San Francisco Space Fiction

Notions of nature in a Dataism age

Master Graduation Project of Leyang Chen
TU Delft | Landscape Architecture
Clearing & Oasis
Nature: Danger & Resource
Aesthetic & Ethic: Surviving

Enclosed Garden
Nature: God’s presents and punishment
Aesthetic & Ethic: Access to God

Rational Garden
Nature: God’s Instruction
Aesthetic & Ethic: Reveal order from chaos

Formal Garden
Nature: A measure of power
Aesthetic & Ethic: Shape and maintain nature

Picturesque Garden
Nature: The source of goodness in man
Aesthetic & Ethic: The reasons in wildness

Urban Park
Nature: Functional component of city
Aesthetic & Ethic: Health and recreation

Natural Design
Nature: An ideal image
Aesthetic & Ethic: Interpret the image of nature

Rational Design
Nature: An ideal image
Aesthetic & Ethic: Interpret the image of nature

Resilient Design
Nature: Dynamic process
Aesthetic & Ethic: Relationship and uncertainty
Speculation of future urban landscape in a data-ism age
Notions of nature in landscape architecture fit in the theoretical frame of Data-ism.
ANIMSIM
Nature justifying human

THEISM
God justifying human and nature
Study model of San Francisco
(Made together with Jeroen van der Kwaak, Zhuting Li and Menghan Fu)
3 x 3 x 3 analyses in bay-scale
(Made together with Seul Lee, Sumanth Rao and Licheng Wang)
Timeline of San Francisco
(Made together with Seul Lee, Sumanth Rao and Licheng Wang)
San Francisco has long way to go to reach its greenhouse gas reduction goals by 2025, through 0 waste, 50% of all trips on sustainable transportation and 100% renewable sources of energy.

Bay area is one of the most productive region in California. But food production will decrease 30% by 2070 due to globe warming and sea level rise.

Infrastructures are insufficient to meet the needs of being a high-growth and prosperous city.

5m SLR=3m Global Surge in $1000

X 7499

45% of tenants in San Francisco pay more than 30% of their income in housing.

76% of possibility to have an over 7.0M earthquake in following 30 years.
100 years to be inundated, every 2 years to be Flooed!

Source: Resilient San Francisco, 2016; San Francisco Sea Level Rise Action Plan, 2016; NRC (2012); NOAA (Online Data); Climate Central (Online Data)
75% probability for an over 7.0 M Earthquake within 30 years.

Liquefaction susceptibility map

Source: USGC (2014); Earthquakesafety (Online Data).
Mayor’s 100% Renewable Energy promise is a Trick!

California Energy Flow (2013)

- Petroleum (35%)
- Natural Gas (27%)
- Renewables (6%)
- Hydroelectric (2%)
- Nuclear (2%)
- Coal (0.5%)
- International Electricity Imports (0.5%)
- Electrical System Losses (16%)

Energy Source

Use by Sector

- Passenger Vehicles
- Transportation (Not Cars)
- Commercial
- Residential
- Industrial
- Agriculture and Forestry
- Not Specified

Resulting Emissions (in Millions of Metric Tons of CO2e)

- Passenger Vehicles (26%)
- Transportation (Not Cars) (11%)
- Commercial (5%)
- Residential (7%)
- Industrial (23%)
- Agriculture and Forestry (5%)
- Not Specified (0.2%)

San Francisco Electricity Supply Mix (2010)

- Commercial Natural Gas
- Municipal Natural Gas
- Residential Natural Gas
- Commercial Electricity
- Residential Electricity
- RPS-Eligible Renewables
- Large Hydro
- Nuclear
- Waste
- Cars & Trucks
- Public Transit

San Francisco Communitywide GHG Emission (2010)

- Fossil Fuels
- RPS-Eligible Renewables

Commuting Means from 2000 to 2014

Commuting Pattern in Bay Area (Alasdair Rae, 2015)

52% green Traffic is an illusion!

Source: SFMTA Factsheet, 2015; American Community Survey; U.S. Census Bureau: Census Transportation Planning Package (2010)
Population is growing (old)!

Population Trends and Age Distribution to 2040

Building Typology Analysis
(Ruojin Wu, Jie Yang)

Land Value Comparison San Francisco vs Manhattan

Source: Census Bureau; ABAG, Projections 2013; Trulia.com
Can we keep our Food production?
Timeline of Future Environmental Risk

Meeting the CO2 budget
The earthquake over 7.0 M
Global warming changes agriculture fundamentally
Sea level rises over Embajadores

2016 2025 2050 2070 2100
Highway system paralyzes
Drainage system paralyzes
Homeless grow

Source: http://www.futuretimeline.net
Technology collection - Resilience
A resilient story with collage
5.2 *Image of the resilient future*
Food and energy production
Three new notions of nature
NATURE AS POST-HUMANITY
Data authorizing the priority for nature
A post-humanity story with collage
Current situation of Embarcadero
Worship of nature in the ruins
A virtual world constructed by signal, consumes very little energy.
A Trans-reality story with collage.
Digitally reclaiming of the outdoor space
An Eco-programme story with collage
Current situation of Embarcadero
Intensive built and lived city
Timeline of Landscape Architecture
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- Nature as Positiveness
- Flood plain
- Self-sufficiency
- Eco Building
- Minimal consumption
- withdraw
- Muscle-based

- Nature as Trans-cality
- Flood plain
- Green house
- Data tower
- Solar-Wind
- Virtual transit

- Nature as Eco-programme
- No flood
- Artificial food
- Continuous Monument
- Pollution collection
- Earthquake harvester
- Flying car: Hyperloop

Comparison of the technology collections
Three living models
Embarcadero Crime Rate Index

Embarcadero Relative Social Vulnerability

This set of maps is done by Jeroen van der Kwaak
This set of maps is done by Zhuting Li.
Phase 0: Current Situation
Nature as Functional Component
Phase 1: 2017 - 2030
Nature as Dynamic Process
Nature as Post-humanity

1. Public Transit:
   Ferry (20%)
   Railway (10%)
   Carpool (30%)
Phase 1: 2017 - 2030
Nature as Dynamic Process
Nature as Post-humanity

1. Public Transit:
   - Ferry (20%)
   - Railway (10%)
   - Carpool (30%)

2. Water Management:
   - Water street
   - Water park
Phase 2: 2030 - 2050
Nature as Post-humanity
Nature as Transreality

1. SOHO Housing:
   Remote working (50%)
   Earthquake (7.9M)
2035
Phase 2: 2030 - 2050
Nature as Post-humanity
Nature as Transreality

1. SOHO Housing:
   Remote working (50%)
   Earthquake (7.9M)

2. 100 Self-driving:
   Water street (road)
   Water square (parking)
 Phase 2: 2030 - 2050
Nature as Post-humanity
Nature as Transreality

1. SOHO Housing:
   Remote working (50%)
   Earthquake (7.9M)

2. 100 Self-driving:
   Water street (road)
   Water square (parking)

3. Flood Defence
   Marshland
   Reinforced Boulevard
Phase 3: 2050 - 2070
Nature as Trans-reality
Nature as Eco-programme

1. New Transportation:
   Digitalisation
   Flying cars
   Hyperloop
Phase 3: 2050 - 2070
Nature as Trans-reality
Nature as Eco-programme

1. New Transportation:
   Digitalisation
   Flying cars
   Hyperloop

2. Water Defence:
   Unexploitation (40%)
   Building demolish (20%)
   Tidal Marshland
Phase 3: 2050 - 2070
Nature of Trans-reality
Nature of Eco-programme

1. New Transportation:
   - Digitalisation
   - Hyperloop
   - Hydroelectric cars

2. Water Defence:
   - Unexploration (40%)
   - Building demolish (20%)
   - Tidal Marshland

3. Self-sufficiency:
   - Trees
   - Windturbines
2070
Phase 4: 2070-2100
Nature as Trans-reality
Nature as Eco-programme
Nature as Post-humanity

1. Environmental risks:
   Earthquake (8.1M)
   Sea level rise (1.8m)
Phase 4: 2070-2100
Nature as Trans-reality
Nature as Eco-programme
Nature as Post-humanity

1. Environmental risks:
   Earthquake (8.1M)
   Sea level rise (1.8m)

2. Climate engineering:
   Species extinction
Phase 4: 2070-2100
Nature as Trans-reality
Nature as Eco-programme
Nature as Post-humanity

1. Environmental risks:
   - Earthquake (8.1M)
   - Sea level rise (1.8m)

2. Climate engineering:
   - Species extinction

3. Mixed living:
   - Continuous city
   - Rebuild isolated tower
   - Living in the ruin
2100 +
THE BOUNDARY OF CITY

How far can you travel within one hour in this VIRTUAL world?

THE DIGITAL ERA

= Infinite Distance?
= Intensive Area?
= High-tech Addiction?

Re-define the boundary of city & individual urban life

ONLINE
YOU

OUR city in one hour

historical foot
modern by public transport
modern by car
current online surfing
City systems are affected by digitalism:
- housing (where people live)
- transportation (how people move around)
- economy (how people make a living)

The trend of digital network has profoundly changed the way people work, live, travel, which released the space and time in the city.
TARGET CITY SELECTED

San Francisco In Challenge

San Francisco is facing challenges from social inequality and environmental uncertainty and growing demand for further development.

Infrastructures are insufficient to meet the needs of being a high-growth and prosperous city.

45% of tenants in San Francisco pay more than 30% of their income in housing.

76% of possibility to have an over 7.0M earthquake in following 30 years.
CURRENT TRENDS FACING
San Francisco In Transitions

Out of the top 100 companies offering remote jobs, 8 companies are located in Bay area:

17. Intuit
26. Salesforce
30. Robert Half International
31. Wells Fargo
42. VMware
51. Adobe
55. McKesson Corporation
95. DataStax

(flexjob.com, 2017)

Emerging Facts:
+ June 2017, Automatic announced to close its headquarters in San Francisco, promoting working remotely.
+ Uber began the test of self-driving car in 2016 and Cruise has invested way more than half a billion dollars in launching in autonomous vehicles for ride-hailing services.
(San Francisco Chronicle, July 2017)

As the cradle of IT companies, Bay area has the potential to offer abundant remote jobs.
# STRATEGY
Towards A **FREE** San Francisco

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**GOVERNMENT POLICY SUPPORT**

- **Encourage Ecommerce**
- **Time**
- **Space**

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**DESIGN/INVENTION**

- **CASSROOFT CONTRIBUTION**
- **Smart Transportation**
- **Office Transformation**

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**FREE San Francisco**

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**#1 Office Transformation**

**[ACTIONS]**
- Provide subsidy to office building taking part in the transformation
- Encourage replacing of affordable housing
- Give priority to young professionals with low-income

**[ACTORS]**
- Government, office companies, low-income groups

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**#2 Smart Transportation**

**[ACTIONS]**
- Provide allowance to abandonment of car ownership
- Encourage self-driving in public transportation
- Reduce parking lot & road and adapt into resilient infrastructure

**[ACTORS]**
- Government, car-owners, driving companies, communities, residents

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**#3 Encourage Ecommerce**

**[ACTIONS]**
- Reduce e-business taxes and provide small loans to young starters

**[ACTORS]**
- Government, young starters, private enterprises

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# 1 Office Transformation

**SPACE-MAKING PRINCIPLES**

- **Current Office**
- **Structure**
- **Ocean**
- **Temporary**

**AFFORDABLE HOUSING SAMPLE**

# 2 Smart Transportation

- **Bus Stop**
- **Street**
- **Green Park**

# 3 Encourage E-Commerce

**Temporary E-Commerce Area**
PILOT PROJECT: Transformation of 101 California St

101 California

Sitting on a strategic but problematic location

Basic infrastructure of living

View  Public Space  Public Transit  Parking  Events  Retail

48-story building offering 116,000 m² office space
OFFICE TRANSFORMATION DESIGN
+ transfer into affordable housing
+ provide different living units (studio/apartment)
+ e-livingroom as shared space

Floor Plan of 39F / office vacancy

+ Interior Design
+ Space Partition
+ Original Structure