of social classes to interact, these programs reinforce the mission of Hanok City to bring all age and social groups together under one roof.
goal: environmental sustainability that lasts
sustainable systems

key characteristics

**Constructured infrastructure**

- Retain and recycle all stormwater generated on site:
  *Water conservation is maximized by capturing stormwater, creating flood tolerant landscapes, and empowering citizens to reduce potable water use.*

- Reduce per capita consumption of fossil fuels within the site by 50%:
  *Low carbon energy is generated on site through the anaerobic digestion of organic waste and the installation of vertical axis wind turbines.*

- Become Seoul’s first zero-landfill district:
  *Waste recycling is supported through a rapid, pneumatic waste collection and sorting system.*

**Landscape infrastructure**

- Eliminate all automobile emissions:
  *Air Quality is improved through generous tree planting and electric vehicle incentives.*

- Create a 100% native species landscape:
  *Biodiversity is protected by exclusively using a native-species planting palette and constructing remediative wetlands.*

- Provide 10 square meters of garden space per resident:
  *Food Security is strengthened by establishing a local food crisis safety net.*

**Action items by stakeholder group**

**Institution**

- Fixture Flow Meters
- Household Stormwater Recycling
- Organic Waste Pre-processing
- Solid Waste Sorting
- Community Forestry
- Urban Agriculture

**Business**

- In-building Stormwater Cisterns
- Pervious Roofing Materials
- Stormwater Irrigation Systems
- In-building Waste Chutes
- Electric Vehicle Facilities
- Native Species Landscaping
- Garden Roofs

**Community**

- Constructed Wetlands
- Stormwater Vaults
- Biogas Reactor
- Pneumatic Waste Pipeline
- Waste Sorting Centers
- Native Species Landscaping
- Urban Forestry
Layout of Major Sustainable Systems Components throughout the Site

- Parc Corridor
- Bioswales
- Constructed Wetlands and Streams
- Stormwater Vaults
- Solid Waste Facilities
- Proposed Wind Turbine Sites
- Public Right of Way
- Bioreactor Facility

Meters: 50 150 500
Hanok City is a place where water ceases to be a commodity and evolves into an active, omnipresent member of the community. Through a series of public and private devices, residents of Hanok City are encouraged and invited to enrich their interactions with water, exposing opportunities for exploration, utilization, and conservation. Over time, the accumulation of these opportunities will generate the intellectual and cultural resources needed to empower future development.

Flowing through buildings rather than over them, water in Hanok City also serves as a critical component of large scale urban patterns. Where water falls, the built environment offers porosity. Where water flows, the ground becomes green and playful. Where water pools, Hanok City responds with generous water-tolerant landscapes. Together these design responses forward a vision of urban environments serving as engines for restoration rather than degradation.

To reflect the multifaceted nature of water use, Hanok City examines sustainable water use through three themes:

**Drinking Water** is the Han’s most precious service. Hanok City conserves this resource by using rainwater cisterns to supplement the regional water supply.

**Stormwater** is one of the Han’s largest sources of pollution. Hanok City ameliorates this threat by using bioswales and pervious roofing to capture runoff.

**Floodwater** can threaten life and property. In many cases the waters of the Han are the primary source of this risk. To reduce this threat, Hanok City maintains a flood-tolerant river side landscape. Flooding can also occur as the result of poor drainage. Hanok City addresses this concern by using constructed wetlands and underground vaults to sequester heavy precipitation.
Layout of Major Water System Components

- Parc Corridor
- Bioswales
- Constructed Wetlands and Streams
- Stormwater Vaults
- Major Drainage Pipes
- Public Right of Way
water
specialized interventions

constructed wetlands

Wetlands are ecosystems specially adapted to the physical conditions associated with regular flooding. In the hydrologic cycle, their ability to hold and filter water plays a key role in maintaining the quality of water bodies and recharging the local water table. The constructed wetlands in Hanok City play a similar role.

Located along the waterfront, constructed wetlands are used to create a landscape where flooding can occur safely. Along the rail yard, wetlands protect sensitive infrastructure and convert wasted space into valuable habitat. Within the Parc, wetlands similarly provide an environment where stormwater can gather, be processed by natural systems, and help reestablish the area’s native hydrology.

stormwater vaults

In high density sites, even moderate amounts of runoff can overwhelm surface storage systems. In areas where seasonal monsoons often generate large volumes of stormwater, like Seoul, it is therefore necessary to develop redundant storage systems. In Hanok City, underground vaults provide this overflow protection.

Linked to block drainage systems, Hanok City’s stormwater vaults provide enough storage capacity to hold 10 cm of precipitation (220 cu m). The distribution of the vault system mirrors the wetland system, and therefore allows renovation without disturbing roadways. Through site-level utilities, the vault system’s reserves can be used for irrigation purposes.

building systems

Water resource conservation begins in buildings. As the largest source of impervious surface, buildings represent the largest generator of stormwater. To compensate, all buildings in Hanok City contain cisterns large enough to store 10 cm of precipitation.

Buildings also support the vast majority of potable water consumption. To offset this consumption, the plumbing in Hanok City buildings contain stormwater plumbing for non-potable water uses. To inform consumption flow meters are installed on every household fixture. Connected to both a household log and the utility metering system, these fixture meters allow greater understanding of how and when potable water use can be reduced.

surface flows

One of the keys to any successful conservation program is public awareness. With regard to surface water quality, this program component is satisfied by showcasing the movement of water through the site.

The movement of water across the surface of Hanok City occurs as three different scales. Within the block, a planted bioswale between the sidewalk and the curb brings water management into the neighborhood. In the district, the construction of channel along the bed of historic stream makes water a central focus for the entire site. At the scale of metro Seoul, restoration of the waterfront facilitates the reintroduction of the public with their city’s greatest natural asset.
Restored in 2005, the Cheonggyecheon is a historic stream channel that cuts through the heart of downtown Seoul. As a visitor moves from the stream’s headwater plaza down to its terminus at the banks of the Han, they encounter a series of landscapes which celebrate different aspects of the city’s relationship with water. This gradient serves as a primary inspiration for Hanok City’s interpretation of infrastructure development. Photo credit: Jean Chung for The New York Times
Hanok City challenges the traditional logic of the electrical grid. Rather than conceptualizing districts as simply consumers, Hanok City situates the urban environment as a tool to generate, store, and recycle energy. The heart of this initiative is a biogas production system that is capable of not only increasing gross energy supply, but also reduce the total amount of energy consumed for the transport and processing of organic waste and municipal sewage.

**Biogas** is the market term given to methane gas that has been produced from the decomposition of organic materials in environments devoid of oxygen (anaerobic). In the past, biogas technology focused on industries such as agriculture, food processing, and other sectors where large amounts of organic waste was produced and energy demand was high. More recently, however, waste management utilities have begun adapting biogas facilities to convert sewage and municipal solid waste into methane. Inspired by this advance, Hanok City takes biogas out of the remote sewage treatment plant into the city. The key to this transition is unifying the organic waste stream.

**Waste disposals elements** are a common feature in many homes. Most commonly they are used to grind food waste. Hanok City, however, asks them to do more. Mimicking a project run Siemens in the City of Milwaukee, WI, USA, Hanok City uses high strength garbage disposals to turn virtually any household organic wastes, including cardboard, into a homogeneous product ideal for anaerobic digestion.

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**energy**

**reinventing the grid**

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**action items by stakeholder group**

**institution**

- Help Build Hanok City's Electric Vehicle Fleet
- Incorporate Organic Waste processing into Household Chores
- Provide Vocal Support for Structural Wind Turbines

**business**

- Provide Electric Vehicle Charging Facilities in all Parking Garages
- Include Organic Waste Processing Facilities in all Buildings
- Provide Loans for Wind Turbine Construction

**community**

- Construct and Manage Biogas Reactors and Facilities
- Create Incentives to Install Wind Turbines
Layout of Major Energy Facilities Throughout Hanok City

- Parc Corridor
- Bioreactor Facility
- Proposed Wind Turbine Sites
- Sewage Mains
- Public Right of Way
Energy: closing the loop

Supporting innovation in energy management requires the utilization of multiple complimentary programs and an integrated network of tools. Hanok City embraces this call for diversity by using wind energy and fuel cell technology to supplement its premier biomass program.

Sanitary sewers are the next key piece of the biogas system. Hanok City’s sanitary sewers transport the organic waste slurry to an array of biogas digesters located beneath the IBD. Within this series of tanks, the waste slurry is inoculated with a culture of methane producing bacteria that expedite decomposition. Capable of being completed in 24 hours, effective digestion will convert a substantial amount of the slurry into gas, thus reducing the overall volume of waste that must be treated and transported. The methane itself can be burned on site to generate heat, be used to power a steam turbine, or pumped through a fuel cell to directly produce electricity.

Vertical axis wind turbines are known for their compact size, low vibrations, and ability to generate electricity even at low wind velocities. For all of these reasons, vertical axis wind turbines are being targeted as a attractive design for highrise wind power generation. Hanok City embraces the opportunity to further wind energy design and provides a builder incentive structure for installing rooftop turbines on high rise structures.

Electric Vehicles are most often conceptualized as private assets and not pieces of regional energy infrastructure. Hanok City challenges this conception by arguing that electric vehicle fleets stored within the district can, during low consumption periods, act as reservoirs for excess energy. Electric vehicles attached to the grid during periods of excess energy production can store unused electricity in their batteries. During periods of high energy demand, the grid can then draw energy back out of the electric vehicles, and thereby reduce the need for expensive, supplemental power plant operation.
Creating innovative energy systems cannot be accomplished alone. Their success requires investments on the parts of multiple stakeholders. With the regard to the development of biogas facilities, perhaps the most central of these investments is made by the public. As the generators of waste, the public is uniquely situated to deconstruct the waste stream into separate, more uniform components. Just like a refined ore, the inventiveness of the private sector can then begin to experiment with ways to create value from these components. Rather than priming the market, institutions can then work to make the infrastructural polices and investments needed to formalize emerging technologies. In the case of biogas production, investments of this kind might include establishing pricing schemes for biogas-sourced energy or loan programs for emerging utility providers.
waste management
making a mountain into a mole hill

Seoul and South Korea as a nation already maintain a highly advanced solid waste management program. Unlike the United States where household garbage is generally unsorted, all solid waste from households and small businesses must be disposed in content specific bags. The bags can be purchased from a variety of vendors, and their price reflects the cost of managing that particular part of the waste stream. In most places this program has lead to a segregation of recyclable from non-recyclable items. In some more progressive areas, however, the South Korean bag system has lead to the consolidation of household kitchen scraps into a distinct, composting waste stream. Based on this success, the challenge of Hanok City is not to organize a muddled waste stream, but instead to facilitate its collection and reprocessing.

The basis of the Hanok City solid waste collection system is a pressured pipeline that quite literally sucks sorted garbage out of structures and into two centralized sorting facilities. The are three major components of this pneumatic system:

Disposal hatches are the first major component. They can be inside units or along sidewalks. They can be locked private facilities or they can operate much like trash cans in a public park.

The pipeline network is the second major system component. Consisting of pressured pipes both within structures and within the public right of way, this network requires strong public-private cooperation to construct.

Centralized sorting facilities are the final system element. Located beneath the IBD and at the southeast corner of the site, the structures sort, store, and prepare household for being shipped to processing centers.

action items by stakeholder group

institution
Sort the Waste Stream into its Individual Components

Generate a Demand for Products with Minimal Packaging and Non-Recyclable Components

business
Integrate Disposal Conduits into Building Design and Construction

Test the Feasibility of On-site Recycling Facilities

community
Construct and Manage Pneumatic System Infrastructure

Continue Developing Pricing Signals to Incentivise Reduced Waste Production
Layout of Major Energy Facilities Throughout the Site

- Parc Corridor
- Solid Waste Processing Facilities
- Pneumatic Pipeline
- Public Right of Way

Disposal Hatches

Pneumatic Pipeline
The Parc serves as Hanok City’s premier piece of landscape infrastructure. At its northeastern tip, it functions as a transitional buffer between the more forested condition proposed for Yongsan Park and the heavy residential areas to the south. Along its western edge, a historic stream channel is uncovered and a series of constructed wetlands and channels reintroduce native floodplain species into the site. Along the site’s riverfront, the Parc reach its full potential, providing abundant tree cover and extensive wetlands amidst a premier social space.

In Hanok City, the natural world is a key partner in the collaborative development process. As a contributor to the management of physical infrastructure, native landscapes freshen the air, reduce the urban heat island effect, and guard against flooding. As a component of Hanok City’s cultural systems, elements of the region’s natural history create a shared identity through which young and old can build rapport. The three main components of this system are:

**Rooftop gardens**, although domesticated, provide a very tactile way for youth to reconnect with the rural traditions of earlier generations. As a component of district wide food security plan, they can also help a community relieve periods of food scarcity.

**Tree canopy** help reduce the severity of urban heat islands, freshen the air, and absorb significant amounts of stormwater. In Hanok City tree canopy are present along every right of way, in concentrated stands along the waterfront, the Parc, and the rail corridor.

**Constructed wetlands** are a central part of Hanok City’s water management system. By providing a place for water to accumulate and be metabolized, they substantially reduce the district’s ecological footprint. As a collection of native species, however, these pocket-habitats also act as reservoirs of native biodiversity.

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**action items by stakeholder group**

**institution**
Create community forestry programs to care for neighborhood tree canopy

Develop gardening programs and clubs to expose the youth to traditional Korean gardening techniques

**business**
Develop nurseries to provide native species planting stock

Integrate landscape systems into building design and real estate development projects

**community**
Regulate landscaping to ensure the use of native species

Train parks personnel to care for naturalized park environments
bioswales throughout the parc

creek/storm water basin

step pool and fountain

Yongsan buffer

greenways

wetland buffer

Stormwater Flow Accumulation and Supporting Landscape Infrastructure
**urban ecology**

*an environment that supports itself through biodiversity*

---

**492 species of birds**

**216 species of freshwater fish found in Korea’s rivers and lakes (carp are the most common)**

---

**shade intolerant plants**

- _quercus aliena_ (a.k.a. the oriental white oak)
- _zoysia japonica_ (grass)

**flood tolerant plants**

- _lindera erythrocarpa_ (tree)
- _miscanthus spp._ (shrub)

**shade tolerant plants**

- _acer pseudosieboldianum_ (a.k.a. the Korean maple tree)
- _euonymus japonica_ (shrub)

---

**Landscape**

The Parc promotes the site’s natural green and water features. It provides fresh air, sunlight, and water amidst a highly dense and built urban fabric.

Various landscape interventions throughout the site, including greenways and local art, help guide people to the Parc. The Parc’s pathway connects Yongsan Park all the way to the riverfront.
bioswales throughout the parc

greenways

creek/storm water basin

step pool and fountain

earth ramp

earth ramp

earth ramp

Layout of Major Landscape Infrastructure
Hanok City connects people by creating the physical space for interaction to occur. These spaces are found in traditional places like the street and parks, but also in the vertical realm as well.

Public transit in Hanok City is a great option, but in designing social spaces, pedestrians must come first. Earth ramps, non-motorized pathways, and sky parks preserve safety for pedestrians and bicycles and create stimulating environments throughout Hanok City that everyone can access and enjoy.

As soon as people arrive at the intermodal hub, they are greeted with colorful signage and breathable spaces along the canopied platform, which directs people to the Parc, the Boardwalk, and Parc Promenade, where they will pass many more vibrant social spaces along the way.
goal: flexible and vibrant social spaces
options for everyone

key characteristics

- Entry points to open spaces are plentiful in number, conveniently located, and accessible for people with special needs.

- Affordable public options and transit stops located strategically near public open spaces ensure that every person has access regardless of age, ability, and social class.

- A pathway along the Parc minimizes traffic barriers and maximizes safety by passing under streets, providing pedestrians with a continuous, safe place to walk and enjoy fresh air.

- Variety in types of spaces provides the elderly with numerous options for leisure activities where they can choose to be alone or with others.

- Skyparks and vertical space requirements ensure that no person is more than 5 minutes from public space in either a building or at street level.

- Community space requirements ensure that spaces reflect the preferences of their users.

- Wayfinding and signage provide users with information about routes, access, and a sense of whereabouts.

- Open spaces are clean, well-maintained, not overcrowded, and have plentiful sitting areas.
street vendors
interacting with the water
learning something new
shopping
selling flowers
playground
transit stop
bike share
rooftop dining
pedestrian mall
plazas
A variety of social spaces at multiple levels gives people the option to be with other people, watch other people, or to enjoy time alone. At ground level, the Parc encourages all types of passive and active recreation.

The streets are a place for the community to be creative, where pedestrians come first and sidewalks become vibrant markets. Tree-lined sidewalks create greenways between parks, provide shelter from sun and rain, and assist in stormwater management.

To meet demands for social space, especially for those with more leisure time, the plan proposes untraditional social spaces within buildings themselves. Because being able to reach street level may actually be a five minute trip down an elevator, vertical social spaces offer an innovative alternative.

In community- and publicly-owned spaces, described in detail in “building the home” (pg A83), people connect above street level - on rooftops, on the skypark, and in studios that they have made their own. The social initiative introduces light, air, and spontaneous interaction to towers.
public open space

- parks and greenways
- hard-scaped plazas
- courtyards
- station marketplace

streets
institutional courtyards
commercial courtyards
Environmental Benefits

The creek runs through a large portion of the Parc, starting near the Station in the north and bringing people to the river. It serves social and environmental purposes by providing an attractive water amenity and a practical storm water mitigator.

- The creek is a year-round amenity where activities change with the season.
- The wetland is vegetated and graded to assist in storm water management, especially during monsoon season and flood events.
- Bioswales, located throughout the Parc and on streets, are used to convey surface water in order to reduce surface runoff.
Connecting Regional Parks Systems

The Parc is the backbone of the social space network; activities surround it in every direction. It gets the name from its arc shape, which completes a continuous, regional parks system by connecting Yongsan Park to the Han riverfront.

The Parc is the so-called “living room” of the home where there are a variety of spaces, both shared and private.
The Parc

The Parc connects people to a large network of the civic attractions and activities. Most spaces are passive recreation and are intended to allow residents to reinvent the space as preferences and users change over time. Greenways and nonmotorized pathways facilitate movement from one major attraction to another.
**Main Points of Access**

Public transit systems and handicap-accessible entries provide multiple modes of accessing the Parc. Signage and wayfinding strategies orient people within the park wherever they are, especially at entry/exit points.

> primary access  > secondary access

**transit modes**
- high speed train
- commuter train
- subway
- light rail
- bus rapid transit
- local bus stops
- water taxi
the parc
highly trafficked and inventive spaces for the community
higher education cluster (plus residential/mixed use)
The boardwalk welcomes people to Hanok City, providing an atmosphere that speaks to the exciting dichotomies of the place.

Hanok City celebrates a lively transportation hub filled with trains, subways, and buses, with pedestrian-oriented design. It presents towers and technology at a human scale.

The boardwalk is the first place that people go after arriving at the intermodal hub, and it is immediately that they are presented with a refreshing mix of people, interacting in small ways around every corner and curve.
Aerial of the boardwalk, the welcoming point in Hanok City.
The plan’s conceived street life represents the objective to provide for the pedestrian first. Large right of ways are a flexible and sustainable model for urban development, allowing public transit to flow while providing safe pedestrian bridges with visually stimulating qualities.

These pedestrian connections are another way to connect people above ground - over transit-heavy streets and between buildings - while still maintaining a close relationship with the street.
Pedestrian bridge on metropolitan road with BRT stop
To resolve both of these issues, many of Hanok City’s more residential blocks were designed around the replication of the village square. Using either a two or four block configuration, the design of the village square occurred in three stages: 1) establishing the maximum building footprint, 2) consolidating setbacks to create interior space, and 3) activate the interior space with key neighborhood services, such as daycares, clinics, and space for street vendors.

Block making process

At the densities proposed by Hanok City, occupation of the street can become highly problematic. In highly desirable areas, formal and informal commercial activity will both begin to protrude into the way of busy pedestrians. In less desirable areas, such as small roads passing between high-rise structures, the height and bulk of the built environment will stifle community use.
Hanok City’s courtyards provide space for neighborhood services like schools, clinics, small theaters, and local grocery stores. They also allow informal, temporary uses like markets, street vendors, and pop-up retail. Midrise interior buildings and barriers between the street and the square help create more intimate, protected space for sensitive uses, like childcare and geriatric medical service.
The Parc Promenade reinterprets the existing Yongsan electronics market in a way that increases visibility and connectivity with the different systems on the area.

By establishing a relationship directly adjacent to the Parc, this lively commercial area draws people onto a decorated live-work-play pedestrian boulevard anchored by a cineplex entertainment mall.
live

- residents: 5600
- community open space: 20,000 sqm
- surfaced public space: 56,000 sqm
- park: 12,000 sqm

work & play

- commercial/office: 245,000 sqm
- retail/restaurant: 205,000 sqm
- cineplex mall: 130,000 sqm
- hospitality: 30,500 sqm
- institution: 10,000 sqm
A home is not just a collection of goods and activities, but an entire experience. The Parc is an organizing element in this home that brings together the exciting programs and opportunities in Hanok City in a setting that is sustainable and easy to navigate. It draws on indigenous species of plants and animals, local art, and adaptable materials to weave together a complex environment in one legible landscape. The harmonious setting balances resident and visitor uses.

Upon arrival at the intermodal hub, fresh air and landscaping interventions lead to the Parc, which is devised to showcase transit connections, cultural institutions, and economic vibrancy. This green arc celebrates togetherness in the city and creates experiences through different “rooms” along the Parc.
arriving at the station
the intermodal hub plaza

Light and airy space that is easy to navigate welcomes visitors to Hanok City.
tour of the home
watching the trains
the train viewing deck on the boardwalk

After exiting the intermodal hub, relax and enjoy views of the trains entering Hanok City.
tour of the home
walking to the library
culture & nature coming together

A winter view of the main library opening to the Parc and Hanok City’s auditoriums.
strolling along the parkway
active and green street life

Whether using public transportation or walking, the journey is part of the experience.
Enjoy year-round recreational activities in the Parc. Its design also enhances safety for pedestrians, incorporates stormwater management capacity, and promotes environmental education.
The Parc Promenade features an exciting international street life and a variety of shops and restaurants.
biking along the han river

enjoying the han river park

The Parc connects directly to Seoul’s Han River Park System and gives bikers and pedestrians expansive views of Seoul and Hanok City.
tour of the home
In order to build for a myriad of inhabitants in such a dense environment, the Hanok City plan uses a flexible framework of policies, block typologies, social programming and builder incentives.

This framework allows for collaboration between multiple levels of stakeholders and a customizable approach to urbandity. There is the potential for the government, the private sector and the community to all have roles in shaping Yongsan from the scale of the site down the roof of a building.

The system’s easy adaptability to open space uses and building typologies presents new possibilities for people-based policies. Rather than developing an implementation system based on current planning and development methods, this plan has a system so flexible it can embrace as many functions for spaces as possible (“building the home”). This philosophy respects the ever increasing and aging population, the innovative culture rooted in the city, and the need for sustainable systems.
connect to the region
using seoul’s assets

Seoul is a global megacity with culture bursting at the seams. The site, located at the heart of the Yongsan District, is exposed to increasing density and development pressures in its surroundings.

The plan uses urban design strategies to enhance Yongsan’s connections to the entire Seoul metropolitan area in terms of cultural identity, transportation, and natural systems. Capitalizing on Seoul’s assets - cultural sites, natural systems, and emerging business hubs - Hanok City renders a unique identity in the metropolitan area.

While programmatic clusters exist, there is a sprinkling of all uses throughout Hanok City at the block level. The plan embraces density and development pressures, integrating them throughout the site to create connections with context.

- Existing historical precints in the site and the residential tissue at the periphery are carried over to provide a seamless transition in the urban fabric.
- The riverfront design brings back the contact of people with water, and consolidates the continuity of the Han riverwalk across the site.
- Urban Ecology principles guide the design of public spaces to enhance the relationship between people and nature.
- The abundant offer of cultural destinations positions the site as a metropolitan center for the arts.
- The International Business District (IBD) capitalizes on the close proximity to Yongsan Intermodal Hub.

existing attractions

integrating existing fabric while creating regional assets
program clusters within mixed-use fabric

- low-rise neighborhood
- international business district
- regional medical center cluster
- institutional cluster
- innovation business cluster
- the intermodal hub
- neighborhood
- commercial/shopping
policy framework
for block structure, affordable housing, and community and public space

key characteristics

Block structure

• To ensure permeable blocks for pedestrians, cyclists and other non-motorized travelers, policies should encourage public through-ways in the middle of blocks longer than 100 meters.

• Every urban block should have a diversity of uses. No block should be 100 percent residential.

• Lot coverage requirements of blocks with residential units limit buildable area to 60-70 percent of the lot in order to provide ground level public space and help ensure light access into buildings and courtyards.

Affordable housing

• In expectation of a high proportion of elderly residents, developments with 50 or more residential units must devote ten percent of all units to affordable senior housing.

• Developers should be encouraged to build more affordable housing through incentives. For example, for every additional five percent of affordable housing provided, the developer would receive a FAR bonus for non-residential use or some tax relief on market rate units.

• Policy should help intermingle senior housing with market rate housing and housing for families. Incentives should be offered for duplex apartments or other innovative units encouraging multi-generation families living together.

Public space

• In the vertical city public space is not limited to the ground plane. Policies should preserve south-oriented interior space within the buildings for public or residential community use.

• Open space should also be available above the ground. A percentage of roof space should be dedicated to the public or the residential community.

• By requiring a percentage of green roofing, these vertical spaces could also provide ecological benefits in the form of water management, improved air quality and urban farming.
green roofs
affordable senior housing
diverse uses
permeable blocks
vertical open space
flexible typologies
family services
block studies

block size tests

To balance the need for density with the need for an accessible, walkable space, we looked to the grid system. As a method used for millenia to demarcate property and efficiently hold density in cities (notably Barcelona, New York and San Francisco in modern times), the grid system also facilitates greater accessibility by providing more intersections and by eliminating ‘dead-ends,’ or roads that only lead to one destination.

Adjusting the size, or major horizontal dimension of the built area, of the block can achieve different effects. Keeping density constant, a large block allows lower Floor to Area Ratio (FAR), and generally speaking, shorter buildings. However, a smaller block means a shorter walking distance between blocks, but a higher FAR to satisfy density goals.

For our study, we looked at three blocks (100 meters, 80 meters, and 60 meters) as well as four general building lot coverages (25%, 50%, 75%, and 100%). The assumptions for these studies include:

- 40m right-of-way widths (average)
- 50% residential
- 4m floor heights
- 35m^2 living space per person
- 100,000 people/km^2 supported

We found that the 100x100m block was the most efficient of the three in carrying density while providing quality sky access.

Keeping the 100x100m block as a base concept across the site allows us to create flexible density even in larger blocks, dividing them with public non-motorized right-of-ways instead of roads.
80x80m block

FAR = 15.75

1 block = 14,400 m² area
100,800 m² built floor area
1,440 people

1km² = 69.44 blocks
7,000,000 m² built floor area
100,000 people

60x60m block

most walkable

FAR = 19.44

1 block = 10,000 m² area
70,000 m² built floor area
1,000 people

1km² = 100 blocks
7,000,000 m² built floor area
100,000 people

9 degrees

71 degrees

7 degrees

51 degrees
**site level implementation**

**phasing and key actors**

### Implementation actors

<table>
<thead>
<tr>
<th>Phase</th>
<th>Actors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1</td>
<td><strong>Public sector:</strong> Seoul Metropolitan Government, Korea Land and Housing Corporation, Seoul Metropolitan Rapid Transit Corporation, Korail</td>
</tr>
<tr>
<td></td>
<td><strong>Private sector:</strong> Samsung Group, LG Group, Hyundai Group, Eugene Constructions Company</td>
</tr>
<tr>
<td></td>
<td><strong>Community organizations:</strong> church groups, school organizations, neighborhood coalitions</td>
</tr>
<tr>
<td>Phase 2</td>
<td><strong>Public + private partnership</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Public + community partnership</strong></td>
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<tr>
<td></td>
<td><strong>Community + private partnership</strong></td>
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</tbody>
</table>

**Phase 1**
- IBD hub construction

**Phase 2**
- the parc

**Phase 3**
- arena and convention center

**Phase 4**
- yongsan park

**Phase 5**
- hospital and continuing education campus

**Phase 6**
phase 1

IBD construction starts around the transit hub

new road infrastructure

clearing rail yard

Saenamteo Church preserved

phase 2

construction of the Parc

parc area develops

northwest urban fabric preservation zone established

library and performance arts center anchor west parc ends
site level implementation
phasing and key actors

phase 3

- arena and convention center built
- development fills in around IBD
- light rail systems developed
- acquires right-of-way for elevated link to yongsan park

phase 4

- yongsan park completed
- elevated park link connects park systems, yongsan station
- pixel park system connects residents on the east side
- yongsan park attracts residents to the east of the site
phase 5

- district hospital built
- continuing education campus built
- development starts to reach site edge
- residential density starts to reach 100,000 inh/km across entire site

phase 6

- continuing collaboration at all levels carries the site into the urban future
block level phasing/implementation
public-private partnership scenario

public-private development scenario

This scenario represents one possible way in which a block on the site might develop and represents flexibility in land acquisition, phasing, programming and building typologies.

developer 1 (D1) - private developer
developer 2 (D2) - private developer
developer 3 (D3) - korea land and housing corporation+
private developer

Here the private developers act quickly and start building out their parcels. The public-private partnership takes longer to acquire total funding and leases the space under their parcels for underground parking to help close the gap. This time loss for the third private developer is offset by the tax savings gained from the provision of additional affordable housing and a public school.

pre-development phase

Land cleared and parcels and mandatory dedication divided.

Block Statistics

block dimensions...........................................107m X 190m
number of residents..............................................2520
housing units.......................................................578
types.................................................................1br, 361 2br, 144 3br
high school.......................................................12,300 sqm, 1000 students, 50 teachers
commercial/retail space........................................24,200 sqm
ground level open space.......................................12,000 sqm
rooftop open space................................................6,800 sqm
green roofs.........................................................5,400 sqm
phase 0
Parcels bought by developers, collective public space negotiated.

phase 1
Developers 1 and 2 start construction, developer 3 leases their underground space for parking to help finance further development.

phase 2
Developer 3 starts construction after receiving public matching funds for the school portion.

phase 3
All construction is complete, project enters management phase.
People of any level of mobility should be no farther than a short elevator ride to a garden, a playground, an art gallery, a reading room, a library, a theater, or a cafe. In the vertical city, no one should feel isolated in a building or feel far away from activities or people.

Working with the vertical community space ratio, the vertical proximity requirement ensures that there are sufficient moments of community and public gathering within the dense, vertical environment.

Developments with heights that require more than one vertical community space will be rewarded with FAR bonuses, depending on district location.
Basic Rule: communal or public space no farther than 90 vertical meters from the street or another communal/public space
vertical proximity requirement
district requirements

central
includes: international business district
average FAR: 18
commercial: 1,956,000 sqm
residential: 1,436,000 sqm
institutional: 795,000 sqm
population: 44,815 inhabitants (20.3%)
northeast
includes: residential and innovation clusters
average FAR: 15
commercial: 567,000 sqm
residential: 774,000 sqm
institutional: 228,000 sqm
population: 24,143 inhabitants (11%)
southwest
includes: commercial and institutional clusters
average FAR: 15
commercial: 1,642,000 sqm
residential: 2,053,000 sqm
institutional: 410,000 sqm
population: 64,029 inhabitants (29.1%)
southeast
includes: residential clusters
average FAR: 12
commercial: 362,000 sqm
residential: 1,691,000 sqm
institutional: 362,000 sqm
population: 52,795 inhabitants (24%)
northwest
includes: low-rise, residential, medical, and institutional clusters
average FAR: 10
commercial: 183,000 sqm
residential: 1,098,000 sqm
institutional: 549,000 sqm
population: 34,266 inhabitants (15.5%)
FAR bonuses

<90m

90-180m

>180m

private

community

public

ownership
The Hanok City plan aims to create integrated infrastructure for neighborhoods by setting up a specific ratio of mandatory community space for every individual housing complex. Community spaces could be used to encourage the mingling of classes and ages and provide needed activities and social programs for building residents.

Developers/architects would incorporate reserved space in parts of the vertical buildings during the planning/design stage; the spaces would then be used in the future either by the residents of the building or block.

The residents’ participation would be needed for deciding the location and the function of the open space from the beginning stage of the planning. There would be incentives for participation, which could include a reduction of the price of the residential unit or preference of housing units near the space.

A ratio of open community space would be reserved in each building with over 100 residential units when the development is initiated, and would be owned and operated by a cooperation of the residents.

10% open space for buildings 30 stories or less
15% open space for buildings 31 stories or more

By using a ratio of community space, each resident is guaranteed more intimate, neighborhood space in addition to the ample public space provided. With a flexible system, residents can better control their own space and program it as it best suits their vertical neighborhood. Here we present three scenarios to show how diverse one community space might turn out depending on the residents of a building.
In one scenario, a community is interested in agriculture and gardening. This community has all active green roofs for gardens, urban farming, and a small orchard. They also have a community kitchen for food start-up businesses, and other amenities like a recreation center, coffee shop, and communal dining.
In another scenario, the vertical community has a high proportion of families with children, so they choose to create a child care center and a number of playscapes and playgrounds. This community has passive green roofs, an educational garden, and amenities like a community coffee shop, sports fields, and a rock climbing wall.
In the last scenario, the community is interested in the arts and other cultural amenities. They create a theater, artist studios and a printmaking shop, and an outdoor cinema. They have all passive green roofs, and also have a café with outdoor dining and a yoga center.
SPECIAL PLACES
1  the intermodal hub (pA18)
2  the boardwalk (pA58)
3  cultural cluster (p58)
4  the parc (p52)
5  the parc promenade (p64)
6  the han river park (p80)
7  yongsan park (p52)

DISTRICTS (p96)
D1  central
D2  southeast
D3  northeast
D4  northwest
D5  southwest

IMAGES
P1  the village square (pA63)
P2  the intermodal hub entrance (pA19)
P3  arriving at the station (pA68)
P4  watching the trains (pA70)
P5  walking to the library (pA72)
P6  shopping at the parc promenade (pA78)
P7  strolling along the parkway (pA74)
P8  kayaking in the parc (pA76)
P9  biking along the han river (pA80)

S1  north/south section (pA22)
S2  east/west section (pA20)
S3  parc promenade section (p64)
additional references
addition references: services

1. civic service centers: Facility sizing and gross amount of facility space for the civic service were based on per capita assessments. Facility design, sizing, and gross built area for the library system was based on two documents. The first was a multi-city review of per capita rates of facility availability for collection cities; Providence Associates Inc (2002) A Master Facilities Plan for the Louisville (KY) Free Public Library. Louisville, KY, USA: City of Louisville, KY. retrieved from http://www.lfpl.org/district/master-plan.htm. The second was a community design guide; Dahlgreen, A. C. (2009) Public Library Space Needs: A Planning Outline. Madison, Wisconsin, USA: Wisconsin Department of Public Instruction. retrieved from http://dpi.wi.gov/pld/pdf/plspace.pdf. Facility design and sizing for the fitness centers were also based on per capita ratios. Those ratios were derived from a review of recreational sports facilities within urban college campuses; University of California-Los Angeles Department of Cultural and Recreational Affairs (2003) The UCLA Community’s Demand for Recreational Space, Los Angeles, CA, USA: University of California-Los Angeles.


3. health service facilities: Facility sizing and the gross amount of facility space for health service facilities was based on per capita recomendations. The basis for this recommendation was an audit of the South Korean healthcare system; Chang Bae Chun et al. (2009) Republic of Korea Health System Review. Health Systems in Transition, 11(7). Copenhagen, Denmark: World Health Organization. retrieved from http://www.euro.who.int/__data/assets/pdf_file/0019/101476/E93762.pdf. This document provided a per capita number of patient beds for a wide range of facility types. To determine the size and number of facilities that would house the required number of patient beds, case studies of the Yonsei Medical System, one of Seoul’s pre-eminent service providers, were conducted. Data concerning facility design was retrieved from http://www.yuhs.or.kr/en/about_yuhs/yuhs/General_Info/

4. retail service facilities: The gross amount of retail space appropriate for the site was determined based on per capita recommendations for general retail and grocery retail. To establish the appropriate rate of service provision for grocery stores a metropolitan-scale food retail case study was used; AECOM (2010) NYC Full Service Grocery Store Analysis. New York City, NY, USA: NYC Department of Health and Mental Hygiene. retrieved from http://www.nyc.gov/html/misc/pdf/nyc_store_analysis.pdf. Unfortunately, establishing per capita rates for general retail lacks industry consensus. To compensate for this lack of data, case studies of dense, large scale mixed use development were conducted. From these studies a general rate of 4 sq m per person was established for neighborhood retail. The remaining retail area was conceptualized as serving hypothetical regional development demand. There is no quantitative evidence for this regional demand. Facility design and sizing was based on case studies of the three different retail formats. The hypermarket format was based case studies of TESCO hypermarket design. Big box retail store design was based on urban store formats for Target and Walmart. The mixed retail format was based on case studies of small scale businesses including chain resturants (Panera Bread and Starbucks), convience stores (7-Eleven), and boutique retail.

3. Education service facilities: The sizing and design of k-12 educational facilities was based on a per student service provision ratio. The age groups included in the projected student body were identified based on an overview of the South Korean educational system; Sorensen, C.W (1994) Success and Education in South Korea, Comparative Education Review, 38(1),pp.10-35 retrieved from http://faculty.washington.edu/sangok/education.PDF. Facility size and design for grades k-12 were then established using a school design guide; Unknown Author (2012) School Construction Square Foot Recommendations. Bismark, ND, USA: North Dakota Department of Public Instruction. retrieved from http://www.dpi.state.nd.us/finance/construct/. Daycare facility design was based on a similar design guide; White, R. & Stoecklin,V. (2003) The Great 35 Square Foot Myth. Kansas City, MO, USA: White Hutchinson Leisure and Learning Group. retrieved from http://www.whitehutchinson.com/children/articles/35footmyth.shtml. Continuing education facility design and sizing is purely speculative and does not have quantitative justification.
a watershed moment

Elliot Weiss - Dinghao Zhou - Bokole Braun
a watershed moment
concept

systems

urban design

implementation
a watershed moment

concept introduction
“A watershed moment” is about water, sure. But not just water. It’s about creating complex and interdependent social, economic, and ecological geographies; it’s about seizing an opportunity. With demographic, commercial, and natural assets, Yongsan can become an urban environment that makes it easy to enjoy a sustainable and fulfilling lifestyle.

The project is premised on the following concepts:

reinvigorate the Korean LANDSCAPE to structure the urban environment

promote SOCIABILITY by ‘extroverting the bang’

design supportive environments for the entirety of the human LIFECYCLE

harness the power of the MARKET to make the triple bottom line

embrace innovative TECHNOLOGY to create a ‘smart city’
The development of this masterplan began with copious research. Throughout the process, we discovered that while the Korean national identity has always been imbued by the legacy of the landscape, a large wave of urbanization in the post-World War II era removed natural features like creeks, rivers, and forests from the urban ecosystem.

The recent daylighting of the Cheonggyecheon in downtown Seoul shed light on the potential of waterways once buried in a rush to complete massive development projects. Hailed as a great success, the Cheonggyecheon is now a world-class public amenity with millions of visitors annually.

Yongsan, too, was home to several natural waterways prior to heavy industrialization. The 1946 figure ground, above, illustrates these features. One stream, on the south side of the site, began in the hills of what is now Yongsan Park; the other, the *Uk’Cheon*, ran from the foothills of *Inwang-san*, past the Seodaemun Prison and the Independence Gate, before skirting downtown Seoul and flowing south to the Han River.

Both of these streams were gone by 2010. Yongsan evolved to accommodate industrial uses and large infrastructure projects. The quality of the urban environment has been compromised.

The masterplan envisions Yongsan as a place where a density of interaction and a restored landscape create a liveable environment with profound social and economic prowess. These features are noticeable in the proposed figure ground above. Density is configured in a way that enhances the urban environment while respecting the context of the surrounding fabric and the social and cultural histories in play.
Having gained an appreciation for the historic evolution of Yongsan, we turned our attention back to the existing condition. Our team conducted a rigorous analysis of assets and liabilities on the site.

We found that Yongsan is home to numerous cultural institutions, natural amenities like the Han riverfront and Yongsan Park, major retail destinations like the Electronics Mall, and a few vibrant neighborhoods. Furthermore, the site has excellent connectivity to other parts of Seoul.

The redevelopment plans in place for parts of the site, including for Yongsan Park and Yongsan IBD, are ambitious and indicate a willingness to invest in the area.

However, our design team also took notice of the history of major flooding in Yongsan, which threatens lives and commerce.

Major infrastructural elements, such as the rail lines leading to Yongsan Station or the large expressways running north-south and east-west, largely disconnect entire swaths of residential land from other amenities while simultaneously creating terrible congestion. And while current development projects aim to improve the site, many have produced negative social externalities by displacing existing residents and destroying neighborhoods that represent the traditional urban fabric.

SWOT Analysis: repositioning the site
Given the site analysis summarized above, our challenge is to retain the best of Yongsan while repurposing the site for an incredibly dense urban environment, without sacrificing livability and access.

**Density** can be configured in any number of ways, but the predominant models each have advantages and disadvantages.

A *uniform* distribution of density, seen in many European cities, disperses density throughout buildings of similar height. Because these types of cities are often heavily regulated, density typically requires either small unit sizes or a large footprint. On the other hand, uniform distributions often create livable cities that respect historical context, since they tend to be dense without relying on overwhelming height.

The *monocentric* model is common in North American cities, with density concentrated in the center city or downtown. This core is surrounded by lower density development of suburban character. Concentrated density has the advantage of creating economies of scale for business and resident services, but can also create oppressive environments marred by congestion, pollution, and perpetual shade.

A *polycentric* or *distributed* model mimics the peaks and valleys of the Korean landscape, contrasting neighborhoods of tremendous density with more human scaled environments in a small area. This model provides a number of benefits for Yongsan, including sunlight filtration, accessible verticality, and a unique aesthetic. Our design relies heavily on this model, expressed in infrastructure, massing, building typology, and landscape.
The idea that the built environment can mimic the natural in form and function is not new. A prominent example of this thinking may be found in Bjarke Ingels Group’s Zira Island Master Plan for a carbon-neutral resort community in Azerbaijan. In the words of Ingels, the plan:

“is an architectural landscape based on the natural landscape of Azerbaijan. This new architecture not only recreates the iconic silhouettes of the seven peaks, but more importantly creates an autonomous ecosystem where the flow of air, water, heat and energy are channeled in almost natural ways.

A mountain creates biotopes and eco-niches, it channels water and stores heat, it provides viewpoints and valleys, access and shelter. The Seven Peaks of Azerbaijan are not only metaphors, but actual living models of the mountainous ecosystems of Azerbaijan.”

In this way, distributing density along a series of “peaks and valleys” can create a city that restores the ecological integrity of the Korean landscape, promotes sociability among diverse populations, creates supportive environments for the human lifecycle, and harnesses the power of the market and innovative technology to effectively and efficiently manage urban issues.

Zira Island, carbon-neutral resort city, Bjarke Ingels Group

Source: www.big.dk
a watershed moment

**concept**

**landscape**

pristine wilderness

swift streams

wide rivers

fertile wetlands

jagged peaks
sociability

verdant parks

grand plazas

seasonal adventures

noraebang

jimjilbang
a watershed moment

concept

lifecycle

multigenerational tradition
meaningful employment
accessibility
family-oriented design
social services
market

international business district
innovative product types
strategic phasing
developer incentives
economic justice
a watershed moment

concept

technology

“smart city” partnerships
effective analytics
intuitive wayfinding
sustainable energy
streamlined service provision
concept
The distribution of population and economic activity among five districts is core to the Peaks and Valleys concept. Defined spatially by major geographic and infrastructural features, each of the individual districts provide adequate living, working and social amenities while simultaneously serving a particular niche. Population and labor is densely concentrated at the district downtown known as the “peak” to accommodate more human-scaled “valleys” at the periphery.

The Keystone – the centerpiece of the site, the Keystone is located along the railroad corridor and Hanango Road at the nexus of the other four districts. Yongsan Station, located at the “center of the center” is among the busiest transit hubs in Korea.

Business District – bound by the Uk’cheon stream to the west and Hangangno Road to the east, the Business District is home to some of the most valuable commercial real estate in Korea.

The Range - the residential compliment to the dense concentration of office space in the Keystone and Business Districts, the Range holds the largest residential population of the five districts and is bound by Hangangno Road to the west and Yongsan Park to the north. The Range’s Ichon’cheon links Yongsan Park to the Han River.

International District – Bisected by Hangango Road and defined by its historic proximity to the U.S. Army Garrison, the International district is Yongsan’s cultural melting pot.

Singu – The Korean word for “old and new,” Singu is defined by the exhumed Uk’cheon stream and the site’s largest historic preservation overlay zone.
program + land use

- ○ = 50 persons
- yellow = residential
- red = commercial
- blue = institutional
- black = transportation

systems
When the demand for floor area is so high (at over 11 million square meters site wide) and the supply of land area so low, vertical development is inevitable. Across the site, building heights range from as low as two stories in the Singu preservation overlay zone to as over 120 stories along the main strip of towers in the Business District. The strategic regulation of verticality and building typology is necessary in order to maximize sun exposure to as many residents as possible.
Topography plays an essential role in the individual district site plans as well as the greater Yongsan-wide storm water management strategy. Given the Han River’s tendency to flood entire portions of the site from time to time, the team investigated the potential of grading and other site engineering techniques in mitigating flood risk.

Watershed Moments takes on an approach similar to Studio Daniel Libeskind’s Archipelago 21 proposal to mount towers and the street grid on a vast multi-story parking deck. Raising roughly two-thirds of the Business District eight meters above grade provides enough clearance for two stories of parking with internal circulation below street level. Moreover, the grade change effectively elevates the heavily commercial portion of the Business District above the flood plain.

The Han Waterfront zone, however, will inevitably remain within the flood plain. Flood risk along the Waterfront is mitigated through the enforcement of design guidelines and regulations.

The reintroduction of naturalistic streams to the site not only provides scenic public space amenities but also constructs major channels for storm water. The resultant soil cut volume from stream excavation will be redistributed as fill volume for earthwork related to the raising of the Business District and burial of railroad infrastructure. Aggregated across the site over the duration of the development project, cut volume will equal fill volume to minimize environmental impact and carbon footprint related to moving soil on and off site.
Managing the impact of the wet season’s potentially devastating major storm events is a highly complex endeavor. The introduction of 220,000 residents and substantial infrastructure improvements only intensifies the need for sophisticated management strategies.

On a very basic level, the drafting of policies pertaining to the regulation of paved surfaces and materials will have to rely on expertise beyond the traditional planning establishment.

Climate change related volatility will further complicate the planning and management processes.

Watershed Moments calls for the integration of built, natural/landscape, and “smart” (i.e. data driven) systems to structure a larger stormwater and watershed management strategy. This is achieved through the use of constructed wetlands, mandates on green space provision, innovative building codes and a state-of-the-art system.
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An effective grey water recycling system can save energy and sometimes scarce—as is the case during the dry season—water resources. Some structures, such as high-rise residential towers, produce large volumes of grey water on a twenty-four hour/weekly basis. In most contemporary buildings, grey water is treated as waste rather than a resource. In large-enough towers, descending grey water can be used to power turbines that generate electricity for low-intensity building systems like thermostats.

Filtered rain water heated by solar energy could be used for showers. While the resultant grey water must undergo preliminary filtration within the building, it can eventually undergo an additional layer of filtration through green roof systems.
The waterways on site all receive their flow from different sources. The Uk’cheon (upper right) is a daylighting project, similar to the heralded Cheonggyecheon. It’s base flow is supplements by runoff.

The stream in the Retail Valley (middle right) is supplied by purified greywater from the buildings on-site. Runoff from the IBD would also settle here.

The Ichon’cheon (lower right) relies almost exclusively on runoff, but also gathers water naturally from the hilly terrain of Yongsan Park, at its headwaters.

These streams aid in stormwater infiltration, but other techniques help prevent damage from flooding. Mobile phone applications like Creek Watch allow residents to supply management partners with a library of information on waterway performance. This aids in flood prediction and preparedness.

On the other hand, when the inevitable flood does occur, flood-resistant architecture (below), which is mandatory in the waterfront overlay zone, helps protect residential uses from damage.
In order to meet floor area requirements while maintaining livability, Watershed Moments optimizes land usage by burying the railroad tracks north of Yongsan Station.

In order to break-up the partition between the east and west sides of the site and to protect pedestrian safety, Hangang Road has been narrowed to four lanes of traffic at street level. Two south and north-bound lanes of high-speed through-traffic, however, have been placed underground to maintain the major thoroughfare. Additionally, a Bus Rapid Transit line has been placed underground (with surface access in the Keystone).
In an effort to make emergency response in Yongsan the fastest in Seoul, two high-speed emergency vehicle lanes have been placed underground. The emergency lanes provide direct access to the emergency room at Yongsan Medical Center.
In an effort to maintain legibility and minimize infrastructure costs, the Watershed Moments road network is arranged in a relatively familiar grid pattern. Much of the existing road fabric, especially in the Singu preservation overlay, has been maintained with a few minor altercations. The grid in the Bussiness and Range districts, however, are almost entirely new.

Given the difficulty in predicting the long term trajectory of transportation technology, lane widths and parking space dimensions—which determine much of our street hierarchy—are based on current standards.

To promote walkability, secondary and tertiary streets are narrowed and certain overlay zones are actually closed-off to automobile traffic from time to time.
road systems
The abundance of public transportation alternatives should minimize—and is, in fact, capable of eliminating—automobile dependence in Yongsan.

Extra-site transport is accommodated by subway, commuter rail, bus, bus rapid transit, water taxi and automobiles. Intra-site transport is serviced by a street car system, local automobile and pedestrian traffic circulation.
transit
Open Space can convey a sense of the larger landscape and of the great web of life. Orientation to the city itself can be improved by contrast and the views which are opened up.

- Kevin Lynch, The Openness of Open Space

High urban density only intensifies the need for quality urban space. In recent decades, research from the social, behavioral and health sciences has highlighted the link between adequate exposure to natural scenes and psychological and physiological wellbeing. The health benefits of quality green space can be enjoyed by people of all ages.

Inevitably, housing 100,000 people safely and comfortably per square kilometer will come at the expense of open space and vise-versa. The Watershed Moments master plan only allocates about fifteen percent of site area to open and green space. Moreover, with the intent of distributing open space evenly throughout the site, most of these parks and plazas have been made relatively small— hardly large enough to evoke a sense of extent from the dense urban environment.

Beyond the allotted fifteen percent at ground level, rooftops and residual surfaces from podiums and setbacks create opportunities for non-traditional open spaces. Landscaped medians, alleyways and pedestrian overpasses constitute an additional category of open space, one that serves the dual purpose of open space and transit amenity.

Residents can acquire a sense of “Contrast,” by traversing the vast Yongsan and Hangang Parks, located just east and south of the site respectively. Nearly two-and-a-half square kilometers in total area, these naturalistic green spaces are spacious enough for residents to literally lose themselves in.
hierarchy of open space
systems
vegetation

The Trident Maple is a small to medium sized tree that grows well in tight locations. It requires a 1m² well and grows to approximately 7.5 meters (25 feet) in height.

Crape Myrtle trees are small but sport beautiful summer blossoms in red, pink, and white.

The Camphor tree is a large (12 meter/40 foot) tree with an aggressive root system. It needs a lot of space but is an attractive evergreen.

Ginkgo trees are popular street trees worldwide because they are adaptable to urban conditions, behave well around hardscape, and are disease-resistant. They grow to 9 meters and produce great fall color.
The Chinese Pistache grows to 15 meters (50 feet) and provides ample shade. It is well-behaved around concrete and has good fall color, but it prefers dry, well-drained soils.

The Goldenrain is a medium sized tree, reaching heights of 9 meters (around 30 feet). It is drought tolerant and is used at higher elevations on site. This tree flowers in the summer.

The Evergreen Pear is a medium sized tree that sprouts beautiful white blooms in spring.

Korean Pines are found in mountainous regions of Korea and grow to be very big. However, as a member of the White Pine family, there are several varieties appropriate for urban conditions. They are tolerant of severe cold.
The project transforms Yongsan into a leader in the global Smart Cities Initiative. The Data-driven, computer interface assisted infrastructure provides city administrators and the public the means to access large amounts of detailed real-time information on traffic and public transit and the electric grid among other things.

Smart Transit – network of sensors, GPS devices and heavy infrastructure used to maximize commute times on public transit and optimize private vehicle traffic volumes.

Rapid Response – network of sensors, traffic flow monitoring devices and specially dedicated lanes and routes for the purpose of improving emergency response times.

Smart Grid – network of Advanced Metering Infrastructure and smart meters used to coordinate energy supply and safeguard against brown/black outs.

Central Command – based in the Keystone, the Yongsan Central Command Terminal (YCCT) houses the main servers, super computers, dispatchers and emergency management personnel that coordinate the networks.
Our design minimizes the disconnect between consumption and waste through the concept of a “waste energy flow.” Traditionally, cities have failed to capitalize on valuable energy and material resources like food waste, grey water and solid municipal waste (SMW).

The waste energy flow system essentially streamlines the waste recycle process by keeping as much of the process at the district or even building scale as possible.

Rather than relying on a single public or private sector utilities provider, energy production has been decentralized to encourage innovation and capitalize on economies of scale and scope.

A minimum of two thirds of a new building’s energy consumption (one third for older existing buildings) must be met by energy produced somewhere on site. This can be achieved using a closed-loop module at the individual building or block scale or through an open-loop module for block clusters and neighborhoods.

Cogeneration units are likely to cover the minimum requirement, however, incentives will be provided to developers who capitalize on other alternative energy sources and innovations in energy production.
Produce Nearly 128,000 metric tons of MSW per year
Consume Nearly 6,000 GwH of electricity per year

Plastic and Metal Waste
Food /Organic Waste
Greywater

Recycling Pre-Sorting
Anaerobic Digestion
Greywater Recycling and Energy Recapture

Methane/Natural Gas
Scrap Material
Smelting and Refining
Usable Materials

Electricity
Cogeneration

Electricity
Electricity

Consume Nearly 6,000 GwH of electricity per year

67% MINIMUM of a new building’s energy demand must be generated on-site

33% MINIMUM of an existing building’s energy demand must be generated on-site
Traditional neighborhood fabric is preserved, providing a vibrant urban neighborhood and a diverse mix of housing types.

A series of signature office buildings provide world-class space for international corporations in the International Business District.

The Landmark Tower is a 365 meter tall commercial mega-structure and is the tallest building in Seoul by 101 meters. It also includes phenomenal facilities for post-secondary and adult education.

The Uk’Cheon, a daylighted stream, is the backbone of a large linear park and provides ample opportunities for recreation.

Yongsan Plaza is a large public space for gatherings and events; at the southwest entrance to Yongsan Station, the space is designed to accommodate hundreds of thousands of people daily.

The Retail Valley projects as one of the world’s most iconic shopping streets; the pedestrian promenade is lined by flowering trees and a landscaped canal.

Yongsan Marina is a premier waterfront on the Han River. With slips for boats large and small, a generous esplanade, a water taxi stop, and an in-river heated swimming pool, the Marina is destined to be a major attraction.

Saenamteo Catholic Church is preserved as one of Yongsan’s major religious and historical treasures; the church was built in 1987 to honor Dae-Gun and other Korean martyrs.

The Skyline Terrace is simultaneously an infrastructural solution and a public space; ramping up to a height of 14 meters, the Terrace provides space for exercise classes and casual strolling, all with superb skyline and river views.
A necklace park provides varied public spaces for informal markets, recreation, and leisure.

Hangangro Road’s high-speed traffic is diverted below ground to access parking, with individual lanes resurfacing at major intersections. The surface road caters to slower, local traffic, making streets safer for pedestrians.

A state-of-the-art regional medical center provides cutting edge care to in-patients and visitors from all over Korea. It’s central location makes it easily accessible by foot, bike, car, or train.

Redesigned Yongsan Station is an intermodal hub for the future, with retail and generous interior/exterior landscaping. Serving tens of millions of passengers each year, the station anchors the entire site.

The international design competition for Yongsan Park is underway, but guidelines for the contest call for areas of agriculture, active and passive recreation, and naturalized landscapes.

A green overpass leads from Yongsan Park directly to Yongsan Station, allowing pedestrians to move between the two without competing against vehicular traffic.

Modern residential towers are retained and complemented by an ambitious infill strategy to densify and vivify the existing urban environment.

Urban agriculture can provide fresh, healthy food for neighborhood residents and can also create meaningful employment opportunities for older adults.

Ichon’cheon is a stream flowing from the hills of Yongsan Park to the Han River. Wider and flatter than the Uk’Cheon, the stream is dependent on seasonally heavy rainfall and provides recreational opportunities for hikers and bicyclists during the dry season.
urban design
overview

<table>
<thead>
<tr>
<th>District</th>
<th>Population</th>
<th>Area</th>
<th>Land Cover</th>
<th>Floor Area</th>
<th>FAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yongsan</td>
<td>220,116</td>
<td>2.2 KM^2</td>
<td>65%</td>
<td>11,275,000 M^2</td>
<td>800%</td>
</tr>
<tr>
<td>Keystone</td>
<td>12,994</td>
<td>.08 KM^2</td>
<td>-</td>
<td>828,357 M^2</td>
<td>1000%</td>
</tr>
<tr>
<td>Business District</td>
<td>35,335</td>
<td>.53 KM^2</td>
<td>-</td>
<td>3,040,269 M^2</td>
<td>600%</td>
</tr>
<tr>
<td>The Range</td>
<td>89,058</td>
<td>.60 KM^2</td>
<td>-</td>
<td>3,389,515 M^2</td>
<td>600%</td>
</tr>
<tr>
<td>International</td>
<td>34,947</td>
<td>.31 KM^2</td>
<td>-</td>
<td>1,742,467 M^2</td>
<td>700%</td>
</tr>
<tr>
<td>Singu</td>
<td>47,832</td>
<td>.68 KM^2</td>
<td>-</td>
<td>1,762,467 M^2</td>
<td>300%</td>
</tr>
</tbody>
</table>

Each district is imbued with a unique character and identity. These identities are predicated on historical and existing conditions, unique characteristics, demographics, natural features, and/or other criteria. All five districts represent all five of our development concepts, and they are linked in ways that all them function symbiotically. However, each of the districts are mated with a concept that is expressed in a more powerful fashion within the district’s geographic confines.

The Keystone District is mated with the concept of technological innovation. As the home of Yongsan’s “smart city” command center, many of the processes that make Yongsan an efficient city of the future are run from here. The Range is paired with the Landscape concept because it is an impressionistic take on the Korean terrain. The peaks, valleys, and streams are reminiscent of South Korea’s ubiquitous highlands and lowlands.

The Business District is mated with the Market concept because the district is a hub for global economic activity. The International District is enhanced by the legacy of an international presence in the form of the U.S. garrison. It is also the home of Seoul’s largest Mosque and it is well-connected with Icheon-dong, which is largely populated by expatriates.

Singu is unique for the area of preserved urban fabric. This area has a singularly vibrant social pattern, where pedestrians take priority on the streets and busy uses crowd the sidewalks. For this reason, Singu most clearly expresses the concept of Sociability.
Arrival: Approaching Yongsan from the northwest on the expressway.
a watershed moment

urban design

keystone
The Keystone District structures the flows of people and resources across the site, and is the site where hundreds of thousands of people arrive or depart daily. It is very dense, but large public spaces channel the density and activity into a 24/7 asset.

Existing Context: Yongsan Station contains a mix of uses but the architecture is imposing and somewhat impenetrable. The public plaza at the front of the station is rather inhospitable.

Existing: Inside the station, commuters are bathed in darkness. Amenities abound, but the experience is neither intuitive nor enjoyable.
a watershed moment

urban design
keystone

Source: Foster and Partners
Source: http://inhabitat.com
The Keystone District contains a mix of residential, commercial, and institutional uses. Many mixed-use towers have an extremely high FAR, but their unique designs make them livable.

Block sizes are larger than average for the site, but they accommodate a tremendous number of people walking to and from Yongsan Station.
Yongsan Plaza foregrounds the Landmark Tower and the skyline of the International Business District. The mouth of the Retail Valley and several cultural institutions (museums, a college) create non-stop activity.

The stream that runs through the Retail Valley springs from Yongsan Station and cuts through the center of Yongsan Plaza, creating an intuitive connection to the Retail Valley and the waterfront.
a watershed moment

urban design
international business district
The International Business District contains millions of square meters of commercial space for world-class multinational tenants. Our design is inspired by the vision of Daniel Libeskind Studio, which won the international competition of the design of Yongsan IBD. Retained from the winning proposal are the marina, landmark tower, and skyline terrace.

Existing: the site for the IBD is almost entirely occupied by a rail yard that has been in use since before World War II.

Existing: large slab or A-pa-tu style apartment buildings line the hill overlooking the waterfront, disconnecting the majority of the site from the Han River.
urban design
international business district
urban design
international business district

Land uses are thoroughly mixed in the IBD. Many of the largest structures are dominated by office uses, but several mid-rise buildings and shorter towers contain residential and institutional uses.

The typologies are selected to create a vibrant street scene and to minimize shadows in what is, in reality, a very tall district.
The Retail Valley runs from Yongsan Station to the waterfront. While the retailers are open for shopping yearround, the stream that structures the Valley freezes in the winter. During this time, residents and visitors strap on ice skates to enjoy the lively scene.

Source: http://www.urbancapture.com
In summer, too, the IBD is buzzing with activity. The waterfront features a full-service marina and water taxi terminal. Retail and entertainment options abound, and there is a pool that sits in the Han River.

The view of the skyline from a boat is astounding.
a watershed moment

urban design

the range
The Range is a dense district, but is distinct for its more tranquil character. A bit of a respite from the non-stop activity of the Keystone and International Business Districts, the Range is home to more residents than any other district on site.

Existing: there is a tremendous amount of new development occurring in the Range, as towers sprout up every year. Some of these are retained in the proposal, but in general the large setbacks are too inefficient to achieve our desired density.

The new development (above) is contrasted with the smaller, more traditional fabric (left), which is rapidly disappearing. The Range is also characterized by significant rail and road infrastructure.
urban design
the range
Land uses are primarily residential, and the typologies selected tend to reflect this. However, there is still a large amount of neighborhood-serving retail at street level. To maximize sun exposure and emulate the “peaks and valleys”, many of the buildings in the Range employ public or semi-private terraces.
The Range is also notable for the Ichon’cheon, a seasonal stream that provides recreational and aesthetic amenities. Seen here (above) in the rainy late-summer months, the stream is full of water as it helps mitigate localized flooding.
urban design
the international district
The International District is designed by the legacy of the U.S. Army Garrison and its connection to the international population in Icheon-dong. The district is known for ethnic diversity, but is also diverse in amenities, typologies, and lifestyles.

<table>
<thead>
<tr>
<th>SCALE</th>
<th>ACTIVITY</th>
<th>RENT</th>
<th>RESIDENTIAL</th>
<th>COMMERCIAL</th>
<th>NIGHTLIFE</th>
</tr>
</thead>
</table>

Existing: The Garrison (right) terminates many of the district’s streets, creating discontinuity.

Existing: mid-rise and low-rise buildings dominate the area, with a few new residential towers here and there. The less dense areas are being subjected to infill development, create a mix of old and new structures.
Like the other districts, there is a rich mix of uses in the International District. The most unique feature, however, is the regional medical center. This large institutional use is clustered with smaller clinics and relevant retail.
The design for the regional medical center is intended to provide views and ample sunlight to all in-patient rooms. A large glass skyway projects through the four hospital buildings, taking patients from their room to the Uk’cheon stream. The hospital is located a short walk from Yongsan Station, so it can easily serve residents from all around Korea.
urban design
international district: the Medical Center

The Regional Medical Center, Yongsan Station, and the Uk’cheon from the north.
The International District will also share a border with Yongsan Park, and the residential uses benefit from its proximity. The design competition for the final Yongsan Park plan is ongoing, but there will be recreational and cultural amenities, as well as “productive” land targeted for urban farming.
Singu’s character is defined by the relationship between older, traditional urban fabric and the new residential towers that are currently being built.

The plan creates a preservation zone to retain the unique low-rise fabric over time.
Existing: the narrow streets of the traditional fabric are dense and well-used with a lot of people and a lot of color. Their vibrancy is difficult to obtain with new construction, so we propose a preservation zone that compliments this fabric with contextual infill over time.

Existing: the Yongsan Electronics Mall is the largest in Korea and is a major attraction. Our design relocates the mall, but retains it as an economic driver.

Existing: new construction projects are rooting out the traditional fabric. Such projects appear dense but have very low lot coverages, making them ill-suited to the demands of this design problem.
a watershed moment

urban design

keystone

Source: Foster and Partners

Source: http://inhabitat.com

Source: www.laurakammermeier.com
Singu is home to a variety of land uses, but the most unique typology (the preserved low-rise), is also a unique mix of uses. These streets consistently have retail uses at street level, with residential uses above. Unit sizes are small and cater to locally-owned businesses that serve neighborhood residents directly.
Singu is well-lit at night, as businesses crowd the street to meet the needs of local shoppers. This atmosphere has tremendous energy. In the background, the towers of the IBD provide stunning relief.
A small tributary to the Uk’cheon begins in Singu. The landscaping pattern makes playful use of old rail infrastructure because the stream runs where the rail lines used to enter Yongsan. Retail uses congregate along the stream at ground level.
The Jade Necklace helps to insulate the preservation zone (at right) from the denser environs of the rest of the district. It also unites people from both areas, with diverse backgrounds, in a series of shared public spaces. These may be suitable for recreation, leisure, and informal commerce (e.g. a market).
These context photos prove some indication of the character of the Uk’cheon. It flows swiftly for nearly 2.5km on-site, and it could be extended to its historic headwaters for a total length of over 7km. It is a recreational asset for all of Seoul.
These context photos illustrate the wet/dry seasonality of the Ichon’cheon. Recreational opportunities differ between seasons, but the potential for an adventure is constant.

The stream begins in Yongsan Park and runs all the way to the Han River. At its terminus, sedimentation from flash flooding is expected to start the process of island seeding, whereby a natural wetlands on the Han forms over time, creating habitat for countless unique species.

The Ichon’cheon relies almost entirely on stormwater runoff for flow, so during the dry months the stream bed may be empty. The landscape is designed to accommodate uses like trail running and mountain biking during such times, so the stream may be used year round.
The waterfront is a premier public space with cafes, bars, shopping, boating, swimming, and more.

The esplanade running the length of Yongsan Marina preserves the linear continuity of the Han Riverfront Park.
a watershed moment

urban design

waterfront
implementation
phasing

A well-conceived phasing plan can help city administrators time infrastructure improvements and services with new development, anticipate fiscal and environmental impact, avoid potential land disputes and help financial planners hedge risk and other liabilities. Phasing plans can also provide financiers with helpful insights into how to schedule their investments and when to expect returns. Moreover, the magnitude and infrastructural complexity of the Watershed Moment project further necessitate effective development phasing. Nevertheless, the sheer length of the project—nearly forty years in duration—almost assures the need for flexible long-term planning as volatile natural, cultural, political and market forces are likely to alter the project’s trajectory over time.

The following phasing plan should be viewed as tentative, mutable and ultimately as a starting point for an ongoing long-term planning process. While each phase begins and ends at specified dates, it is possible for construction to continue into the succeeding phase. However, in an effort to avoid title disputes and assure that new development is met with adequate infrastructure and services, demolition and new construction should not be permitted prior to the start of its respective phase.

Phase I (2016 – 2020)

This phase primarily consists of site preparation. Parcels highlighted in red are set for demolition and will be acquired prior to 2016. The construction of a two-story underground parking deck, along with related earthwork will occur early in the phase. Major infrastructure improvements, such as the burial of the hatched portion of the rail and subway corridors and four lanes of the major northwest arterial thoroughfare, are scheduled to begin at the start of Phase I.

Phase II (2020 - 2025)

Daylighting of the Uk’Cheon stream begins early in Phase II. Re-development around the new Yongsan Station will immediately follow the completion of the underground parking deck and earthwork. Construction on several high-profile towers located just west of the station will begin towards the end of the phase. This marks the emergence of the Keystone and Business Districts.

Phase III (2025 – 2040)

As major infrastructure work reaches completion, development of the Business District towards the waterfront picks-up. Ichon-Cheon stream is introduced to the site early in the phase. Existing buildings in the stream’s vicinity are set for demolition.

Phase IV (2040 – 2050)

As construction in the Business District wraps-up, attention is turned eastward as development of the Range begins early in the phase. Development north of Yongsan Station capitalizes on high land value along the Yongsan and Uk’Cheon park fronts giving rise to the Singu and International districts. Construction on the Yongsan Medical Center begins.

Phase V (2050 – 2055 and beyond)

Construction in Singu and International districts extends northward towards the site boundary. Structurally unsound buildings in Singu preservation zone are replaced by infill development.
phase i
a watershed moment

implementation

phase ii
phase iii
a watershed moment

implementation
phase iv
phase v
implementation

Financing and administering the development of Watershed Moments will require close collaboration between many departments of city government, private sector consultants, contractors, developers, investors and existing as well as future Yongsan residents. Coordinating efforts between actors and stakeholders is an intricate and often formidable endeavor. In an effort to streamline the collaboration process, the implementation of “A Watershed Moment” will be broken into four primary Stages.

Stage 1: Planning

The planning stage begins with a visioning and master planning process. Early in the planning process, government, private and academic specialists should be called to submit their research and visions for redeveloping the Yongsan site. The resultant diversity of insights, recommendations and admonitions should serve as a valuable resource in composing a formal master plan.

During the master planning process, the city should seek geotechnical and engineering expertise to ensure the feasibility of the City’s vision for the Yongsan Site. Special attention should be paid to storm water management threats and climate change adaptation. Transportation planners and engineers will play a major role in designing a phasing strategy for infrastructure improvements and the construction of the new Yongsan Station.

Public participation will also serve an important role in the planning stage. Historically, the Seoul Government has paid lip service to the concerns of residents, in areas set for redevelopment. Planners should work to mitigate potential conflicts of interest between the existing community and the master plan as best as possible.

Stage 2: Financing

Once the City has adopted a clear vision for the Yongsan site, economic development and fiscal policy experts should be consulted to form a coherent financial plan. The City should pursue a rigorous public outreach campaign early in Stage 2 to attract potential investors and private partnerships. Municipal bonds should be issued at this time to ensure adequate funding for at least the first phase of development. City financial managers should develop a clear strategy for land acquisition, debt amortization and revenue generating policies and programs.

Stage 3: Development

Provided adequate capital is secured, the first phase of construction should begin in 2016 as scheduled.

Stage 4: Management

As new development takes place and new residents begin to inhabit Yongsan, the demand for public services and programs will increase rapidly. The Yongsan District Administration (YDA) and Yongsan Community Council (YCC) will begin playing major roles in public management at the conclusion of development Phase II at or around 2025. YDA will administer utilities, on-site waste and energy management, public education and employment programs and Yongsan’s Smart City initiatives. YCC will address the concerns of the community, and facilitate public participation and local governance.
implementation time line

**PLANNING**
- Master Planning  
- Site Engineering  
- Environmental Impact Analysis  
- Stakeholder Analysis  
- Public Hearings

**FINANCING**
- Bond Issuance  
- Budget Drafting  
- Land Acquisition  
- Contract Bidding  
- Debt Amortization

**DEVELOPMENT**
- Demolition  
- Infrastructure Construction  
- Real Estate Construction

**MANAGEMENT**
- Community Relations  
- Utilities  
- Public Services  
- Smart Systems  
- Welfare, Pensions and Endowments

<table>
<thead>
<tr>
<th>PHASE I</th>
<th>PHASE II</th>
<th>PHASE III</th>
<th>DEVELOPMENT PHASING</th>
<th>PHASE IV</th>
<th>PHASE V</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>2016</td>
<td>2020</td>
<td>2024</td>
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<td>2036</td>
<td>2040</td>
<td>2044</td>
<td>2048</td>
<td>2052</td>
<td>2056</td>
</tr>
</tbody>
</table>

**STAGE 1**
- Seoul Metropolitan Government  
- Economic Planning Office  
- Urban Planning Bureau  
- Engineering Review Board  
- City Transportation Bureau  
- Parks and Landscape Bureau  
- Private Sector Consultants  
- Urban Planning + Design  
- Architectural  
- Engineering + Geotechnical  
- Economic Development  
- Yongsan Residents

**STAGE 2**
- Seoul Metropolitan Government  
- Economic Planning Office  
- Finance Bureau  
- Housing Policy Office  
- City Assessor  
- Banks  
- Investors, Sponsors and Partners

**STAGE 3**
- Seoul Metropolitan Government  
- Urban Planning Bureau  
- Engineering Review Board  
- City Transportation Bureau  
- Parks and Landscape Bureau  
- Seoul Metropolitan Infrastructure  
- Private Sector Contractors  
- Private Sector Developers  
- Yongsan Residents

**STAGE 4**
- Seoul Metropolitan Government  
- Housing Policy Office  
- Health and Welfare Bureau  
- Engineering Review Board  
- Water Management Bureau  
- Green Seoul Bureau  
- Information Systems Planning Bureau  
- Emergency Planning Bureau  
- Urban Safety Office  
- Public Utilities Providers  
- Private Sector Developers  
- Yongsan Residents
implementation
housing, labor and entitlement programs

Koreans, who as a whole, enjoy long life expectancies and a relatively early retirement age can be faced with a sizable dilemma as they enter their golden years: perpetually shrinking finances and fewer prospects for generating their own income.

Korea’s low fertility and labor replacement rates further complicate the matter as they imply potentially fewer workers to fund social security programs. Moreover, the influences of globalization have begun to erode the traditional family support structure in Korea, often depriving the elderly of a historically reliable safety net. Any program that reduces the cost of living while increasing the income potential of retired people will benefit the aged population and the economy as a whole.

Job Retraining and Entrepreneurship Program

While the collective knowledge of the elderly population constitutes a tremendous asset to society, an increasing number of jobs require technological literacy and other skills which many aged people either lack or underperform in. A jobs retraining program could provide retirees with marketable skills.

The Business District, with its abundance of highly skilled individuals, would be an ideal location for a jobs education center.

Nevertheless, many retirees already possess valuable and even lucrative skills. A charity or venture capital program could assist these individuals with acquiring the funding to start businesses that serve local needs.

While the elderly are certainly to gain from job retraining and entrepreneurship programs, such services would be of great benefit to individuals of all ages. Neither initiative is meant to be exclusive.

Affordable Housing

The map grades parcels based on their likely affordability. Market rents and affordability are, however, influenced by subsidies and other rent control policies. The Singu preservation overlay zone, for example, is likely to experience sharp increasing in rents as land value in other areas of the site escalate. From a market perspective, it is unlikely that such a low density neighborhood would survive in its current configuration without government protections on land use, building height or rent. The preservation zone is one of several zones throughout the site targeted towards the elderly. All housing in the overlay has been subsidized in an effort to prevent this demographic from being priced-out of the area as land values rise.

Housing Voucher and Welfare Endowment Program

In many countries, local governments incentivize private sector developers to provide public goods or fund public programs through the provision of development bonuses, tax breaks and infrastructure improvements. The Seoul Metropolitan Government can use public-private partnerships to create programs that benefit the elderly and also current residents of Yongsan. One possible way in which the city could do this is through the issuance of housing vouchers for current Yongsan renters. The vouchers would be used to purchase living units during the early phases of development. Home ownership would effectively safeguard locals from the gentrification likely to ensue as land values escalate during the latter phases of development. Another option is for the Seoul Government to provide developers who dedicate a portion of their returns towards a welfare endowment program with development bonuses or other incentives. The endowment will grow as development proceeds over the five phases. At maturity, the endowment could fund social welfare programs and housing subsidies for the elderly.
affordability index
annex
COURSE OVERVIEW

The Physical Planning and Design Capstone Winter 2012 frames a collaboration with Arch 562 Architecture Systems Studio: EVERYBODY AGES, under the 2012 Vertical Cities Asia International Competition. Sponsored by the National Singapore University, the competition invites ten international schools to address the contemporary dilemma of housing an aging population in sustainable and highly dense environments.

Building on the comprehensive nature of the agenda established by the Taubman College, the urban planning students enrolled in UP631 will collaborate with five different Architecture Studio Sections in a highly coordinated setting. The semester is structured to ensure a dynamic learning structure, where students will alternate leadership roles in a collaborative environment.

The architecture - planning partnership registers different gradients of intensity over the semester, in order to accomplish the pedagogic goals pertinent to each program. According to the Urban Planning Capstone pedagogic goals, students address the planning and design of sustainable physical environments to assist social interactions across scales, considering multiple agents and agendas, and the cultural frameworks at play.

During the course of the semester, the group works on the development of urban design schemes including infrastructural systems design, studies on building typologies, and other programmatic and performative considerations in the definition of a series of distinct urban projects.

The course positions graphic representation as a powerful tool to organize and communicate information associated with complex problems with precision and clarity. The course requires advanced graphic representation skills to facilitate the development of the analytic and propositive phases in the course of the semester.

The classes are structured to ensure a dynamic learning structure, and include technical workshops, weekly lectures, desk critiques, group discussions, and public presentations and reviews with guest critics.

There are four assignments during the course of the semester:

- Assignment 01. This phase includes four stages: [a] the research on the precedent, [b] the site analysis of the competition, [c] the quick charette on the master plan, and [d] the master plan workshop lead by Dan Wood. This phase will require a high investment of time and self-discipline given the tight schedule and complexity to coordinate with the architecture sections and the expert visiting.
- Assignment 02. This phase includes two stages: [a] master plan schematics, and [b] the Identification of the areas of focus for the urban design proposals.
- Assignment 03. This phase includes two stages: [a] Master Plan development, and [b] Areas of focus development
- Assignment 04. This phase includes two stages: [a] Draft Proposal and [b] Final Publication / report

The final publication registers the different assignments and present the two final proposals as presented in the final review in the Taubman College.
VERTICAL CITIES: “EVERYBODY AGES”

Competition preamble
Vertical Cities Asia Competition encourages design explorations into the prospects of “new models of urban architecture”.
The competition will promote the development of ideas and theories in urban growth and architectural form related to density, livability and sustainability specific to the rapid and exponential growth of urbanism in Asia.
[For more information: www.verticalcitiesasia.com]

Competition Criteria
1. Sustainability
   [Environmental]
2. Quality of life
   [Inclusiveness and Community]
3. Feasibility
   [Buildability, Financial, Social Support]
4. Relation to Context
   [Place, Awareness of Conditions, Climate, Cultural Milieu]
5. Technical Innovation
   [Technology & Techniques]

Taubman College Interdisciplinary Framework
The 5 master of architecture studio sections participating under the Systems semester are:
• Over [populated]&Under [valued] L Graebner+J McMorrough
• alllsystemsgo! Jen Maigret + Geoffrey Thun
• New aged Collective Vivian Lee + El Hadi Jazairy
• Part to Hole Daubmann + Wigger
• Room, treet and Human Agreement M.Kennedy+T.Patterson
annex: precedent studies
The Precedent Studies represent the first research stage in the semester. The goal is to provide a critical approach to different urbanization models and parameters currently under development in the world.

The studies also generate a collective knowledge to be applied and challenge over the semester and explores initial representational techniques in 2 and 3D.

precedent studies

Ijburg, Haveneiland, The Netherlands
Kronsberg, Hannover, Germany
Masdar, United Arab Emirated
Orestad, Copenhagen
Barcelona, Plan Cerda, Spain
Songdo_IBD, South Korea
Tianjin Eco-City, China
Wulijie, China
annex: precedent studies

Barcelona, Plan Cerdá
Spain

Development of Barcelona over time

Population Density (1854) 802 people/ha
12.5 m² per person

Population Density (2009) Barcelona (city proper): 159.9 people/ha

Elxample District (city center, Cerdá planning area): 351.38 people/ha

23.5 m² per person

62.5 m² per person
Barcelona, Plan Cerdá, Spain

Population: 1,621,537 inh. (262,485 inh. the eixample)
Density: 25,000 inh/km²
Project Area: 5.73 km²

Ildefons Cerdá’s plan of reform and expansion for Barcelona in 1860 followed a grid structure with diagonals to allow the sea breeze to flow through the city. At the time, the 6 m wall that protected the City during medieval times prevented the City from expansion. Cerdá considered the intimacy of the home the top priority. He believed that the ideal home is isolated and rural, but also believed in the advantages of a compact city. His plan attempted to combine both worlds by providing light, ventilation, and semi-private space for all residents, while also deploying public transportation, sanitation, open space, and other public amenities.

While Cerdá’s plan called for plenty of semi-private open space, developers implemented more dense blocks, and much of the open space was eliminated. Still, the idea of the grid with apple-shaped blocks was carried out, along with an excellent transportation and sanitation systems.

Barcelona has undergone a significant change since the 1980s. Early transformations were the result of an improved transportation system and new infrastructure connecting to the sea. The 1992 Olympic Games was another force for urban transformation of the waterfront. The highway that separated the City from the sea was rebuilt underground in many areas. In newly-open land, the City build new beaches, parks, and neighborhoods. The Olympics were used to reshape the City’s form by creating a more well-defined relationship to the water.

Cerdá’s plan is still under development, and even today, the City is improving the connections to the sea, and updating and consolidating other areas. The flexibility of the scheme allows for multiple updates and reconfigurations.
Haveneiland, Ijburg, Amsterdam
The Netherlands
Haveneiland, Ijburg, Amsterdam

Population: 65,000 inhabitants
Density: 52 dwellings/km² (7,080 units)
Project Area: 1.35 km²

Designed by Claus, Van Dongen, Schaap, Haveneiland aimed to facilitate mixing between social economic classes, and required a parallel of diversity of housing types, including: single family detached homes, row houses, and apartments. The living working ratio is 2:1.

Transportation infrastructure in Haveneiland consists of automobile, bicycle, and mass transit facilities. Roadways are generally constructed of two opposing lanes. The main east-west arterial is an exception to this rule, with two paired lanes for each direction of travel. Water infrastructure in Haveneiland consists of a series of perimeter drains which capture and transport floodwaters away from the site.

Land use is rather homogenous and creates a landscape where multi unit housing is seamlessly integrated with single family districts. Services, like health care centers and educational facilities, similarly enjoy full integration into the community as a result of the island’s broad mixed use classification. Parking is provided on-street facilities and courtyard spaces. None of the commercial or institutional buildings possess surface lots. By sacrificing a portion of their first story, however, some buildings do provide covered parking areas.

Natural spaces in Haveneiland are varied in their composition and scale. Eco-preserves operate at the scale of the entire development, and serve to balance disturbance with conservation in the IJmeer. Reed beds are propagated in the canals to aid in the filtration and absorption of stormwater. Courtyards are generally located in the center of rectangular apartment and row-house complexes.
Kronsberg, Hannover
Germany
Kronsberg, Hannover, Germany

Population: 15,000 inhabitants
Density: 25,000 inh/km²
Project Area: 1.4 km²

The € 2.2 billion Modell Kronsberg project sought to address a 20,000 person housing shortage in Hannover, through ecologically sustainable suburban living. The project adhered to United Nations Agenda 21 Sustainability Model, and in 1995, the Government declared full commitment to develop the site through the participation of multiple stakeholders.

The first residential phase of the project was unveiled at the 2000 World Expo in Hannover. This international trading hub represents a new model of free economic zone through the development of a sustainably designed built environment. Public institutions include an international school for 2,100 students, hospital and museum. The buildings follow rigorous Low Energy Housing building standards and the UN Agenda 21. Combined Heat&Power are provided for every 750 housing units to reduce 60% CO² emissions of typical developments.

Kronsberg is arranged in a typical grid network. Average urban block size ranges from 270’ x 340’ to 600’ x 1000’ for residential tower blocks. Parking spaces are limited to only 0.8 per resident with an extra 0.2 allotted for street parking. To limit the desireability of driving in Kronsberg, the urban infrastructure accommodates non-motorized modes of transit: an extensive network of bike and pedestrian paths. Kronsberg is also accessible by the Hannover tram line.

Kronsberg spreads along a long low hill and the main development is located about 30 meters above the land surrounding it. Greater Hannover is home to an extensive watershed of large and small lakes and rivers, and Kronsberg, located at Hannover’s fringe, is surrounded by large swaths of farmland, woodland and wetlands.
Ørestad
Denmark
Ørestad, Copenhagen, Denmark

Population: 5,000 inhabitants
Density: 3,125 inh/km²
Project Area: 3.10 km²

The Ørestad Development Corporation is the local organizing committee. CPH City & Port cleans and sells the sites previously unused and undeveloped. Ørestad is divided in four districts, each with its own local plan, goals and expectations:

- Promote the business climate through
- Boast location, infrastructure, and architecture
- Follow a “Green and Blue Structure”
- Integrate canals, green areas, & bicycle paths
- Expected completion, 2020-2030, housing 60-80k workers, 20k residents, 20k students
- The high-quality public transport service serves most buildings within 600 m of existing Metro stations.

A robust urban infrastructure serves as a backbone for development. The Metro opened in 2002, and it now counts with 6 stations in Ørestad. Ørestad’s bicycle culture is consistent with that of Greater Copenhagen: 1 in 3 people own bicycles. 36% bike to work. A complete north-to-south canal system, with east-west outlets, is designed to capture stormwater runoff and drainage and for recreation. Waterholes, ponds and canals are characteristic elements of this former marshland. Water bodies on site are estimated to retain 178,000 m³ of water.

The district plan for Ørestad South was adopted 2005, and scheduled for completion in 2020. There are two spatial strategies for the district: “North of Town Common”, dominated by commercial high-rises and “South of Town Common”, dominated by residential mixed-uses; characterized by narrow inner spaces, transitional areas, and architectural distinctiveness and diversity. The three north/south curved spaces are designed to provide access to the lake at their southern ends.
annex: precedent studies

Masdar
United Arab Emirates
Masdar, United Arab Emirates

Population: 65,000 inhabitants
Density: 11,344 inh/km²
Project Area: 5.73 km²

Economical background:
Site of first Economic Free Zone in South Korea
Incheon International Airport - largest in South Korea
Sea Port

Environmental Background:
1/3 wastewater+1/3 saline soil+1/3 abandoned saltpan
Built near sensitive wetlands and numerous fragile lakes

The design by Kohn Pederson Fox includes an international business district, and the development of residential and commercial areas tied together by a robust multi-modal transportation system with more than 40 km. of roads
15 minute drive to Incheon International airport
50 minute drive to the center of Seoul
36 Bus Stops, (1/4 mile radius from residential & retail)
Bike paths (24.6 km), bicycle rental network
Incheon subway (4 local stops), connected to the Seoul Water taxi (4 km) from the coast into Central Park.

More than 1/3 of the land is devoted to open space.
Pocket park system based on the Savannah plan
Central Park canals use salt water
Water recycling and management systems -green roofs and bioswales- reduce use of fresh water.

This international trading hub represents a new model of free economic zone through the development of a sustainably designed built environment. Public institutions include an international school for 2,100 students, hospital and museum
Average urban block size ranges from 270’ x 340’ to 600’ x 1000’ for residential tower blocks
Wulijie
China
Wulijie, Wuhan, China

Population: 100,000 inhabitants
Density: 10,000 inh/km²
Project Area: 22km²

Economical background:
90% of residents work in the Optics Valley

Environmental Background:
Climate: humid subtropical. Precipitation: 50 inches/year
Built near sensitive wetlands and numerous fragile lakes

The site plan by Turenscape deploys a robust “Ecological Infrastructure” ensure that all residents in Wulijie will be no more than two blocks from a greenbelt and water course. This promotes natural infiltration of surface runoff, purifying water before it enters larger natural systems. Furthermore, it promotes the waterways as recreational and transportation infrastructure, because their accessibility makes them convenient travel routes.

Wulijie uses a number of low impact development (LID) techniques to maintain clean, ecologically productive waterways. Some of these techniques include bioswales, constructed wetlands, and reconstructed streams and rivers.

Density is congregated in a ring around the city, with the least dense neighborhoods fronting the major waterways. Blocks range from 100-150 meters long, and the vast majority of them are characterized by U-shaped mid-rise apartments with an internal courtyard accessed by alleyway or pedestrian thoroughfare.

The buildings house three to four stories of retail at street level, and approximately 16 stories of residential space above. They are roughly 225 feet tall. These large buildings front on a pedestrian mall about 150 feet wide with water features and active frontages.
annex: precedent studies

Tianjin Eco-City
China
Tianjin Eco-City, China

Population: 350,000 inhabitants (projected)
Density: 11,700 inh/km²
Project Area: 30 km²

Economical background:
Employment: 50% local residents
Main drivers: creative industry

Environmental Background:
1/3 wastewater+1/3 saline soil+1/3 abandoned saltpan
Built near sensitive wetlands and numerous fragile lakes

International Collaboration between the China Academy of Urban Planning and Design and the Urban Redevelopment Authority of Singapore.
Located in non-arable land with poor ecological value, and limited water resources, the development looks for commercial viability and economic sustainability.

Goals and Objectives
- Healthy Ecological Environment (air, water, native plants, wetland conservation) Local/Native plant index ≥0.7
- Balance of man-made environment (green buildings, noise, carbon emission)
- Carbon emission/unit GDP <150tonneC/ US$1mil
- Renewable energy usage ≥ 20% of total usage
- Vibrant technology innovation
- Comprehensive Infrastructures: 90% green trips by 2020
- Solid waste recycling and disposal: recycling rate ≥60% Solid waste generation ≤ 0.8kg/d/capita
- Provision of green space/recreational/ sports facilities per capita ≥ 12m²
- Zero net loss of natural wetland
- 100% potable tap water supply
- Quality of surface water bodies to meet GB Grade IV
- Water supply from non-traditional resources ≥ 50%
the New Songdo City
South Korea
New Songdo, Incheon, South Korea

Population:  65,000 inhabitants  
Density:    11,344 inh/km2  
Project Area:  5.73 km2

Economical background:
Site of first Economic Free Zone in South Korea  
Incheon International Airport - largest in South Korea  
Sea Port

Environmental Background:
1/3 wastewater+1/3 saline soil+1/3 abandoned salt pan  
Built near sensitive wetlands and numerous fragile lakes

The design by Kohn Pederson Fox includes an international business district, and the development of residential and commercial areas tied together by a robust multi-modal transportation system with more than 40 km. of roads.  
15 minute drive to Incheon International airport  
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36 Bus Stops, (1/4 mile radius from residential & retail)  
Bike paths (24.6 km), bicycle rental network.  
Incheon subway (4 local stops), connected to the Seoul Water taxi (4 km) from the coast into Central Park.

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Public institutions include an international school for 2,100 students, hospital and museum.  
Average urban block size ranges from 270’ x 340’ to 600’ x 1000’ for residential tower blocks.
After the precedent studies, students recombined together in ten different groups to develop the context analysis under different thematic approaches. This stage brought together students outside from their studio group, increasing the exposure to other colleagues methods and others instructors advice.

The research developed in this phase was presented at the beginning of the workshop lead by the Studio Expert, Dan Wood. Stemming from this study, and under Dan’s leadership, students worked together in 5 different schemes for the Yongsan site during the fourth week in the semester.

The images on the left portraits the working sessions, and the drawings on the right represent three of the master plan proposals emerging from the four days charrette.
“expert in Studio” & workshop

DAN WOOD of WorkAC

Dan Wood’s visit closes the first phase in the semester. The Workshop learns from the previous research conducted by the students in the precedent studies and the context analysis, and fosters a playful approach to site, program and form. During one week, planing and architecture students worked together responding to the expert feedback.
A Watershed Moment

Hanok City

vertical cities asia competition
1) design for unprecedented density
- design for unprecedented density

2) design for all aging population
- design for all aging population

a new multigenerational home
- the traditional korean home
- the modern korean home
- the new multigenerational home

site context

connected
- goal: a central and connected network
- components: interconnected transit, complete and flexible streets, intermodal hub, services network

healthy
- goal: envir sustain
clean water
energy waste
landscape urban
Desire for a more diverse and urban environment was a major factor in driving Jonathan Moore from rural Maine to Ann Arbor and the University of Michigan, where he earned a Bachelor of Arts in 2009, majoring in political science. After graduation, he helped start the Ann Arbor College of Martial Arts, a practical self-defense and fitness center. Interest in the community and urban experience led him to further studies at the University of Michigan in the Master of Urban and Regional Planning Program. Jonathan’s studies and work ranged from planning for more complete streets in Macomb County Michigan, to three-dimensional modeling for engineers in Bangkok and collaborating with architecture students on a lexicon for modern Chinese urbanism.

Alex Jendrusch received a Master of Urban Planning degree with a concentration in Physical Planning and Design from the University of Michigan Taubman College. She became interested in city planning and urban design after traveling abroad a number of times and after developing an interest in placemaking around sport during her undergraduate studies and soccer career. Through creativity and accuracy, she imparts added value in projects with the representation of urban planning ideas and analysis. Alex’s overarching goal is to leave a positive imprint on people’s urban experiences in even the most mundane places, hoping to achieve that by maintaining a people-based approach to planning at any scale and expanding her range of community-service experiences.

Elliot Weiss is from Davenport, Iowa, and grew up in towns large and small across that state. He attended the University of Iowa and received degrees in Political Science and International Studies, as well as a minor in Spanish. After graduation, he worked as an Americorps VISTA in Iowa City, taking a leading role in community-focused redevelopment and energy efficiency projects. An ever-present interest in urbanism then led to the Master of Urban Planning program at the University of Michigan. In an effort to synthesize the planning, design, and financing processes, Elliot chose to pursue a concentration in Physical Planning and Urban Design and a Certificate in Real Estate Development. In hopes of making concrete contributions to the built environment, he aspires to a career in development.

After growing up in Dallas, Texas, Justin Meyer traveled to Stanford University in California to study Product Design Engineering. Once graduating with his Bachelor of Science, he worked for a couple years as a junior designer at Hill Glazier Architects before continuing his design and engineering studies at the University of Cambridge. There, Justin received a Master of Philosophy in Environmental Design and worked as a graduate engineer for the engineering consultancy, Max Fordham, LLP. Realizing his desire to impact the design and policy of places at the city-scale, Justin completed a professional Master of Urban Planning degree at the University of Michigan and is currently pursuing a PhD in Urban Planning.
William Tardy is an environmental planner, specializing in urban natural area restoration and stormwater management. His interest in planning began during his undergraduate study of botany and ecosystem ecology at Ohio University. Following the completion of his B.S. in 2007, William worked in community development with Habitat for Humanity-New Orleans and The Louisville Parks Conservancy. As a Master’s of Urban Planning student at the University of Michigan, William deepened his understanding of the environment’s role in community development through projects in park system naturalization, community urban forestry, and stormwater utility development.

Bokole Braun (Bo) earned a BA in Public Policy and Urban Studies from Richmond, Indiana’s Earlham College in 2010. His bachelor’s thesis, which examined Richmond’s historic economic downturn, earned him Departmental Honors from Earlham’s Sociology and Anthropology faculty. Bo’s interest in the economic development of cities lead him to the Master of Urban Planning and the Graduate Certificate in Real Estate Development programs at the University of Michigan. During his summers in college and graduate school, Bo worked in the Manhattan office of Arthur John Sikula Associates, an architectural firm specializing in liturgical design.

Erin Guido graduated from Indiana University Hutton Honors College with degree in fine arts in May 2009. As an undergrad, she also participated in a semester-long architectural studio program at Columbia University in New York. After school, Erin worked in her hometown of Cleveland, OH as a project manager at a nonprofit public art organization. She then studied city planning to explore how planning, art, and design can improve the livelihood of urban neighborhoods. Erin received a Master of Urban Planning, with a concentration in physical planning and urban design, from the University of Michigan in May 2012. Through her experiences, she is continually convinced of the importance of collaboration between professionals in many different fields and the need for creativity and openness as we approach major urban issues.

Dinghao Zhou comes from Southeast China, where the incredible urban development speed and the associated consequences have led him into the field of urban studies. He has worked at various levels in planning and urban design industry ranging from 600-ha new city international urban design competition to street-scape improvement design. Dinghao holds a Bachelor’s Degree in Urban Planning and Urban Design from the Peking University in Beijing, China and a Master’s Degree of Urban Planning in Physical Planning and Design from the University of Michigan.
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We we would like to express our gratitude to everyone that contributed to this publication and shared with us their time, energy, and expertise throughout the semester.

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