PORTFOLIO

Chenyang Lu
(LEED AP O+M)

BACKGROUND:

Master of Environmental Building Design,
School of Design,University of Pennsylvania
Bachelor of Architecture,
School of Architecture, Chang'an University
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Phone Number: 267 574 5416

CONTENT

ACADEMIC WORK

- **SYMBIOSIS ROOF, MEBD STUDIO 2015** 4-13

  Concentrated on the public accessibility of Net Zero building. Exploring the regeneration of cities after growth.

- **THE CROSS, ULI COMPETITION 2015** 14-19

  Cross-discipline collaboration. Explored the Financial efficiency of sustainable design. Collaborated with Haoran Lee, Ray Zhao, Baihe Cui in landscape architecture, Lu Tian in real estate.

- **TWO GREEN VILLA DESIGN 2013, 2014** 20-29

  Experience based vs. Simulation based design

- **MOVE TO CARE, SENIORS' APARTMENT DESIGN 2014** 30-35

  Focused on the barrier-free design and all - season human comfort. Created a modern senior community.

- **HIGH RISE VS. BICYCLE 2012** 36-39

  Moderate the impact of high rise building on their neighborhood. Encourage public transportation.

PROFESSIONAL WORK

- **2100: A DYSTOPIAN UTOPIA** 40-45

  Produced high quality renderings. Researched on new technology and energy distribution and output in 2100 and visualized data. Cooperated with StudioTEKA team, and editor, graphic designer in Terreform.

- **CARIBBEAN HIGHLANDS 2015 - 2016** 46-51

  Conducted lighting, energy, comfort simulation to support the team. Developed and optimized the detail. Produced high quality renderings. Involved in clients meeting. Coordinated in project with StudioTEKA team, account, contractor and developers.

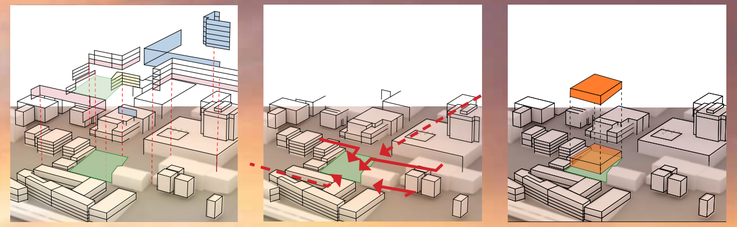
- **PERFORMING ART CENTER 2015 - 2016** 52-57

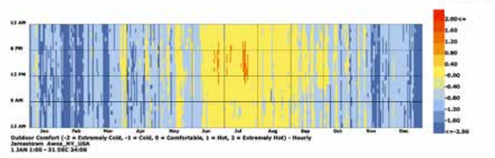
  Streamed and visualized data, researched on music complex building type. Produced massing and draft models, collage and renderings.

SYMBIOTIC ROOF

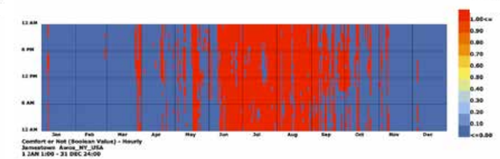
Collaborated with Le zhai
MEBD STUDIO 2015
INSTRUCTED by William w. braham, Mostapha Sadeghipour, Rob Diemer

GOVERNMENT
RETAIL
OFFICE
OPEN SPACE
RESIDENTIAL





OUTDOOR TEMPERATUREI



OUTDOOR COMFORT

BEFORE AFTER

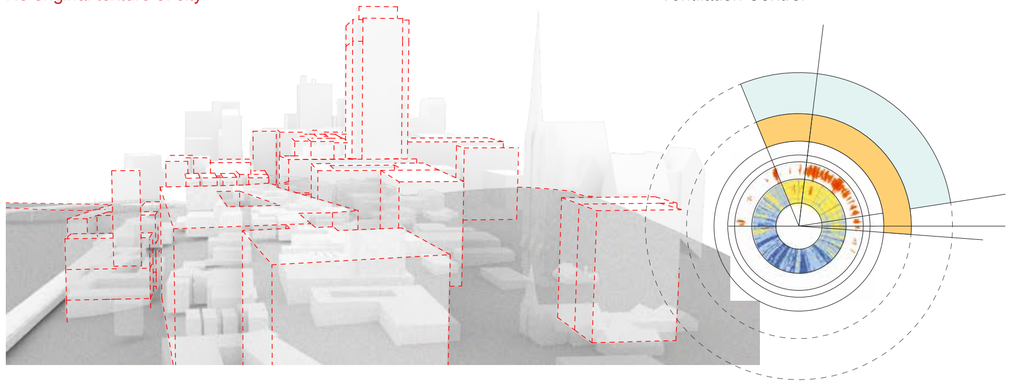
! WARNING

Without proper planning, there will be:

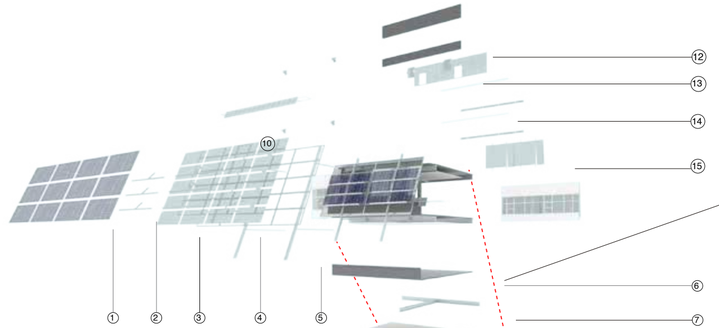
No parking lot
No Open spaces
No original texture of city

SOLUTION

- Outdoor Human Comfort
- Climate zone 5, Dry Bulb Temperature > 20
- Green Roof
- Lighting Control
- Ventilation Control

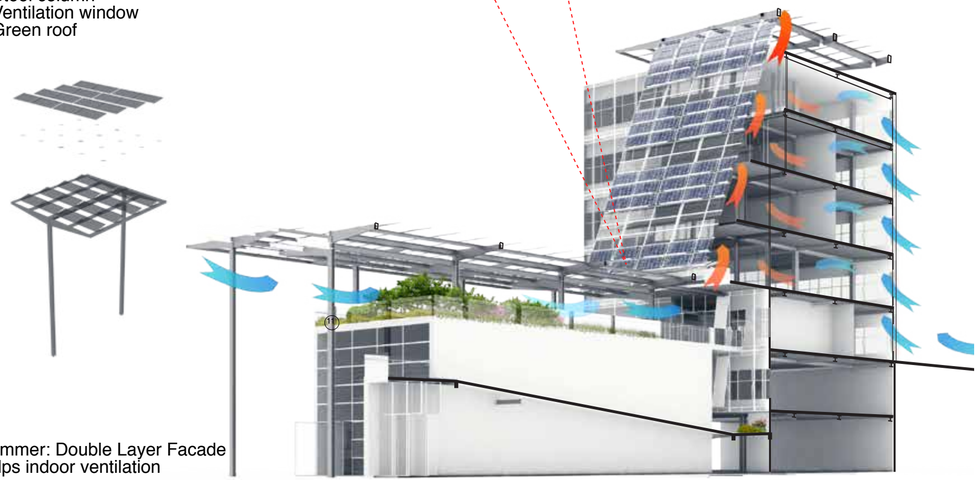


THE CITY AFTER GROWTH



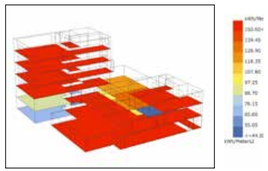
1. PV panel
2. PV supporting structure
3. Low-E Glass
4. Window frame
5. Vertical supporting system
6. Thermal mass (radiation floor)
7. I-beam
8. Ceiling
9. Steel column
10. Ventilation window
11. Green roof

12. Concrete wall
13. Ventilation window
14. Louvers
15. Exterior glazing

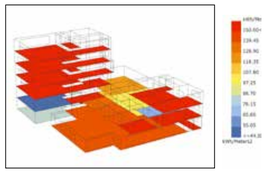


- Summer: Double Layer Facade helps indoor ventilation

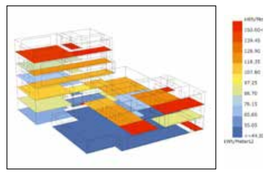
BUILDING LOAD ANALYSIS



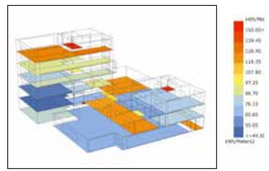
ENERGY
49.75 kWh/m2



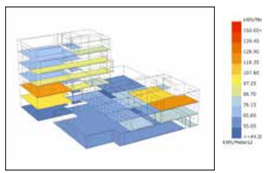
HEATING ENERGY
38.96 kWh/m²



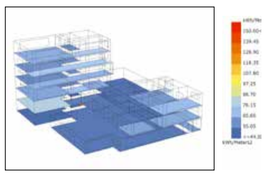
HEATING ENERGY
33.27 kWh/m²



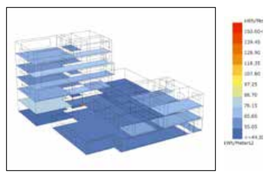
HEATING ENERGY
29.97 kWh/m²



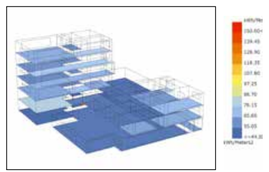
COOLING ENERGY
12.99 kWh/m²



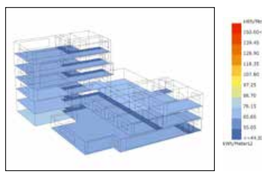
COOLING ENERGY
11.45 kWh/m²



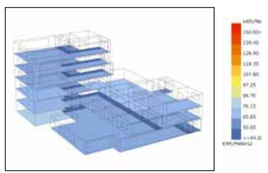
COOLING ENERGY
8.93 kWh/m²



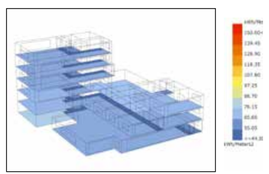
COOLING ENERGY
8.12 kWh/m²



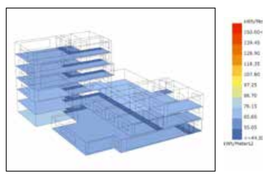
LIGHTING ENERGY
33.96 kWh/m²



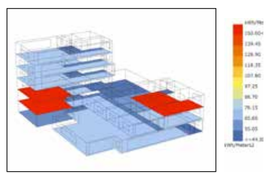
LIGHTING ENERGY
27.60 kWh/m²



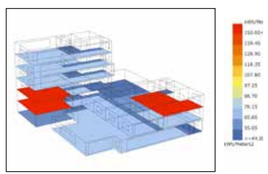
LIGHTING ENERGY
23.35 kWh/m²



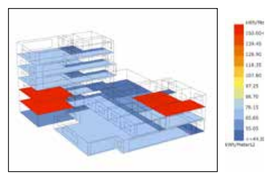
LIGHTING ENERGY
21.23 kWh/m²



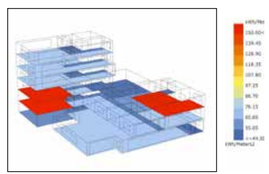
EQUIPMENT ENERGY
3.1 kWh/m²



EQUIPMENT ENERGY
3.1 kWh/m²

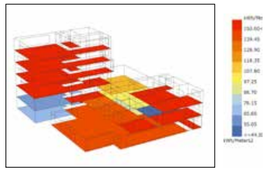


EQUIPMENT ENERGY
3.1 kWh/m²

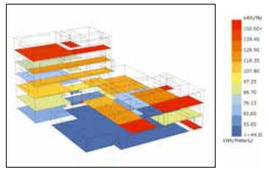


EQUIPMENT ENERGY
3.1 kWh/m²

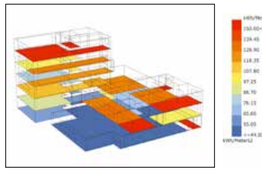
INDOOR COMFORT MAP & BUILDING LOADS



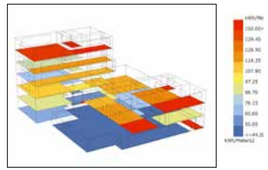
TOTAL THERMAL ENERGY
99.9 kWh/m²



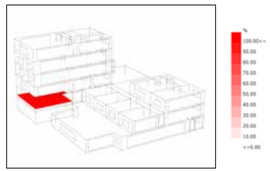
TOTAL THERMAL ENERGY
81.17 kWh/m²



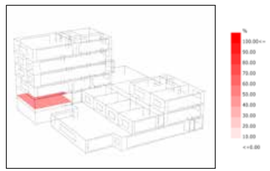
TOTAL THERMAL ENERGY
68.68 kWh/m²



TOTAL THERMAL ENERGY
62.44 kWh/m²



OVERHEATED AREA 4.36%



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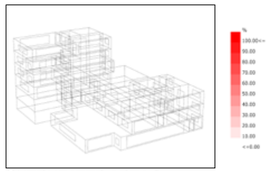
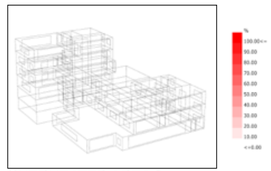
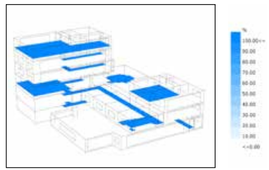


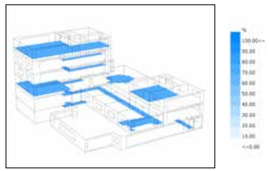
OVERHEATED AREA 0



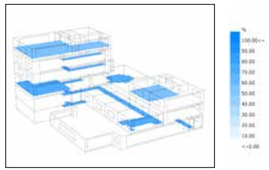
OVERHEATED AREA 0



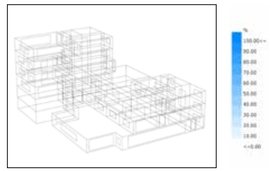
UNDERHEATED AREA 22.11%



UNDERHEATED AREA 22.11%



UNDERHEATED AREA 22.11%



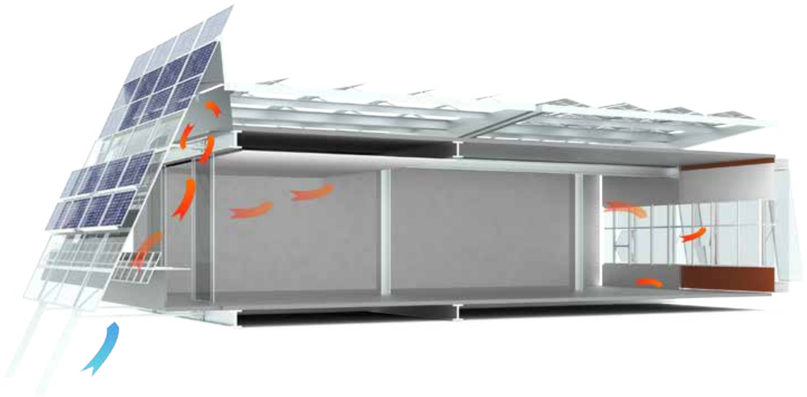
UNDERHEATED AREA 22.11%

+ASHREA 90.1

ASHREA 90.1
+ Heating set point
+ Cooling set point: 28
+ Natural ventilation type: Window natural ventilation
+ Min Indoor Temperature for natural ventilation: 22
+ Max Indoor Temperature for natural ventilation: 28
+ Wind discharge co-efficiency: 0.6
+ Stack Discharge Co-efficiency: 0.6

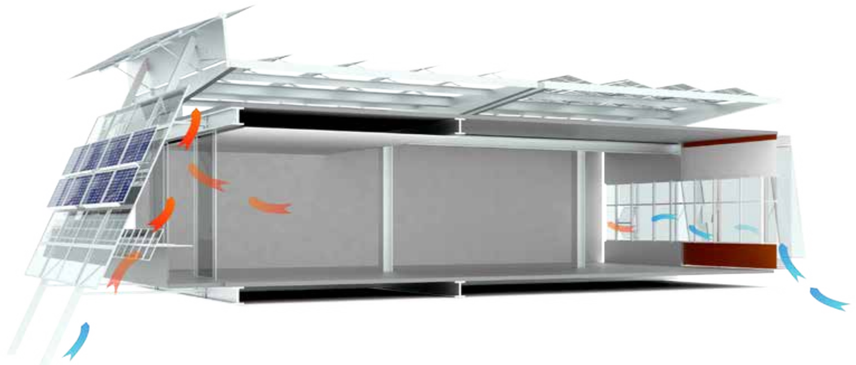
+ ASHREA189.1 (High Performance)
Heating set point
Cooling set point: 28
Natural ventilation type: Window natural ventilation
Min Indoor Temperature for natural ventilation: 22
Max Indoor Temperature for natural ventilation: 28
Wind discharge co-efficiency: 0.6
Stack Discharge Co-efficiency: 0.6

+ Green roof
+ Lighting control
+ New schedule
+ Ashrea 189.1 (high performance)
Heating set point
Cooling set point: 28
Natural ventilation type: Window natural ventilation
Min Indoor Temperature for natural ventilation: 22
Max Indoor Temperature for natural ventilation: 28
Wind discharge co-efficiency: 0.6
Stack Discharge Co-efficiency: 0.6



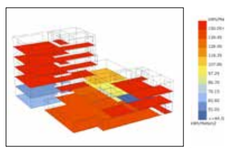
SUMMER:

- One - axis tracking PV panel control the opening of the windows, according to the sun vector
- Double layer facade helps with natural ventilation

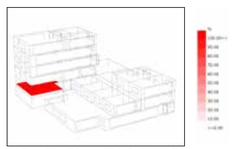


WINTER:

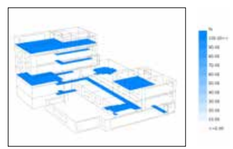
- One - axis tracking PV panel closed to create buffer zone
- Double - layer facade works as a buffer zone



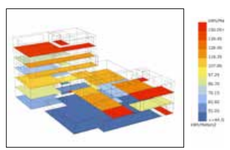
TOTAL THERMAL ENERGY
52.74 KBTU/SFT



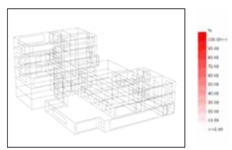
OVERHEATED AREA 4.36%



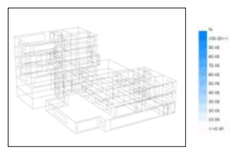
AREA 22.11%



TOTAL THERMAL ENERGY
38.09 KBTU/SFT



OVERHEATED AREA 0



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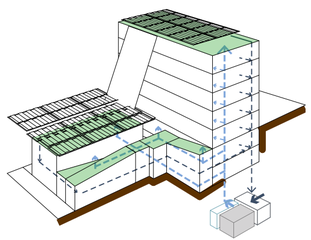
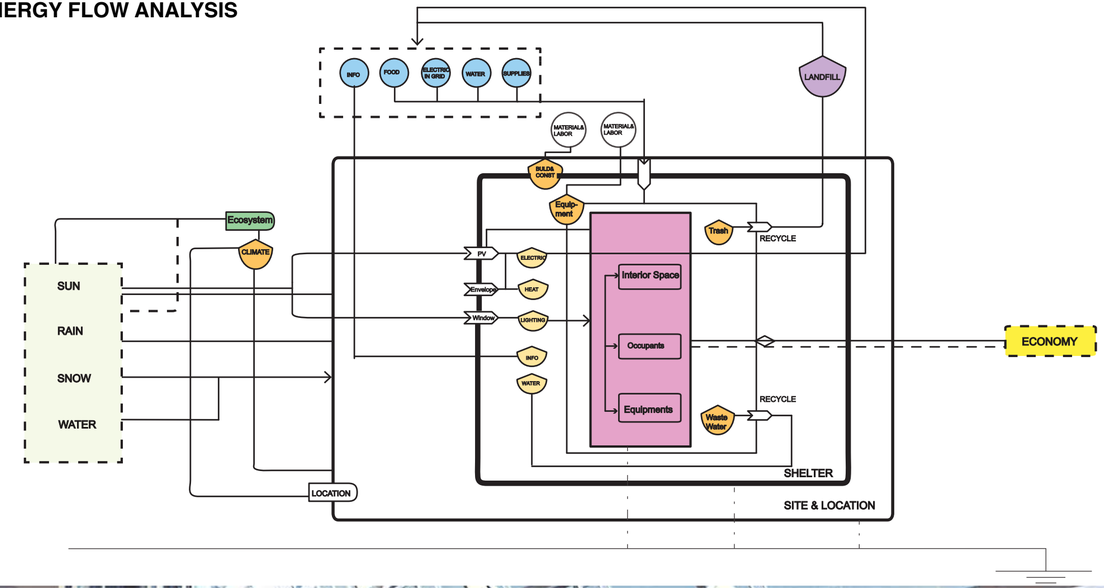
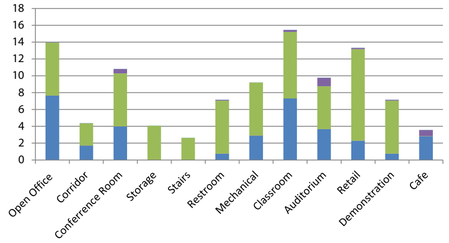


GREEN ROOF
WATER FLOW
CLEAN WATER
WATER PURIFICATION ENGINE

ENERGY FLOW ANALYSIS





Ventilation Per Area
Number of People per Area
Lighting Density(W/m2)
Infiltration Load(W/m2)
Equipment Load (W/m2)

BUILDING LOADS

BASELINE BUILDING

- CBECS Average

HEATING/ COOLING

- Ground source heat pump
- Natural ventilation
- Heating and Cooling set point
- Low infiltration
- Radiant Heat Ceiling
- Solar thermal heat

SCHEDULE

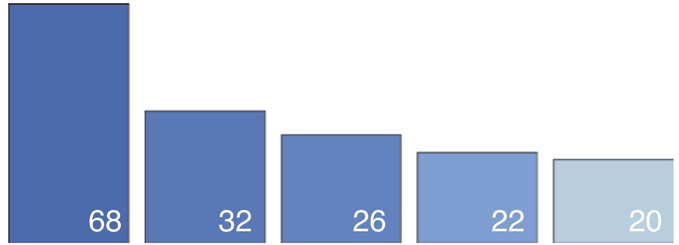
- Motion control lighting and equipment

LIGHTING

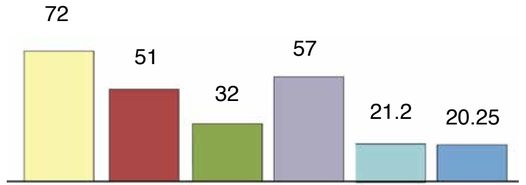
- Maximize daylighting
- Daylighting Control
- Efficient light(Energy Star rec-ommended products)

MATERIAL

- Green Roof
- Hight R-val-ue material (ASHRAE 189.1)
- High per-formance glasses



ENERGY REDUCTION(KBTU/SFT)



UNIT KBTU/SFT

- Average Building(Energy Star Score=50)
- Seattle Energy Code Building
- LEED Platinum Building (10 Energy Credits)
- Baseline Building
- Electricity generated on site
- Total Energy Consumption

THE CROSS

Collaborated with Haoran Lee,
Baihe Cui, Ray Zhao, Lu Tian

Centered parking
Increase large open spcae area by **26%**

Mix-income housing
Attract new settlers and increase density by **184%**

Renovated factory
Reduce construction fee by **53%**

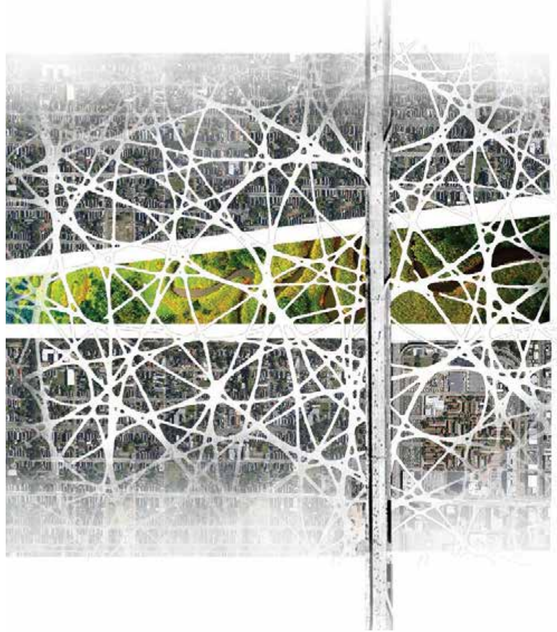
Various open space
Biking
hiking
picnic
meeting

NEIGHBOURHOOD HOTSPOTS

1 High-End Apartment(armamentarium)
2 G.H. Tichenor Antiseptic Co.
3 Bank of New Orleans
4 Health Care Service Corporation
5 Meals From The Heart Cafe
6 Fresh Grocer
7 Parking Building
8 Hampton Inn & Suites Greenway
9 Wicker Elementary School
10 Community Library
11 **Bienville Ave Apartment(market-rate)**
12 **N Roman St Apartment(affordable)**
13 Jazz Musicians' Loft
14 High-End Greenway Apartment(market-rate)
15 Bicycle Rent Station
16 NGO Environmental Protection Agency
17 Oil Painting of New Orleans Association
18 Starbucks
19 Contemporary Arts Center New Orleans
20 Jackson Brewery
21 Westin Hotel
22 Creative Cultural Retail
23 Rouses Supermarkets
24 St. Louis Cemetery
25 Iberville Housing
26 Chemotherapy Treatment Area
27 Two-way Bicycle Lanes
28 Sport Court
29 **N Galvez St Citizen Park**
30 Pecan Orchard
31 Jackson Brewery Square
32 French Quarter Plaza

MASTERPLAN

Affordable Housing 15.2% total housing
Green Space 32.9% total area
Total Investment phase 1 32.9% total area

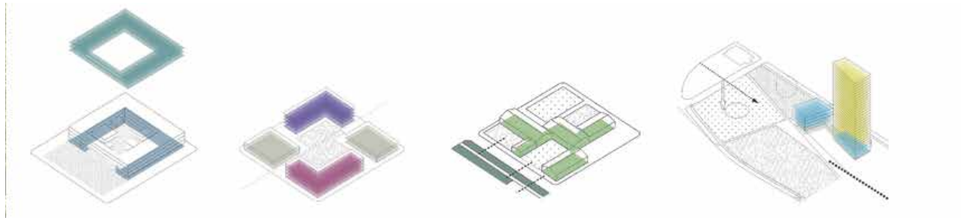


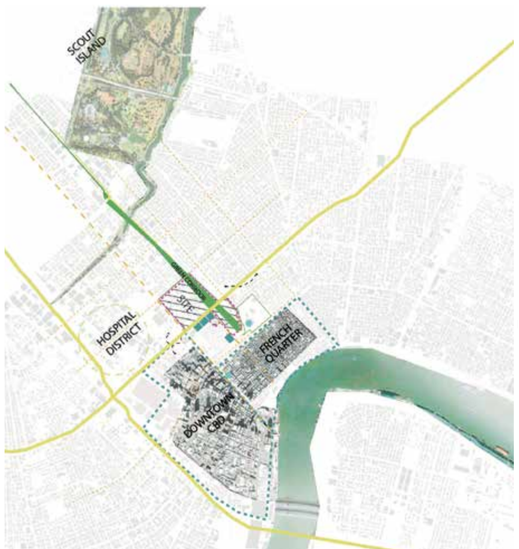
The cross acts as an identity of the site that helps to bring different people together to create a mixed area. New Orleans is a city that attracts may tourists every year. It is a chance to improve the community identity as well as livability. The east-west line act as the gateway from the green corridor to French Quarters along the riverside. It largely expands the tourism area into the city community to increase the retail chance and meeting of diverse people. The south-north line of the cross connects the community with the downtown CBD area, which can attract workforce here.

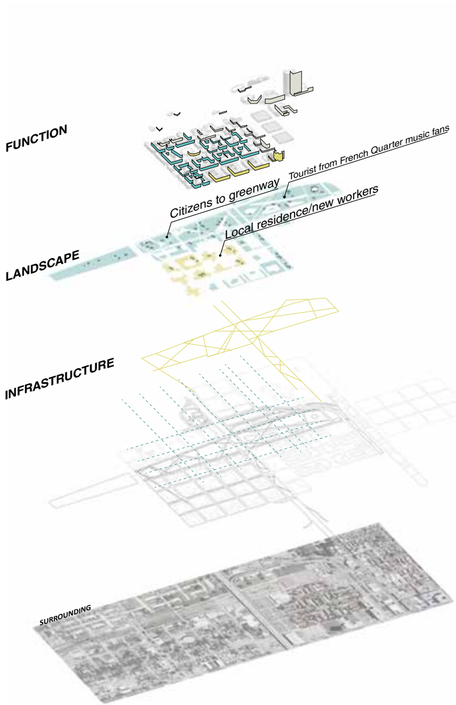
SKELETON CONSTRUCTION

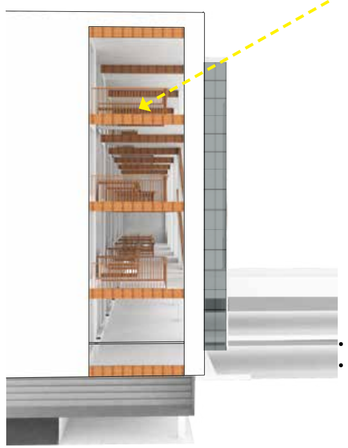
DEVELOPMENT WITH SKELETON

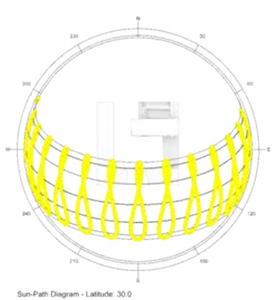
DEVELOPMENT WITH SKELETON



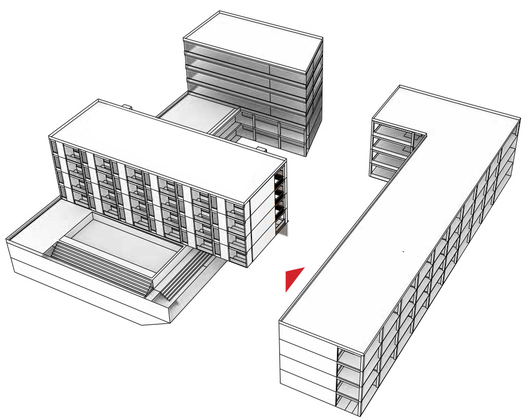








- Deep Corridor Protect sunlight
- Public space



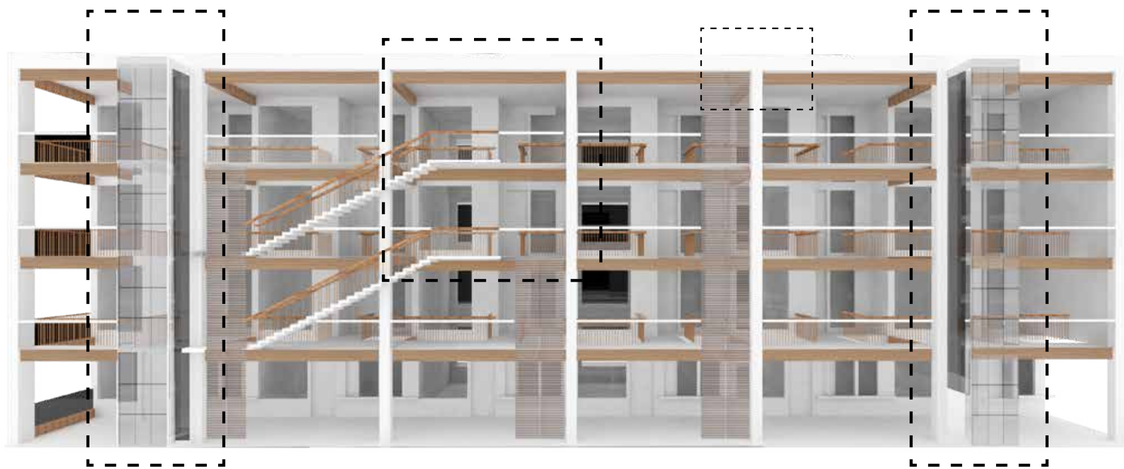
PROTOTYPE FOR RESIDENTIAL UNIT

- TRANSPORTATION
- VIEW

- PUBLIC COMMUNICATION OUTDOOR AREA

- SHADING
- BUFFER ZONE

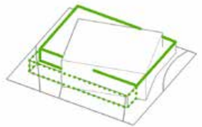
- TRANSPORTATION



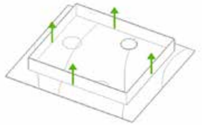
TWO GREEN VILLA DESIGN

From Green Building Concept to
Energy simulation

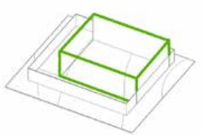
Define the Space



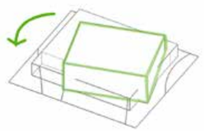
Make a Concession



Protect Threes

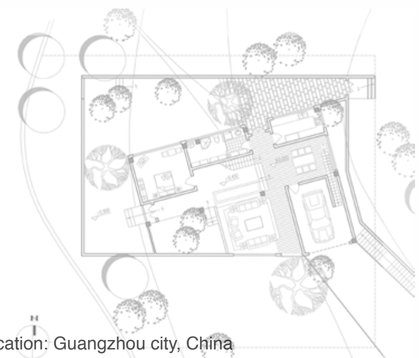


House and Garden



Rotate the House

GREEN HOUSE DESIGN 1
Experience - based design 2013

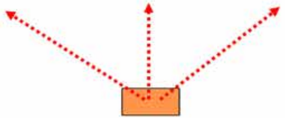


Location: Guangzhou city, China

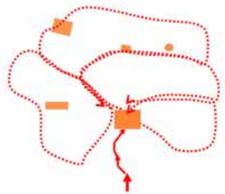
Gross Area: 425 m2
Floor Area: 160 m2
Plot Ratio: 0.528

1ST FLOOR PLAN

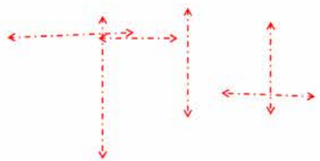
Chines philosophy about Architecture:
Our ancestors love nature. Whether they are rich or poor, they spent money on bringing the nature into their house or garden, Dui Jing (scenic focal point) and borrowing the scenery from a distance are two major techniques. Space created by the way reflect classical Chinese Philosophy, ZEN.



RADIATE FROM CENTRAL VIEW



SCENE CHANGED WITH WALKING



RELATIONSHIP BETWEEN BUILDINGS

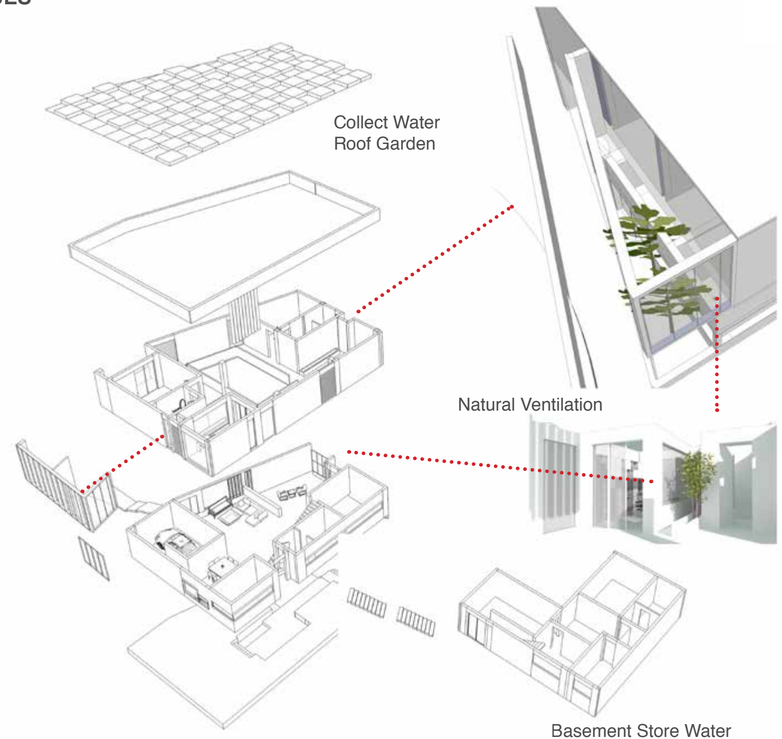
INTERPRETATION OF VERNACULAR ARCHITECTURE

TRADITIONAL BUILDING TECHNIQUES

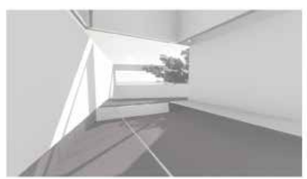
Shell walls can cast shadow by themselves. Shells can provide air layer to make the interior environment more moderate without any HVAC system.

Traditional Tang Long is used for natural ventilation. It is a kind of door in front of real door. Functions: protect, connect, decide, decorate.

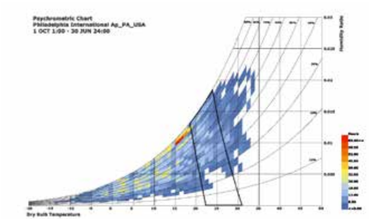
Traditional Leng Xiang is used for natural ventilation principles: Thermal pressure helps ventilation.

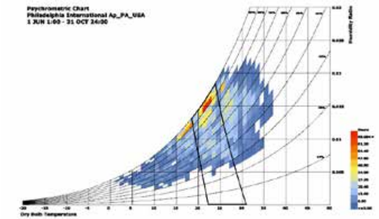


INTERIOR DESIGN



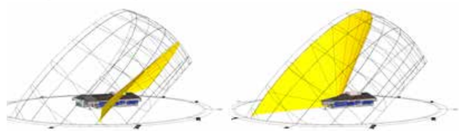
HUMAN COMFORT IN DIFFERENT SEASONS





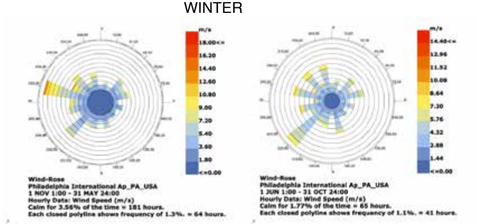
SUN PATH ANALYSIS BY LADYBUG

Find the position of the skylight and define the position, facing of building.



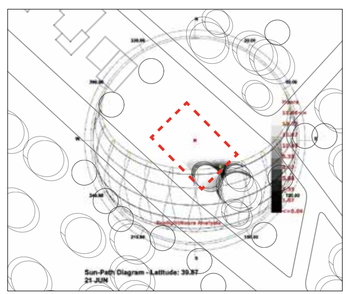
SUN POSITION ANALYSIS: WINTER

SUMMER

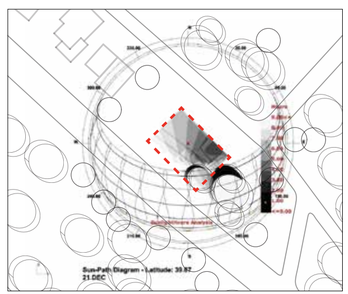


WIND ANALYSIS: WINTER

SUMMER



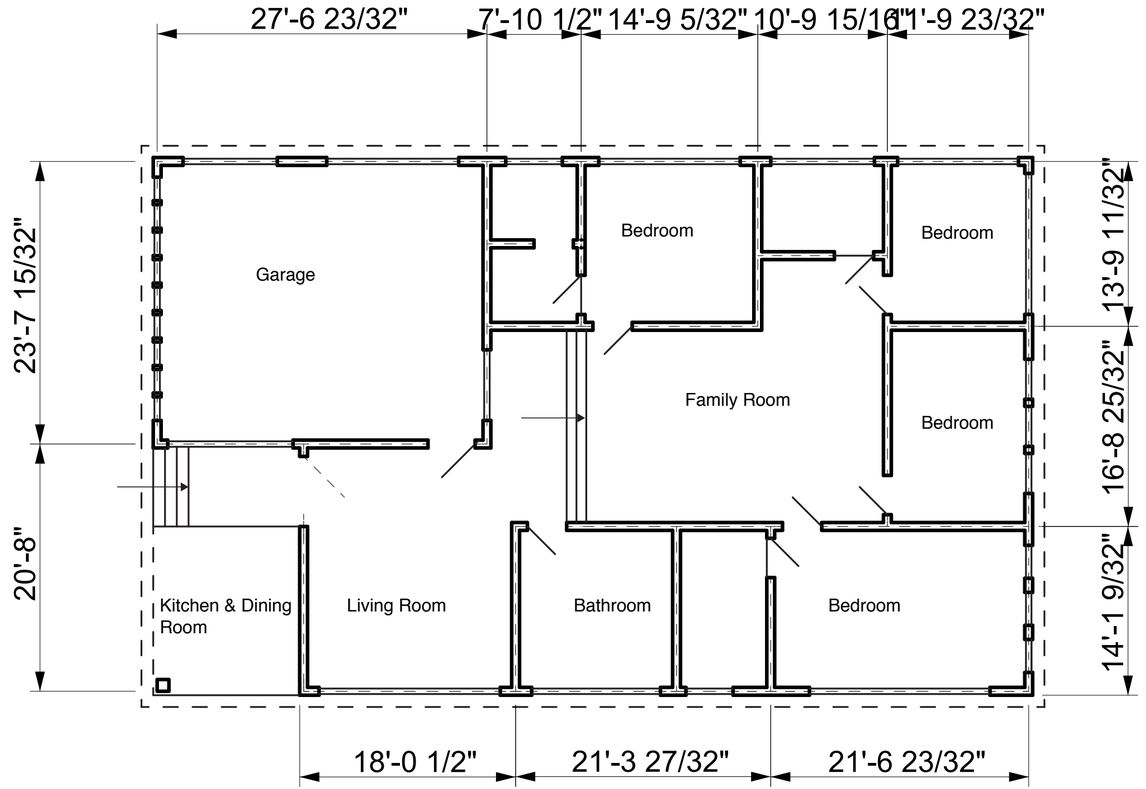
SHADOW ANALYSIS: WINTER



SHADOW ANALYSIS: SUMMER

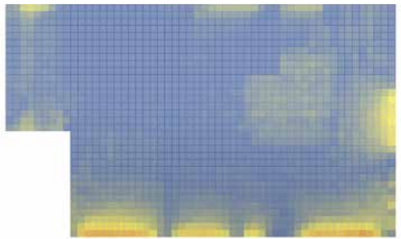
GREEN HOUSE DESIGN 2

Simulation based design 2014

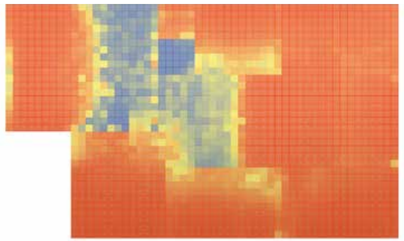


1ST FLOOR PLAN

DAYLIGHT AUTONOMY

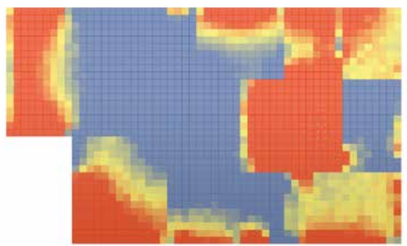


DIVA-for-Rhino Simulation
Daylight Autonomy (5000 lux)
Mean Daylight Autonomy = 7.69% of time occupied

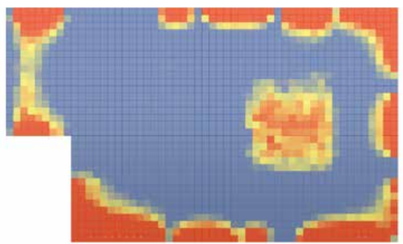


DIVA-for-Rhino Simulation
Daylight Autonomy (300 lux)
Mean Daylight Autonomy = 76% of time occupied

DAYLIGHT ILLUMINANCE

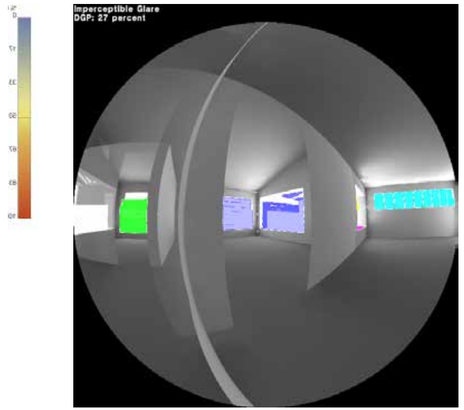


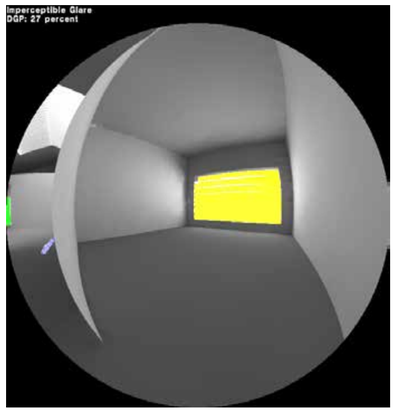
DIVA-for-Rhino Illuminance Nodes Analysis
Sky Condition, Month, Date and Time: +s 06 21 12
Mean Illuminance = 788.35 lux
38.4% of Area between 500 & 1000 lux

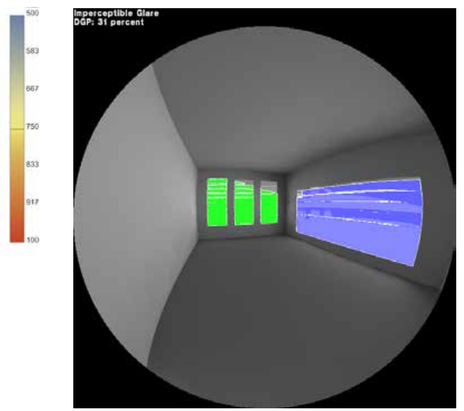


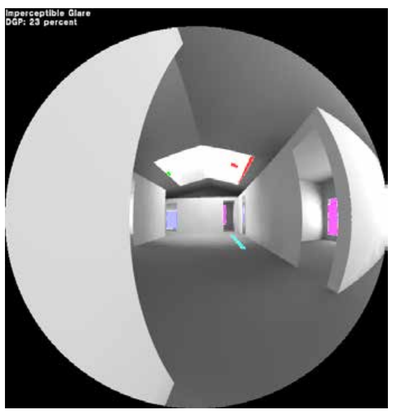
DIVA-for-Rhino Illuminance Nodes Analysis
Sky Condition, Month, Date and Time: -c 12 21 12
Mean Illuminance = 534.31 lux
27.1% of Area between 500 & 1000 lux

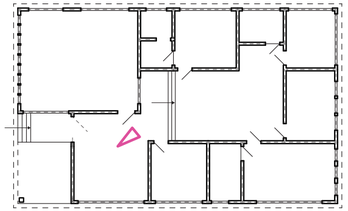
GLARE POSSIBILITY



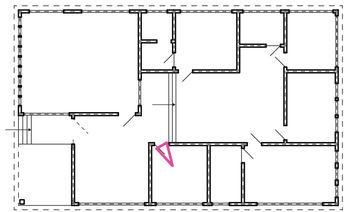




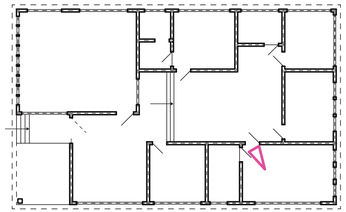




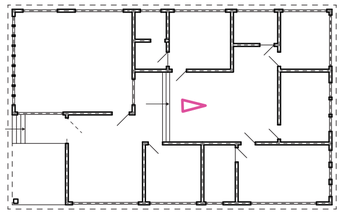
12:00PM, JULY 21ST
DGP 27%
DGI 24.3%



12:00PM, JULY 21ST
DGP 27%
DGI 22.64%

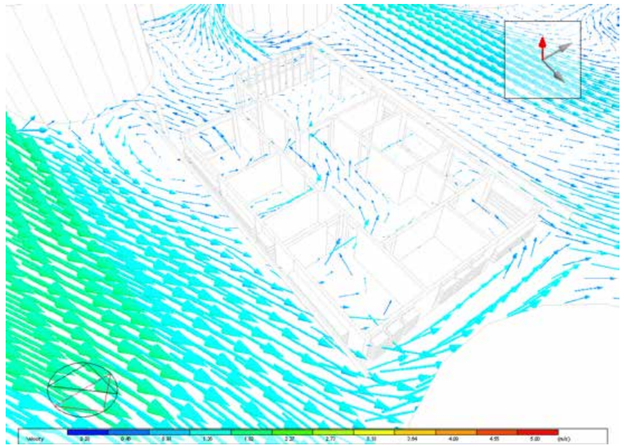


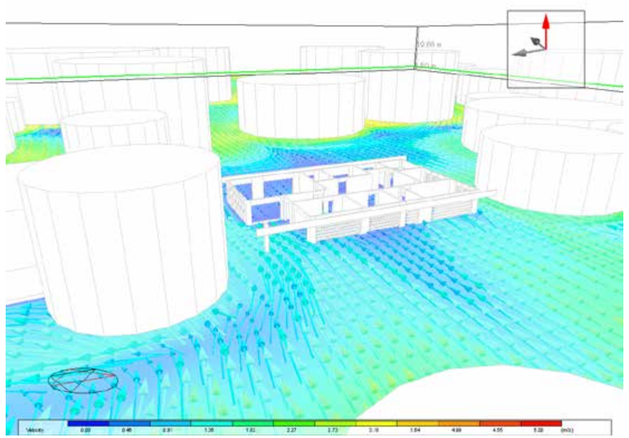
12:00PM, JULY 21ST
DGP 31%
DGI 24.2%

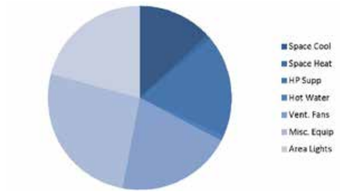


12:00PM, JULY 21ST
DGP 23%
DGI 18%

WIND DIRECTION & SPEED

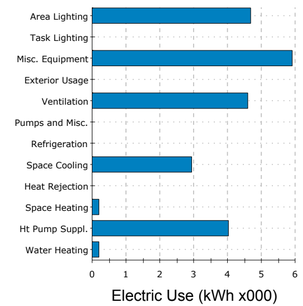






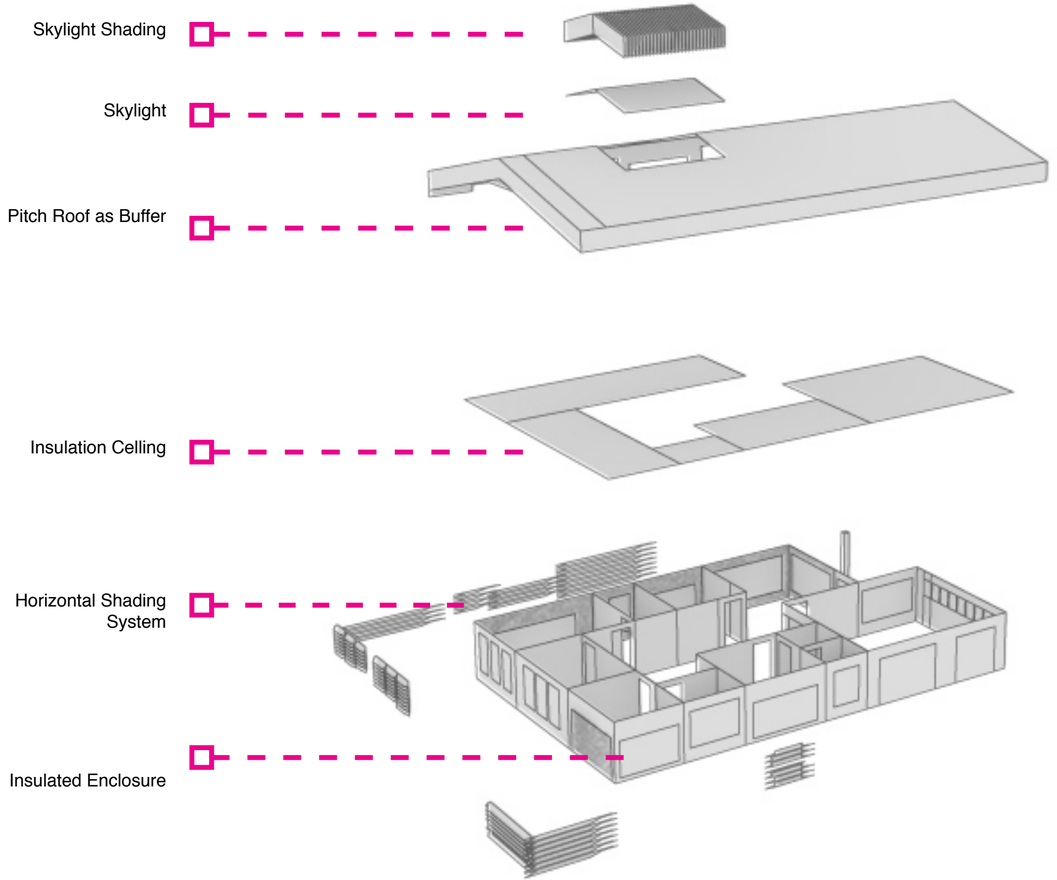
CONCLUSION:

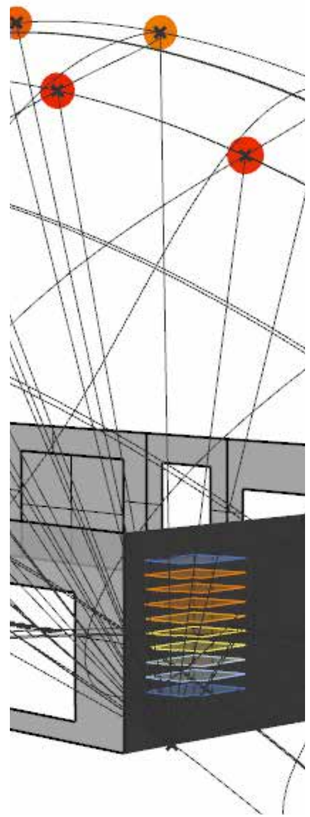
The climate analysis and the site analysis is the first step to design a green building. But each specific site has its own micro-climate.
Simulation software is a good way to get further understanding of the site and design.



Summer Wind Direction and Speed.
The indoor wind speed is around 1.5 m/s, in which people will fell comfortable

Winter Wind Direction and Speed.
The indoor wind speed is around 1.5 m/s, in which people will fell comfortable





The color Gradient on the overhanging shows the necessity of the shading device. And the color of the sun represent the sun position and its radiation, temperature.

SENIORS' APARTMENT 2014

ENTERTAINMENT
Dancing Room
Singing Room
Chesting Room
Movie Theater
Auditorium

COMMUNICATION
Lounge

ACTIVITIES

NATURE






HEALTH CARE
Diagnostic Room
Singing Room
Chesting Room

LIVING
Senior Apartment
Assisting Living
Assisting Living 2

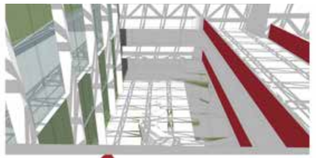
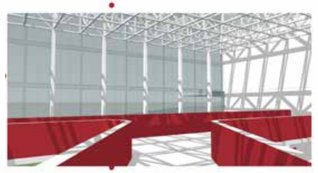
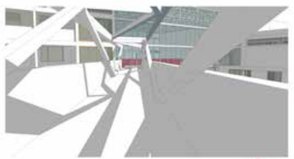
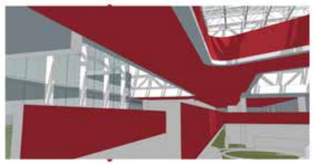
EDUCATION
Computer room
Libraries

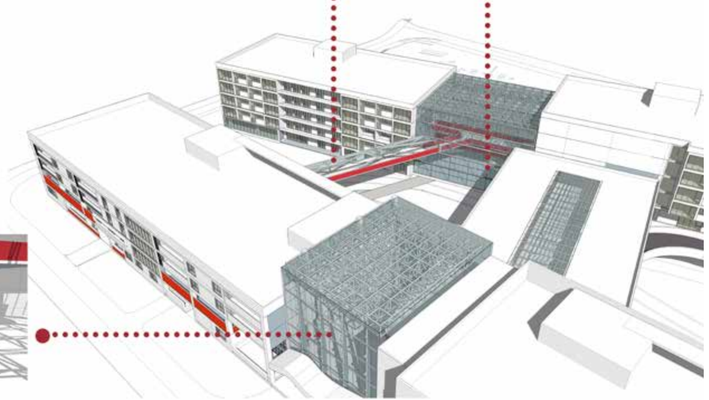
ACCESSIBILITY
COMMUNITY
DAY LIGHTING

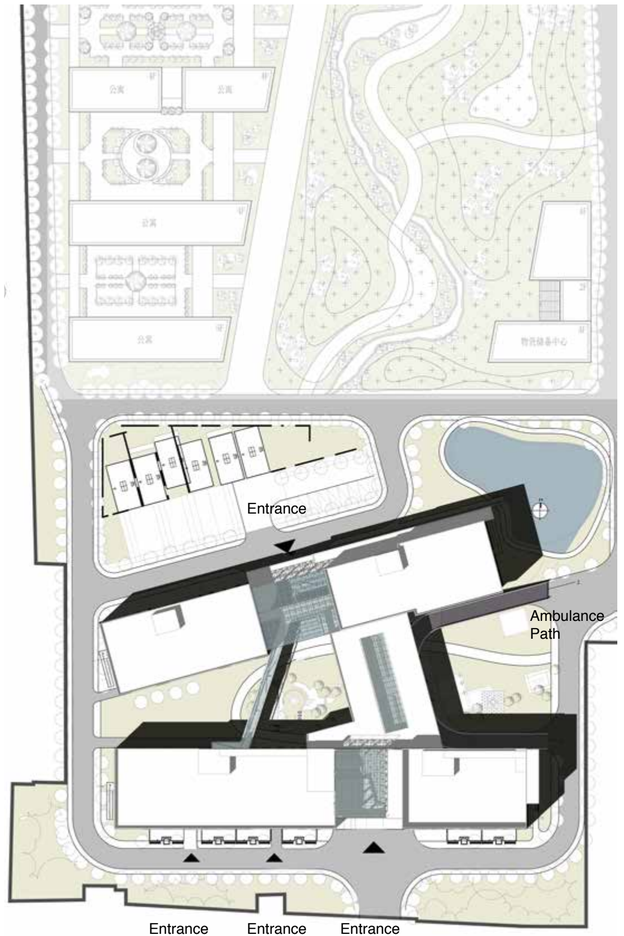
• Four groups of buildings are connected by winter gardens. Numerous plants are planted in the garden, which provide the chance for seniors to relax themselves and get involved in gardening.

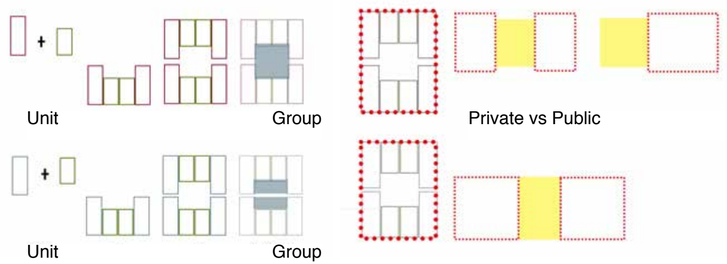
• Colorful corridors going through winter gardens offers a different perspective to the nature.

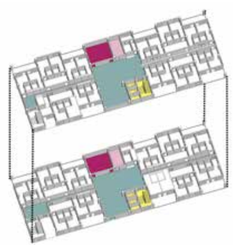
• The winter gardens are also for communication and entertainment. Cafe and tea house are placed along the corridors and bridges.



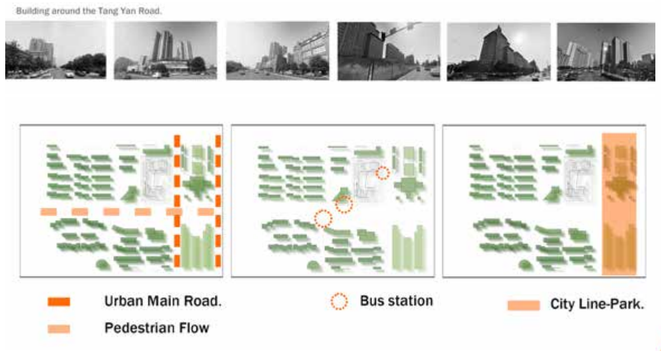


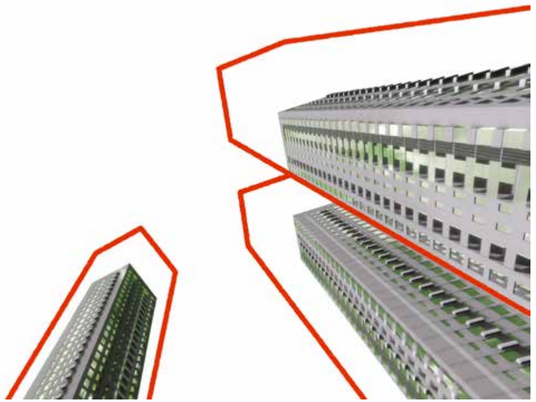


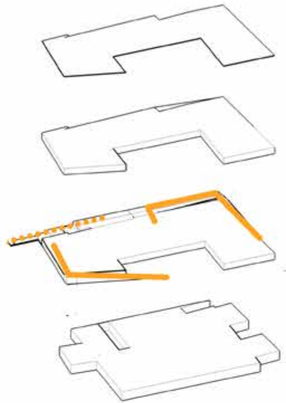


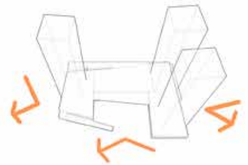
LIVING UNIT DETAIL

HIGH RISE VS. BICYCLE 2012

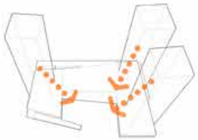






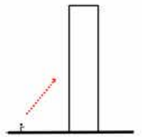


Separates quiet and noisy spaces

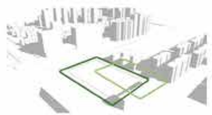


Public Supervision

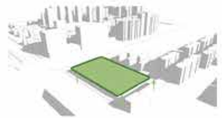
Human Perspective



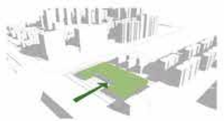
City Perspective



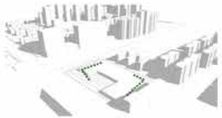
Boundary



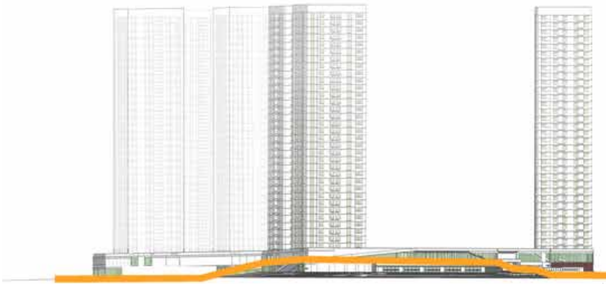
Available Space



Public Square



Ramp



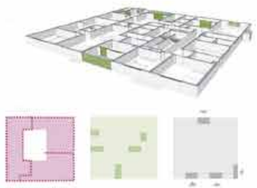
CONCEPT:

• Sustainability - Reduce the impact on surrounding , which created by high-rise building.

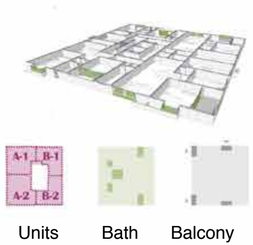
• City Memories - Respect the traditional city planing and architecture by providing the same scale and pattern, and rhythms.

• Modern Living - Meet peoples basic living needs and provide entertainment and public spaces.

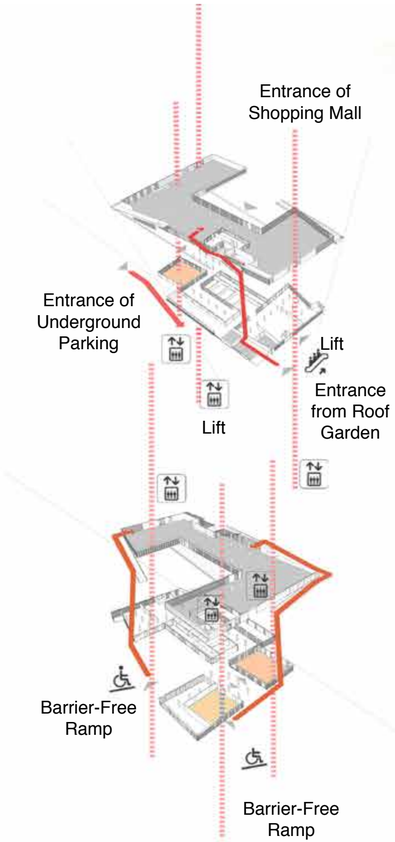
Increase the percentage of the useful space of buildings so as to increase the environmental and economical efficiency, as well as keep a comfortable indoor environment.

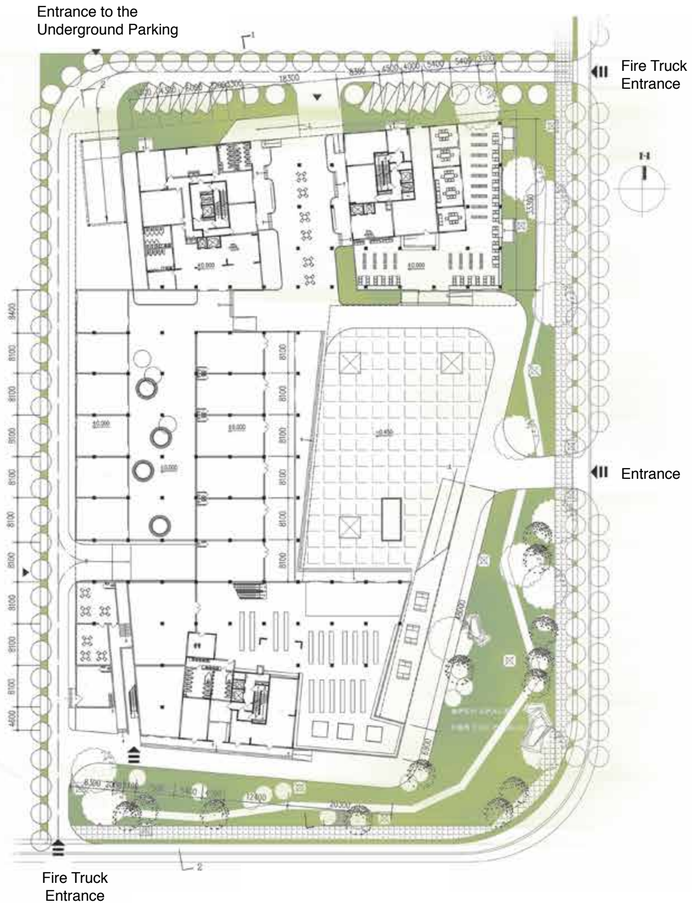


Increasing the building unit efficiency to reduce the bad impact on surrounding buildings and people.



East Elevation North Elevation South Elevation





1ST FLOOR PLAN

Vertical Transportation

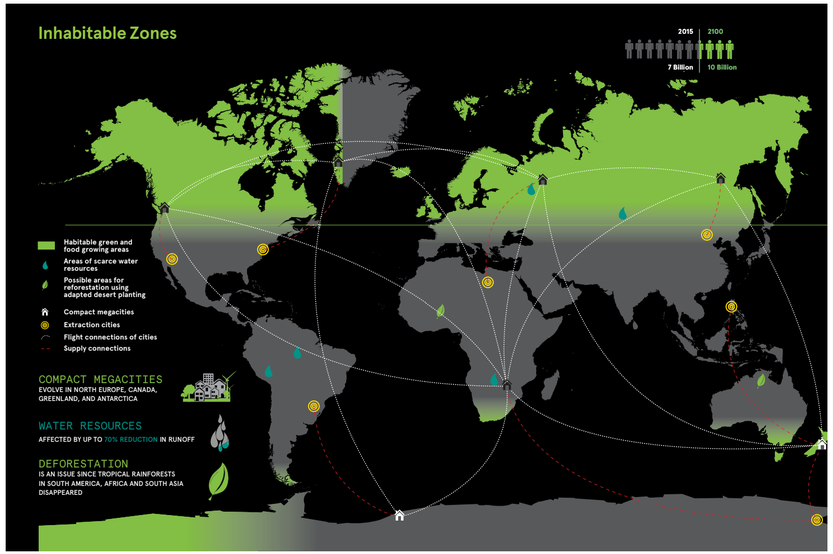
Three Towers

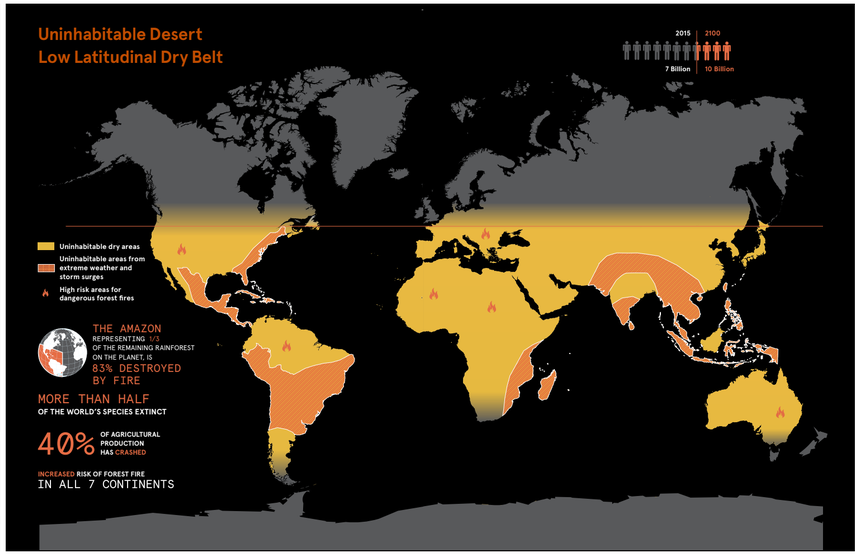
Bicycle Lane

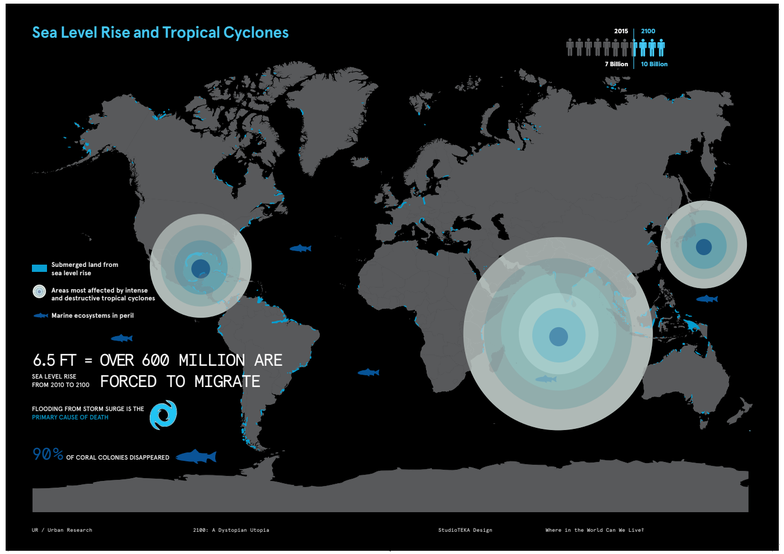
Pedestrian Pass Way

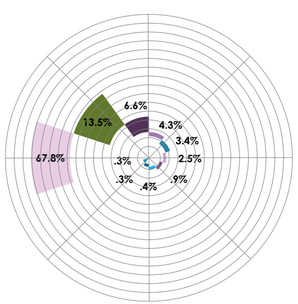
PROFESSIONAL WORK

2100: A Dystopian Utopia

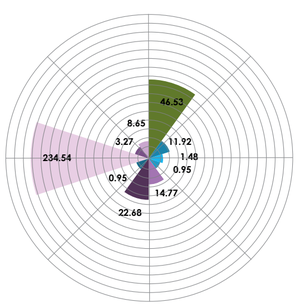




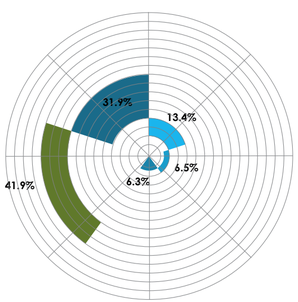




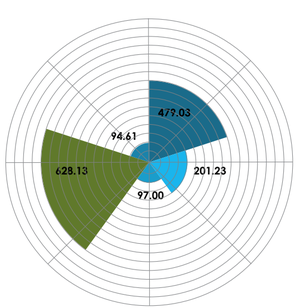
Current Energy Distribution



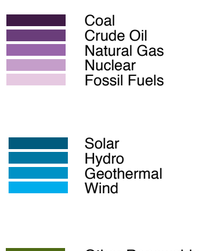
Current Energy Output
(QBtu/y)

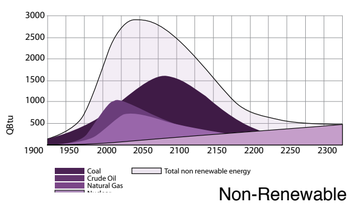


Future Energy Distribution

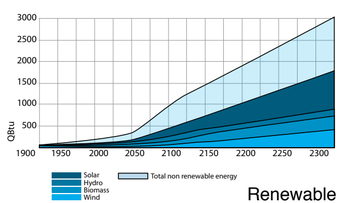


Future Energy Output
(QBtu/y)

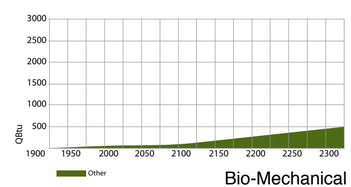




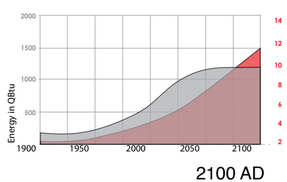
Non-Renewable



Renewable

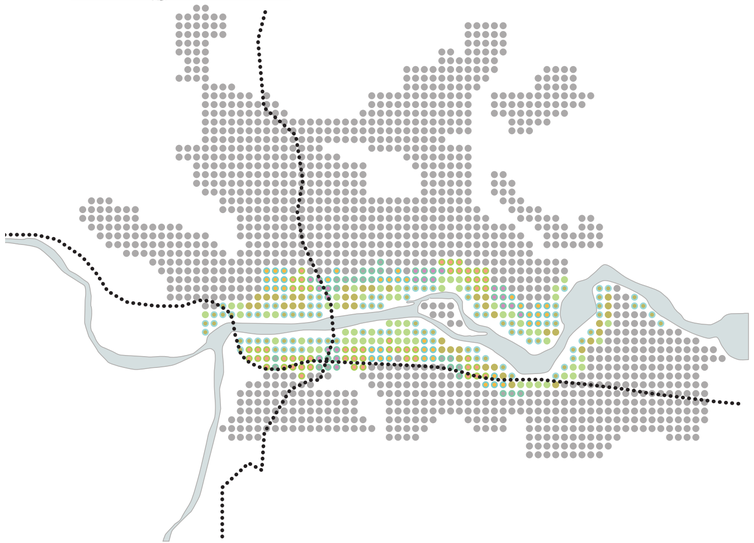


Bio-Mechanical



2100 AD

TYNDA



PROGRAMS

- Existing
- Vertical Farm / Recreational
- Commercial
- Greenscape + Commercial
- Greenscape + Energy Gen.
- Greenscape / Institutional
- Greenscape / Existing
- Residential + Farming

NEW TECHNOLOGIES

TRANSPORTATION

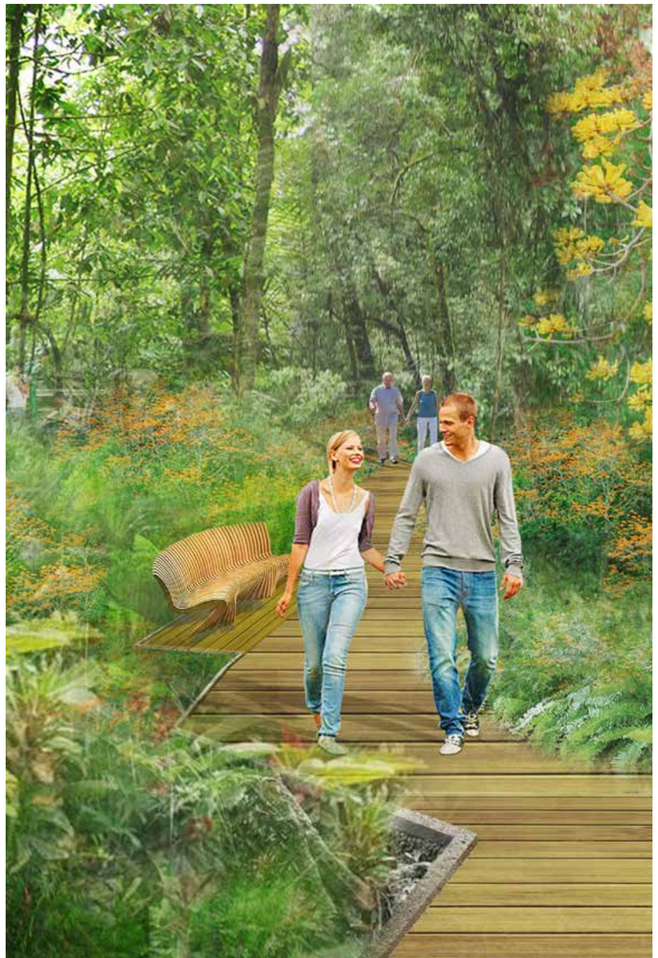
- Rail
- Automobile
- Airplane
- Boat
- Superbus
- Maglev
- Universal Platform Transport
- Space Port

TERRAIN

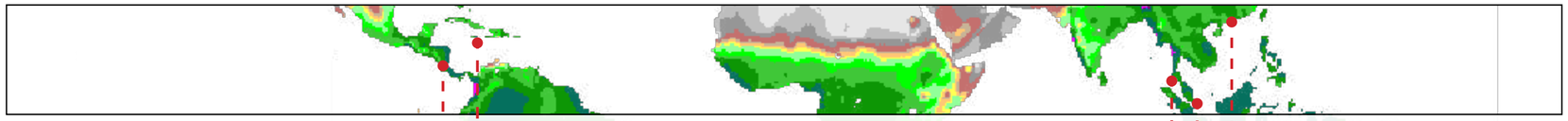
- Water
- Flat

STRATEGIES

- Biomass
- Solar Energy
- Wind Energy
- Water Collection
- Geothermal

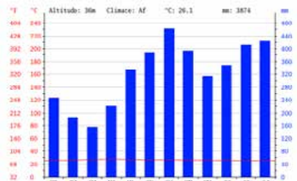


CASE STUDY



Puerto Viejo, Costa Rica

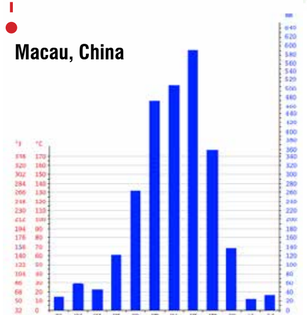
In Puerto Viejo, the average annual temperature is 26.1 °C. In a year, the average rainfall is **3,874 mm**.



Puerto Viejo de Talamanca is a popular tourist destination. It is known in the surfing community for the biggest and most powerful waves in Costa Rica, known as Salsa Brava. It is also home to beautiful beaches, such as Playa Chiquita, Playa Negra, and Punta Uva, which are a few of Costa Rica's most spectacular beaches that can be found between Puerto Viejo and Manzanillo. International arrivals in Limon, 2014 : **2.4M**

Official statistics ICT: http://www.visitcostarica.com/ict/pdf/anuario/Statistical_Yearly_Report_2013.pdf

Macau, China

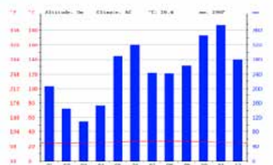


Macau has ample rainfall, with average annual precipitation being **2,120 mm**. Summer is very warm to hot (often rising above 30 °C (86 °F) during the day). The hot weather is often followed by heavy rain, thunderstorms and occasional typhoons. The city received **31.5 million** visitors last year(2014) - a 7.5 percent jump over 2013 - the Macau Government Tourist Office said 21 January 2015.

http://www.scmp.com/news/hong-kong/article/1688347/macau-tourist-arrivals-75pc-amid-fall-gambling-revenue

Port Antonio, Jamaica

In Port Antonio, the average annual temperature is 26.4 °C. In a year, the average rainfall is **2,967 mm.**

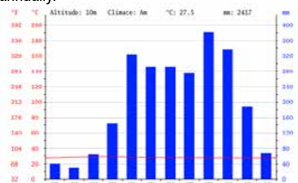


There were **20,630** stopover visitors reported on the 2014 annual travel statistics report.

http://www.jtbonline.org/statistics/Annual%20Travel/Annual%20Travel%20Statistics%202012.pdf

Phuket Island, Thailand

The average annual temperature is 27.5 °C in Phuket. About **2,417 mm** of precipitation falls annually.



Phuket Island is a rainforested, mountainous island in the Andaman Sealn. The island is home to many high-end seaside resorts, spas and restaurants. Patong, the main town, has a more casual vibe and is filled with wild nightclubs, bars and discos. ...Phuket ranked 31st with **3.3M** visitors, in Euromonitor International's Top City Destination Ranking, 2008.

Euromonitor International (Jan 2010). "Euromonitor International's Top City Destination Ranking". Retrieved 14 October 2010.

Batam, Indonesia

The temperature here averages 26.8 °C. Precipitation here averages **2,441 mm.**

A short boat ride from Singapore, Batam is a free trade zone with multiple busy ports, known for its beaches, raucous nightlife and malls offering duty-free shopping. Upscale resorts in the shoreline areas of Nongsa and Waterfront City offer golf courses and water sports including windsurfing, parasailing and jet skiing. International arrivals in Batam is **1.2M**, in 2014

http://indonesia.travel/en/news/detail/1565/the-riau-islands-province-targets-2-5-million-international-arrivals-in-2015







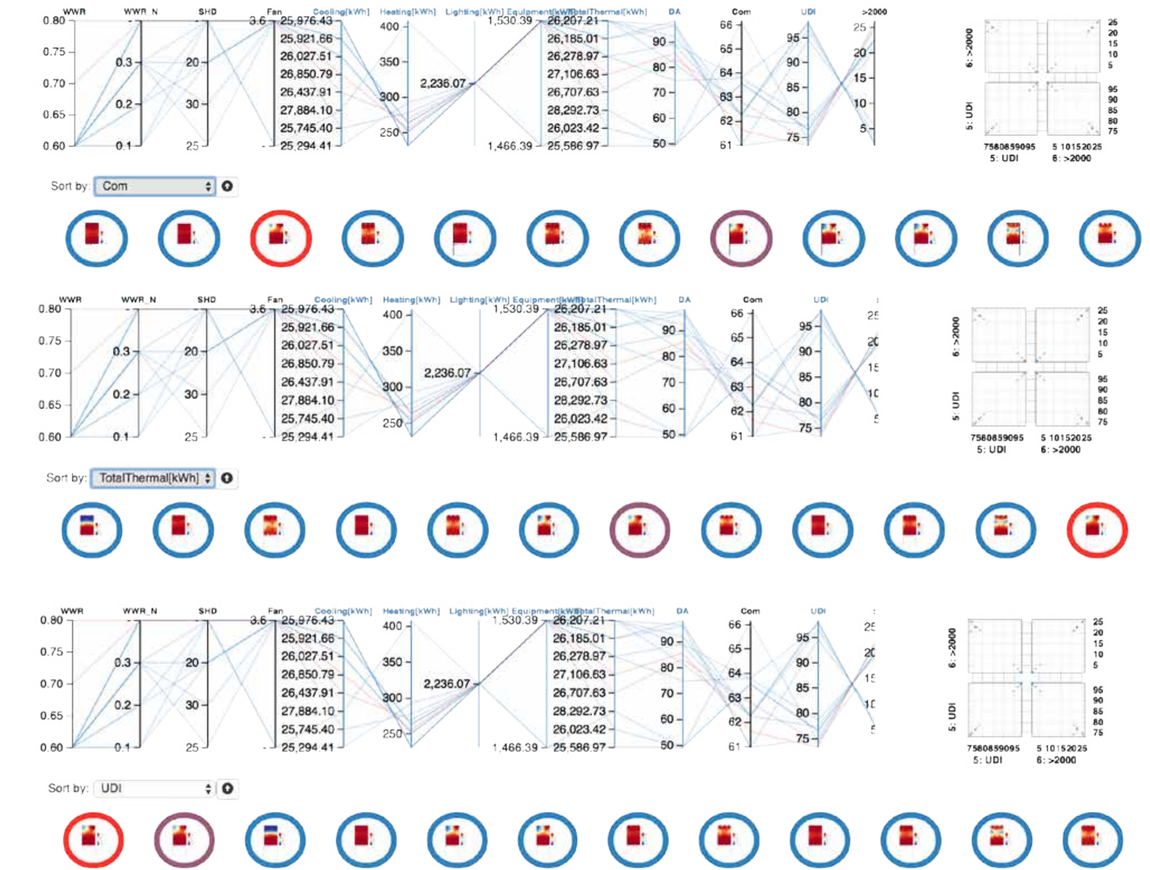




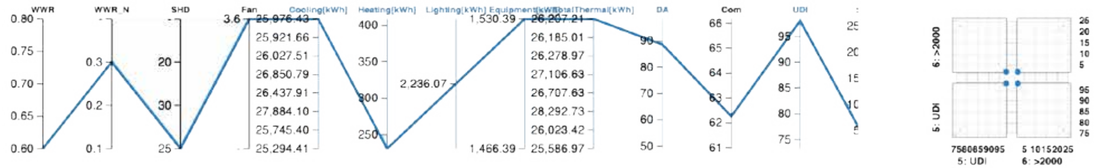




DATA ANALYSIS AND VISUALIZATION



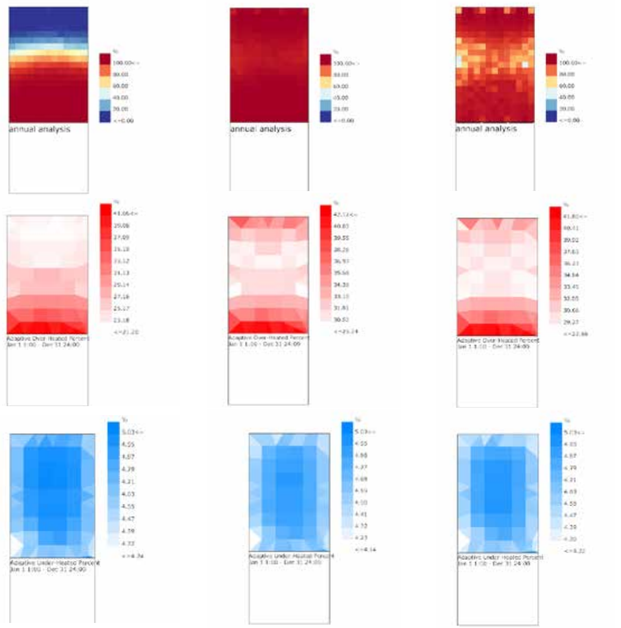
BEST SCENARIO

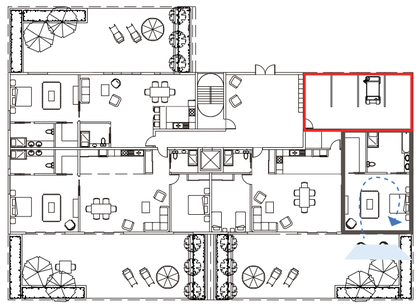


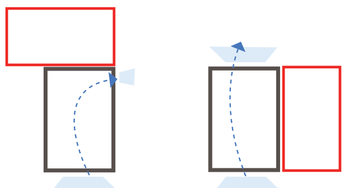
COMFORT
WWR_0_0_0.6_0

DA
WWR_0.3_0_0.6_0

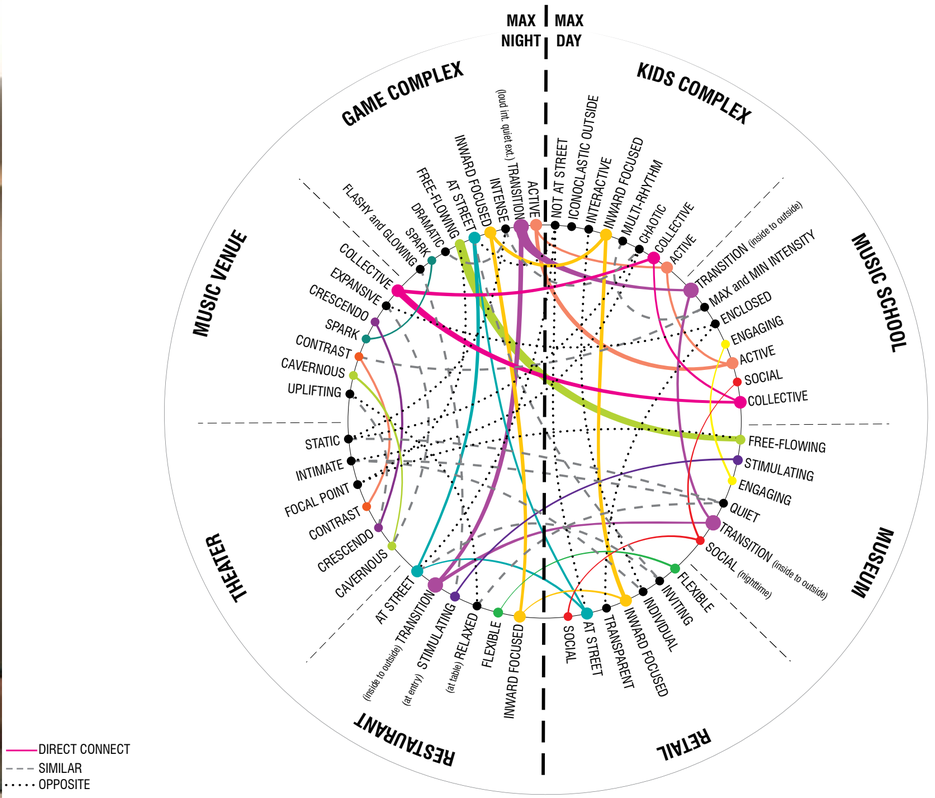
UDI
WWR_0.3_0_0.6_0_BL 25







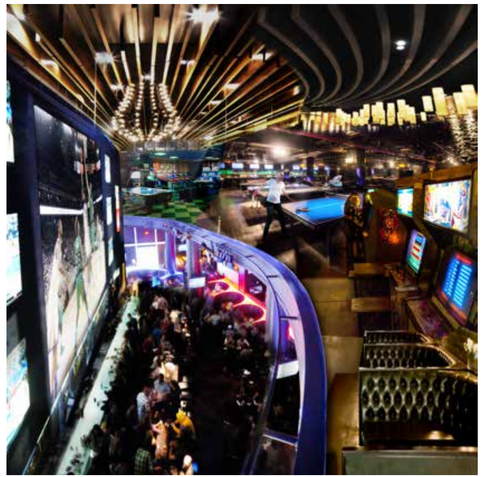
Natural Ventilation

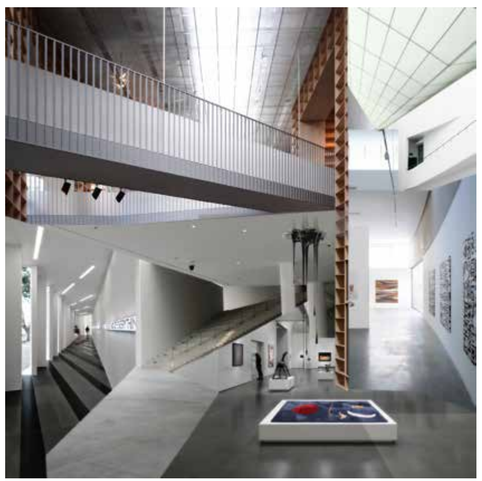


DIRECT CONNECT
SIMILAR
OPPOSITE

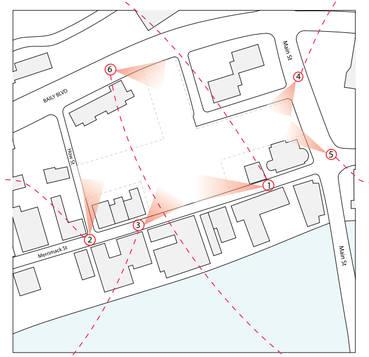
PROGRAM PROPERTY

Performing Art Center 2015 - 2016



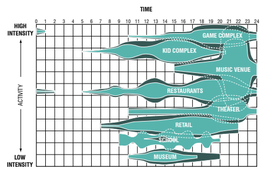


PEDESTIRAN VIEWS FROM MERRIMACK STREET

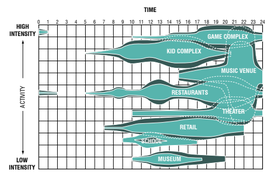


PASSENGER VIEWS FROM MAIN ST AND BAILEY BLVD

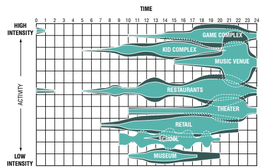
PROGRAM ACTIVITY



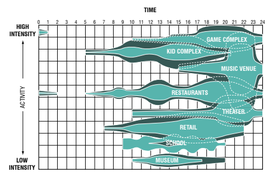
Spring



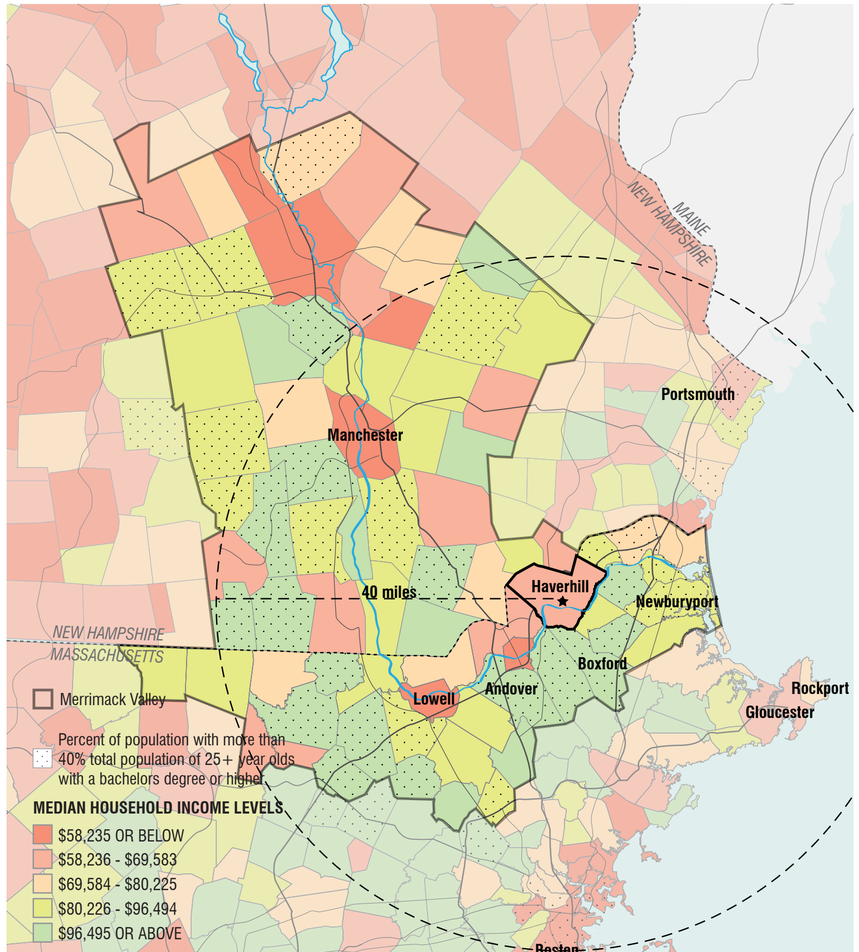
Summer



Autumn



Winter



43 MILES
on average, distance fans travel to attend a concert

100 MILES
about 10% of fans travel in excess of 100 miles to attend a concert

CONCERT

AVERAGE INCOME 2015: $74K
AVERAGE INCOME 2013: $75K

AVERAGE AGE 2015: 43
AVERAGE AGE 2015: 43

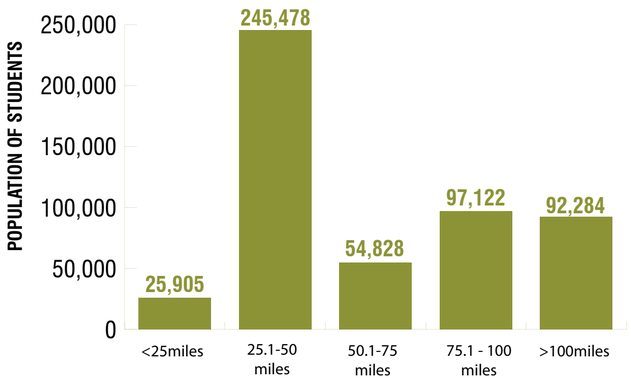
LIVE THEATER OR ARTS EVENT

AVERAGE INCOME 2015: $80K
AVERAGE INCOME 2013: $80K

AVERAGE AGE 2015: 47
AVERAGE AGE 2013: 47

http://insider.ticketmaster.com/concert-road-trips/
http://www.slideshare.net/LiveAnalytics/us-live-event-attendance-study

STUDENT POPULATION NEAR HAVERHILL



The Merrimack Valley is made up of approximately 75 towns and cities in New Hampshire and Massachusetts.

The average income for this region is $84,266, with the average age being 41.4. Over half of the towns in the area have a bachelors degree education level above Massachusetts' state average of 40%, which is comparably high in relation to the 29.7% US average. This makes Haverhill's location suitable to support a performing arts center. The residents are highly educated, earn a substantial income, and also fall within the 2014 average age of live performance attendees, as conduced by Live Analytics, a Ticket Master research group.

DRAFT MODELS