INSIGHTS

Sustainable Housing and Community Design

2008 MIT Advanced Japan Design Workshop with Sekisui House, Ltd.
The following are six important rules that will guide the growth of the development in time. To interact with each other by sight, sound, smell, taste or touch. It is through this lens that the strategies, strong parameters are also needed to ensure strong and sustainable communities that will form and evolve over time.
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The work contained in this book was produced in the Fall of 2008 in the MIT Advanced Japan Design Workshop in partnership with Sekisui House, Ltd. This course was taught by Dean Adele Santos, Professor Eran Ben Joseph, Professor Shun Kanda, and Professor Andrew Scott. The participating students are graduate students from the Department of Architecture and the Department of Urban Studies and Planning.

“Insights from an Inquiry into Sustainability” frames the investigation for sustainable housing and community design in Japan. Distilling from this broad topic a more targeted set of questions and developing parameters for sustainable development is the intent of this 5 month inquiry.

The inquiry is designed in a series of investigations. First is a short charette project completed while in Japan after visiting Sekisui facilities and a number of sites and housing developments. Second is a series of expert lectures on sustainable issues. Third are individual research investigations. Fourth and finishing this inquiry are final group presentations of sustainable proposals for Tama New Town.

Building from this framework will be 2 design studios: one urban planning studio and one architectural design studio. In this forthcoming investigation, these frameworks will be further developed into concrete design proposals.
The first chapter in this investigation was completed in a three-week trip to Japan. Dean Adele Santos, professors Shun Kanda, Andrew Scott, Eran Ben Joseph, and 12 MIT graduate students traveled throughout Japan for 10 days and visited many sights in the Kyoto and Osaka region.

The students then began a 10 day charrette on the case study of Tama New Town. The site was visited several times, during which observations and data were collected. 3 design teams then made initial proposals to begin a direction of research for the next chapter of the investigation.
Finding Synergy

Tama New Town

Site Observations and Goals

Advanced Japan Design Workshop 2008
Connie Chung MIT City Planning
Cha-Ly Koh MIT City Planning
Laura Rushfeldt MIT Architecture
Erica Weiss MIT Architecture
Makoto Ochiai Sekisui House Ltd.

Left: Broken trellis  Right: Green space

Goals
After making observations about Tama New Town and relating them to our meta idea, we set the following goals:

1. increased awareness and transparency of systems
2. self-sufficient energy production
3. maximizing output of assets
4. ability to fluctuate between networked and independent resources.

The hope is that within 15 years Tama New Town will have self-sufficient energy resources and within 30 years will be able to plug and unplug from city resource grids. A variety of energy options, together with a personal awareness of energy consumption will reduce Tama New Town’s dependency on unsustainable energies.

Maintenance
Areas of disrepair remain unoccupied. Areas that have been taken care of and maintained retain occupancy and evoke a sense of vibrancy.

Left: Broken trellis  Right: Green space

Accessibility And Visibility
The changes in elevation throughout Tama New Town create issues for the movement of its aging population. While some areas have been outfitted with extensive ramps, more often steep sets of stairs are used instead.

Left: Public access stairs  Right: Public access ramps

Activity Level
Successfully developed areas without the market to support them are unable to retain an audience. The frequency and variety of public spaces must be accounted for when replanning Tama New Town.

Left: Shopping plaza  Right: Public library

User Diversity
Places designed for a highly specific user group without the proximity of spaces for other groups are often inactive. A synergistic use of space allows places to appeal to many different user groups, and thus a wider and more diverse audience.

Left: Children’s play area  Right: Community baseball field

Pride of Place
When people take an interest in their surroundings the results benefit both the individuals and the community. A lack of pride for your neighborhood can lead to the deterioration of public spaces.

Left: Community bulletin board  Right: Personal home

Observations and impressions of Nagayama/Suwa Districts in Tama New Town
SUMMER TRAVEL
Data collected from Tama New Town

Nagayama/Suwa Land use map

Public Facilities Map

Detached Housing:
Density: 33 units/ha
Site coverage: .3
FAR: .61

Townhouse/Duplex:
Density: 56 units/ha
Site coverage: .28
FAR: .57

Townhouse/Maisonette:
Density: 70 units/ha
Site coverage: .26
FAR: .78

Walk-up (new):
Density: 61 units/ha
Site coverage: .20
FAR: .78

Housing Density Samples

Commercial, Industrial, and Community Facilities
- retail/residential
- convenience-retail
- big box retail
- office
- mixed use retail
- community-resource
- public school
- university
- health facility
- heavy industry
- light industry
- day care
- closed facility
INSIGHTS: sustainable housing and community design

1. DETACHED
2. TOWNHOUSE (DUPLEX)
3. TOWNHOUSE (MAISONETTE)
4. WALKUP (NEW)
5. WALKUP (OLD)
6. HIGHRISE

Density: 33 units/ha
Site Coverage: .30
F.A.R.: .61

Density: 70 units/ha
Site Coverage: .26
F.A.R.: .78

Density: 120 units/ha
Site Coverage: .19
F.A.R.: .94

Density: 56 units/ha
Site Coverage: .28
F.A.R.: .57

Density: 61 units/ha
Site Coverage: .20
F.A.R.: .78

Density: 138 units/ha
Site Coverage: .09
F.A.R.: .75

Circulation and Access Map

Tokyo Metro Monthly Cloud Cover

Tokyo Metro Monthly Solar Radiation

Average Winds Speed (m/sec)

Average Humidity (%)

Walk-up (old)
Density: 120 units/ha
Site coverage: .19
FAR: .94

High-rise
Density: 138 units/ha
Site coverage: .09
FAR: .75

Pathways
Parking lot
Highway
Main street
Neighborhood street
Sidewalk
Path
Staircase
Pedestrian bridge
Most accessible
Accessible
Least accessible
200 m
Four initial proposals emerged from the summer investigation of Tama New Town: 3 MIT student teams and 1 from the Sekisui staff accompanying the research team. While they are not completed or thorough, the investigations have a certain immediacy to them since they were completed in the place while visiting the site for the first time. In this sense, these proposals are intended to capture initial impressions of the place. From this initial snapshot emerged ten central themes that serve as a valuable guide for subsequent investigations:

1. Carbon neutrality/zero-carbon: developing Tama New Town for a sustainable future requires understanding current trends in energy use and carbon output, as well as finding ways to reduce carbon output in future development.

2. Environmental regeneration: Initial development in Tama New Town ignored natural topography and water systems. Can some of Tama be regenerated as nature?

3. Local resource management: Increasing self-sufficiency within Tama New Town locally and regionally, in terms of food production, energy production, waste management, and jobs and labor resources.

4. Energy generation: What types of energy can be generated in Tama New Town?

5. Flexibility of built space: Designing buildings and communities that are flexible for different uses and different population groups.

6. Infrastructure and transit: One of Tama's greatest assets is its connection to the rail lines of Tokyo. Additional transit strategies can be implemented within the area at a smaller scale.

7. Mobility for aging population: Mobility and universal access for elderly and handicapped populations is a major issue in Tama New Town and must be addressed.


9. Demographic diversity: Tama New Town has a shrinking and aging population. Strategies to attract other demographic groups and adapt to fluctuating populations must be considered.

10. Shared and overlapping ownership of resources: Finding new and creative strategies to share resources and take care of open spaces within Tama New Town.
The Meta-idea of Synergy is the basic premise that different resources—human/labor, natural assets, earth/minerals, energy, and water—can combine in order to generate user satisfaction. User satisfaction is thus dependant upon achieving the optimal combination of these resources. When discreet sets of resources are required for each user group, resources are under-utilized. Synergy is created when user satisfaction from the combination and sharing of resources is greater than when used by each user-group separately.

After making observations about Tama New town and relating them to our meta idea, we set the following goals: 1. Increased awareness and transparency of systems; 2. Self-sufficient energy production; 3. Maximizing outputs of assets; and 4. Ability to fluctuate between networked and independent resources.

Separate resources for each user group

Correct balance of resources generates user satisfaction

Sharing and overlapping resources for all user groups creates synergy
Principle: Flexibility

**Flexibility** means adapting to changing needs over space and time. It includes decentralized infrastructure, mixed density, and use + program overlaps. This strategy gives us 1) space reserves (for urban agriculture, water retention or other uses; 2) increased life-cycle of built environment; 3) ease of access; and 4) opportunities for place making, spatial identity, and a sense of ownership.

![Concept diagram: Flexibility](image)

Principle: Conservation

**Conservation** means reusing and reallocating existing assets. It includes life cycle energy, infrastructure, natural resources, human resources, and the concept of program layering. This strategy gives us 1) efficient resource use; and 2) adaptive reuse.

![Concept diagram: Conservation](image)

Principle: Generation

**Generation** means grouping and repurposing resources. It includes infrastructural energy generation, sustainable energy production, and community growth. This strategy gives us 1) energy and resource gains; 2) a catalyst for further growth and development; and 3) a sense of community—the humanistic experience.

![Concept diagram: Generation](image)
The urban fabric of Tama New Town is inflexible because the physical conversion of any area would require a large amount of time, monetary and social cost as demographics, transportation needs, work and living behavior changes. A more diverse configuration provides more opportunities for flexibility, conservation and generation in Tama New Town. Over time, as needs change, spatial relationships can reconfigure over time. This creates opportunities for people to reconfigure their environment to their needs, and therefore extend their sense of ownership to the public space.

Team one: Finding Synergy

New models of zoning and proximity of uses

Changing allocation of resources over time
Investigation of overlapping and layering resources provides a physical example. A matrix demonstrates all possible overlaps between land uses, in terms of buildings, open space, and infrastructure. The layering strategy allows for flexibility, conservation and generation by creating several uses in the same physical area. The overlapping of these programs create a vibrant community feel and urban identity. The intervention conserves land and resources while generating social opportunities.
Team two: TAMA a new identity
Chris Guignon, Sarah Snider, Deborah Morris

Tama New Town did not meet or sustain its population projections. The aging population and slowing birth rates in Japan have tipped the demographics out of balance in Tama New Town, with many more “Supported” and “Semi-supported” residents.

Changing Population

Japanese lifestyle requires 5.94 hectares of land to support each resident. Area of Nagama and Suwa (354.6 ha) could support 42 people.

Shrinking population = Shrinking traditional workforce.

As the traditional work force shrinks, new live-work centers with support options will encourage a new divers work force.

1. Supported Lifestyle Group: 0-5 yrs and assisted elderly
2. Semi-Supported Lifestyle Group: 5-24 yrs and active elderly
3. Professionals Lifestyle Group: young professionals and empty-nesters
4. Family Lifestyle Group: often supports groups 1 and 2

Current Demographic Trend in Tama NT
Lifestyle Analysis

Rigidity + Imbalance (existing conditions)

Tama New Town was designed with the short term vision of rapid growth.

Flexibility

Flexibility ensures functionality despite unforeseen changes in population and lifestyle groups.

Balance

Consistently attracting diverse lifestyle groups over time will reduce the effects of population decline and make Tama New Town a vibrant city.

<table>
<thead>
<tr>
<th>USE</th>
<th>SCHOOL AND COMMUNITY CENTER</th>
<th>SHARED FIELDS</th>
<th>RESIDENCES</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00 - 17:00</td>
<td>used by children</td>
<td>use by children+elderly + young family</td>
<td>use by live/work employees, elderly + young family</td>
</tr>
<tr>
<td>17:00 - 20:00</td>
<td>use by elderly + young family</td>
<td>use by children+elderly + young family</td>
<td>use by live/work employees, elderly + young family</td>
</tr>
<tr>
<td>20:00 - 24:00</td>
<td>fully used by residents</td>
<td>fully used by residents</td>
<td>fully used</td>
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Currently community resources allow only allow use by a single suer and have lengthy vacancies throughout the day. Combining use and condensing spaces allows 24/7 use of community assets and eliminates unnecessary vacancies and redundancies.

Improving the physical conditions of Tama for the future requires strategies that set the foundation for an environment for a variety of lifestyles, while remaining flexible and adaptable to meet the needs of fluctuating demographics. Structural flexibility, adaptable multi-user public spaces, and cooperative governance structures all promote physical conditions for participation and neighborhood stability.
Team two: TAMA a new identity

Governance

Existing Conditions
management of individual residential units does extend not extend beyond the unit's boundaries

Extended Property Lines
Granting tenant control over immediately adjacent open space creates a sense of individual responsibility for care of open spaces.

Tenants Associations (small co-ops)
Small associations of neighboring tenants can create coordinated management and responsibility for shared spaces.

Block Associations (large co-ops)
larger associations of neighboring tenants facilitates group management of shared open space and allows for adaptability as block changes over time

Neighborhood Cooperatives
Neighborhood associations allow residents to manage large community resources (parks, schools, community centers) and adapt these resources as the neighborhood needs change.

Flexibility

Adaptable Spaces
Buildings can have flexible interiors that allow for the contraction and expansion of units.

Design for Disassembly
Engineering buildings that can be reconfigured or disassembled while preserving the quality of the materials so they can be recycled or reused would allow neighborhoods to easily adapt to lifestyle shifts.
The existing transit station internalizes its assets, minimizing its influence on the area. Precedent studies reveal that mixed use development within walking distance of the station will re-energize and reorganize the station, taking advantage of assets. Transit oriented development can be carried out in planned phases, allowing for a steady growth of unique vibrant districts designed within walking distance of a rapid transit system.
Predictions of the future and climate change give insight into the needs of Tama New Town. The roles of cities and their surroundings, climate and environment, energy generation and natural resources, lifestyle habitats and living structure are all integral components. Based on this and impressions of Tama new town, the issues that need to be addressed are the following: income and age demographics, debt and budget, and unbalanced resource/energy inputs and outputs.
**ZERO CARBON** Defined

*Zero Carbon:*
A neutral total carbon release, brought about by balancing the amount of carbon released with the amount sequestered or offset.

*For Tama:*
Neutral release of carbon throughout town. Inevitable positive release counterbalanced by surplus production of renewable energy through various generation strategies including bio-fuel, solar, geothermal, and wind.

*Zero Carbon can refer to:*
1. Balancing the CO2 released with renewable energy, OR
2. Carbon offsetting by paying others to remove or sequester the equivalent amount emitted

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**STRATEGIES** for Zero Carbon

- **Waste Management**
  - 99% waste diverted from landfills
  - Use biological waste as fertilizer
  - Incinerate waste to provide additional source of energy
  - Recycle as much as possible

- **Water Management**
  - Recycle 80% of water consumed
  - Reduce consumption through efficiency and lifestyle

- **Energy Efficiency**
  - Minimum standards for all buildings
  - Encourage lifestyle changes regarding consumption
  = Provide ample education and information for community

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**PRECEDENTS**

- **SAMSP “Self Sufficient and Carbon Neutral”**
  - Island off of Denmark
  - Local initiative with help from government
  - Population: 4,800
  - Land area: 80,000 HA
  - Total Cost: $135 Million

- **DONTGTAN “The World’s first Eco-City”**
  - Near Shanghai, China
  - ARUP, 2006
  - Population 50,000
  - Land area 100-3,000 HA
  - Total Cost N/A

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**Project Thesis:** Striving toward a Zero Carbon redevelopment, by applying principles from current research and models to an existing bedroom community of Tokyo.
Team three: A Zero Carbon Community

Condensed Living w/Agriculture or Industry
- concentrate residential development around the transportation node
- sufficient access to transportation, mixed-use, entertainment venues, etc.
- Buildings produce energy and use arable land for food
- higher and more taxable property values

Back To Nature - Response to Topography
- reduce population size and increase the amount of land per person
- potential for whole families to live by themselves and live off the land
- allow nature to control and determine landscape over time

Adaptive Re-use Integrated Mixed-Use
-Adapting old buildings and reusing them for new uses.
-Reusing green spaces for agricultural purposes
-integration of uses and a restructuring of space to create a mix of ages, incomes, and building typologies
-through the production of energy and reuse of buildings. Encourages more pedestrian activity.

Flexible, Practical and Adaptable
-Reuse existing circulation infrastructure to organize the location of expandable town centers.
-Use town squares to create a place for community
-Flexible land used for agriculture and production of energy

High-End Design and Eco-Friendly
-Net zero buildings that produce at minimum 100% of the energy they use. Preserving outlying land for agriculture and local energy production
-create a community of high income earners, encouraging an ecological lifestyle through ownership of ecological ideals and initiatives.

Aggregate Scheme

Study in extreme scenarios
INSIGHTS: sustainable housing and community design

Timelapse development of Composite Scheme: A dense “spine” to provide amenities as well as guide and limit growth to prevent sprawl.
In 2050, fossil fuels will be empty from the Earth.

Oil: 40.6 years left
Natural gas: 65.1 years left
Coal: 155 years left
Uranium: 85 years left

In Japan, the degree of self-sufficiency in energy is only 4%.

In 2050, the number of people will be like this without import.

Case Study: HAMMARBY SJOSTAD
A new district on the waterfront in the centre of Stockholm. The city has imposed tough environmental requirements on buildings, infrastructural solutions and the traffic environment.
The number of population planned and the area is nearly the same size of Suwa / Nagayama district.

TAMA AND SUWA / NAGAYAMA
Comparing the Suwa/Nagayama to Hammarby Sjostad, the method for the sustainable community is totally different.
Including the use of land, transportation system, usage of renewable energy resource. But looking at the master plan, there is possibility of Tama being a sustainable community. Renovating old building, using the open space more efficient, turning the road space to another use including solar panels, bio fuel plant, or a farm. 1971, Tama new town was made, and in 2001 Hammarby was made. Then next, what we could do in Tokyo 2050?

Problems
Listed on the left are the problems in Tama now. To make it sustainable community, the solutions could be on the right side. But everything changes in 2050. We have to back-cast the problem.

Summary
To make a sustainable community, we have to change the usage of lands.
Small streets on red could be an new transit system that meets peoples demand. Zip car could reduce the amount of car in use. And not well used facilities, it could be used as a community kitchen, or farm educational place with farm converted land next to it. And making a renewable energy plant on unused hill, they could reduce the energy source from outside the city. By sharing the community could change the Tama. There is big potential in this area.

Advanced Japan Design Workshop 2008
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Tokyo, the capital and the largest city of Japan, has a population of 12.5 million people, accounting for 9.8% of the nation’s total population. The population will continue to concentrate in the Tokyo area and by 2050, the estimated percentage of population of Tokyo is 17% of nation’s population.

Japan has one of the highest average life expectancies in the world, and the aging of the population is proceeding at a rapid rate. The ratio of people aged 65 and over to the whole population more than doubled from 7.07% in 1970 to 18.0% in 2001.

The share of nuclear families in the total number of households was 59.1% in 2000, while single-member households accounted for 24.1% of the total.

Advanced Japan Design Workshop 2008

Kenta Konishi  Sekisui House Ltd.
Makoto Ochi  Sekisui House Ltd.
Kaori Miura  Sekisui House Ltd.
Issues emphasized by the Sekisui team included: advancing towards Zero negative environmental impact, the demographic problems of Japan and feasibility of Tama, balanced population society, creating a flexible city to stabilize the generation balance, and the flexible use of existing building stock.
FRAMING THE QUESTION

In this body of research, Massachusetts Institute of Technology (MIT) had partnered with Sekisui House, Ltd. to investigate strategies of sustainable housing and community design in Japan.

A problem faced by designers when attempting to address sustainability is the question of scope. Just as one book cannot address every area of knowledge, neither can an architectural or urban design address every sustainable issue at every scale. Because of this, the task of selecting--out of a wealth of knowledge--specific sustainable strategies pertinent to a design can be daunting. By clearly defining and stating both the question and the parameters of the investigation, distilling down to the core principles of an inquiry into sustainability.

An important first task in defining the parameters of this inquiry was the selection of a site. By investigating a specific case study, that of Nagayama/Suwa Districts in Tama New Town, research could be focused on concrete and spatial example and yet still be applicable to the larger Japanese society. The summer investigations clearly illustrated this. By establishing a specific site that is representative of demographics in Japan as a whole, the students could much more quickly observe and understand the issues by visiting and observing the site and its residents. From this more immediate understanding, overall themes and several specific goals were more directly responsive and closely tied to the context.

The second step, to further refine the parameters of inquiry, was the selection of a series of speakers to join the discussion and share their specific expertise in sustainability. The 5 speakers addressed sustainability with differing approaches and intents. Along with gaining knowledge from numerous viewpoints, discussing the investigation of Tama New Town and its specific issues gave new perspective and insights each week.
Parallel with this series of lecturers, the MIT students engaged in independent research on a topic that had emerged thus far in the investigation. Presented in the form of a paper and presentation, this research provided more detailed information in numerous interest areas related to sustainability in Japanese society.

From this series of steps, the parameters for the inquiry were set and much of the necessary knowledge gained to define sustainable strategies for the design and regeneration of Tama New Town. Four group proposals were the result of the final inquiry. The strategies contained in the final inquiry are not applicable only to Tama New Town; many could become regional or even national strategies.
The Eco-municipality approach for sustainable community change combats two global trends: that of deteriorating living systems and increasing population & consumption. It originated in Sweden, where 75% of municipalities use this approach. The framework is from “The Natural Step framework for sustainability”, which has 4 objectives and is available at <www.planning.org/policyguides/sustainability.htm>.

1. Use approaches that reduce dependence on fossil fuels, underground metals, and minerals.
   - example: Falkenberg’s solar and wind power.
2. Use approaches that reduce dependence on synthetic chemicals and other unnatural substances.
   - example: Eskilatuna’s ‘non-toxic’ school
3. Use approaches that reduce encroachment upon nature.
   - example: GreenZone Eco-Business Park in Umeo, Northern Sweden
4. Use approaches that meet needs fairly and efficiently.
   - example: U.S. Co-housing communities

A comprehensive system approach in all branches of government, rather than isolated projects, is the difference between Sweden’s approach and the United States’

**Strategy Implementation:**

- ABCD Strategic planning process can serve as a framework for community mobilization and action:
  A. raising AWARENESS about sustainability
  B. BASELINE analysis--where are we today?
  C. CREATING vision
  D. DEVELOPING an action plan

- Could a bottom-up system like this work in Japan?
Week 2: Daniel Pearl  
Professor, University of Montreal  
Principal, L’Oeuf Architecture

Loeuf is a self-described “office of eclecticism and urbanism”, focusing on different scales of community urban design.

Ronald Wright’s “A Short History of Progress”: outlines civilizations that knew they were consuming beyond their capacity but continued regardless of that knowledge.  
- how do we develop an assessment tool that will value socio-economic and socio-cultural values?  
- How to use resources in a sustainable way, in a low-tech, high-intellectual way  
- if we do not deal with social issues, technology will be wasted. Technology should be supplemental.

Projects:  
1. “Inside:Outside” (exhibition) was an installation to highlight the firms’ work. One part was high-tech, one part low-tech. The goal was to react and display environmental situations within the house.  
2. Benny Farm is a housing complex with 372 units built in the 1930’s and 1940’s, owned by the Canadian Gov’t. The project develops of new social model, retrofits buildings for greater efficiency, and reuses building materials on site for new buildings.  
3. Green Acres is a new development project that strives to use land intelligently and preserve water paths and biodiversity avenues on the site.  
4. Meadowbrook is a private development project, worked with ecologist, landscape architects, forestry engineer, traffic engineer to intelligently design site.

Strategy Implementation:  
- "Green DNA" of a culture  
- collaboration with other experts  
- ecology and biodiversity  
- waterflows  
- access to transit  
- smart social models are as important as technology and intelligent master planning  
- community engagement  
- sacrifice public space to improve the public realm  
- phasing and economic model
Sasaki is an interdisciplinary team with a strong emphasis on sustainability—projects are related to “regeneration.” Adherance to green principles: integration with the environment, enhance water and natural resources, design for energy and atmosphere, champion natural habitats, prioritize transit.

Projects:
2. 789 Arts District (Beijing, China): former factory and military site taken over by artists. Emphasize arts and introduce arts-related industries. Make district more accessible and visible. Work with existing buildings and introduce new ones. Plan transit, public spaces, linear parks, along with buildings.
3. Caohai North Shore (Kunming, Yunnan Province, China): pairs private development with public effort to treat lake pollution. Improve water through site design.
4. Hongxing Urban District (Dalian, China): new form of development while maintaining density. Work with topography and watershed areas to develop while preserving site flows and hillside environments.
5. Golden Dream Bay/Bohai Bay (Quinghuangdao, China): Ecological restoration of sand dunes systems adjacent to new building development.
6. Sidney Olympics Site, Australia: Strategies to better integrate Olympic park with greater Sydney area to increase functionality. New 2025 vision for the district.

Strategy Implementation:
- Design as a catalyst for regeneration + redevelopment
- How do you balance ecological concerns with economic development goals of densification/intensification?
- Understand what the site was, and wants to be. Forming a baseline, then interpreting the carrying capacity through the masterplan.
- Balance the urban, architectural and ecological benefits and necessary functions.
10 Societal forces are causing us to rethink how we design, fabricate and provide services for places of living:
1. The nature of work is changing: 1/3 of workforce is working in the workplace, 1/3 in third places, 1/3 in the home.
2. The center of gravity of healthcare will shift from the clinic to the home.
3. Increasing cost of energy
4. The home the next big untapped market technology companies
5. Building material companies migrating from low margin commodities to high value systems.
6. Shortage of skilled construction labor
7. Sophisticated, internet-based supply chains are changing product marketing and fabrication
10. New tools allowing us to be more efficient (such as BIM)

Research:
2. PlaceLab: a highly instrumentalized living laboratory. Prefabricated components have imbedded technology. Serves as a microscope to study human behavior through imbedded sensor technology.
3. 24 Living: Kalasatama, Finland 2010, current project as part of Helsinki. Old industrial area, lots of warehouses. Group of 5 companies working with MIT group to put in a joint proposal. Create a bottom-up process: starting with people, needs of occupants at the site, rather than starting with large planning concepts. Incorporates concepts of mass-customized housing, building in disentangled layers of assemblies, assembly only on site, homeowners at center of “design process”

Strategy Implementation:

What Aspects of building technology to address climate?
Create high performing zero energy cost effective mass customized as a model? Can we create mass customized, urban infill multi-family housing? Can non-expert designers navigate through a complex design process (without forcing them to think like a designer) to make informed decisions about: Design, sustainability, change over time, systems, and services? How can we study Human behavior in architectural environments? Can we encourage responsible health-related behavior? Where, When and in what social context does innovation occur? How can we understand workplace behavior in order to design better places of work?
Focus on environmental design consultancy. Have office in London, New YOrk, New Haven, Baltimore, and San Fransisco. Work at all project scales as a highly collaborative practice.

How can buildings and landscapes do more so systems can do less?

Integrated priorities: Environmental, economic and social come together to create an integrated design. Look at how natural systems an building system interact. Once you think about the life cycle of something you can begin to figure out a building’s role in a broader stage of systems.

Small-scale Projects:
1. Federation Square: create building systems that generate their own sources of heat and cool through materials.
2. Theatres by the Bay--Singapore: Shading fins reduce direct solar gain while allowing views out of the site, and became an identifier for the project and the city.
3. Kroon Building--Yale school of Forestry: Use materials and siting to minimize systems needs of the building.

Mid-scale Projects:
5. Harold Ickes Homes--Chicago, IL: Large scale 1950’s housing development. Area of social, economic decline. Retrofit for energy efficiency: avoid unnecessary A/C by focusing on envelope efficiency and greenroof strategies

Large-Scale project:
6. Tianjin Eco-City--Tianjin, China: post-industrial ocean site. propose mix of high, mid, and low-rise density to maximize site use, daylighting, pedestrian access, other green amenities, and healthy community.

Strategy Implementation:

-Integrated priorities: Environmental economic and social= come together to create integrated design

-How do you get towards carbon neutral?

-Go away from the model where a building is stuff going in and out, thinking of the

-Building as a part of the larger system: air cycle, material cycle, energy cycle,

-There is no silver bullet--it’s important determine goals up front and define your metrics

-How can these green improvements become an architectural feature
Green, How and Why? Drivers Behind Green Residential Development at the Macallen Building

The research investigated a case study: the Macallen Buidling in South Boston. The Macallen Building is 140 unit condominium built in 2007, and achieved a LEED Gold rating. The building has many sustainable features, including siting for sun exposure and transit, phasing construction for waste recycling, local and recycled materials, energy- and water-saving fixtures and appliances, 20,000 sq. ft. green roof to reduce stormwater runoff, a cogeneration plant (combined heat and power), pervious pavement, and greywater recycling.

The drivers for this development were 1. Profit--as sustainability becomes more popular in the market, consumers value the added costs; 2. Moral Conscience: carbon footprint and construction waste; and 3. Image: publicity and marketing by being an industry leader.

Mixed use zoning and its application to Tama New Town

Zoning systems in Japan are not entirely different from zoning systems in the United States. Following the idea of Euclidean zoning, the concept of separating uses in order to provide protection from conflicting uses is the foundation of the system. Codes tend to be looser than traditional US Euclidean standard codes, generally allowing for a greater mix of uses.

Overlay districts could potentially drive mixed use development in Tama New Town. This would require planners to take a more prescriptive approach to planning and push development in catalyst areas, rather than set general requirements, and allow the city to grow organically. Tama New Town was not an organic city, but a master planned community. It is, however, decaying in a very organic, haphazard way, and prescriptive planning in catalyst areas may be necessary for it to make a comeback.
Chris Guignon

Land Use in a Shrinking City

The turn of the 21st century brings telling signs that the developed world may have reached the crest of a 150-year history of progress. For urban areas experiencing declining populations, this means that the key question in sustainable planning may be “in what ways can we not develop to make our community more sustainable?”

Shrinking cities strategies offer a robust planning method that abandons the short-term visions of development that led to 1960’s new towns and suburban sprawl. It also attempts to address the environment, community, and identity of place simultaneously to varying degrees of success. Tama New Town, a town that has betrayed an inability to maintain its landscaping and attract residents, may be a model town for a shrinking cities approach to sustainable development. It seeks to set into reverse the monotonous redundancy of suburban and new town planning to make distinct urbanities where people will choose to live.

Mary Hale

Working Domestically:
How Technological Innovation and Smart Community Design can Enable Mothers in the Workforce

Trends of women in the Japanese workforce are changing. Japanese youth population is declining. This population decrease is related to social structures. How can design and technology help women work and not give up their families? A number of case studies, both of technological advancements and urban environments, are investigated for functionality and practicality for use within Japanese Culture.
Digitally Fabricating Tama New Town

Larry Sass has a vision for the future of home production that includes manufacturing homes using cutting edge technologies and assembly process. Sass’ vision of automated home production, called Digital Fabrication, represents the latest generation of home production ideas. Sass’ work has global applications to developing and developed countries alike.

This paper examines Digital Fabrication in the context of Japanese developer Sekisui House and a Japanese suburban development, Tama New Town. The paper begins by describing what Digital Fabrication is and then analyzes the advantages and disadvantages of the process. After analyzing the process, the paper then highlights five benefits that could result from using Digital Fabrication in Tama New Town: 1) Reduces the costs of home building; 2) Reduces the factory space needed for manufacturing; 3) Enables multistory automated home building; 4) Speeds up design; and 5) Incorporation of energy saving and generating technologies.

Rethinking Reuse Redux: Exploring the Relevance of Reuse in Tama New Town

In the context of a decreasing population and an aging society, one could argue that the need for new construction is steadily becoming obsolete. Traditionally, architecture in Japan is fluid and impermanent. In this context, a materially permanent, large-scale development like Tama New Town is unique. Can the perception of permanence and fluidity be reversed to accept material permanence and programmatic fluidity?

Currently in Tama New Town, there exist a number of school buildings that are unused or underused because of the declining population of school-aged children. Further, these school buildings are distributed evenly throughout Tama New Town, so have the potential of having a specific relevance to individual neighborhoods across the region. Specifically in Suwa and Nagayama, there are seven existing element.

How can these buildings be usefully and effectively reused? What are the range of possibilities of reuse? And most importantly, why should these buildings be reused at all?
INDIVIDUAL RESEARCH

Chaly Koh

Mobility of Aging Population in Nagayama, Tama New Town

Mobility is highly important for the health of an aging individual as well as the wellbeing of a community. Considering the physical limitations of aging adults, topographically challenging areas such as Nagayama need to provide alternative transportation modes to accommodate their needs. This paper first examines the characteristics of an aging individual as compared to those of a young adult. The current mobility of aging individuals in the Nagayama district are critical to analyzing the existing transportation modes, topography and land use in the area. Three transportation alternatives that could possibly accommodate the needs of aging individuals in the area are investigated, along with their monetary, physical, temporal and energy costs as well as the social and urban impacts and benefits that each brings to Nagayama.

Deborah Morris

Cooperatives and Conservancy: Case Studies in Land Management Techniques

In Tama New Town, there are vast swaths of unused open spaces surrounding an obsolete and under populated housing development. Resolving the ambiguous ownership (both technical and psychological) of these open spaces is a requisite for any rehabilitation of this residential landscape. Further, any sustainable scenario for an existing place must take into account resource management strategies that beget environmental stewardship, adaptability to changing community needs, and civic awareness. Open space land cooperatives are methods of management that can encourage community participation while creating a framework for adaptability and local stewardship. An examination of the case of Sunnyside Gardens, a New York City community, and conservation sub-divisions in Hamburg, Michigan, illustrate the potential and flexibility of zoning cooperative models can be paired together so as to change land use patterns in new communities.
Mainstreaming Energy Efficiency in the Residential Sector: Consumer Drivers for Market Penetration

Energy efficiency in the residential sector provides many advantages over current typical building practice. The economic as well as environmental benefits have been proven and demonstrated over the past few decades with little to no extra cost or significant effort.

Energy Efficiency is an aspect of residential design that has received increased attention recently. The adoption of high performance envelopes, reduced consumption appliances, passive strategies for heating/cooling, and other mechanisms to minimize energy consumption are becoming more frequent in homes.

I would assert that energy efficiency has qualities of all listed drivers of change. The strength of the argument for energy efficiency, however, should eventually facilitate mainstream penetration into the residential building sector.

New Working Models: A Sustainability Assessment

It is now undisputed that telecommuting, or eWork, can and has been incorporated into the workplace world. Converging demographic trends in the workplace driving workplace model innovation. The organization of a workplace is a complex balance of spatial, economic, and social factor individual to each workplace. Workplace models can be objectively assessed through their energy and environmental impacts. This research proposes to assess the energy use impact of traditional and new working models in order to evaluate their impact on sustainable urban development. The investigation method is to collect and compare on the environmental effects of building operation, building use and transportation related to energy use for four simulated Tokyo homes and workplaces. A balance of both efficiently pooling shared resources and minimizing the adverse effects of large centralized facilities uses energy most efficiently. This will provide quantitative data, for energy and environmental factors, with regards to sustainable office environments, which can then inform planning for the future of urban development in Tama and elsewhere.
A Comparison of LEED ND and Tama New Town’s Nagayama District

On paper, there are many aspects of Tama New Town that resemble a well-planned and sustainable community by contemporary United States planning standards. However, in person, the condition of Tama New Town, particularly the Nagayama district, lack the quality of life that the original plan so eagerly tried to produce. If the fate of Nagayama only thirty years after its beginning is the need for redesign, demolition, and reconstruction, how can we ensure the future communities we design today will not face the same fate if we use some of the same design principles?

Sustainable rating systems, when culturally and geographically specific, can have a positive effect on encouraging sustainable development patterns. The combination of good design and knowledge of the latest sustainable design issues will still determine the long-term outcome of a community.

Overcoming Machismo: Shaping a Community to Support Working Women

In 2000, when Japan initiated the Basic Plan for Gender Equality the country was making its first attempts to elevate the role of women in society. However, the involvement of women in Japan has deteriorated since its efforts began. The under-representation of women in positions of influence within Japan contributes greatly to its poor ranking. There are many factors that contribute to the absence of women in the workforce in Japan, including societal stigmas, lack of childcare, and gender discrimination in the workplace. With the opportunity to plan a new community, some of these factors can be diminished while others will require strong policy work to effect change.

Countries in Europe, Spain in particular, have made great strides in the past few decades to relieve women of their “chores” and welcome them into the growing workforce. The success of the growing female workforce in Spain offers valuable lessons for the enrichment of the Japanese female labor market.
Sekisui Staff

Three members of the Sekisui Staff, Kenta Konishi, Makoto Ochiai, and Kaori Miura, served as guides and liaisons for the MIT faculty and staff in the summer travel in Japan and fall investigation at MIT in Boston. They completed an investigation of sustainable community design in Europe for several weeks in the fall. Concentrating primarily on Western Europe and Scandinavia, each investigated numerous cities to study examples of sustainable community design.

Each acted as an independent researcher, visiting different countries and sites and investigating specific interest areas of sustainable design such as successful density of living and re-use of existing building stock.

This research culminated in a completed report of observations and analysis and a presentation to Sekisui Staff and MIT faculty and students in December.
Originally, Tama was designed as a suburban "new town" providing a comfortable living space, with connections to Tokyo and providing some local jobs and retail. Today, Tama has a dwindling population due mainly to the aged building stock, as well as unbalanced percentage of public housing.

From analyzing economic, social and environmental challenges facing Tama, 7 design principles have been outlined as integral to Tama New Town's current and future success: 1. Carbon zero; 2. Flexible buildings; 3. Concentrated services; 4. Micromasures implemented state-wide; 5. Education and transparency; 6. Coordinated redevelopment; and 7. Waste reduction and on-site processing.

These seven principles that shape a proposed future for Tama New Town

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### Economic Challenges for Tama
- Town debt
- Poor quality buildings
- Decreased retail / commercial sector
- Unbalanced income class of residents
- Increased cost of energy
- Global competition for manufacturing and industry

### Social Challenges for Tama
- Unbalanced age of residents
- Oppressive buildings and unmaintained streetscape
- High vacancy rate of buildings
- Difficult mobility in areas, due to hilly terrain
- Underutilized spaces
- Reduced interaction among residents

### Environmental Challenges for Tama
- Increased extreme climate conditions
- Dependence on coal and natural gas, polluting energy sources
- Animal habitat and species disruption due to global warming / habitat loss
- Energy wasted by inefficient buildings
- Energy wasted by heavy input of goods and services
EXISTING SYSTEM

PROPOSED SYSTEM

BUILDING MATERIALS

ENERGY

WATER

MATERIALS

BUILDING

WATER

LOCAL COMPOSTING FACILITIES WITHIN COMMUNITIES

NEW BUILDINGS TO BE BUILT IN PART OUT OF RECYCLED OLD TAMA BUILDINGS

WASTE MANAGEMENT SYSTEM TO SERVE THE GREATER TAMA REGION

ENERGY PRODUCED ON-SITE LOCALLY AT BUILDING AND COMMUNITY SCALE

BIO-SWAILS IN EXISTING VALLEYS TO CAPTURE AND FILTER SEWAGE

EXISTING SYSTEM

QUALITY SYSTEM

BUILDING MATERIALS

ENERGY

FOOD

WATER

BUILDING

SEWAGE

EDUCATION

JOBS CREATED BY INDUSTRIAL PRODUCTION AND NEW UNIVERSITY

RECYCLING CENTER LOCATED AT THE BOTTOM OF SITE

ENERGY PRODUCED ON-SITE LOCALLY AT BUILDING AND COMMUNITY SCALE

PROVIDE EDUCATION AND RESOURCES FOR COMMUNITY PARTICIPATION

EXISTING SYSTEM

INPUTS OUTPUTS

QUALITY SYSTEM

INPUTS OUTPUTS

EDUCATION

FOOD

MATERIALS

BUILDING

RECYCLING

WASTE

SEWAGE

SERVICES & LABOR

TAMA REGION

INSIGHTS: sustainable housing and community design
Team One: Tama “Flexible Adaptable” Town

2010: Existing conditions

2020: Land reclamation, university, new blocks, meandering corridor, high density low rise housing, retail spine
The vision for “Flexible Adaptable” Tama includes small multi-generational mixed-use, a university town with connection to Tokyo, responsible for providing the majority of consumed energy and processing the majority of its waste, with desirable living spaces and built-in flexibility to adapt as time passes. Over time, updated housing, with proximity to Tokyo University as major industry, retail boulevard Coordinated pathway throughout site will also be included. Physical design elements are supported by environmental and energy measures, as well as community building programs.
Team One: Tama “Flexible Adaptable” Town

section through university and urban core

section through site
Team One: Tama “Flexible Adaptable” Town

detail section through urban core

detail section through urban core and university
The new University will provide an identity to the community. The campus is an anchor at the end of the dense urban core. Dispersed facilities throughout Nagayama mix the university with the community. Old walk-up apartment buildings can be converted to student housing.

The university could have a specific focus on ecological and environmental areas of study, due to its unique siting outside of the city of Tokyo.
University campuses will change over the next 50 years as the internet and web-based learning become more common. However, there will still be needs for physical gathering spaces some of the time by the university. To ensure these facilities are well-used, they are dispersed in Nagayama, for use by residents and visitors as well as university students.

These “media centers” can become community-builders, similar to a community center or library today.
The Urban Core is a linear development from the train station to the university. This dense area creates an active street life and provides economic activity, jobs, and amenities to the residents of the area along with servicing the University.

This urban core would have mixed uses and density, similar to more successful urban areas in Japan and other precedents such as Philadelphia.
Team One: Tama “Flexible Adaptable” Town

Mixed use block types

Residential block types
Tama New Town’s population shrinkage demonstrates the limitations of an inflexible, single-use, monocular community. Because of its proximity to Tokyo and the significant existing built infrastructure, Tama cannot be abandoned. To give Tama longevity, the population must be consolidate and its physical footprint reduced. Community resilience comes from self-sufficiency land uses, where the neighborhood can work to support its own food and energy consumption habits. Improved connectivity, along with mixed-use industry, garden allotments, and a community-supported agriculture farm yield the resources that can be flexibility employed regardless of population size.

This comes from density strategies, population consolidation strategies, food production strategies, transportation strategies, and ecological restoration strategies.

Self-Sufficiency + Connectivity = Resilience

Demographic Analysis

The demographic imbalance in Tama New Town is caused by national trends as obselete built environment Understandings interests and needs of different lifestyles necessary for building a community that will appeal to broad spectrum of residents

Few young professionals are choosing to locate in Tama. Young professionals prefer neighborhoods that are culturally active and provide variety.

Families in Tama prefer to inhabit new single family homes. Convenient to the highway system is important, as is proximity to schools and parks. Families are heavy users of community resources.

Elderly people make the majority of people in Tama New Town. They tend to live in older apartment complexes which are inconvenient to transit and make mobility difficult.
Recognizing Topography

Community Connections through Food Production

Self-Sufficiency through Food Production

Physical Connectivity

Melding urban and agrarian uses will promote economic and social security through self-sufficiency. Urban food and energy production can provide greater security at the time of an escalating global crisis. Interjecting this land use with urban infrastructure will create a more environmentally sustainable and civic-minded live-work structure within Tama. Different types of agricultural use (a CSA farm and an allotment community garden) create an opportunity for residents of different ages to contribute the efficiency to food production and community action.

Recognizing Topography

Building a vibrant community of the future, regardless of population size, requires a system of connectivity that makes mobility possible for every resident. By limiting the location of the population, and suggesting a pattern for shrinkage and growth, connective tissue (a new greenway, walking paths, roads, a street car system) will allow this district to thrive as the population and its commuting habits shift.

Physical Connectivity

The system proposed addresses the cumbersome topography of the district by creating an urban core, with a streetcar system with frequent stops convenient to residences. This system emphasizes mass transportation over individual automobile use, envisioning that a more sustainable future will be one with fewer individual cars.

Christopher Guignon, Haruka Horiuchi, Deborah Morris, Sarah Snider
Team Two: Building Resiliency

Ecological Responsibility

Restoring a natural water and wildlife system to Tama New Town will restore bio-diversity. By connecting Suwa and Nagayama with an existing natural landscape, Tama can become a model community that combines residential, commercial, industrial, and natural uses.

Confronting Habitat Fragmentation With Landscape Ecology

Habitat Solutions:
1. Design and plan for future habitat corridors in conjunction with future growth.
2. Design and remediate habitat with only native vegetation material

Current Water Management Solutions:
1. Treat naturally using landscape techniques.
2. Slow the speed of the stormwater with natural, non-canalized paths.
3. Collect stormwater for productive uses: Irrigation and landscaping and agricultural spaces, cooling systems, and attractive design features.
4. Reconnect community to water through innovative landscaping, collection, and irrigation techniques

Suwa and Nagayama In the Tokyo Bay Context

Pollution Levels in Tokyo Bay

Toxic Emissions in Tama River

Current Water Management Issues:
1. Non-native plant species exist.
2. There are no habitat corridors through Tama, isolating biological diversity.
3. Stormwater is not used productively.
4. Flow speed in increased due to water treatment is energy intensive.

Current Water Management Solutions:
1. Treat naturally using landscaping techniques.
2. Slow the speed of the stormwater with natural, non-canalized paths.
3. Collect stormwater for productive uses: Irrigation and landscaping and agricultural spaces, cooling systems, and attractive design features.
4. Reconnect community to water through innovative landscaping, collection, and irrigation techniques.

Re-establish Natural Resources

Habitat

Hydrology

Size

Small
Medium
Large

Shape

Large interior habitat
Fragmentation
Further Fragmentation

More Interior Habitat
Less Interior Habitat

Source: http://dane.wcp.edu/html/pak2.htm

Source: http://dane.wcp.edu/html/pak2.htm

2008

2030

Christopher Guignon, Haruka Horiuchi, Deborah Morris, Sarah Snider
This regional map of the Tokyo Metropolitan area shows the disconnection of natural resources and habitat corridors as it exists today. Nagayama and Suwa are outlined in red.

This map shows the possibility for more natural connections in the future. The movement of water through natural landscapes creates important connections between terrestrial and hydro-based ecological systems.
The proposed Nagayama Core area extends from Nagayama Station in the North of the research area. It consists of two of the original developments in Tama New Town, as well as three underutilized schools and a difficult topography.

Transit Corridor Extending from Regional Transit Hub: The first strategy aims at providing better connectivity through Nagayama by extending a public transportation line from Nagayama Station through Nagayama Core. Stops are spaced 400 meters apart, meaning that a shuttle stop is rarely more than 10 minutes by foot, even given the difficult terrain. The transit corridor that extends down Nagayama Core is widened slightly to accommodate a hybrid bus or streetcar line. It becomes a main pedestrian corridor as civic, commercial, and service buildings are built on the hillside. These public buildings have the added function of providing better access between elevations.

Preemptive Historic Preservation: Though the housing blocks that make up Tama New Town are problematic, it cannot be denied that the Tama New Town project holds historical value. By preserving the very first development in Tama New Town, historical and cultural significance is added to the site. When Nagayama becomes a new sustainable community, the preserved buildings can act as an educational tool in the narrative of Tama New Town's progress.
Fundamentally, the urban form consists of a Dense Mixed Use core area and flexible peripheral areas; Biodiversity Corridor and Recreation Escape are provided by converting the area east of the core into a recreation zone. Another important element of the design is Preemptive Historic Preservation: Though the housing blocks that make up Tama New Town are problematic, it cannot be denied that the Tama New Town project holds historical value. By preserving the very first development in Tama New Town historical and cultural significance is added to the site. When Nagayama becomes a new sustainable community, the preserved buildings can act as an educational tool in the narrative of Tama New Town’s progress.
The Nagayama-Suwa resilient city plan is made up of two main neighborhoods. The first one, on the previous pages, is primarily connective in nature, extending a transit corridor from the regional train station. Its center and its edges are made clear and legible, providing a sense of orientation and identification for the residents who reside there. The other neighborhood, illustrated here, is primarily self-sufficient. It is connected to the greater region by Nagayama Core but provides much of its own sustenance through resident food production. A third main element to the plan is a productive landscape that serves the system as a whole. This takes shape as a Community Supported Agriculture plot. By creating two distinct neighborhoods, residents of Nagayama-Suwa can choose from a variety of supported lifestyles.
Detail Area 01: Community Gardens

- Public, but intimate, food production is encouraged, flexibility in size.
- 180 community gardens exist.
- Managed by local and non-profit organizations.
- Crops: aloes, mint, pumpkins, lettuce, spinach, parsley, beans, beetroot, tomatoes, carrots, coriander, potatoes, peppers, etc.
- Materials: wooden posts, lockers, shared garden supplies.

**Table: Community Gardens**

<table>
<thead>
<tr>
<th>Type</th>
<th>Size</th>
<th>Location</th>
<th># of People</th>
<th>Use of Crops</th>
<th>Yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allotments</td>
<td>250 m²</td>
<td>Urban or peri-urban</td>
<td>One person or family</td>
<td>To supply cultivator or family</td>
<td></td>
</tr>
<tr>
<td>Community garden plots</td>
<td>Less than 1000 m²</td>
<td>Urban or peri-urban, vacant lots, unexploited area within educational or health facilities, state owned or private.</td>
<td>One person or family</td>
<td>To supply cultivator or family</td>
<td></td>
</tr>
<tr>
<td>Community gardens (intensive cultivation)</td>
<td>1000 m² - 3000 m²</td>
<td>Urban or peri-urban, stae owned or private.</td>
<td>One person or family, several families or cooperative</td>
<td>Feed, producers and for trade.</td>
<td>1996: 1-2 kg/m²-yr, 2000: 8-12 kg/m²-yr</td>
</tr>
<tr>
<td>Urban community gardens</td>
<td>2000 m² - 5000 m²</td>
<td>Vacant urban sites, not suitable for direct agriculture use, require imported soil and containers</td>
<td>Groups of individuals formed into a collective, institutional technical support and advice.</td>
<td>Produce for trade and small-scale consumption by producers</td>
<td>1996: 1-2 kg/m²-yr, 2000: 8-12 kg/m²-yr</td>
</tr>
<tr>
<td>High yield urban gardens</td>
<td>10000 m²</td>
<td>Government alloted vacant urban sites, not suitable for direct agriculture use, soil and containers for growing brought in</td>
<td>Commercially viable work centres or cooperatives</td>
<td>Produce for sale to the population and tourist sector</td>
<td>1994: 312 kg/m²-yr, 2000: 20 kg/m²-yr</td>
</tr>
</tbody>
</table>
Detail Area 02: Educational Farms

Precedent:
Organiponico, gastronomica playa, municipio playa, Havana

Serves residential area, constructed on artificial plateau. Pedestrians walk the perimeter, experience varied relationship to urban agriculture.

Crops: tomatoes, lettuce, parsley, cabbage, chives, leeks, onions, rocket, peppers, aubergines, beans, cauliflower, pumpkin

Materials: stone, concrete test cores, concrete rubble, corrugated cement sheet, chain link fence, earth.

Detail Area 03: Community agriculture

Precedent: Red Fire farm
-50 acres, 25 shares per acre
-one acre feeds 50-100
-farm can feed 5000
-produces 300 different varieties of vegetables, fruits, berries, plants, and flowers
-makes deliveries to in-city pickup locations
-work exchange is available as a pay option
Detail Area 04: Vertical Agriculture

Precedent:
reuse of 1970s structures

Materials: precast concrete slabs, 400 mm by 400 mm precast concrete beams, concrete blocks, concrete fence posts, wire fence

Crops: aloes, mint, pumpkins, spinach, lettuce, parsley, beans, beetroot, tomatoes, carrots, coriander, citrus trees

Site is covered from above with apartments and terraces. Recycled precast concrete beams enclose planting beds and define territories and edges. Possibility for public paths and spaces.

Characteristics: undulation, marking topography, viewing from above, making a new surface, bridging territories and edges. Possibility for public paths and spaces. Landscape, currently a visual resource, could become a physical resource if overlaid with publicly accessible paths and spaces.

Detail Area 05: High yield urban Garden

Precedent:
Organiponico, pastorita cienfuegos

Materials: 1970s structures

Crops: aloes, mint, pumpkins, spinach, lettuce, parsley, beans, beetroot, tomatoes, carrots, coriander, citrus trees

Site is covered from above with apartments and terraces. Recycled precast concrete beams enclose planting beds and define territories and edges. Possibility for public paths and spaces.

Characteristics: undulation, marking topography, viewing from above, making a new surface, bridging territories and edges. Possibility for public paths and spaces. Landscape, currently a visual resource, could become a physical resource if overlaid with publicly accessible paths and spaces.
Team Two: Building Resiliency

The existing site is full of disconnected green areas and a homogenous building type. This leads to undifferentiated spaces that are unidentifiable and difficult for residents to orientate themselves within.

By 2030 a public transit line efficiently connects the two changing neighborhoods to each other and the greater region. A CSA at the east corner of the site provides food to both neighborhoods, creating a small food based economy and offsetting Nagayama_Suwa’s reliance on external resources. Densification begins near the station.

In 2050, the changes implemented for a sustainable community in Nagayama-Suwa have attracted new lifestyle groups, creating a socially diverse community. The two neighborhoods, while still distinct in character and identity, begin to operate as a unified system, bolstering its self-sufficiency and resilience. The urban agriculture lifestyle and large recreational nature reserve, attract people from both inside and outside the metropolitan region. Density around the station and by new eco-industry to the South supoprt an efficient transportation system.
The Nagayama-Suwa resilient city plan is made up of two main neighborhoods. One is primarily connective in nature, extending a transit corridor from the regional train station. Its center and its edges are made clear and legible, providing a sense of orientation and identification for the residents who reside there. The other neighborhood is primarily self-sufficient. It is connected to the greater region by Nagayama Core but provides much of its own sustenance through resident food production. A third main element to the plan is a productive landscape that serves the system as a whole. This takes shape as a Community Supported Agriculture plot. By creating two distinct neighborhoods, residents of Nagayama-Suwa can choose from a variety of supported lifestyles.

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Tama New Town was developed on a rigid patriarchal model of the bedroom community. In this model, the father commuted into the city to earn a living for the family, while the mother reared their children in a healthy, safe community and a natural setting.

Now, Tama New Town is struggling. The demographic trends there are a reflection of trends in Japan at large, while the inflexible physical environment and aging building stock cannot address the shifting needs of its residents or attract new demographics. By addressing the question of changes in society and the workplace with respect to women, a framework can be created to address the challenges Tama New Town faces today to create a thriving, sustainable community for years to come.

Support Networks

Case Study: Scandinavia
- the most vigorous social-welfare systems in Europe
- one of the highest fertility rates in Europe (1.8)
- accommodates advancing women and their families
- 75-80% of women work
- 54 weeks of maternity leave, as well as
- 6 weeks of paternity leave
- government payment of about 4,000 Euros with birth of child
- state-subsidized day care is standard

Case Study: Italy
- society prefers women to stay home after becoming mothers
- only 50% of women work
- little state-financed child care

<table>
<thead>
<tr>
<th>COUNTRY</th>
<th>FERTILITY RATE (births per woman)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>1.29</td>
</tr>
<tr>
<td>Spain</td>
<td>1.32</td>
</tr>
<tr>
<td>Italy</td>
<td>1.33</td>
</tr>
<tr>
<td>Switzerland</td>
<td>1.42</td>
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<tr>
<td>Canada</td>
<td>1.51</td>
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<td>Netherlands</td>
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<td>UK</td>
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<tr>
<td>Norway</td>
<td>1.81</td>
</tr>
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<td>USA</td>
<td>2.04</td>
</tr>
</tbody>
</table>

Lack of support networks for women is an important factor for both fertility rates and women-employment rates in developed countries, such as in Scandinavia versus Italy. By designing a community model that supports all types of women, the design will be successful for all demographic groups, both Male and Female.
Case study: Japanese Convenience stores
- new models of proximities
- flexibility of model, rather than large centralized regions

Amendities in one location
- work, live, shop and farm in one location
- flexibility of model, rather than large centralized regions

background research: urban environment and density

Case study: Namino, Kyushu Elementary School
- converted into a training center that caters for 5000 people per year
- facilities include cafeteria, kitchen, great hall, public bath, tatami area

background research: reuse of public facilities and land reserves
Team Three: Women in 2050

Growth scenario

1. current facilities
2. creating public service hubs
3. housing neighborhoods

Employment demographics

Demographics

2010
- total population: 8,600
- working: 29%
- non-working: 71%
- working women: zero

2020
- total population: 9,600
- working: 47%
- non-working: 53%
- working women: 890
- addition of:
  - married women working part-time
  - elderly people working PT
- overall population growth: 12%

2030
- total population: 11,300
- working: 56%
- non-working: 44%
- working women: 2,100
- overall population growth: 17%

Lifestyle

Laura Rushfeldt, Erica Weiss
Connie Chung, Cha-ly Koh,
As the needs of Tama New Town shift with the constantly-evolving population, the shape of the built environment must evolve to adapt. The demographics of working and non-working women and men will continue to change, influencing the design and planning of the community. Terrence Tao and festivity are crucial in understanding the current landscape and planning for the future.

**EMPLOYMENT DEMOGRAPHICS**

**Time-lapse development:**

**Re-imagining Demographics in Tama New Town**

**WOMEN IN THE WORKPLACE**

- **2010:**
  - Married working men: 200
  - Married women: 100
  - Working women: 40
  - Non-working: 50
  - Total population: 1,000

- **2020:**
  - Married working men: 250
  - Married women: 150
  - Working women: 50
  - Non-working: 50
  - Total population: 1,000

- **2030:**
  - Married working men: 300
  - Married women: 200
  - Working women: 60
  - Non-working: 50
  - Total population: 1,000

- **2040:**
  - Married working men: 350
  - Married women: 250
  - Working women: 70
  - Non-working: 50
  - Total population: 1,000

- **2050:**
  - Married working men: 400
  - Married women: 300
  - Working women: 80
  - Non-working: 50
  - Total population: 1,000

**GROWTH SCENARIO**

**A Sustainable Community through 2050**

**Lifestyle**

<table>
<thead>
<tr>
<th>Year</th>
<th>Married Men</th>
<th>Married Women</th>
<th>Working Women</th>
<th>Non-Working</th>
<th>Total Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>200</td>
<td>100</td>
<td>40</td>
<td>50</td>
<td>1,000</td>
</tr>
<tr>
<td>2020</td>
<td>250</td>
<td>150</td>
<td>50</td>
<td>50</td>
<td>1,000</td>
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<tr>
<td>2030</td>
<td>300</td>
<td>200</td>
<td>60</td>
<td>50</td>
<td>1,000</td>
</tr>
<tr>
<td>2040</td>
<td>350</td>
<td>250</td>
<td>70</td>
<td>50</td>
<td>1,000</td>
</tr>
<tr>
<td>2050</td>
<td>400</td>
<td>300</td>
<td>80</td>
<td>50</td>
<td>1,000</td>
</tr>
</tbody>
</table>

**INSIGHTS:** sustainable housing and community design
The central tenet of this new model is the social service hub. The hub is created by building up and re-purposing existing public facilities to create flexible, multi-purpose service centers within Nagayama. School-proper properties have been chosen due to their pre-existing visibility and importance in the community as well as their available land for use and development. By providing many public and social services in one place (school, day care, community centers, elder facilities, playgrounds, parks, and others) in a single condensed area, activity and convenience will be greatly increased. The area will become a desirable hub for working women to live. Research has been done into how to re-purpose and mix uses within existing school buildings, and also incorporate new construction. Although some open land must be retained for ball-fields and other school uses, there is currently an over-abundance of underutilized land that can be used to create a service-hub.
Hub Population:
Population increases to 13,000
Three service hubs (13,000/3) =
-elderly (20%) = 866 persons
-working age (64%) = 2774 persons
-children (16%) = 694 persons

General Programs Areas
For one hub using above population information:
- Primary School 680 sq.m.
- Evening Education 170 sq.m.
- School Yards 1160 sq.m.
- Daycare 325 sq.m.
- Community Center 300 sq.m.
- Government Center 530 sq.m.
- Multipurpose Center 240 sq.m.
- Gardening Center 150 sq.m.
- Community Gardens 200 sq.m.
- Atlantic Center 370 sq.m.
- Senior Center 500 sq.m.
- Transit Center 400 sq.m.
Team Three: Women in 2050

Neighborhood Growth Model and Parameters

**NEW "NEIGHBORHOOD" HOUSING GROWTH**

**LAND RESERVE BOUNDARY**

**AREA FOR NEW GROWTH**

**MIX-USE DEVELOPMENT**

**PUBLIC FACILITY HUB**

3-Dimensional Proximity Diagram

**NEIGHBORHOOD GROWTH ILLUSTRATION**

2008

2010

Existing housing

Back offices, working space

Generating mixed-use, mixed-density transformations

Commercial key (restaurants, retail, offices, private residence)

2020

2050

Building towards a sustainable community through the 4 sides of urban growth

A feasible change of use sensitive to topographic changes may incorporate diverse urban compositions or different mixed-use compositions.

Change from school to public services to other uses
With the strong catalyst being placed as a seed of growth in Nagayama, various other land uses and development will result from the strong concentration of a strong Public Service Hub. This growth will penetrate into the existing housing, transforming the current housing, retail and other land use types in the area. While the growth will be bounded and guided by the land reserve strategies, strong parameters are also needed to ensure strong and sustainable communities that will continue to attract new residents to Nagayama.

The following are six important rules that will guide the growth of the development in time. To form a strong community, the built environment needs to provide the opportunities for residents to interact with each other by sight, sound, smell, taste or touch. It is through this lens that the following six rules were formed.
Team Three: Women in 2050

Land Reserve Model and Parameters

Food self-sufficiency ratio in Japan and other countries
(on a calorie basis)

Source: Food Balance Sheet (MAFF); Food Balance Sheets (FAO).

Domestic production and domestic consumption of vegetables

Value of imported food products and the share of processed food products

Adjusting Infrastructure

Critical infrastructure issues will focus on the movement of evacuation services, particularly for the elderly population. The infrastructure may also relate to human services—issues such as nursing and child care. One way to relieve tension for working, non-working, and single women is to create a neighborhood which shoulders some of this responsibility. The creation of social support adds workers, jobs, and commercial growth to the community.

Produce Local, Consume Local

- Farms in Japan have traditionally operated on a small scale. Reallocation of open space within Tama New Town provides the chance to cut down on imports such as wheat, beans, fruit, and animal feed.
- Current government subsidies for farming combined with food cooperatives and green markets will offset the costs.

Local Jobs Don’t Need New Industries

There are many jobs currently being supported in the community, but those that will self perpetuate with the increase of working women include: elderly care, education, child care, local business, local government positions, home offices, and e-business to their products has set high agricultural standards, yet Japan only produces 39% of its food products domestically. A reallocation of open space within Tama New Town provides the chance to cut down on imports such as wheat, beans, fruit, and animal feed.

Local Jobs Don’t Need New Industries

There are many jobs currently being supported in the community, but those that will self perpetuate with the increase of working women include: elderly care, education, child care, local business, local government positions, home offices, and e-business.
A combination of the current conditions in Tama New Town can be overlaid to determine an appropriate place from which to jump-start the new distribution of community beneficial land resources. By examining the current green spaces, whether government sanctioned, abandoned, or residual, as well as the areas of inadequate housing and the current topography, an initial diagram of potential spaces is identified. This initial mapping is meant only as a suggestion of prime spaces and must be considered in relation to the new facility and neighborhood growth maps.

**1. Impermanence/Permanence**

A stringent planning process can maintain a structured settlement. As the community grows around its new social service hub growth will be controlled to prevent sprawl. By defining boundaries of town growth with local resources such as green space, agriculture, and energy production.

**2. Appropriate Distribution of Program Uses**

In order to properly sustain the population physically and environmentally, the ideal proportion of land must be allocated to each type of land reserve.

**3. Consider the Return on Land Investments**

Some land uses more beneficial to the community than others. Most valuable use is environmentally and physically beneficial. Land uses contained in this category will be more stable and will anchor the physical growth limits of the community.

**4. Integration of Resources**

Current greenspace allotments are fragmented. The quantity is vast, but proximities prevent it from being used. Proper adjacencies allow for overlapping of uses and thus a more efficient use of resources.

**5. Where necessary, modify the landscape to meet your needs**

If the current condition of the land is not inline with the community plan, alterations may be necessary. Steep terrain can be bridged, stepped, or terraced to align with new planning guidelines. This includes returning some land to it’s natural condition.
Team Three: Women in 2050

Transit Model

1. Current rapid mobility (none)
2. BRT stations connect hubs using existing infrastructure. Micro-mobility stations introduced at BRT stations.
5. Further integration of network with adding of each new hub.

The new transit strategy for Tama New Town includes two systems: Mass transit in the form of a BRT (Bus Rapid Transit) system, and individual transit in the form of car-sharing and micro-mobility systems. The BRT route can be re-directed to include new Hubs over time as development grows.
The parameters for growth of the Social Service Hubs, Neighborhood Growth, and Land Reserves are graded against a 3-point strategy for sustainability: Promoting density and mixing uses; Preserving all natural resources; and Planning for a socially sustainable future.
Team Three: Women in 2050

“Day-in-the-Life” vignette of different users in the new Tama New Town

Working Mother
- bringing children to school
- family dinner

Single Working Women
- going to work
- shopping with friends
- ballroom dancing

Seniors
- grocery shopping

Single Working Men
- going to work
- ramen for dinner

Working Father
- going to work
- going for a walk

Newly Married Couple
- morning on the terrace
- rooftop romantic dinner

Laura Rushfeldt, Erica Weiss

Connie Chung, Cha-ly Koh,
What is the appropriate density for successful and sustainable community growth? This is a difficult question to answer, but by analyzing existing communities and considering extreme scenarios, certain proposals can be made to generate a Tama New Town that is both a successful and sustainable community. Combinations of different housing types, new transit systems with close proximity to living, integrating a “3rd place” which is neither home nor work, reuse of existing buildings, and fostering a true understanding of ecology and connection to nature are main strategies of this scheme.
Density for Living

**Concept**

solid + void

50% 50%

Suwa/Nagayama

void > solid

House Moriyama

void = solid

Rome

void = solid

- solid and void are equal value.
- new index of density which alternates building coverage.
- decent balance(density) is essential to vibrant community.

Community

**present design strategy**

- design solid (personal property) and its function first, and left over space ends up to be the void.

**design strategy of 2050**

- design void (buffer zone) and its function first, then design the connection between the solid.
**Insights: Sustainable Housing and Community Design**

**Walkable Distance**

Walking distances is short in the southern part of the station due to many hills and winding roads. Many houses are not included in walking distance.

**Problems**

Topography, shape of road, transportation, density.

**Possibility:**

1. Cut down all hills and make the land flat.
2. Place elevators or escalators.
3. Build new roads to make more accessible.
4. Place houses along straight roads.
5. New transportation system.
6. Place every public facility and houses inside 10 minute walking distance.

**Strategy**

Use existing infrastructure (roads, hospitals, schools, etc.) to replace the housing inside the area that can get 10 minute accessibility.

**Density for Living**

Density that every person can reach public facilities in 10 minute walk.

---

**Multi Core**

**Present Condition:** Every public facility except schools gather around station.

- Hospital
- Library
- Post office
- Community center
- Police office

**Future Condition:** Place core of facilities and shops in 10 minute distance from each house.

---

Average walking speed of senior people:

- 1.05 m/s = 6.3 m/min

When the inclination is 2.2 or more, 0.67 is multiplied as a decrease coefficient.

---

**Electric Bus Transit**

- Economical: can use existing road.
- Sustainable: No CO2.
- Efficient transportation: simple route.

---

**Electrical Bus in Hoheikyo/Hokkaido**

- Charge: one every two weeks.
- Mileage: 400 km (250 mile, 312 mile).

---

**Electrical Bus in Nanjin-ru/Shanghai**

Free mall ride bus in 16th street mall/Denver.
Density for Living

Case studies for the third place

first place: home
second place: workplace
third place: community anchors that facilitate and foster broader creative interaction. They are informal meeting places.

Design elements:
- Personal flow
- Flexible personal Space
- Food service
- Retail
- Residence
- Office
- Building boundary

<table>
<thead>
<tr>
<th>IMAGE</th>
<th>PLAN</th>
<th>ZONE DIAGRAM</th>
<th>METHODS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harvest Cafe, Cambridge, MA</td>
<td>![Plan Image]</td>
<td>![Zone Diagram]</td>
<td>*located between functions&lt;br&gt;*no border between spaces&lt;br&gt;*inside a cafe building</td>
</tr>
<tr>
<td>Roadside Cafe, Kichijoji, Tokyo</td>
<td>![Plan Image]</td>
<td>![Zone Diagram]</td>
<td>*human scaled narrow street&lt;br&gt;*easy access&lt;br&gt;*complex of small spaces&lt;br&gt;*roofed arcade</td>
</tr>
<tr>
<td>Street Restaurant, Denver</td>
<td>![Plan Image]</td>
<td>![Zone Diagram]</td>
<td>*located between functions&lt;br&gt;*near the retail zone&lt;br&gt;*using the street as a space&lt;br&gt;*near residential area</td>
</tr>
<tr>
<td>Court Cafe, London</td>
<td>![Plan Image]</td>
<td>![Zone Diagram]</td>
<td>*big street and large flow of people&lt;br&gt;*mixed with retail zone&lt;br&gt;*using the street as a space&lt;br&gt;*roofed space</td>
</tr>
<tr>
<td>Court Cafe, London</td>
<td>![Plan Image]</td>
<td>![Zone Diagram]</td>
<td>*narrow streets&lt;br&gt;*court style space&lt;br&gt;*mixed with the retail zone&lt;br&gt;*using the street as space</td>
</tr>
<tr>
<td>Mixed use zoning&lt;br&gt;*Near the retail zone&lt;br&gt;*using the street as a space&lt;br&gt;*near the residential *seperated flexible space</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mono use zoning&lt;br&gt;*near the natural resource&lt;br&gt;*using the street as a space&lt;br&gt;*flexible connected spaces</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In the office zoning&lt;br&gt;*mobile cafe facility&lt;br&gt;*Large people flow</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
"How can we compact the city?"

Problem in Suwa / Nagayama

The planning based on functionalism made the urban function and living function totally separate. Collecting these urban functions and condense it in a certain way, that could compact the city.

1) Reclassification of living function
2) Recontext the urban function
3) Design concept for "Third Place"

Reclassification of living function

Considering about urban function and living function, some urban function could be included in living unit. And spreaded urban function could be condensed and placed efficiently. Using the third place diagram, those function could be efficient to the users and could generate a place where various people communicate. It could create more sustainable and vibrant community.

"What is third place?"

1) Tool for condensing the community
2) Place creating program
3) Connected place
4) Information hub
5) Activity starter
6) IT technology platform

Functionalism Design
of Suwa/Nagayama

All the functions are not related to each other, only considered in a 2D plan. Lot of unused spaces. It is possible to make a compact city with same capability of functions.

Design Frame Proposal

By designing in this framework and making it dense, the community will be interact with each other. Not only dense the community, considering the 3D zoning and connection, vibrant community will be real.

Third place as a community hub

By replacing the urban function into the residences and in the third place, the form of living function could change. Placing the third place in the center of community and on the people flow, it will be a place that people gather informally, and start a conversation. The "Third place" could be a catalyst of vibrant community.
Density for Living

distance between the individuals

Defining the space between individuals

- Open buffer zone
- Closed buffer zone
- Personal space
- House boundary
- Property boundary (strong)
- Property boundary (weak)

Density of site

<table>
<thead>
<tr>
<th>Value</th>
<th>Project Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>15 Poundbury</td>
</tr>
<tr>
<td>20</td>
<td>32 Nagayama</td>
</tr>
<tr>
<td>40</td>
<td>51 BedZed</td>
</tr>
<tr>
<td>60</td>
<td>69 Accordia Living</td>
</tr>
<tr>
<td>80</td>
<td>100 GWL Terrain, 100 Borneo Sporenburg</td>
</tr>
<tr>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Typology of open buffer zone

- Park model
- Street model
- Terrace model
- Court model

- Mixed-use housing
- Detached housing
- Multi-family housing

Density for Living

- Open buffer zone
- Closed buffer zone
- Personal space
- House boundary
- Property boundary (strong)
- Property boundary (weak)
### Shortcomings

**Detached housing:**
- *no space for connection with neighborhood*
- *load for maintenance, management high for elderly*
- *possession of property unadaptable to changes*

**Public Housing Complex:**
- *no space for connection with neighborhood*
- *lack of housing typologies*
- *weak accessibility*
- *surplus of space as family shrinks*

**Studio Apartment:**
- *no space for connection with neighborhood*
- *large dependence on public facilities*
- *not adaptable to elderly who need support*

### Adaptable Lifestyle Models

<table>
<thead>
<tr>
<th>Model</th>
<th>Park</th>
<th>Path</th>
<th>Court</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single-member household residence</td>
<td><em>single member household residence</em></td>
<td><em>single member household residence with shared facility</em></td>
<td><em>residence for close related single-member household</em></td>
</tr>
<tr>
<td>Single-family residence with parents</td>
<td><em>single-family residence with parents</em></td>
<td><em>single-family with children with the need of support</em></td>
<td><em>single family with children</em></td>
</tr>
<tr>
<td>Elderly couple</td>
<td><em>elderly couple</em></td>
<td><em>elderly couple needing support</em></td>
<td><em>single family with low income</em></td>
</tr>
<tr>
<td>Single family desiring detached housing</td>
<td><em>single family desiring detached housing</em></td>
<td><em>single family with elderly co-housing</em></td>
<td><em>single family with elderly co-housing</em></td>
</tr>
<tr>
<td>Retired couple, leisure</td>
<td><em>retired couple, leisure</em></td>
<td><em>single family with elderly co-housing</em></td>
<td><em>single-family with children co-housing</em></td>
</tr>
<tr>
<td>Wealthy single-family</td>
<td><em>wealthy single-family</em></td>
<td><em>wealthy single-family</em></td>
<td><em>wealthy single-family</em></td>
</tr>
</tbody>
</table>

+ open buffer zone
Density for Living

Three dimensional green minimum

If it is valuable to green the plan in percentage of 50%, Tama New Town, Suwa / Nagayama already has good environment. But is that a good environment for living? The photo on the left above shows as if that Suwa / Nagayama has a good green environment. But this photo is taken from a high point and it is not an usual situation. It is not easy to feel green from human basic activity, sitting or standing. It is significant to consider green in three dimensional evaluate system when you design green environment that effects the living. By evaluating green in this way, the form of living will change, and it could even change the lifestyle.

Ventilation Path

Creating a sustainable new development, natural resource from the surroundings should be considered. The analysis map shows the average temperature in summer condition of Tokyo. Tama is one of the coolest city in Tokyo. Using this benefit more efficiently, Suwa / Nagayama would be more attractive. Designing the environment in point of the wind of the district could be one proposal. Designing the ventilation path could create a comfortable community.

Hot and humid summer time is one of the big issue in living in Japan. Suwa / Nagayama has a potential of cool natural resource in the south part. Using this natural benefit with ventilation path would be part of solution.
### 1. Conversion

<table>
<thead>
<tr>
<th>Site</th>
<th>Image</th>
<th>Old Image</th>
<th>Plan</th>
<th>Building Type</th>
<th>Classification of Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Queen Anne High School Condos (Seattle/USA)</td>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
<td><img src="image3.png" alt="Image" /></td>
<td>Residence</td>
<td>Preservation of the original facade's original arched windows, original hardwoods, original hand-laid brickwork, original art deco style elevators.</td>
</tr>
<tr>
<td>The Cobb Apartments (Seattle/USA)</td>
<td><img src="image4.png" alt="Image" /></td>
<td><img src="image5.png" alt="Image" /></td>
<td><img src="image6.png" alt="Image" /></td>
<td>Residence</td>
<td>Preservation of the original facade's hand-laid brickwork, the original art deco style elevators.</td>
</tr>
<tr>
<td>Butlers Wharf (London/England)</td>
<td><img src="image7.png" alt="Image" /></td>
<td><img src="image8.png" alt="Image" /></td>
<td><img src="image9.png" alt="Image" /></td>
<td>Residence</td>
<td>Preservation of the brick exterior front walls.</td>
</tr>
<tr>
<td>Gasometer (Vienna/Austria)</td>
<td><img src="image10.png" alt="Image" /></td>
<td><img src="image11.png" alt="Image" /></td>
<td><img src="image12.png" alt="Image" /></td>
<td>Residence</td>
<td>Preservation of the brick exterior front walls.</td>
</tr>
</tbody>
</table>

### 2. Renovation

<table>
<thead>
<tr>
<th>Site</th>
<th>Image</th>
<th>Old Image</th>
<th>Plan</th>
<th>Building Type</th>
<th>Classification of Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>La tour Bois-le-Pretre Porte Pouchet (Paris/France)</td>
<td><img src="image13.png" alt="Image" /></td>
<td><img src="image14.png" alt="Image" /></td>
<td><img src="image15.png" alt="Image" /></td>
<td>Residence</td>
<td>Airtight and insulation, Addition of balcony.</td>
</tr>
<tr>
<td>Hellersdorf Housing Complex (Berlin/Germany)</td>
<td><img src="image16.png" alt="Image" /></td>
<td><img src="image17.png" alt="Image" /></td>
<td><img src="image18.png" alt="Image" /></td>
<td>Residence</td>
<td>Addition of Elevator, Addition of balcony.</td>
</tr>
<tr>
<td>Leinefelde Housing Complex (Leinefelde/Germany)</td>
<td><img src="image19.png" alt="Image" /></td>
<td><img src="image20.png" alt="Image" /></td>
<td><img src="image21.png" alt="Image" /></td>
<td>Residence</td>
<td>Addition of Elevator, Addition of balcony, Addition of garden.</td>
</tr>
</tbody>
</table>

### 3. How it will work in TAMA

- **How can we use existing stock?**
  - Demolishing all buildings creates too much waste.
  - Renovating all buildings does not solve "10 minute walk" problem.
- **Regeneration of Tama by Chain Reaction**
  - Rebuild one part
  - Renovate one part

![Diagram](image22.png)
Ventilation Path
Considering the natural wind resource and planning the ventilation path will provide summer ventilation and create a comfortable environment.

Accessibility
Topography considered zoning and walkable distance compact community are needed. Making a compact plan with third place hubs would improve accessibility.
What insights can be drawn from this inquiry? Four rich and productive investigations were set up in the final inquiry. Much of the earlier charettes, lectures and research is rethought and incorporated into the projects. Each expressed different interests and goals, but common threads can be seen between the projects:

1. Such buzzwords as ‘green’ and ‘zero carbon’ mean little unless a designer has the expertise or can work in a team with experts to truly understand and address the term from numerous disciplines such as building systems, energy generation and use, landscape and ecology, food production, water systems, and habitat and forestry. This is a common thread from the lecturers, as well as evident from the individual research.

2. Sustainability can be defined environmentally, socially, and economically. All have different and sometimes competing interests which must be carefully balanced when planning for community growth. For Tama New Town, demographic diversity to sustain the population is an important social factor just as energy use and carbon creation are important environmental factors.

3. Sustainable technology was not a primary focus of the workshop. Although new smart technologies and I.T. present new strategies for sustainable design, understanding of natural systems and design principles, along with public awareness and education, will remain vital components to sustainable design.

4. As economies become more aligned with sustainable issues, new ideas of resource flow and proximities will redefine markets and import/export models for Japan. More local food production and energy generation will have great importance in new community design.

5. Flexibility and mixing of densities and uses within the built environment creates more efficient land use, greater sense of community, and more resilient urban design. Sharing and overlapping resources increases efficiency as well.

6. Transit and mobility continue to be an important issue in neighborhood design, particularly for an aging population. Mobility and universal access will need to be addressed in Tama New Town.

It is these investigations and common themes which provide a strong foundation, from which subsequent investigations will begin.
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Dean, M.I.T. School of Architecture and Planning
An architect and urban designer, her career combines professional practice, research and teaching. She is principal architect in the San Francisco-based firm, Santos Prescott and Associates. She has built work in Japan, South Africa and the United States.

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Eran’s research and teaching interests include urban and physical design, standards and regulations, site planning technologies and urban simulation. Eran has worked as a landscape architect and urban planner in Europe, Asia, the Middle East and the US.

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Prior to MIT, Connie was employed as a paralegal in real estate finance. She has a degree in business management from the University of Pennsylvania.

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Chris’s interest in architecture began in Japan during early visits to mountain temples in Kyushu. His interests include Japanese traditional architecture, philosophy and architecture, and more recently, sustainability.

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His work is centered upon Sustainable Architecture. The underlying theme in his work is the relationship of Architecture to today’s environmental needs; namely the creation of the built form relative to the limitations of the earth’s resources, ecological systems, global climate change, and the excessive use of energy.

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Catherine is interested in urban design. Prior to her studies at MIT, she studied graphic design and painting.

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Mary’s design work has been recognized in international publications and awarded by the Schnitzer Foundation for the Visual Arts.

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Jesse has a degree of Landscape Architecture from the University of Pennsylvania and is interested in sustainability and mass-produced housing.
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Cha-ly is interested in pedestrian movement and the design of public spaces in the urban environment, and has worked on relevant projects in London, Boston and Korea.

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Alice is interested in sustainable design, particularly building performance and efficiency of materials and systems. Having never been to Asia, she is looking forward to seeing Japan, and experiencing a completely new place and culture.

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Sarah received her Architecture and Urban Planning bachelor degrees from the University of Virginia. She is LEED certified and interested in sustainability, city dynamics, agricultural preservation, and tourism as it relates to and defines a place.

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