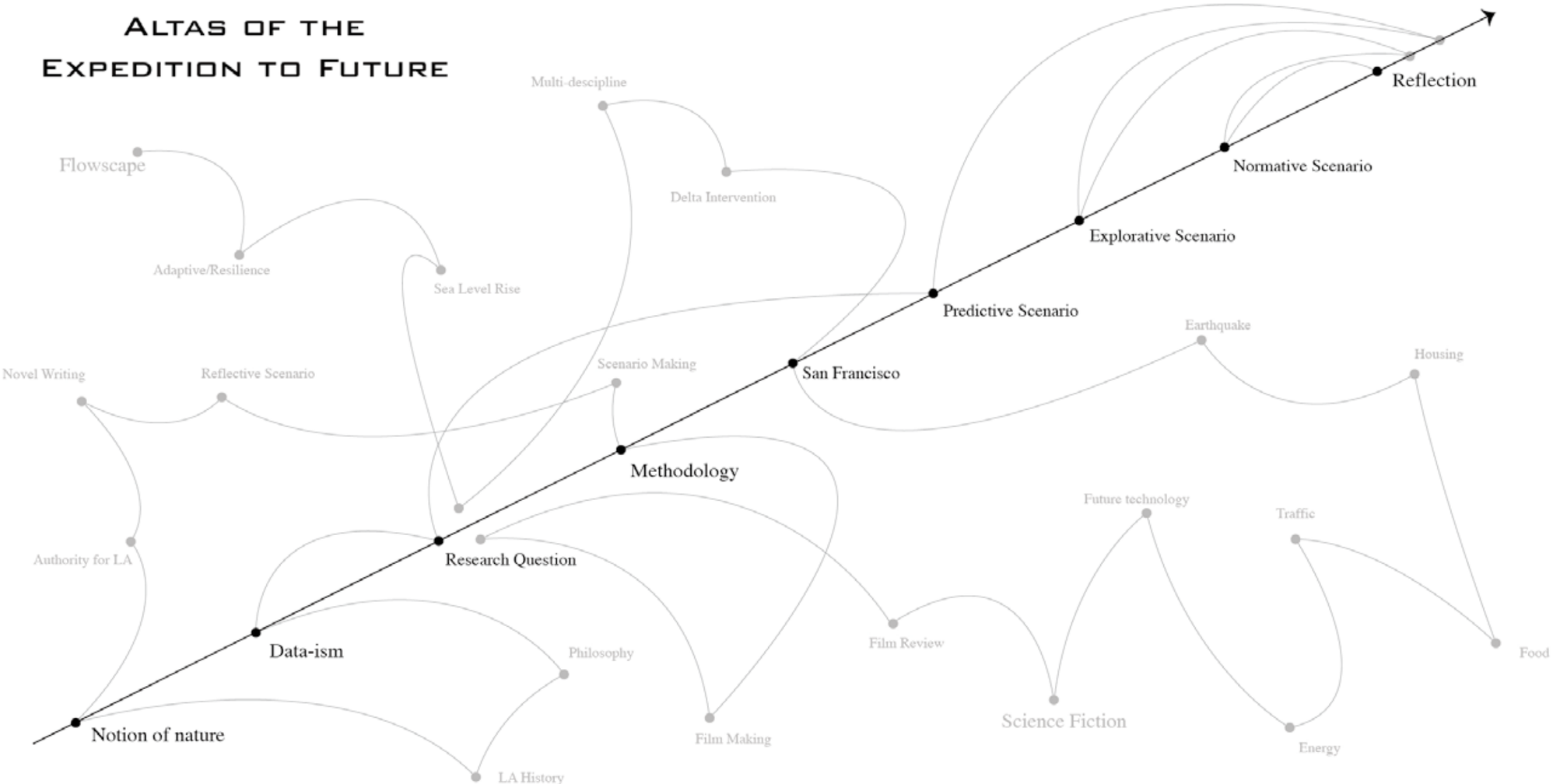
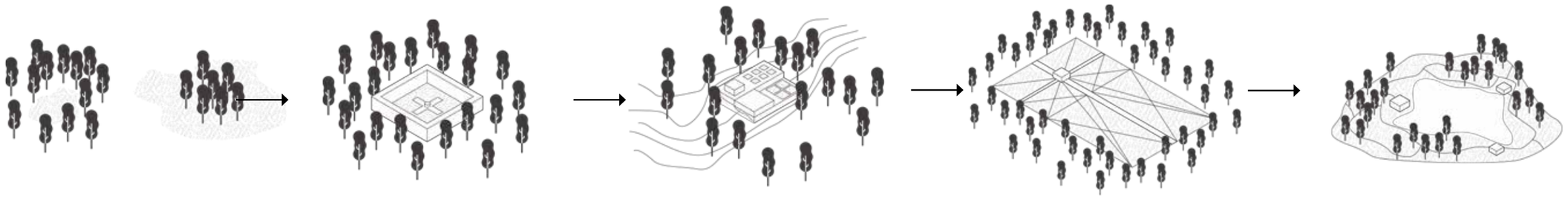
San Francisco Space Fiction

Notions of nature in a Dataism age

Master Graduation Project of Leyang Chen
TU Delft | Landscape Architecture

Altas of the Expedition to Future





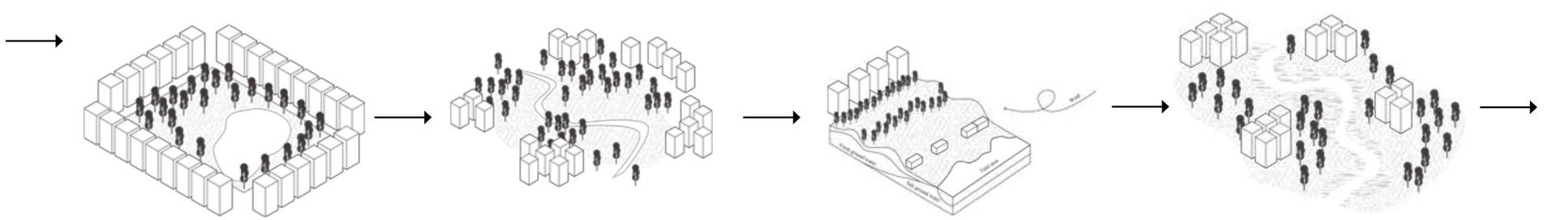
Clearing & Oasis
Nature: Danger & Resource
Aesthetic & Ethic:Surviving

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 mantain 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 recreatio

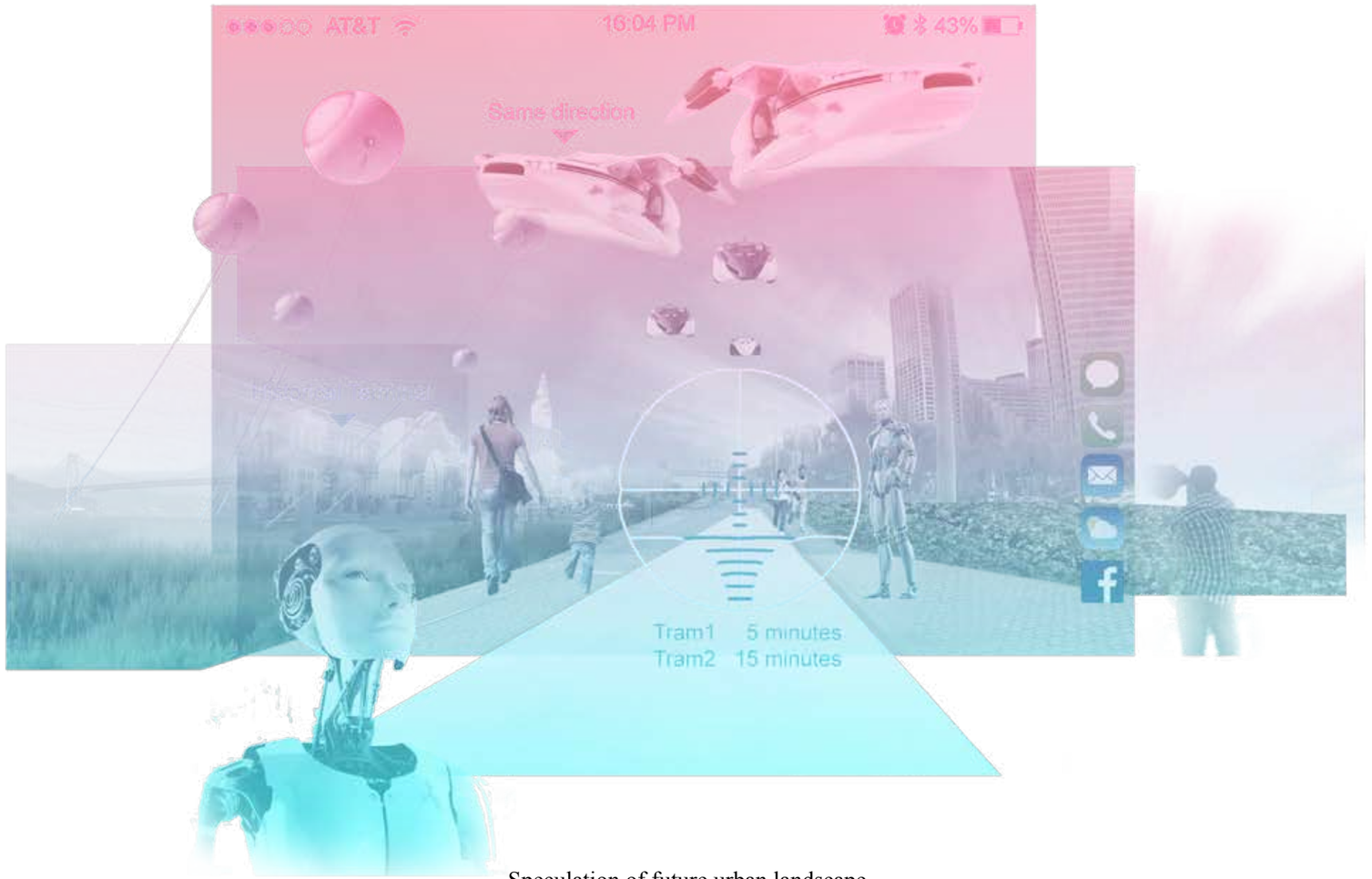
Natural Design
Nature: An ideal image
Aesthetic & Ethic: Interpret the image of nature

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

Resilient Design
Nature: Dynamic process
Aesthetic & Ethic: Relationship and uncertainty

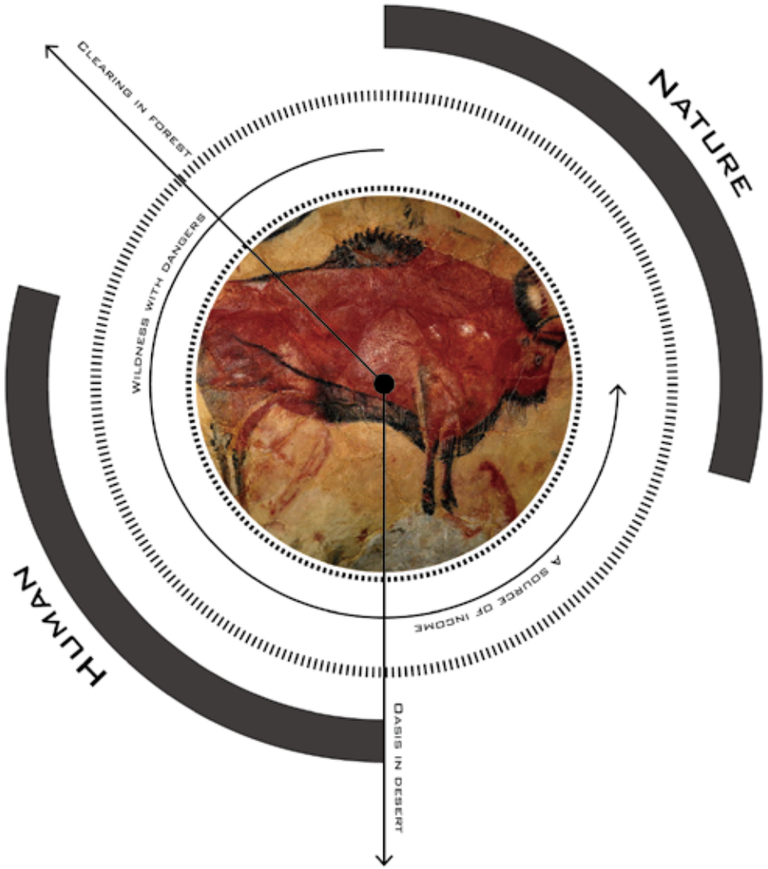
?


Human Brain
Algorithm
Big Data



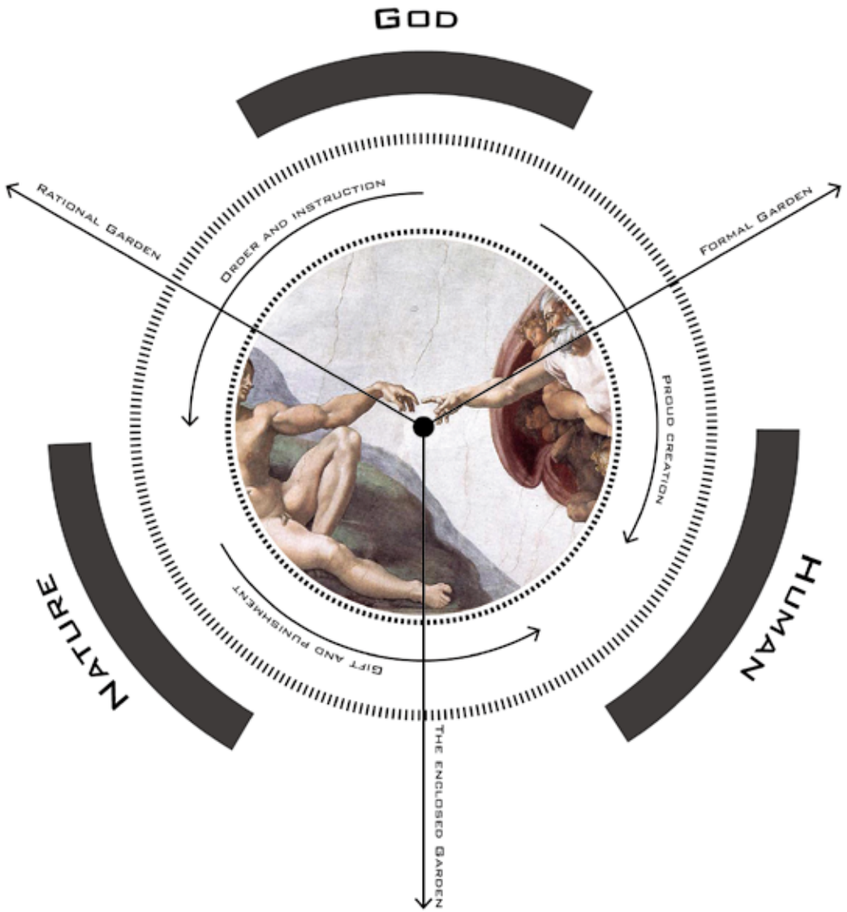
Speculation of future urban landscape
in a data-ism age

Notions of nature in landscape architecture fit
in the theoritical frame of Data-ism



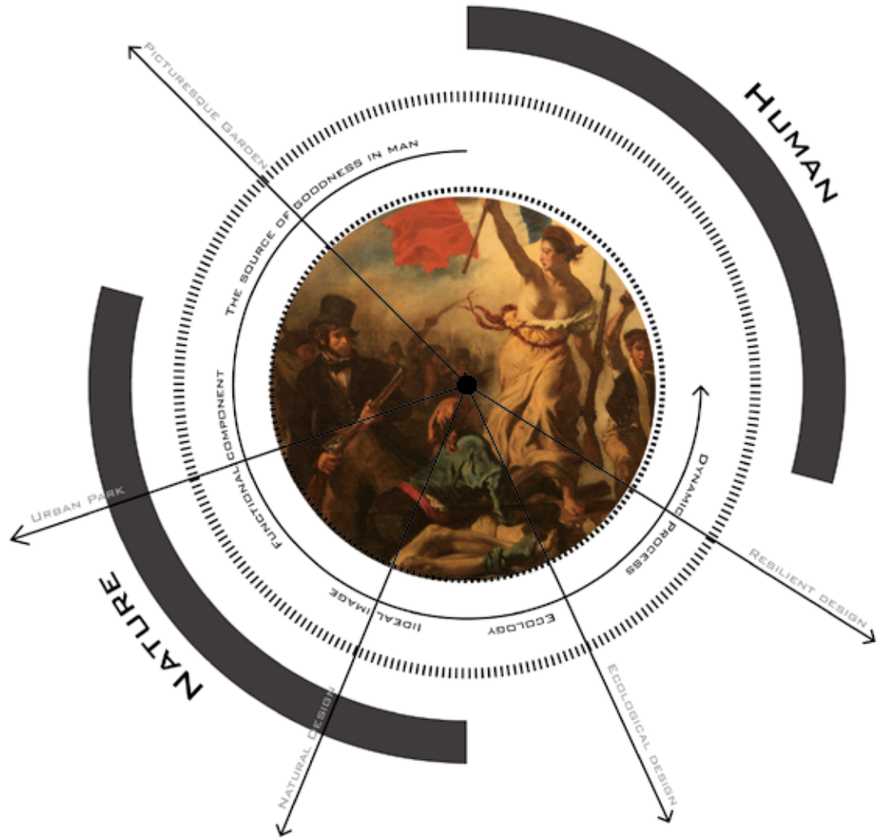
ANIMSIM

NATURE JUSTIFYING HUMAN



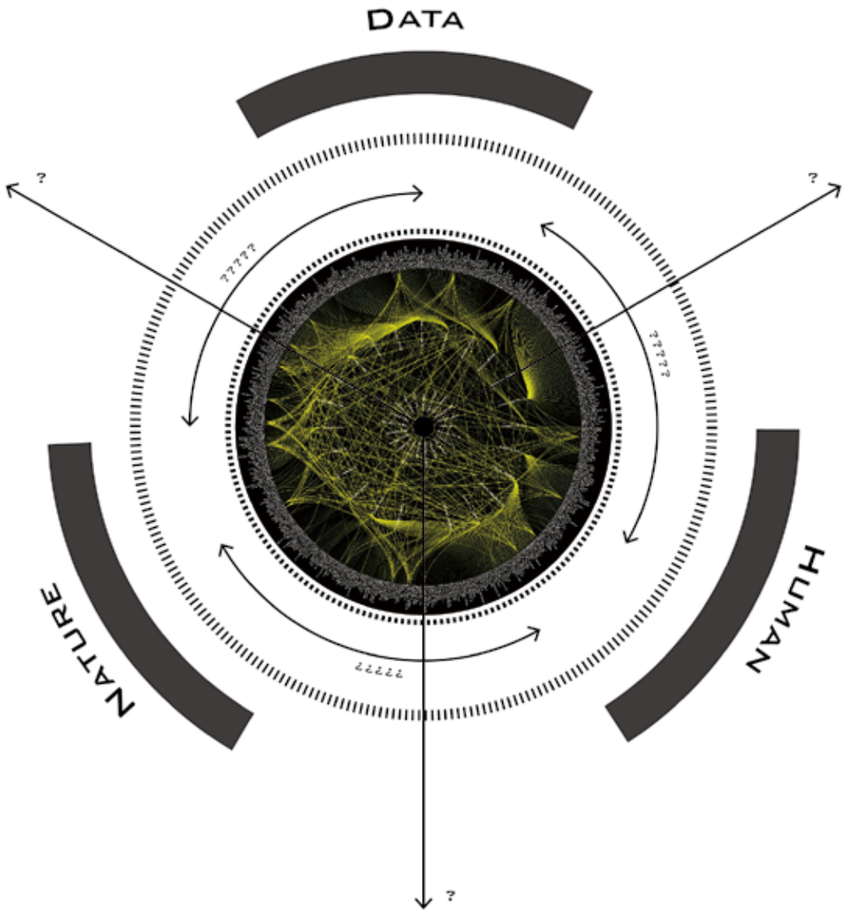
THEISM

GOD JUSTIFYING HUMAN AND NATURE



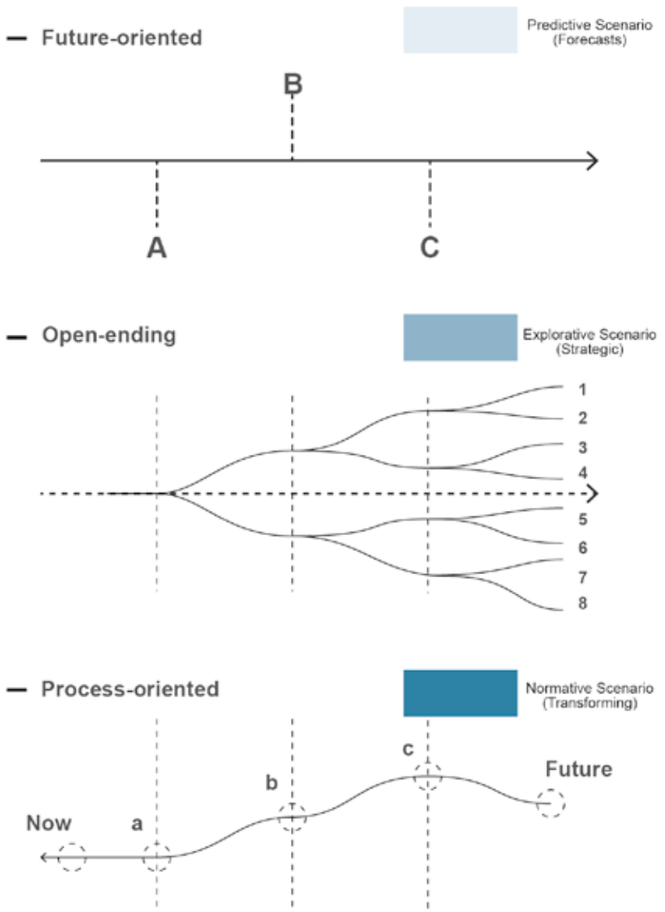
Humanism

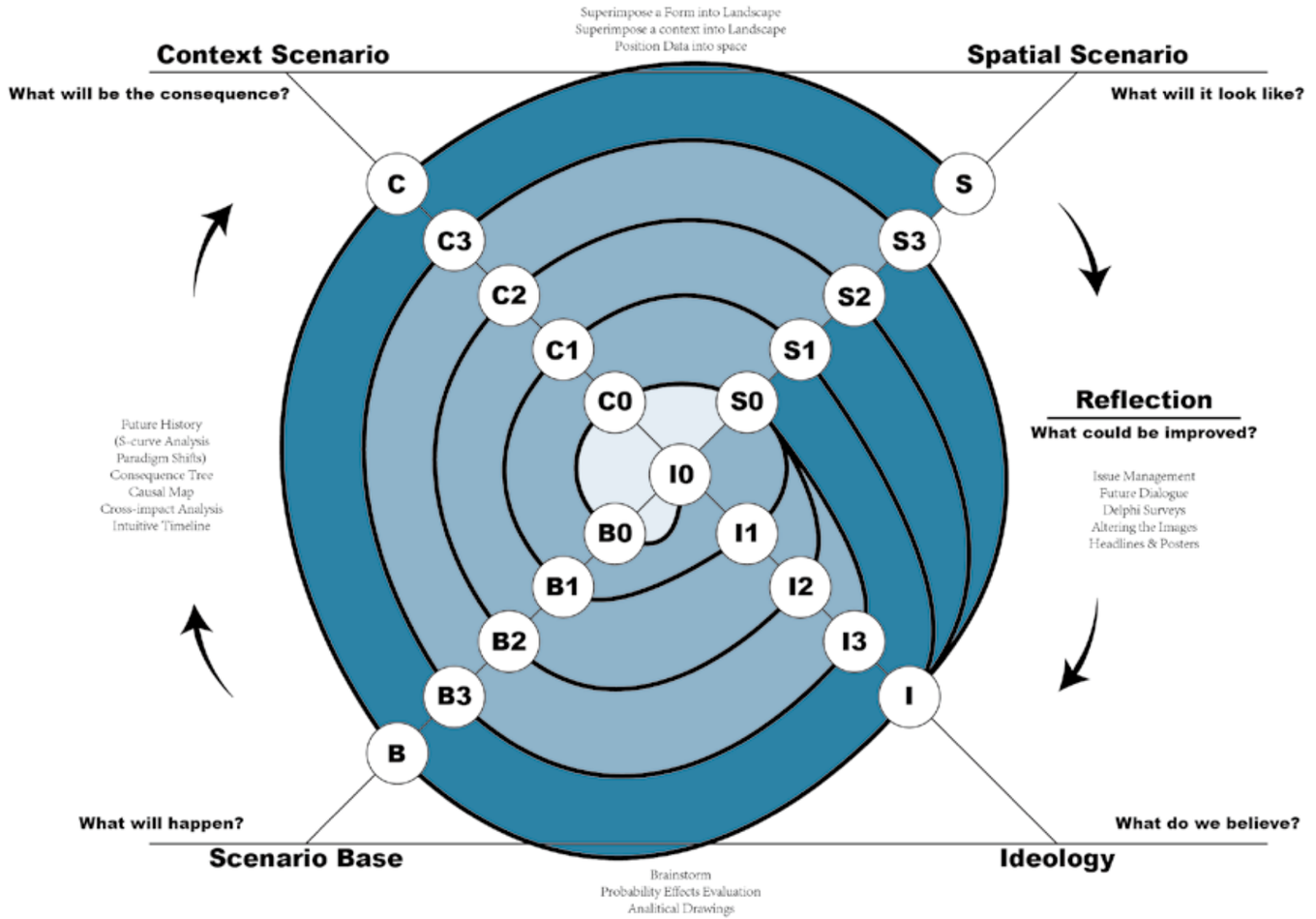
Human justifying nature

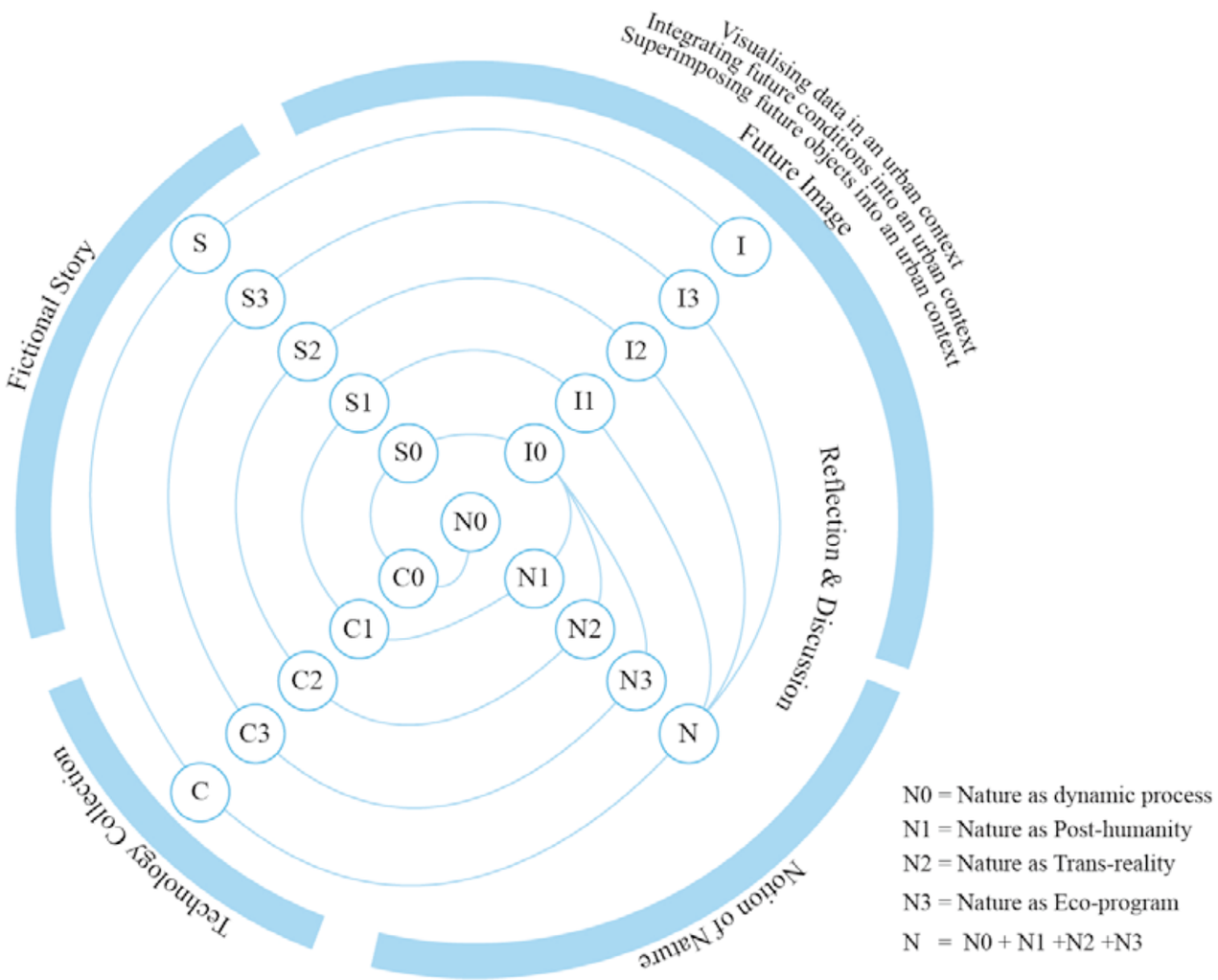


Data-ism

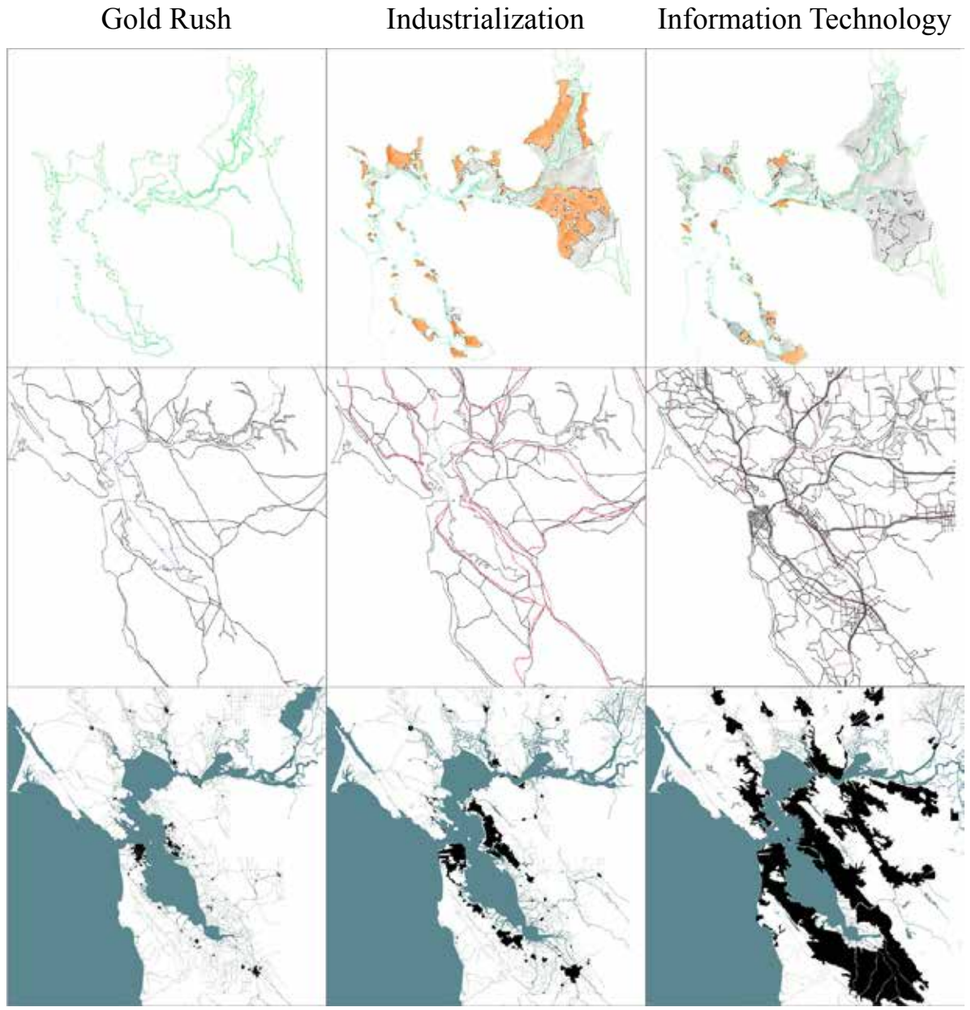
Data justifying human and nature?


Future-oriented
Predictive Scenario
(Forecasts)
B
A
C
Open-ending
Explorative Scenario
(Strategic)
1
2
3
4
5
6
7
8
Process-oriented
Normative Scenario
(Transforming)
c
b
Future
Now
a

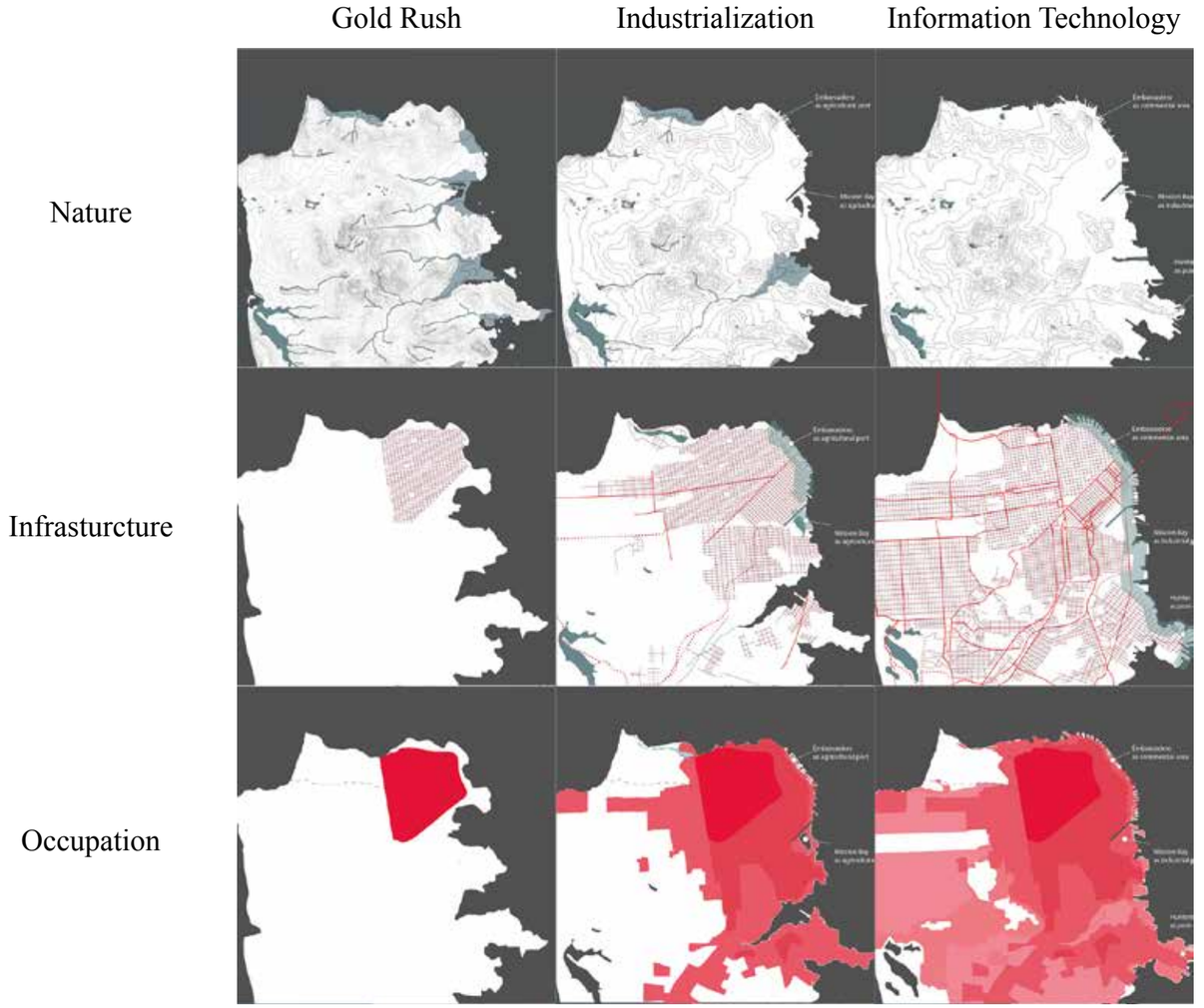

Superimpose a Form into Landscape
Superimpose a context into Landscape
Position Data into space
Context Scenario
What will be the consequence?
Spatial Scenario
What will it look like?
C
C3
C2
C1
C0
S
S3
S2
S1
S0
I0
B0
B1
B2
B3
B
I1
I2
I3
I
Reflection
What could be improved?
Issue Management
Future Dialogue
Delphi Surveys
Altering the Images
Headlines & Posters
Future History
(S-curve Analysis
Paradigm Shifts)
Consequence Tree
Causal Map
Cross-impact Analysis
Intuitive Timeline
What will happen?
What do we believe?
Scenario Base
Ideology
Brainstorm
Probability Effects Evaluation
Analitical Drawings


Visualising data in an urban context
Integrating future conditions into an urban context
Superimposing future objects into an urban context
Future Image
Reflection & Discussion
Notion of Nature
Technology Collection
Fictional Story
S
S3
S2
S1
S0
I
I3
I2
I1
I0
N0
C0
N1
C1
N2
C2
N3
C3
N
C
N0 = Nature as dynamic process
N1 = Nature as Post-humanity
N2 = Nature as Trans-reality
N3 = Nature as Eco-program
N = N0 + N1 +N2 +N3

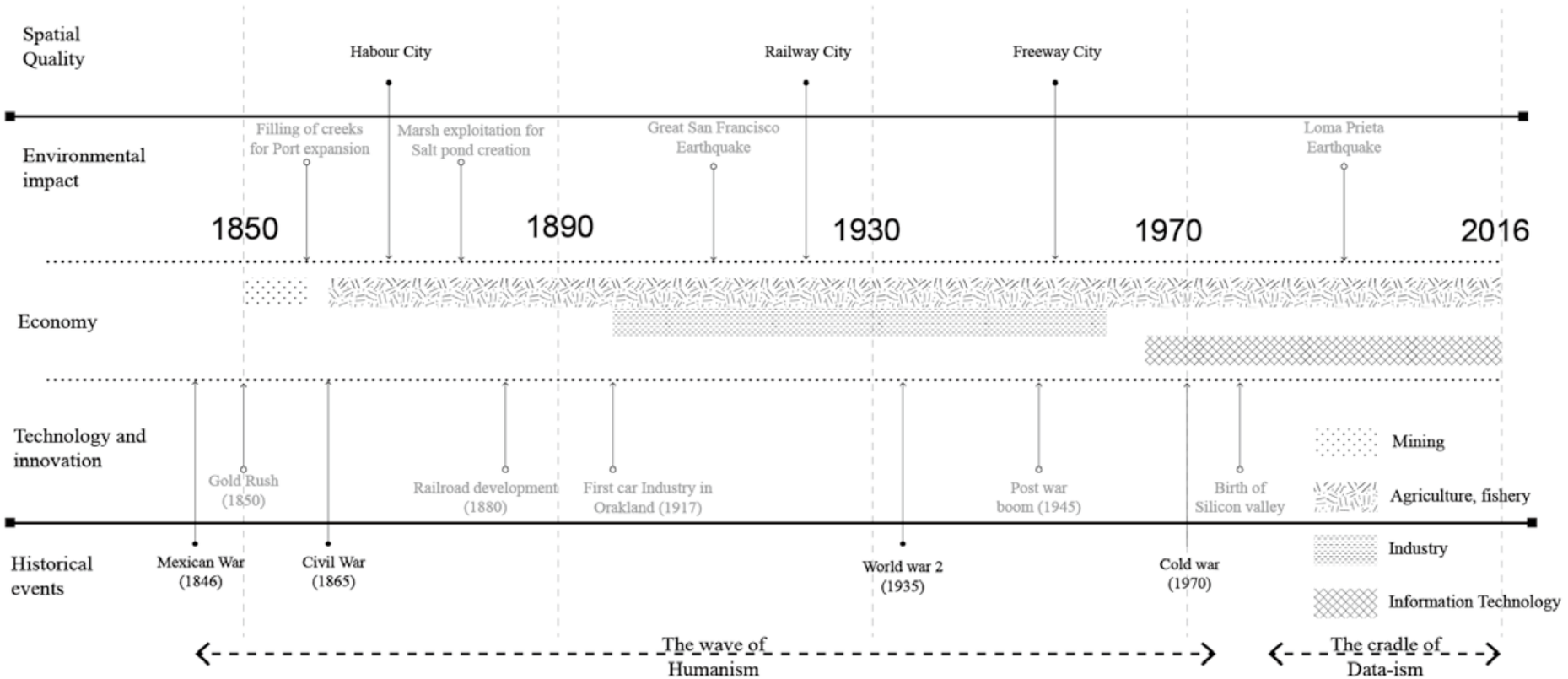
Study model of San Francisco
(Made together with Jeroen van der Kwaak, Zhuting Li and Menghan Fu)



3 x 3 x 3 analyses in bay-scale
(Made together with Seul Lee, Sumanth Rao and Licheng Wang)

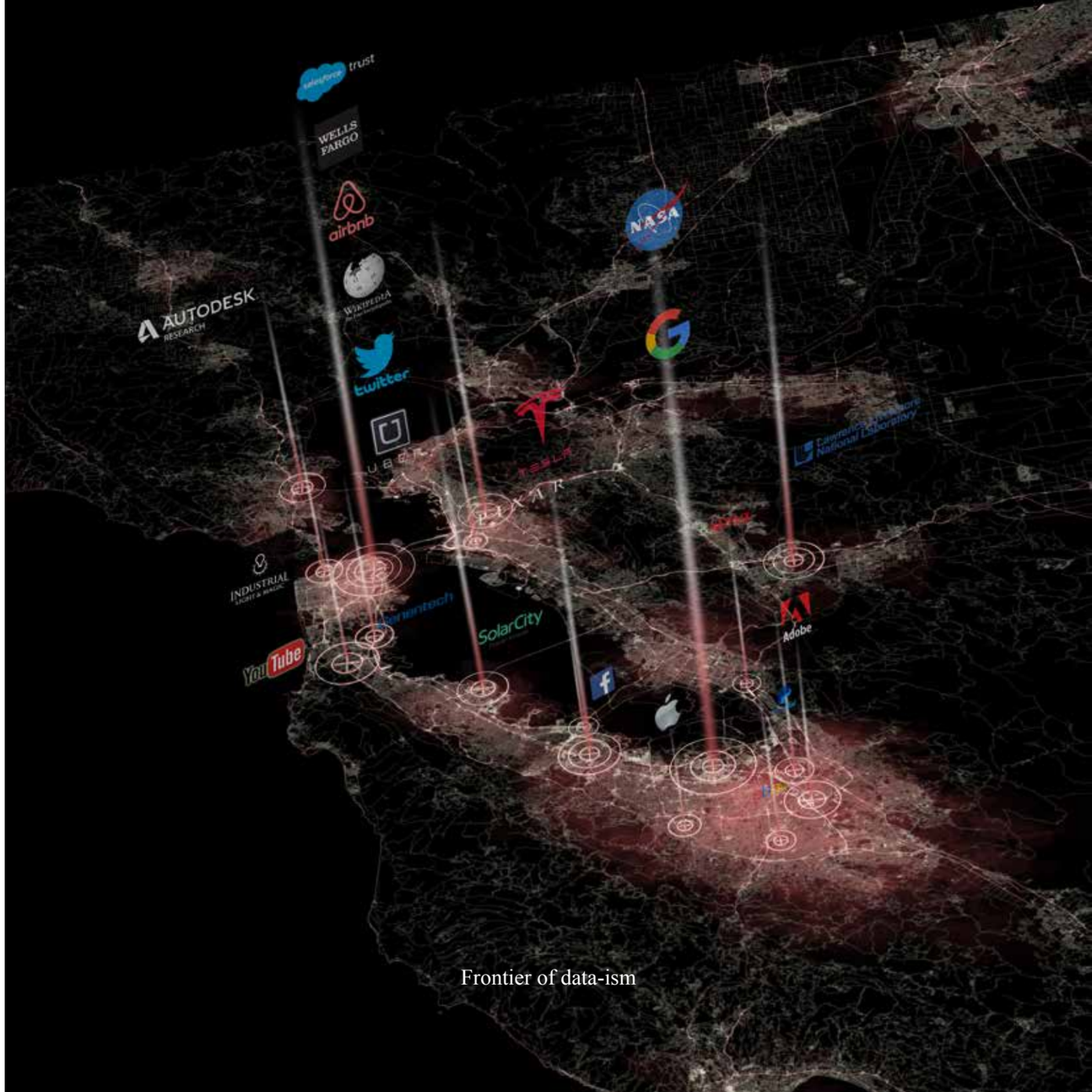


3 x 3 x 3 analyses in city-scale
(Made together with Seul Lee, Sumanth Rao and Licheng Wang)



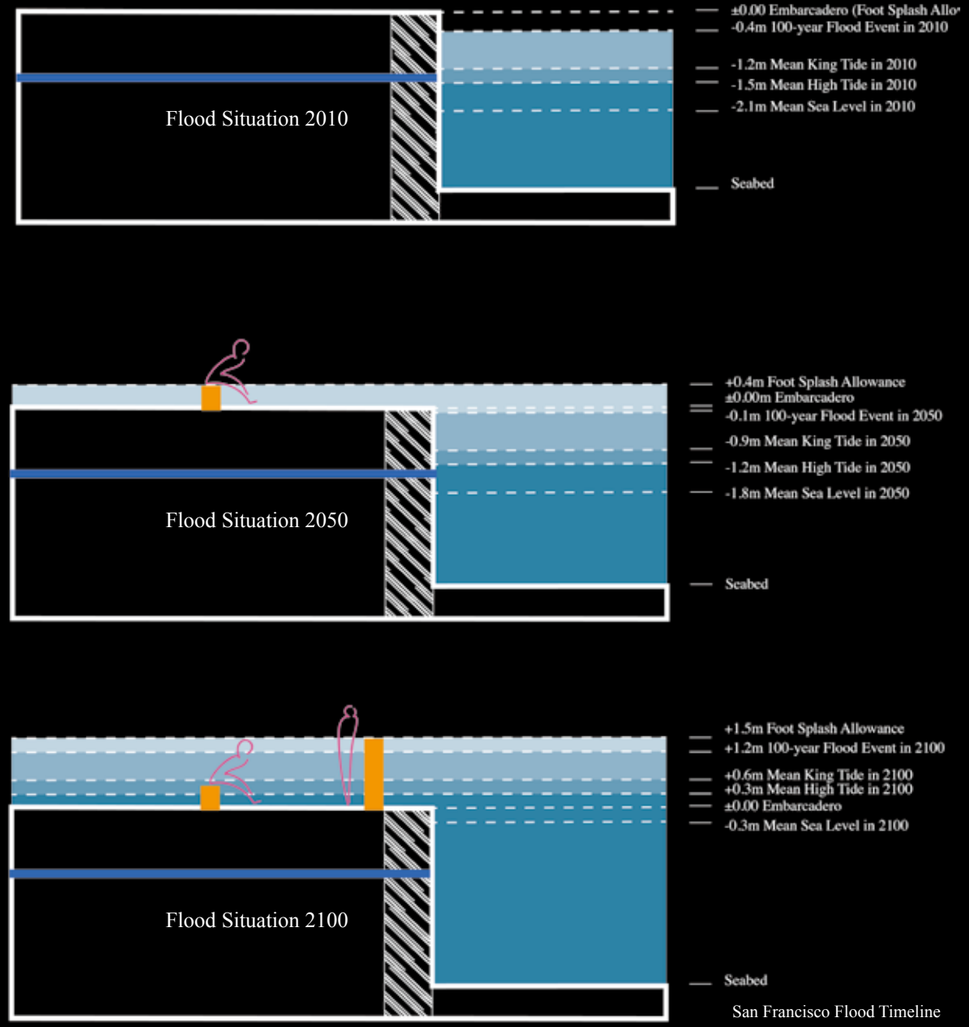
Timeline of San Francisco
(Made together with Seul Lee, Sumanth Rao and Licheng Wang)

Monument of humanism



Frontier of data-ism

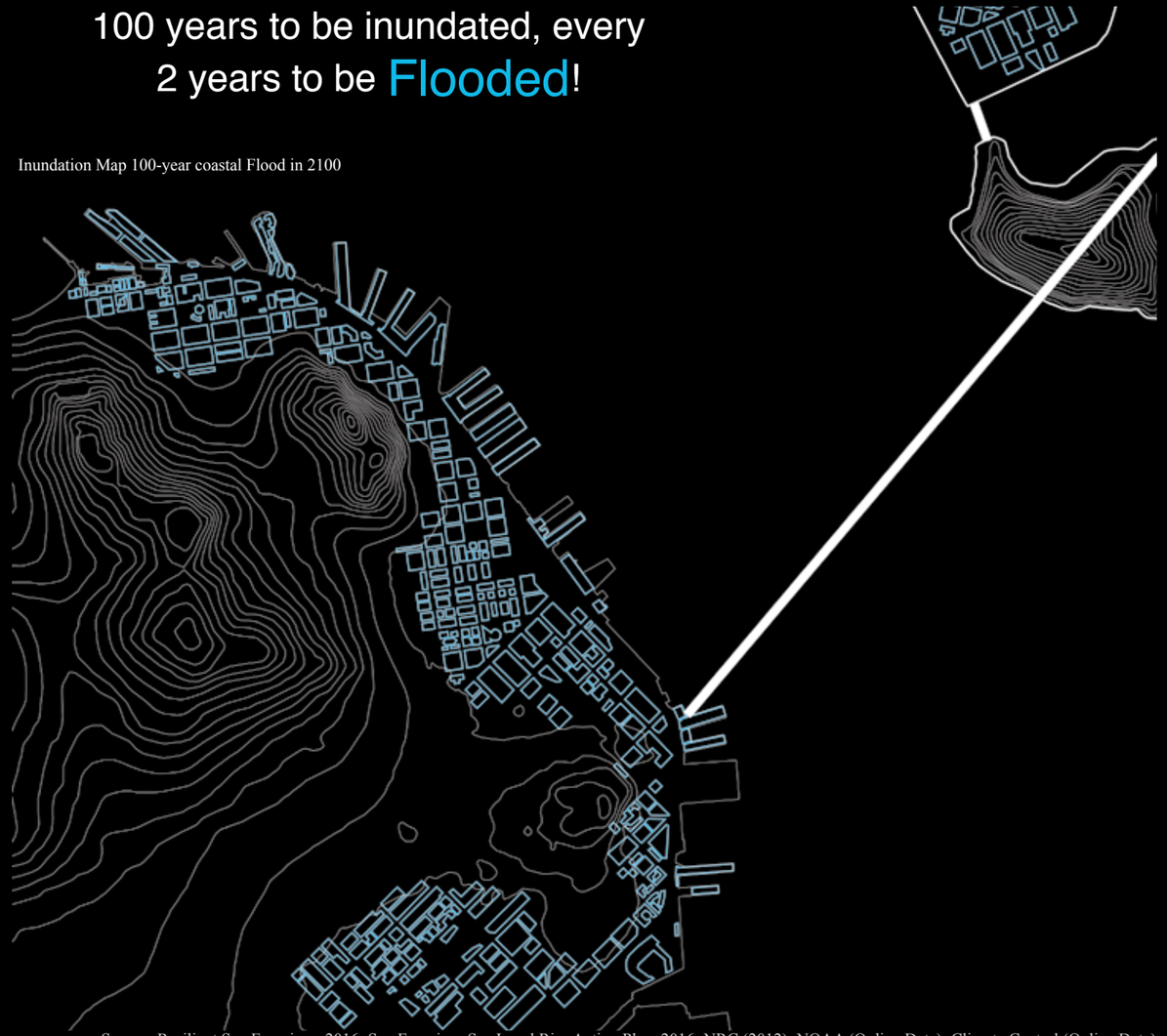
Six environmental risks in San Francisco
(Made together with Qiao Yang)



San Francisco Flood Timeline

100 years to be inundated, every 2 years to be Flooded!

Inundation Map 100-year coastal Flood in 2100

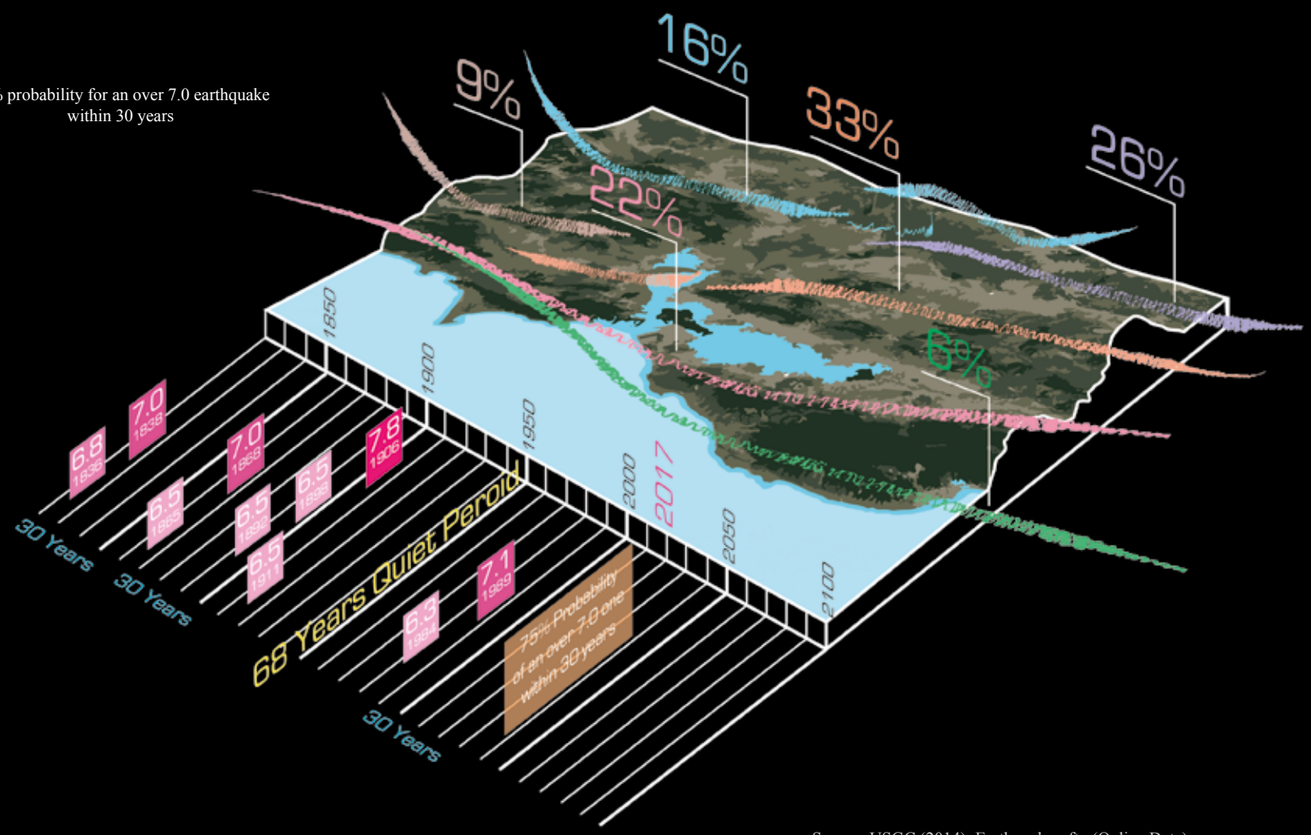


Source: Resilient San Francisco, 2016; San Francisco Sea Level Rise Action Plan, 2016; NRC (2012); NOAA (Online Data); Climate Central (Online Data)

Liquefaction susceptibility map

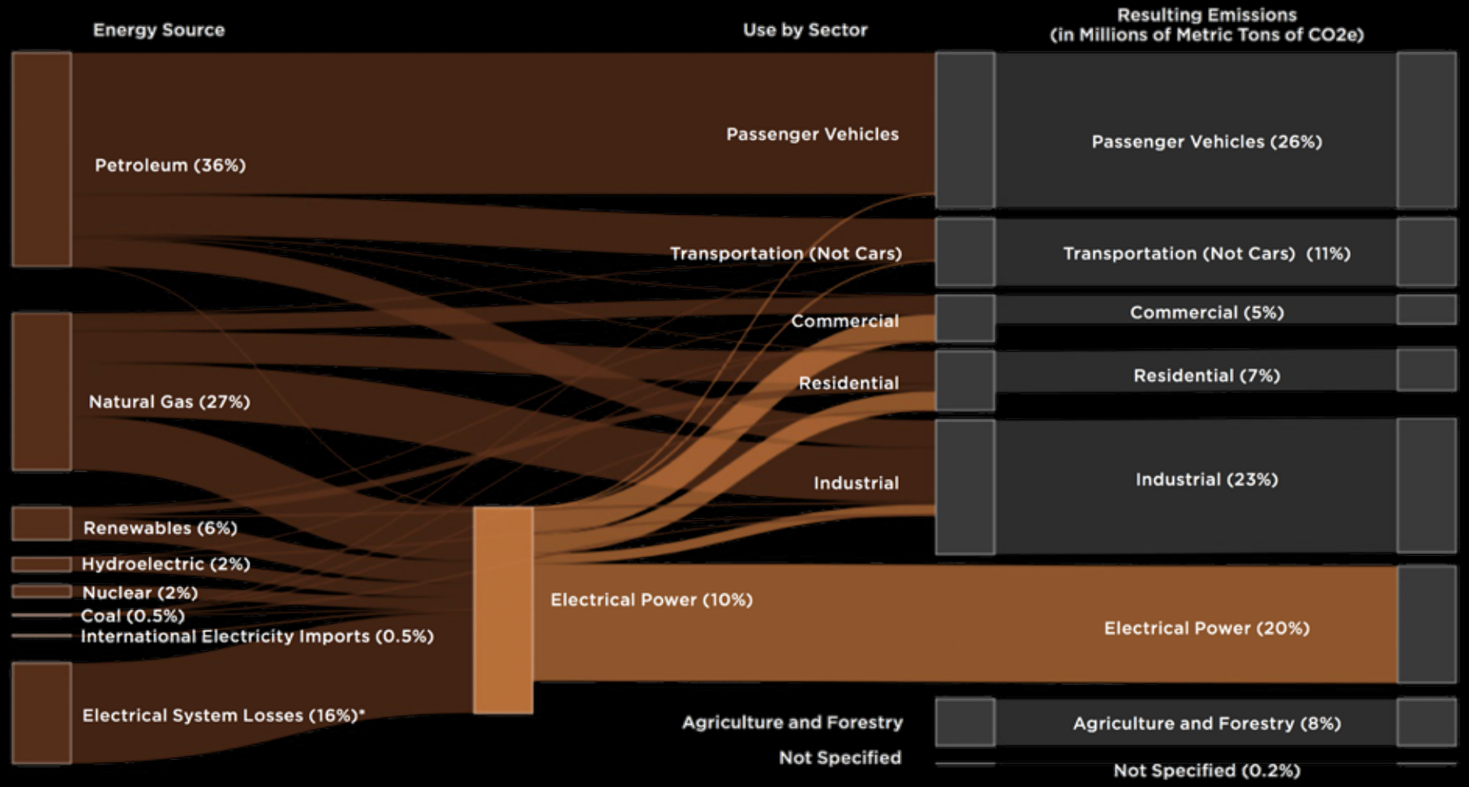
75% possibility of a over 7.0 M Earthquake in the next 30 years !

75% probability for an over 7.0 earthquake within 30 years

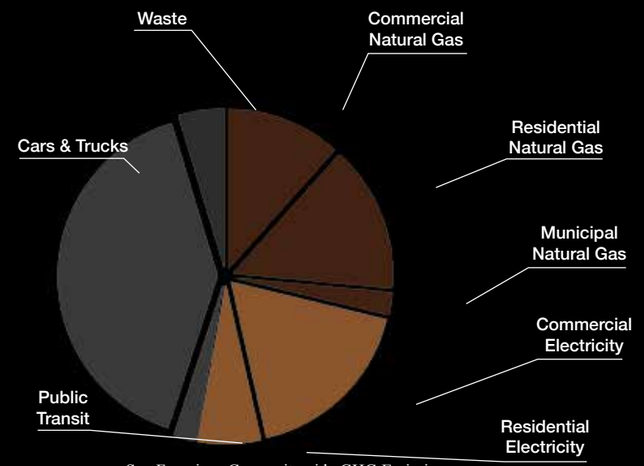


Source: USGC (2014); Earthquakesafty (Online Data).

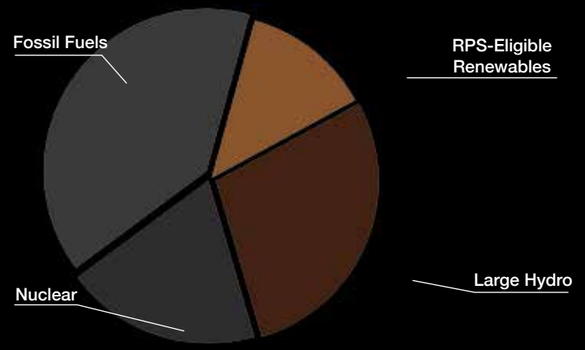
Mayor's 100% Renewable Energy promise is a Trick!



California Energy Flow (2013)

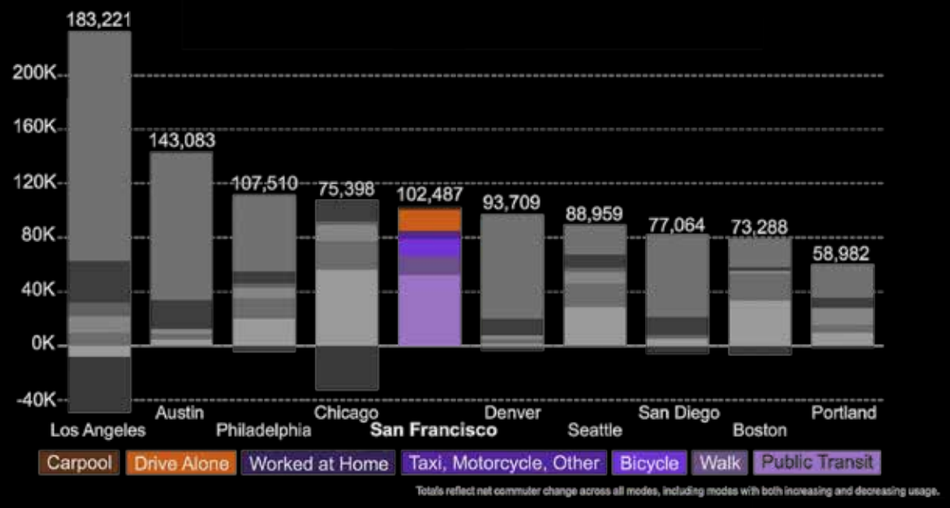


San Francisco Commnitywide GHG Emission (2010)

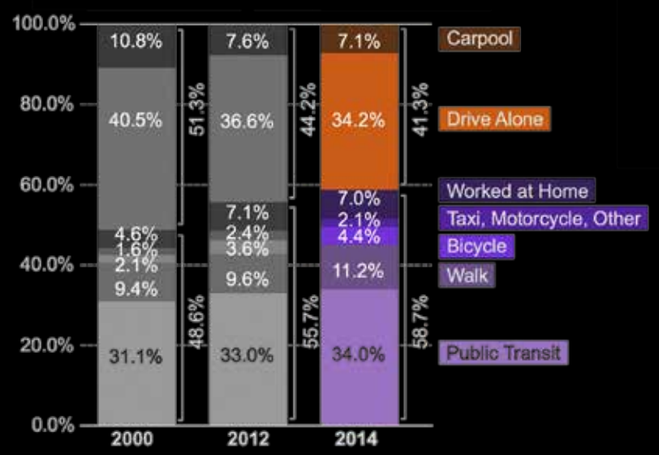


San Francisco Electricity Supply Mix (2010)

Source: Fossil Free Bay Area, 2016; San Francisco Mayor's Renewable Energy Task Force Recommendations Report, 2012

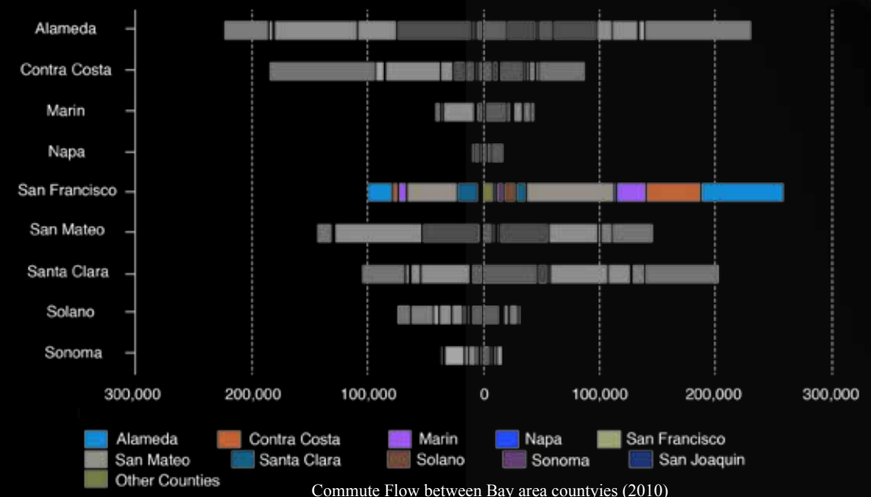


Commuter Growth from 2006 to 2015

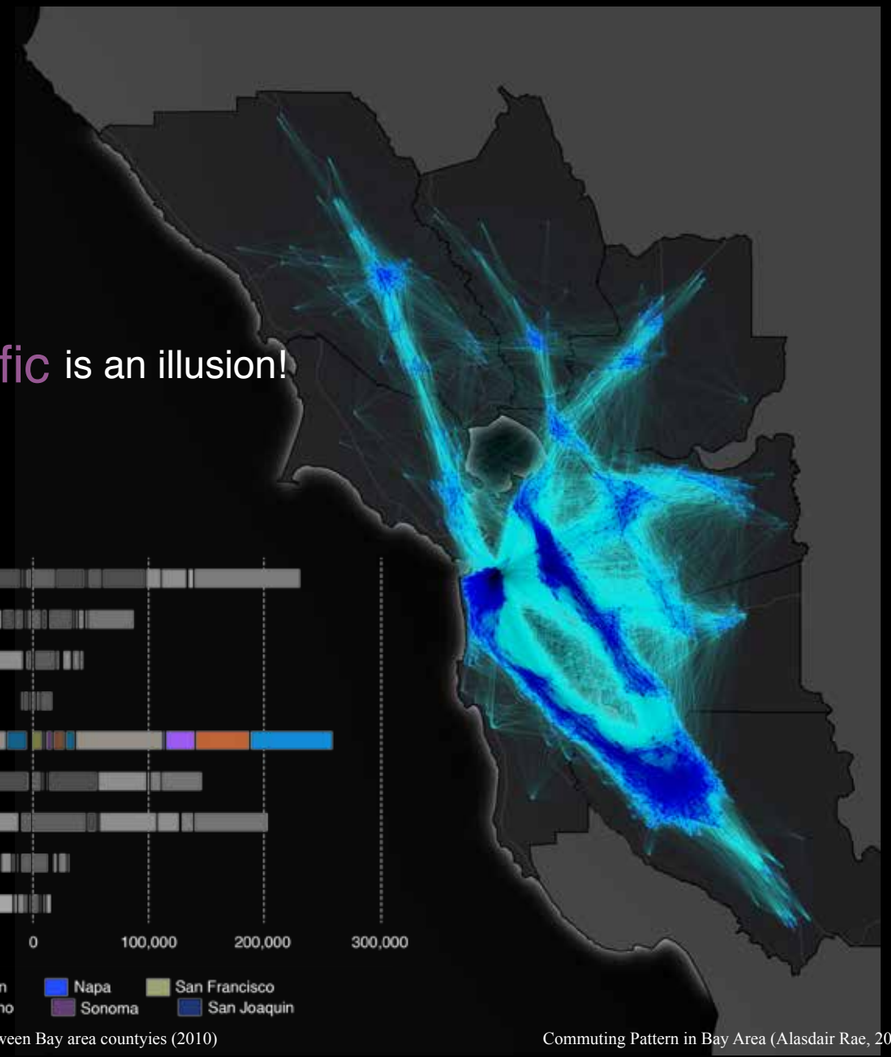


Commuting Means from 2000 to 2014

52% green Tranffic is an illusion!



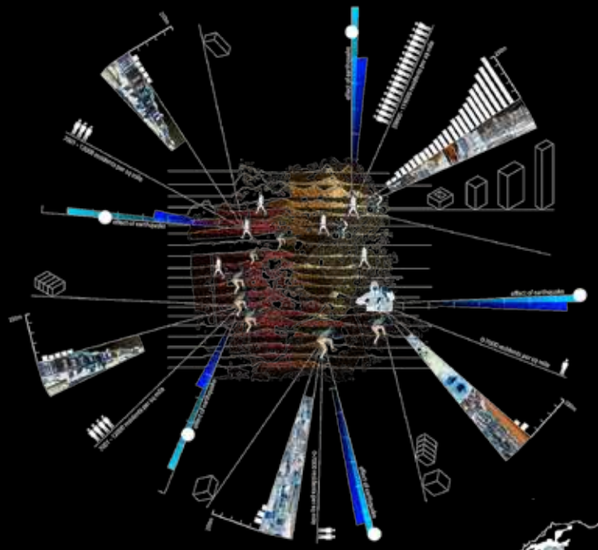
Commute Flow between Bay area countyies (2010)



Commuting Pattern in Bay Area (Alasdair Rae, 2015)

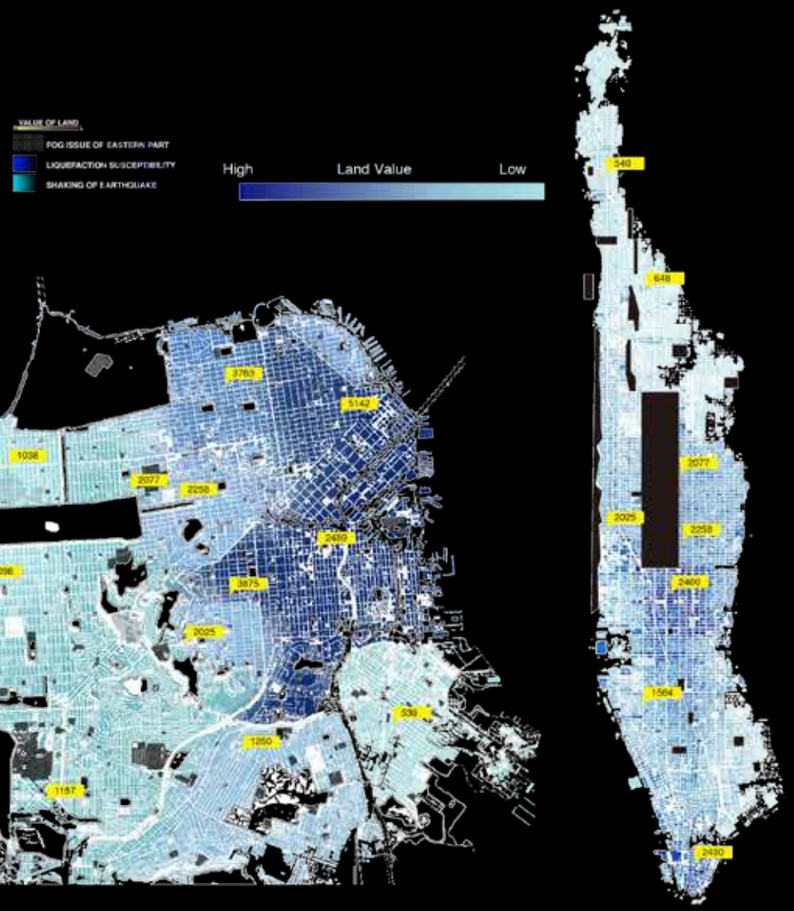
Source: SFMTA Factsheet, 2015; American Community Survey; U.S. Census Bureau: Census Transportation Planning Package (2010)

Population is growing (old)!



Building Typology Analysis
(Ruojin Wu, Jie Yang)

Population Trends and Age Distribution to 2040

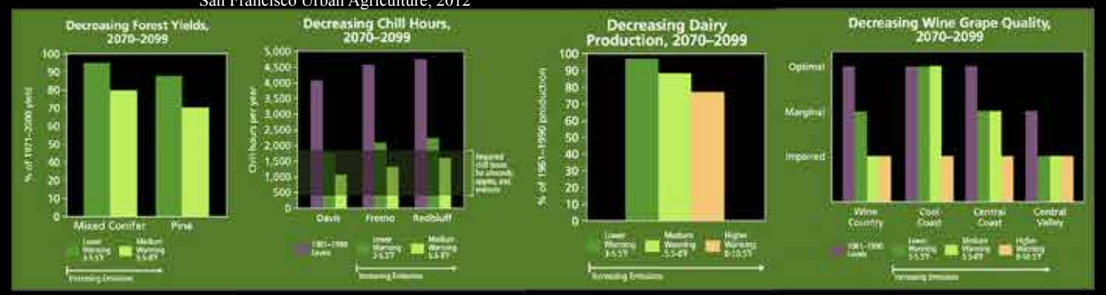


Land Valve Comparison San Francisco vs Manhattan

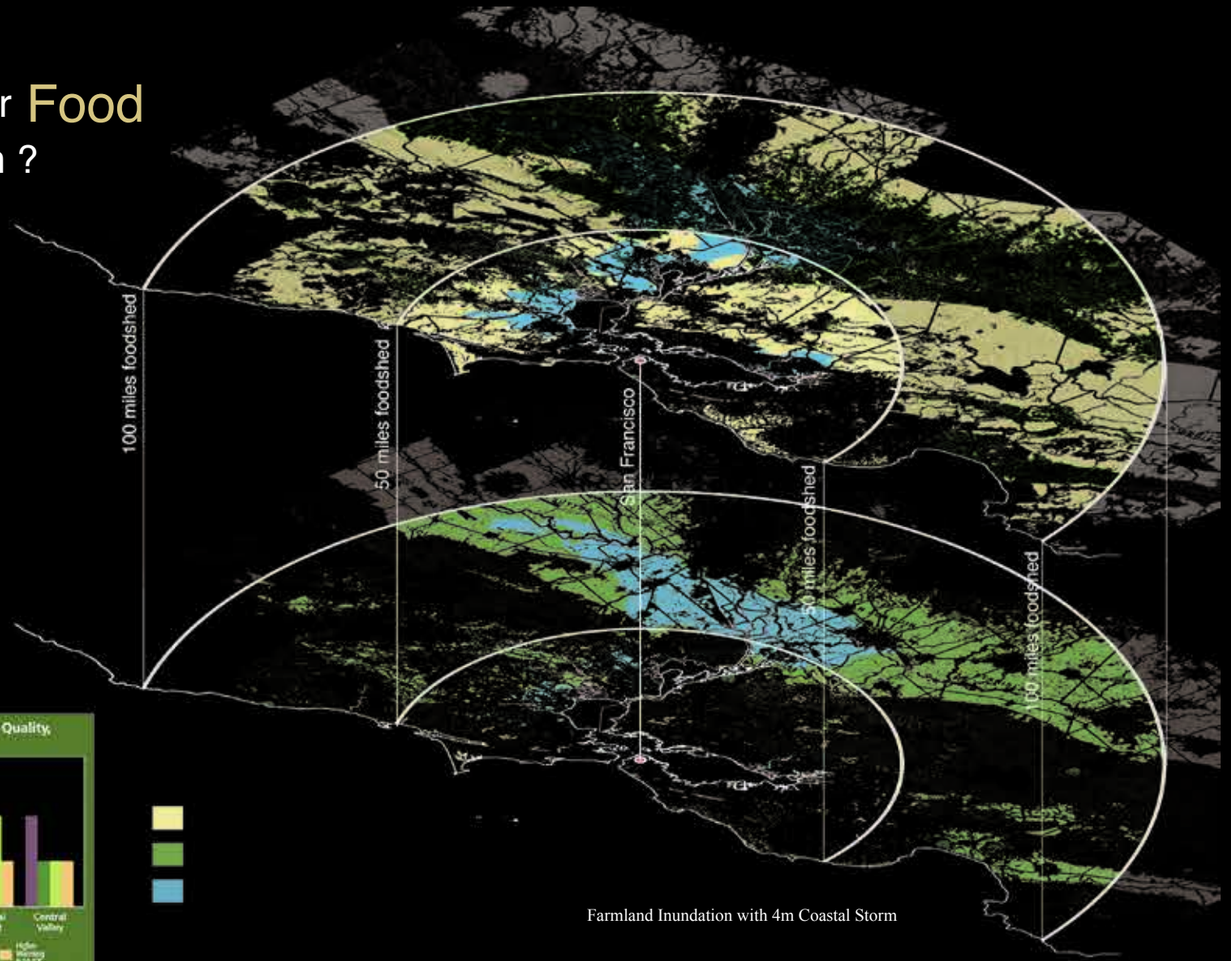
Source: Census Bureau; ABAG, Projections 2013; Trulia.com

Can we keep our Food production ?

San Francisco Urban Agriculture, 2012

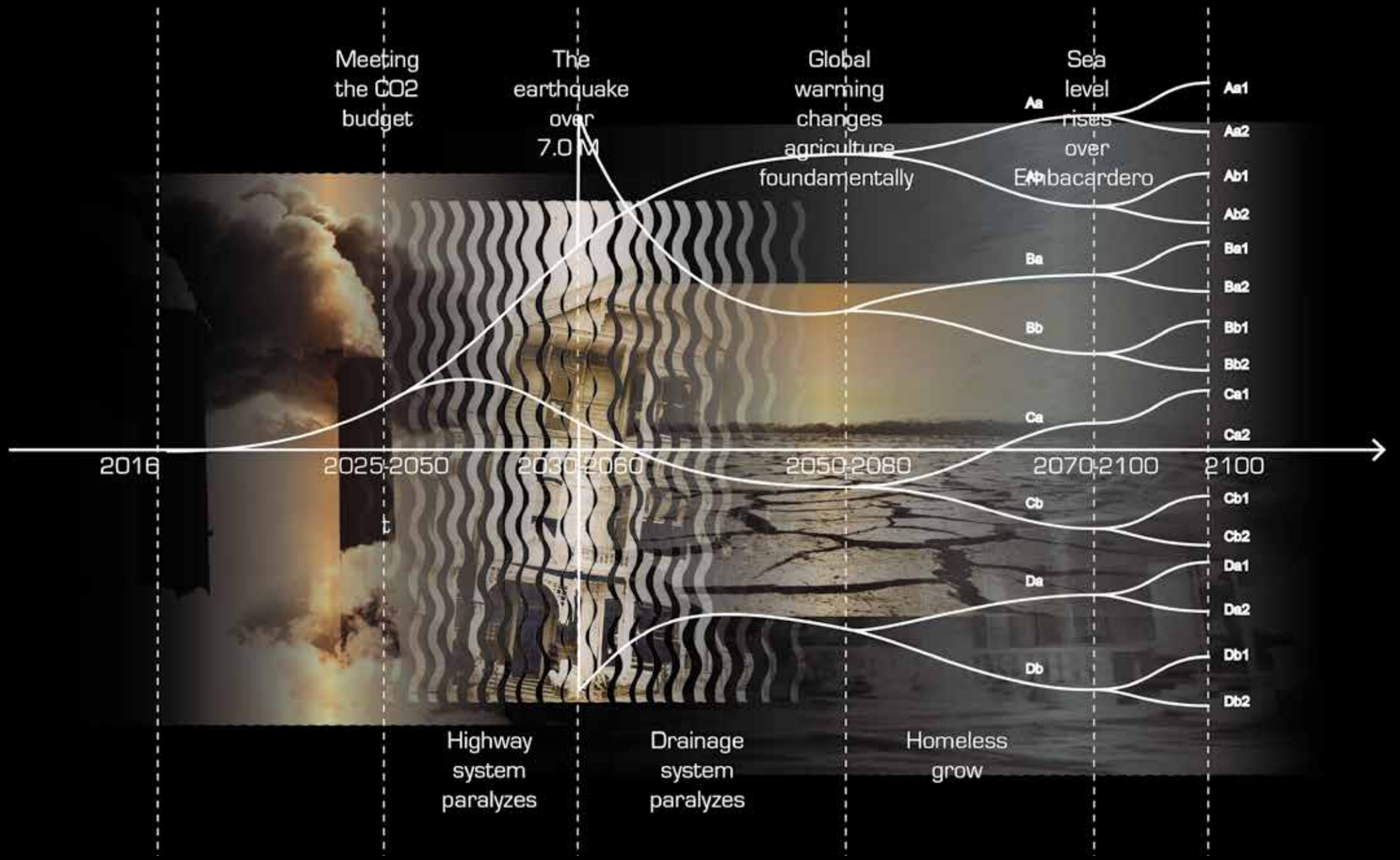


Global Warming and California Agriculture (UCSUSA)



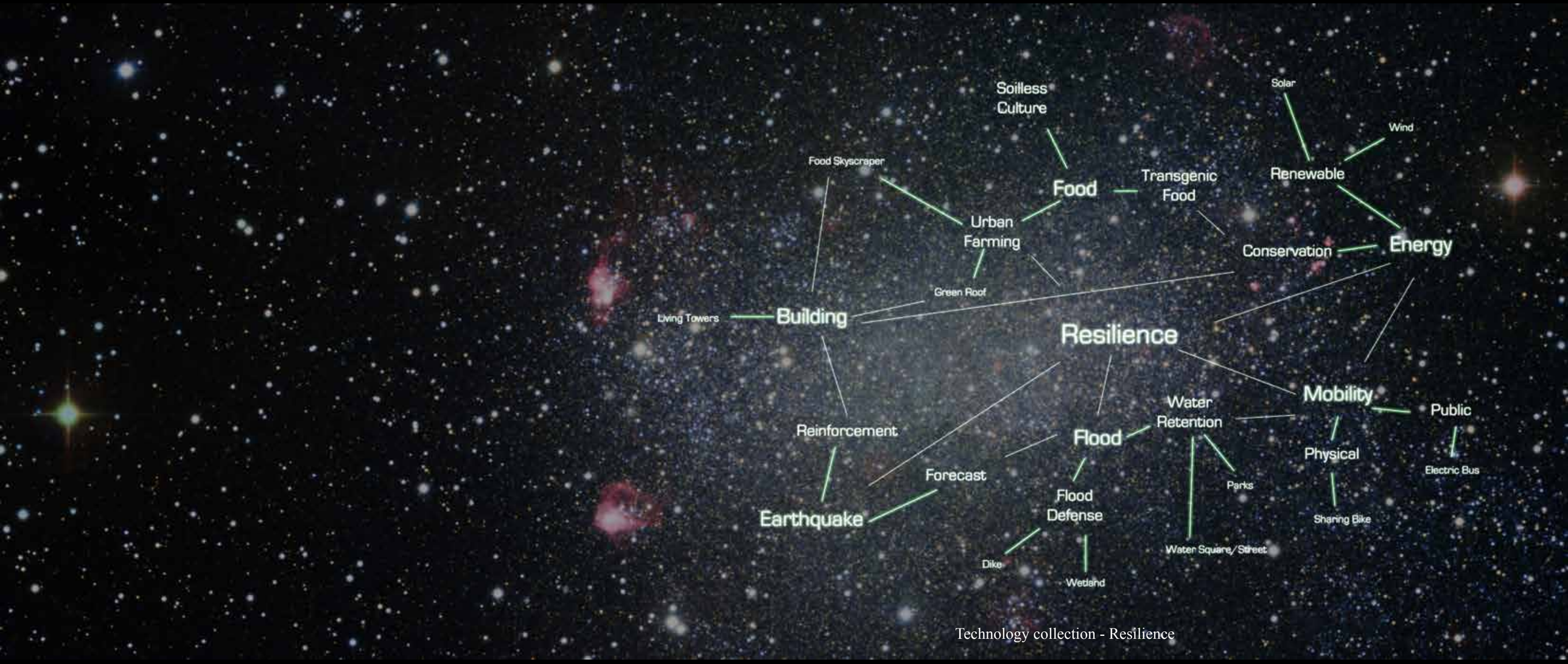
Farmland Inundation with 4m Coastal Storm

Source: SPUR, 2012; UCSUCA; San Francisco Foodshed Assisment, 2008.



Source: http://www.futuretimeline.net

Timeline of Future Environmental Risk

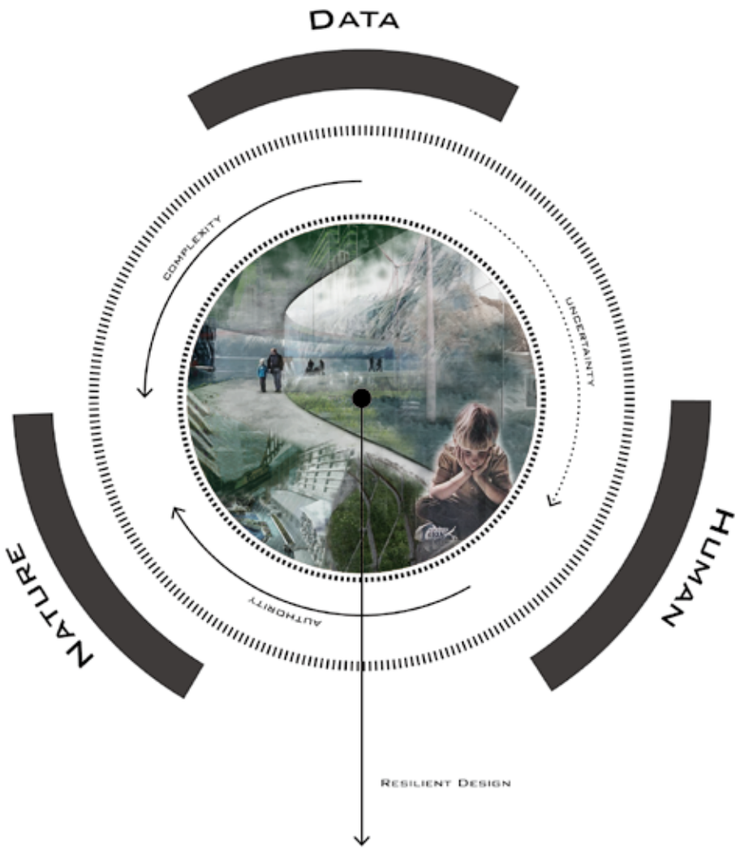


Technology collection - Resilience

A resilient story with collage

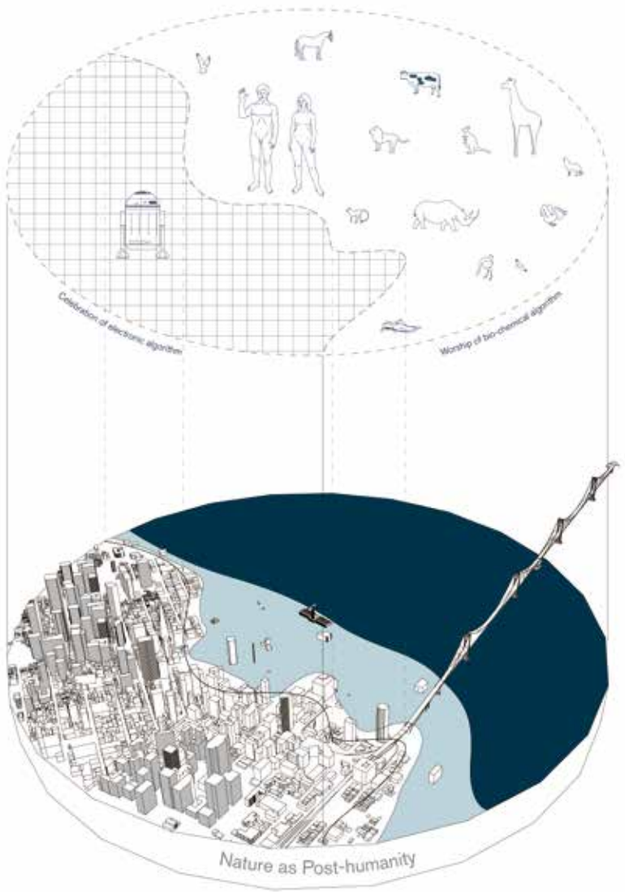
Current situation of Embarcadero

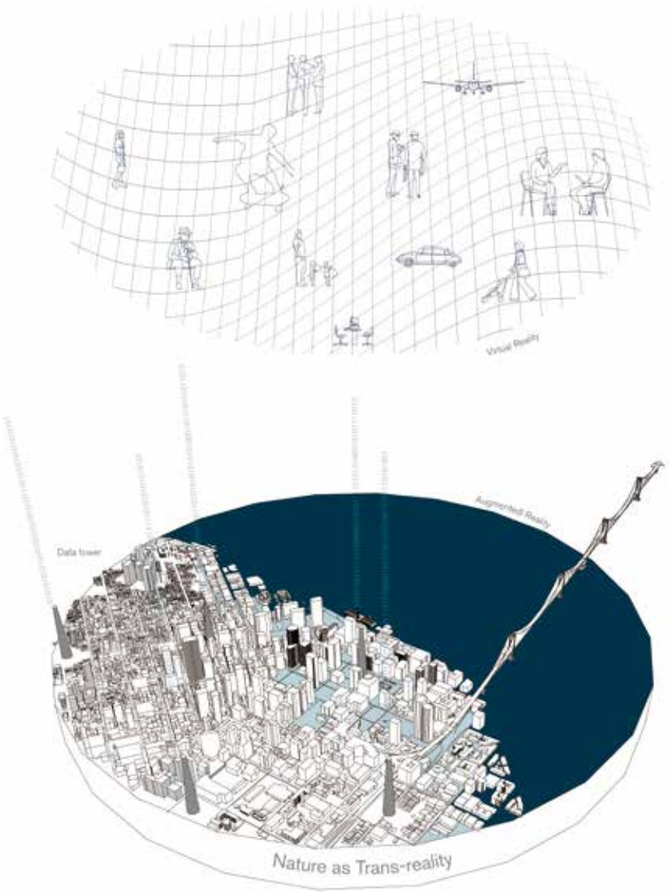
Food and energy production

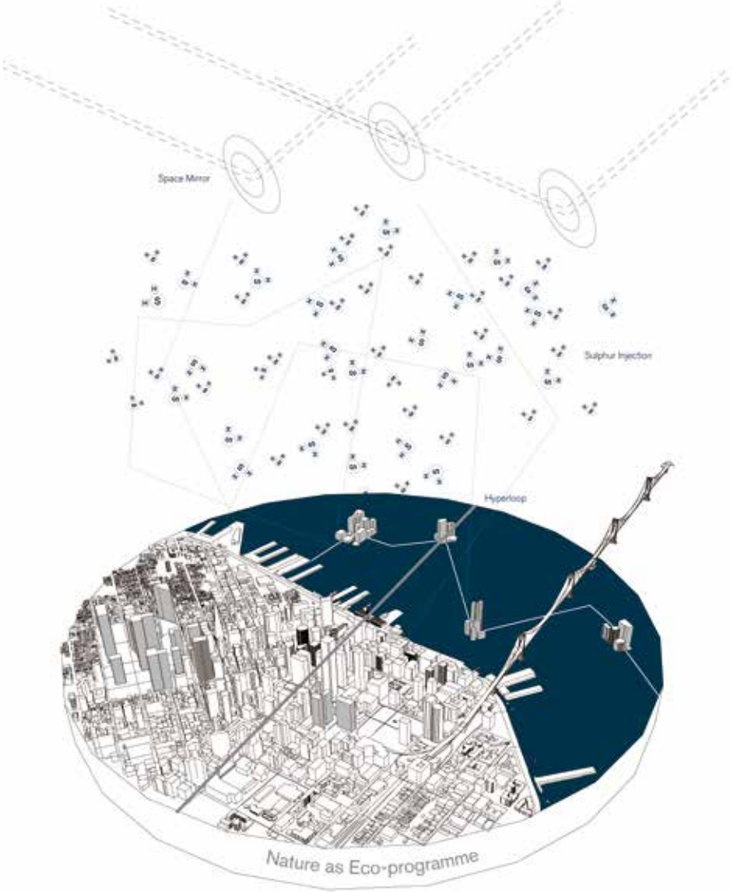


NATURE AS DYNAMIC PROCESS

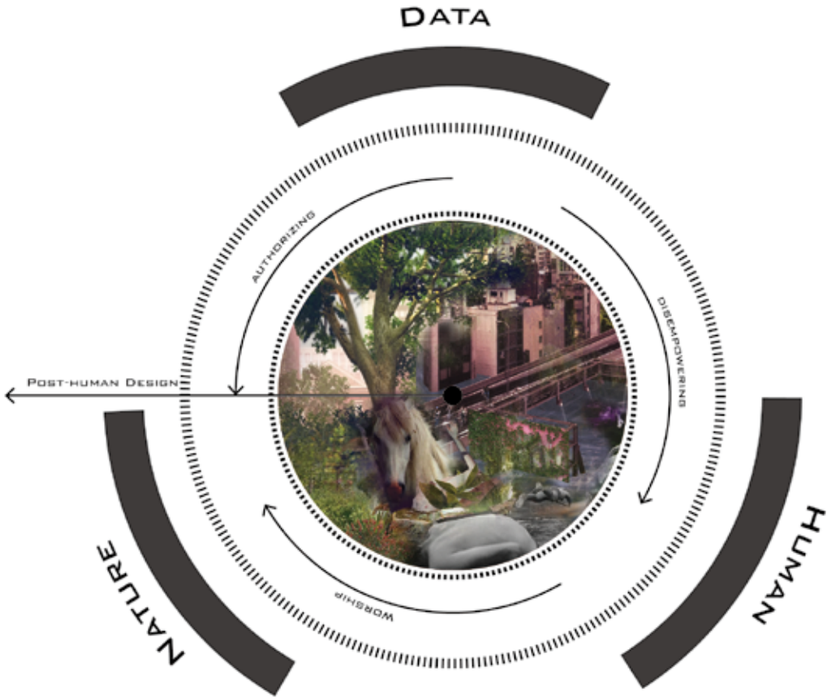
SUCCESS IN DATA-COLLECTION AND FAILURE IN DATA-PROCESSING





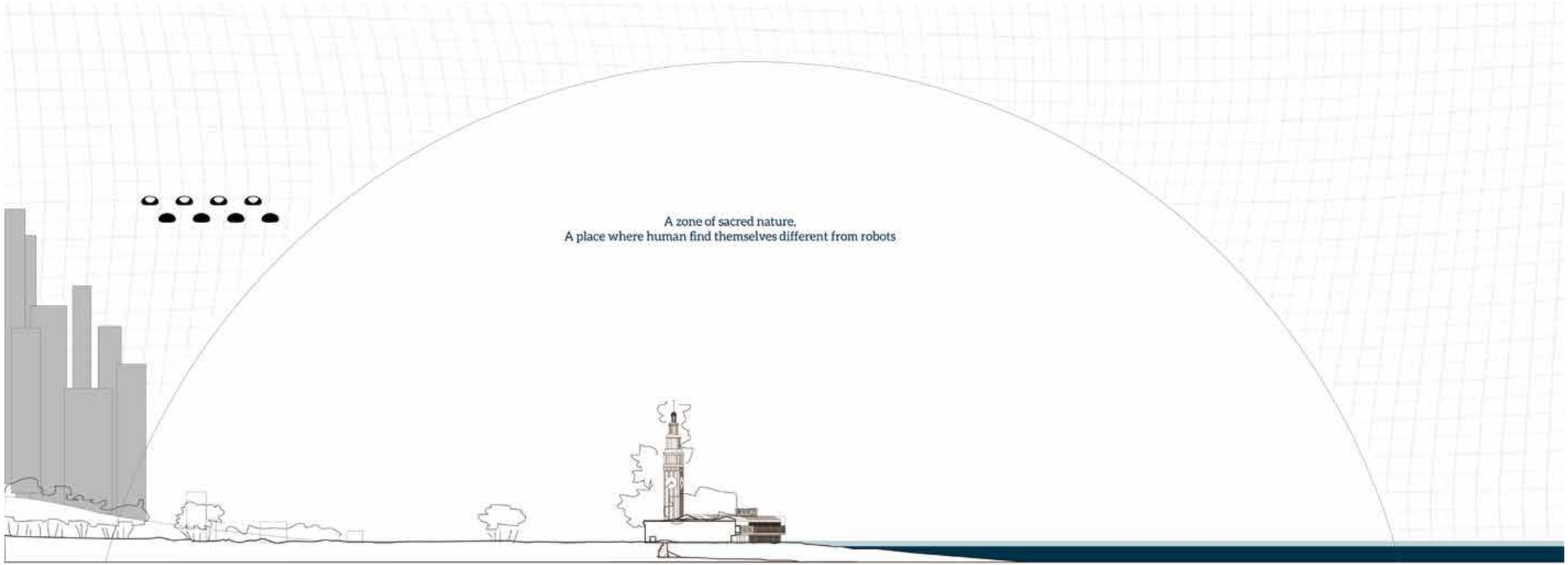


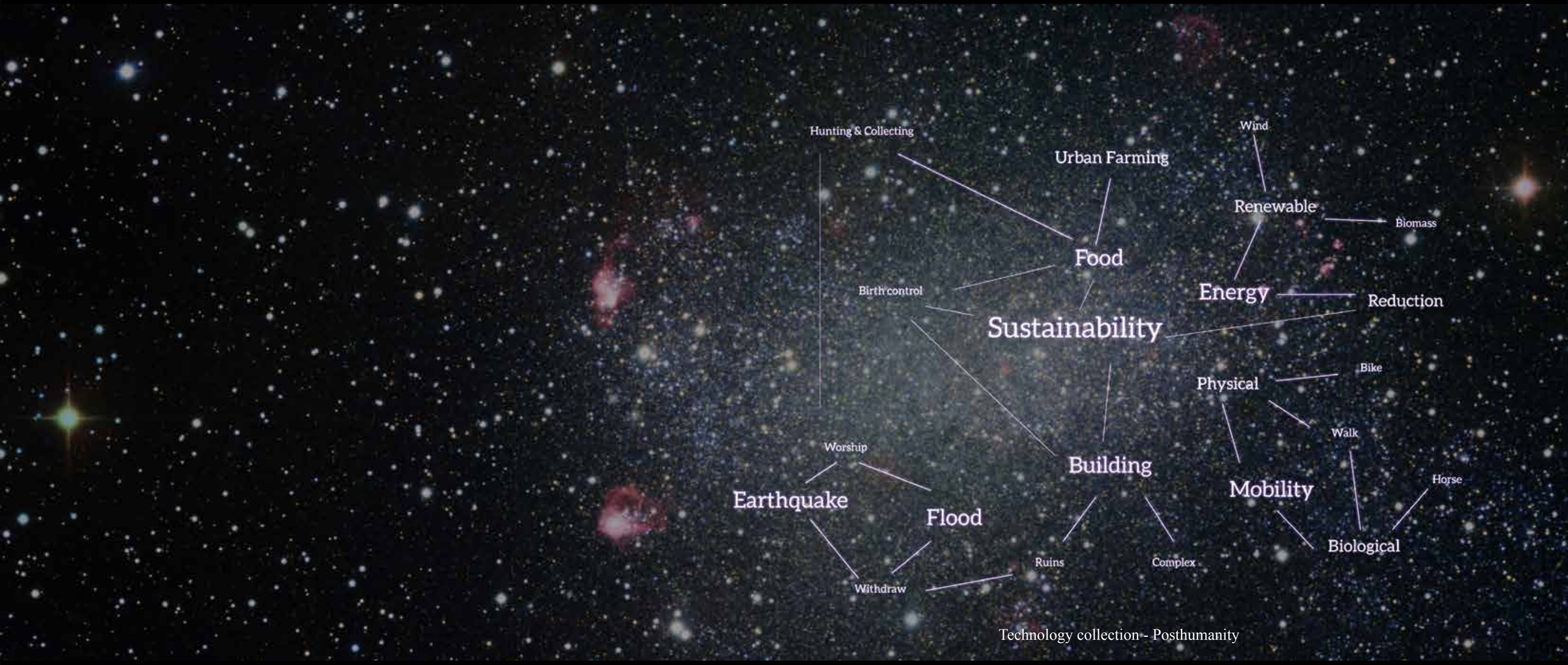
Three new notions of nature



NATURE AS POST-HUMANITY

DATA AUTHORIZING THE PRIORITY FOR NATURE


A zone of sacred nature,
A place where human find themselves different from robots

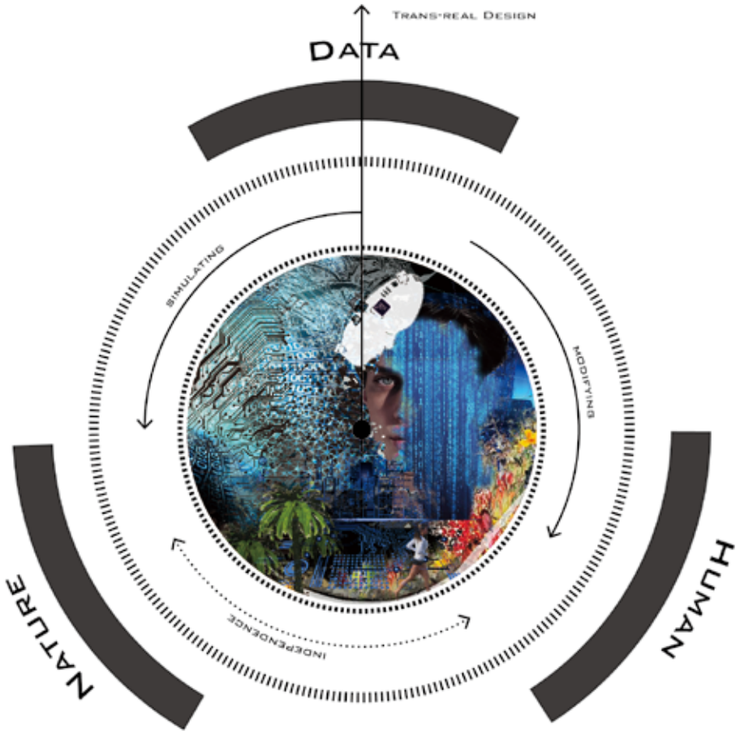


Technology collection - Posthumanity

A post-humanity story with collage

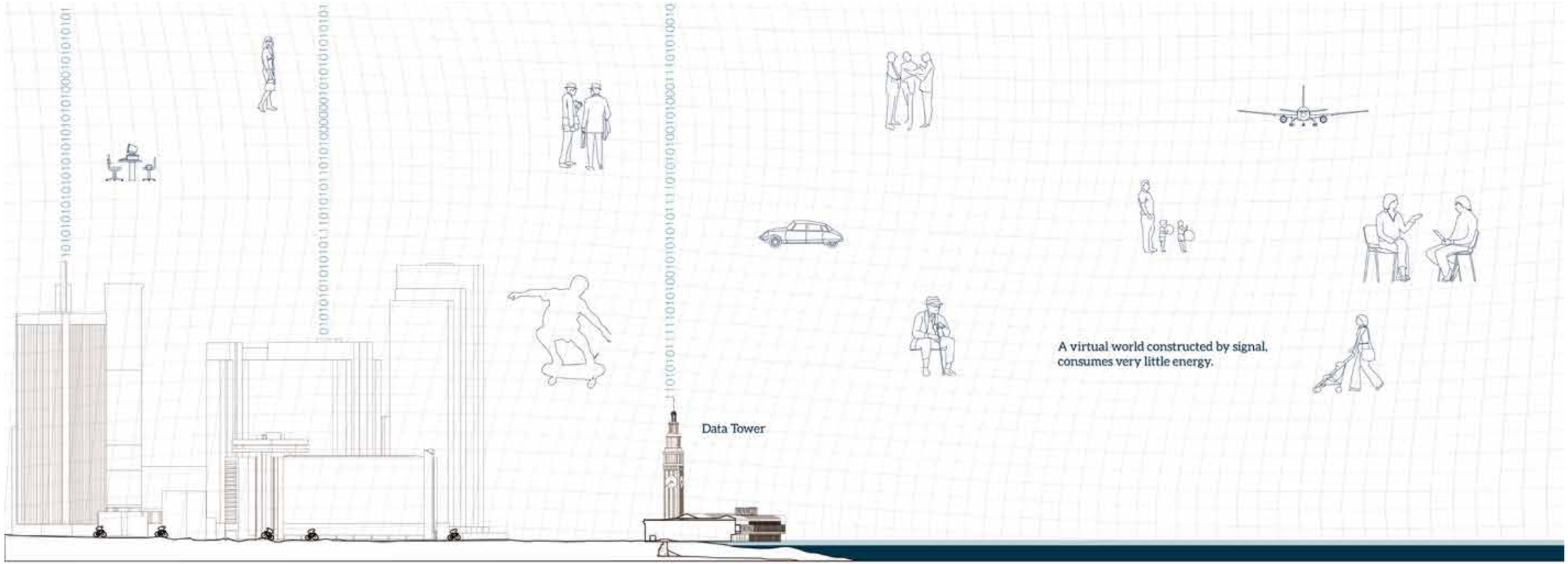
Current situation of Embarcadero

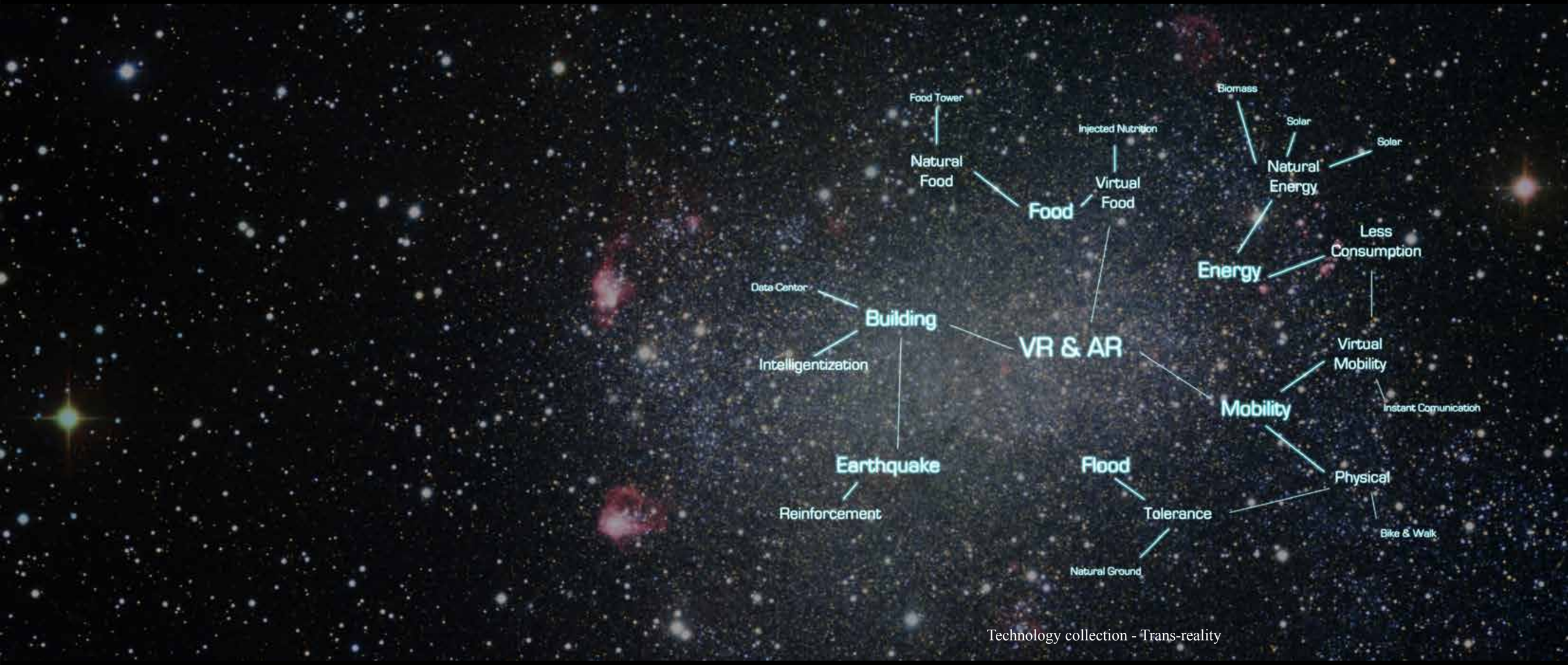
Worship of nature in the ruins



NATURE AS TRANS-REALITY

DATA ISOLATING HUMAN FROM NATURE


Data Tower
A virtual world constructed by signal,
consumes very little energy.

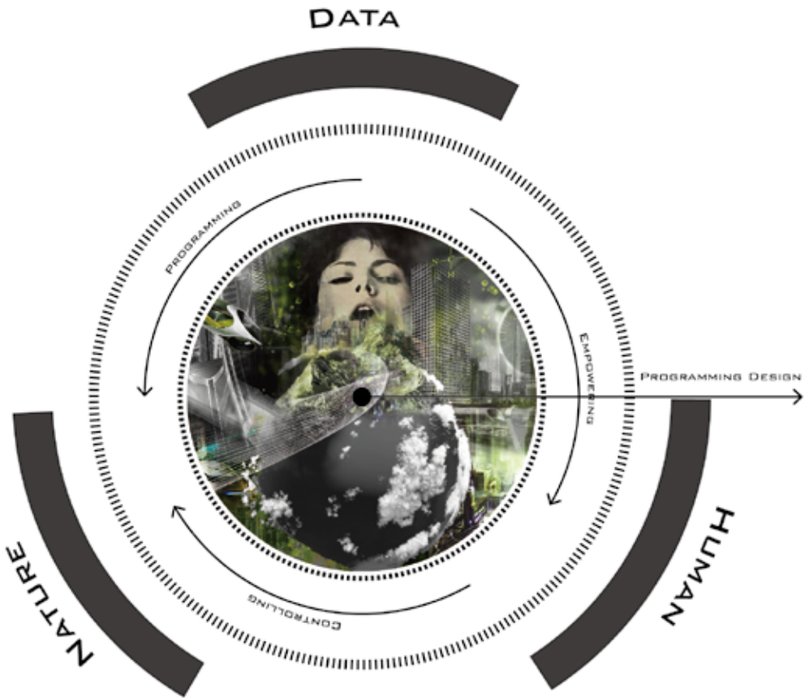


Technology collection - Trans-reality

A Trans-reality story with collage

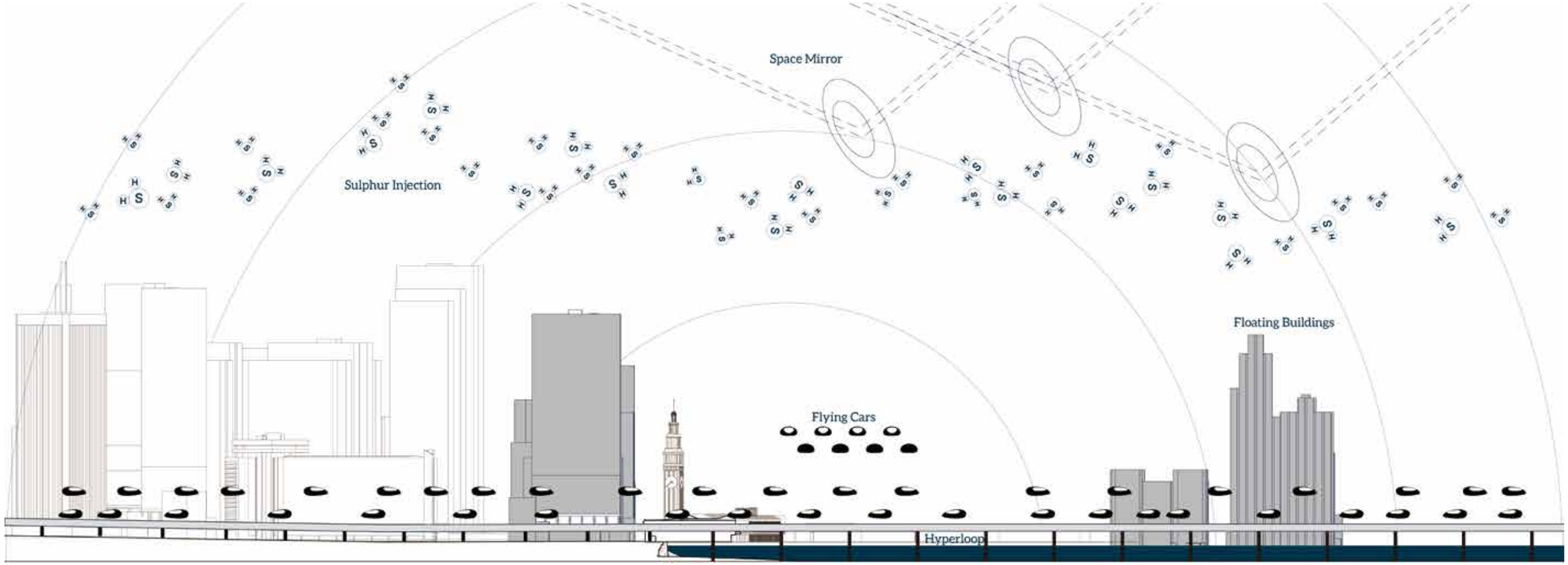
Current situation of Embarcadero

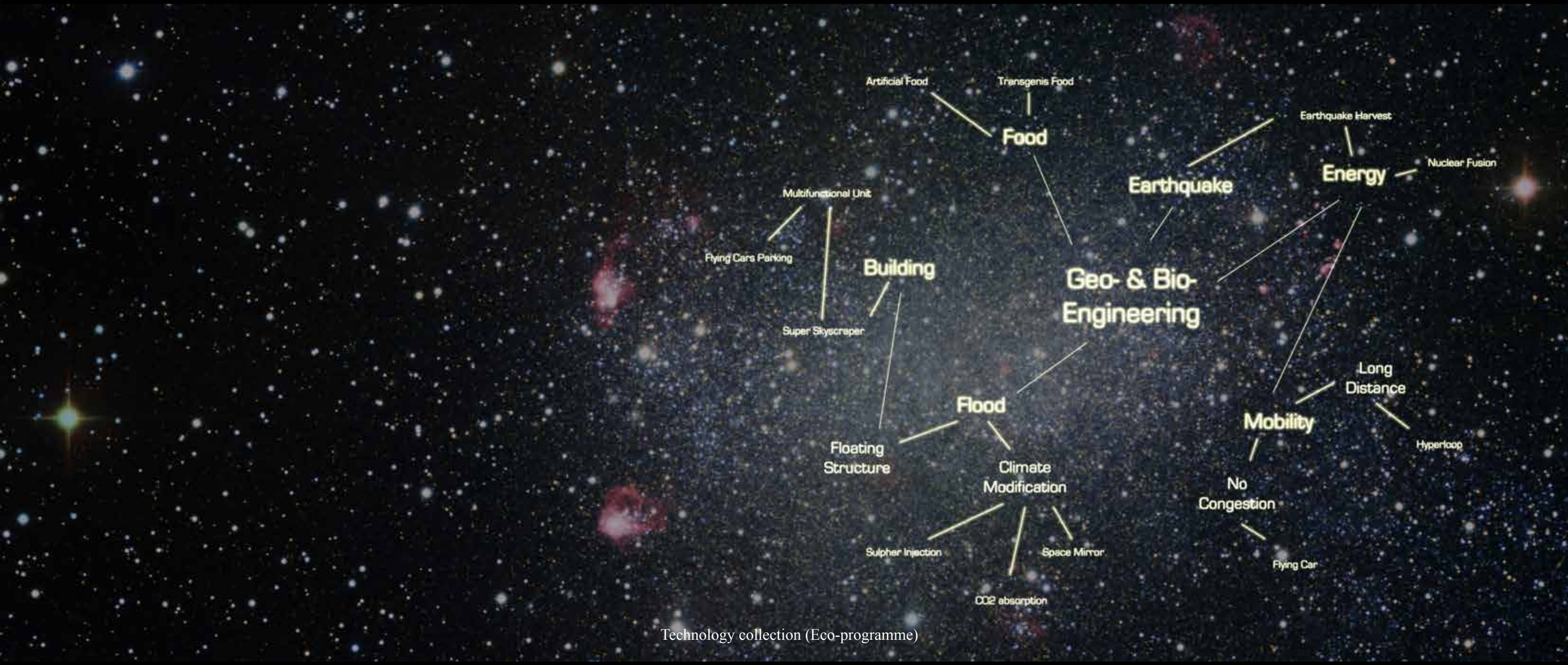
Digitally reclaiming of the outdoor space



NATURE AS ECO-PROGRAMME

DATA EMPOWERING HUMAN TO PROGRAMME NATURE


Space Mirror
Sulphur Injection
Floating Buildings
Flying Cars
Hyperloop



Technology collection (Eco-programme)

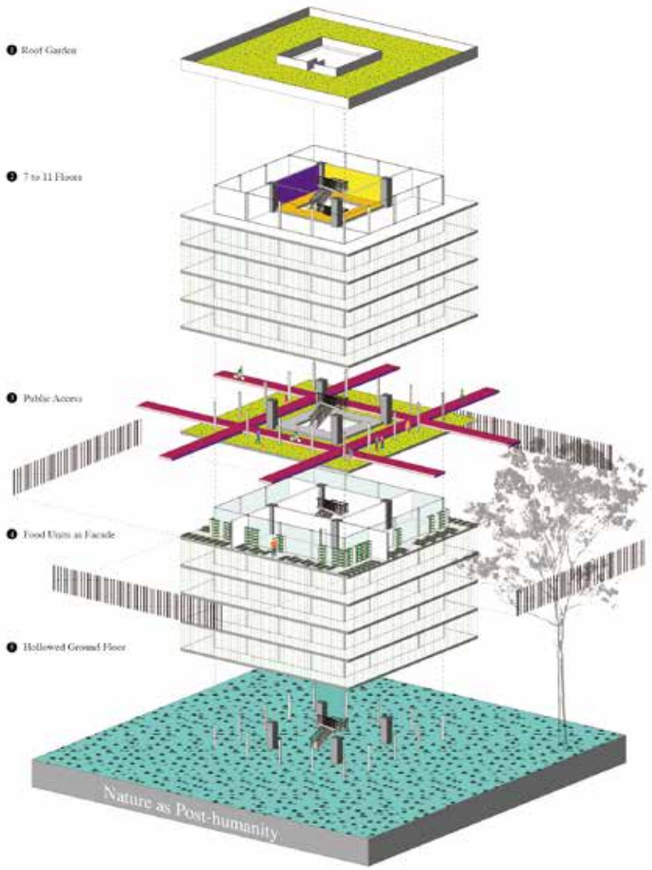
An Eco-programme story with collage

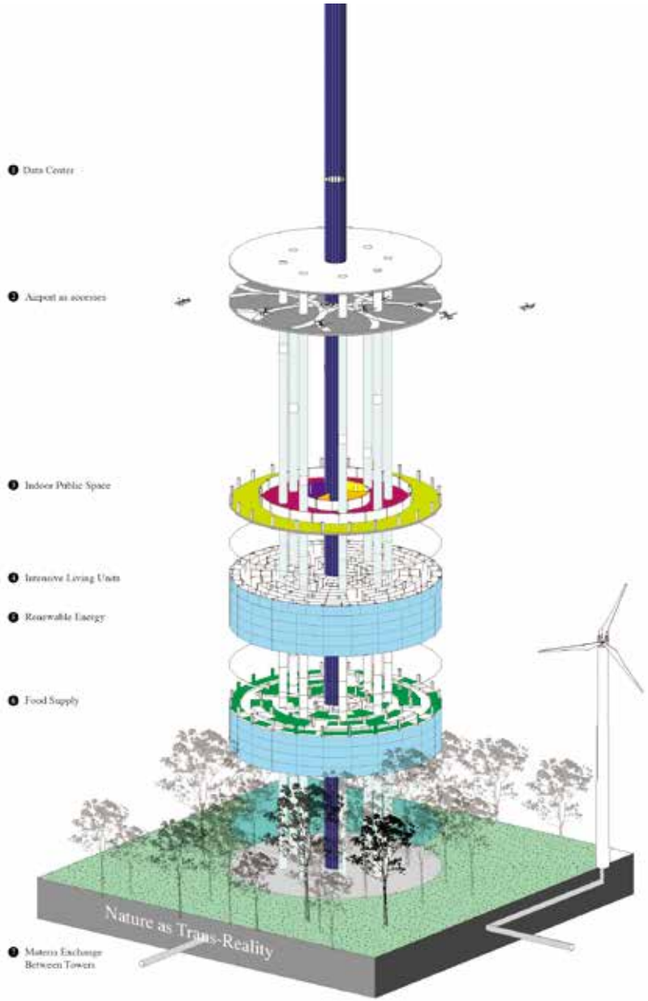
Current situation of Embarcadero

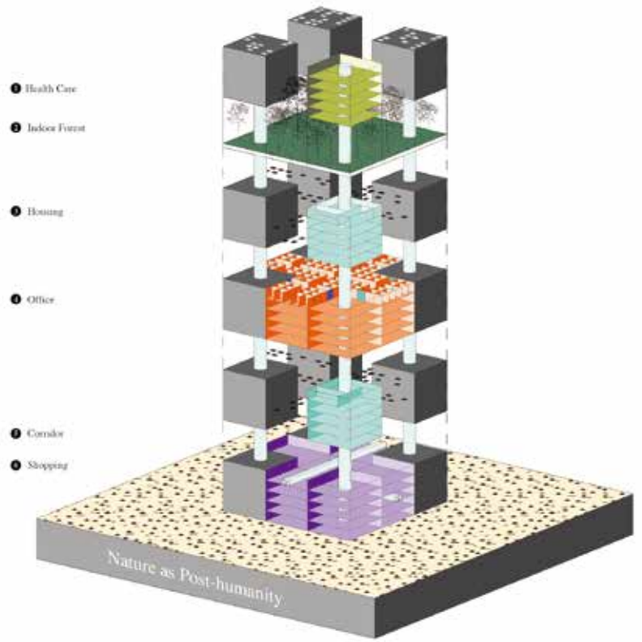
Intensive built and lived city

Timeline of Landscape Architecture

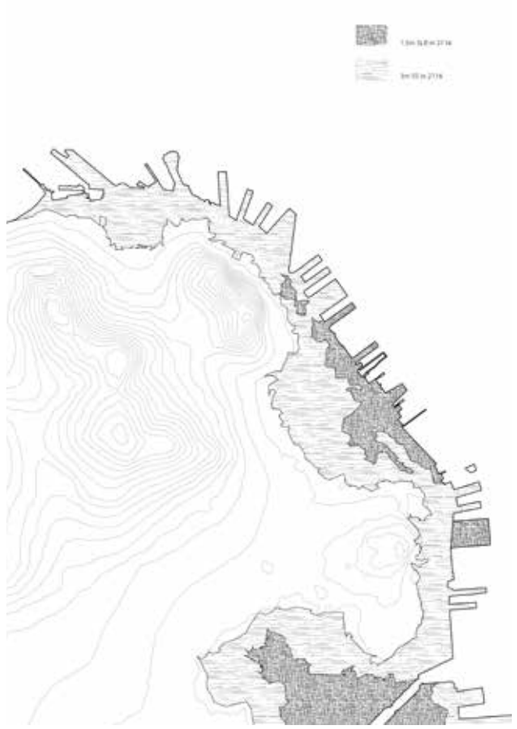
Comparison of the technology collections







Three living models



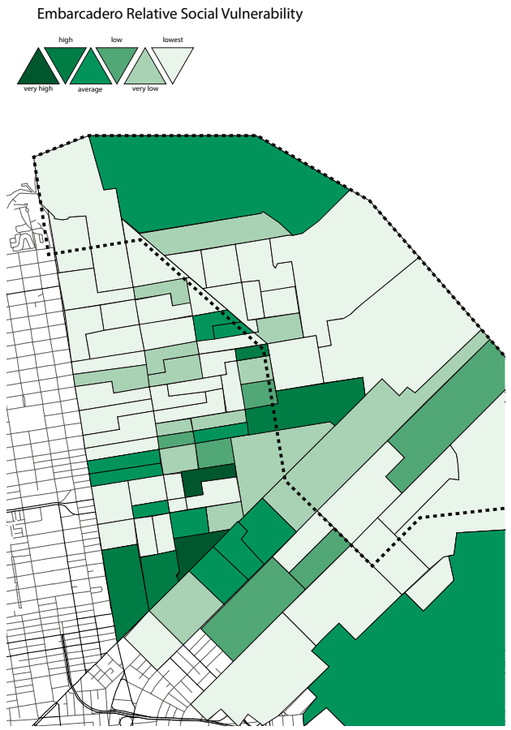
Inudation

Liquefication susceptibility

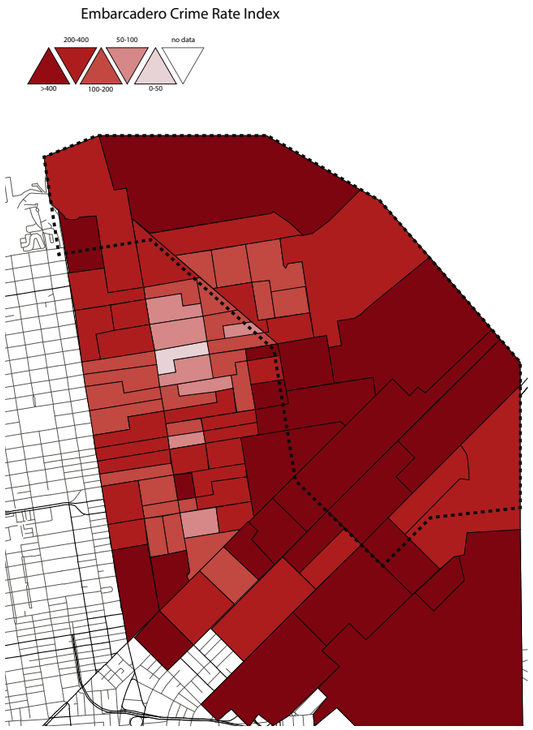
Soil map

This set of maps is done by Jeroen van der Kwaak

Transportation



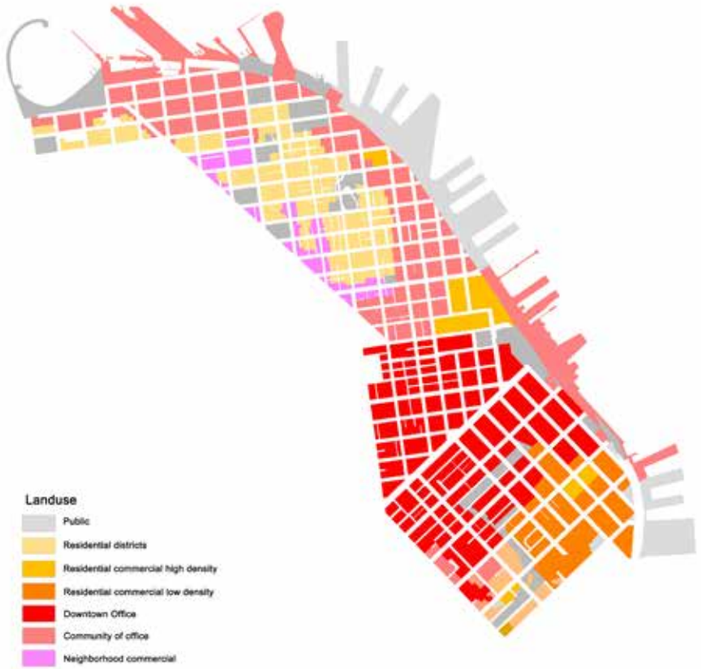
Social vulnerability



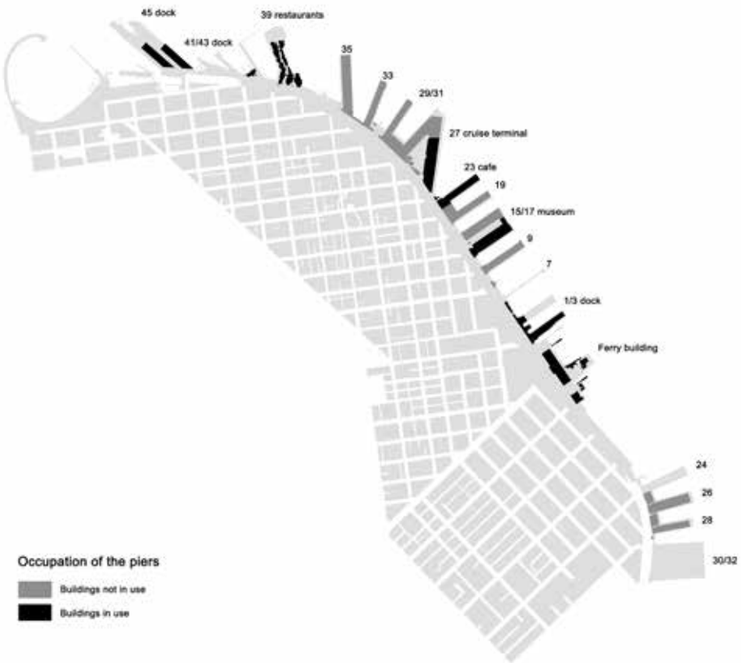
Crime rate

This set of maps is done by Zhuting Li

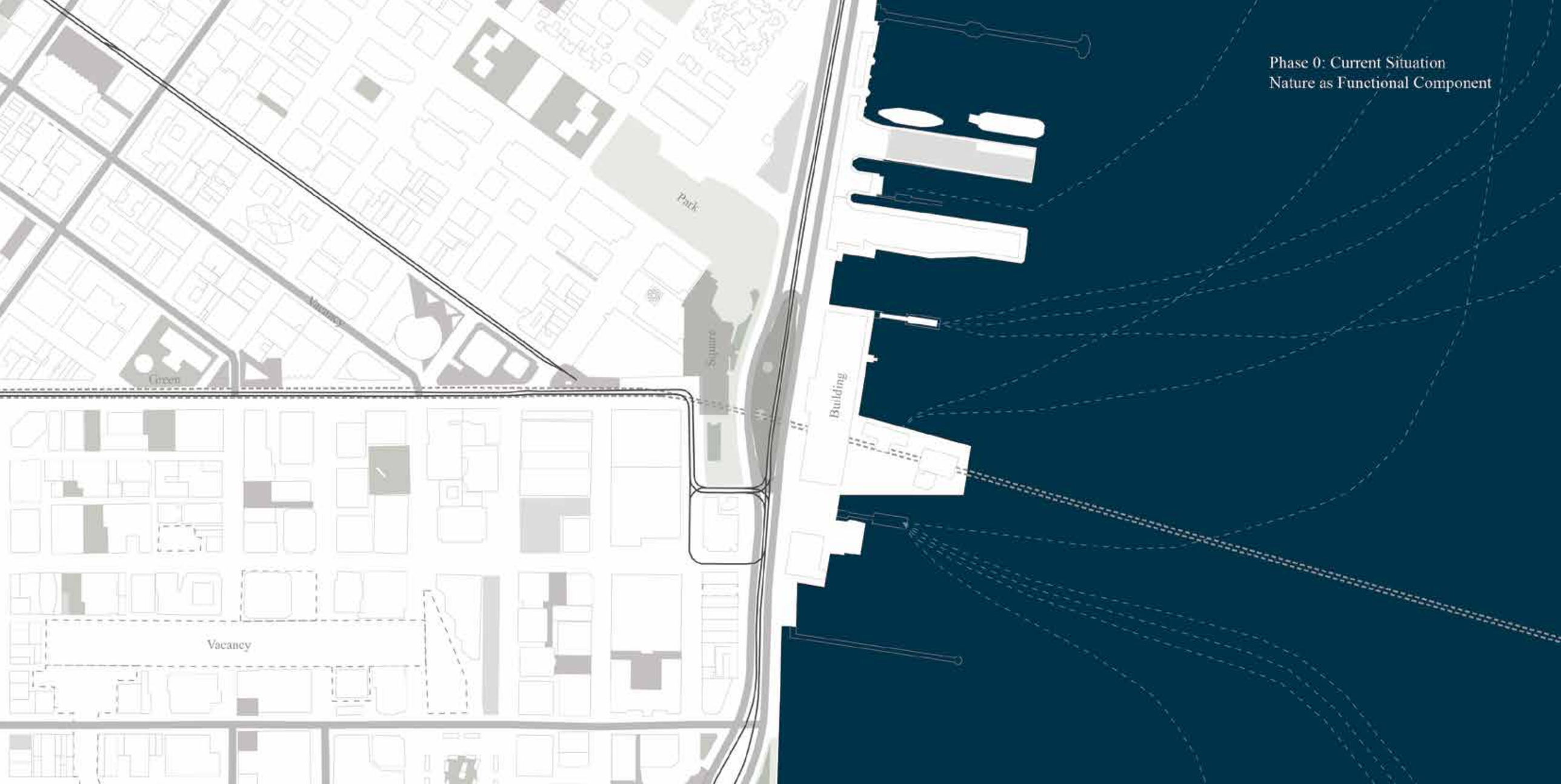
Open space

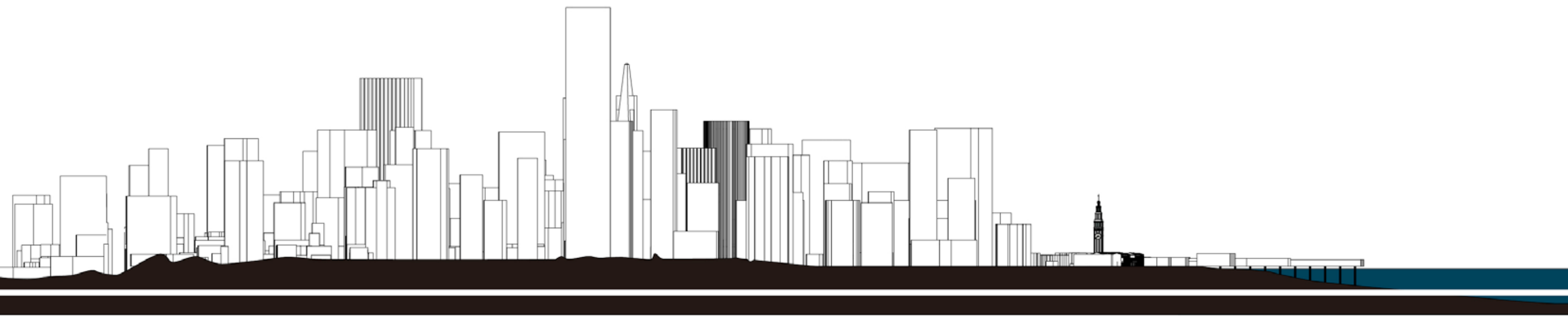


Land use

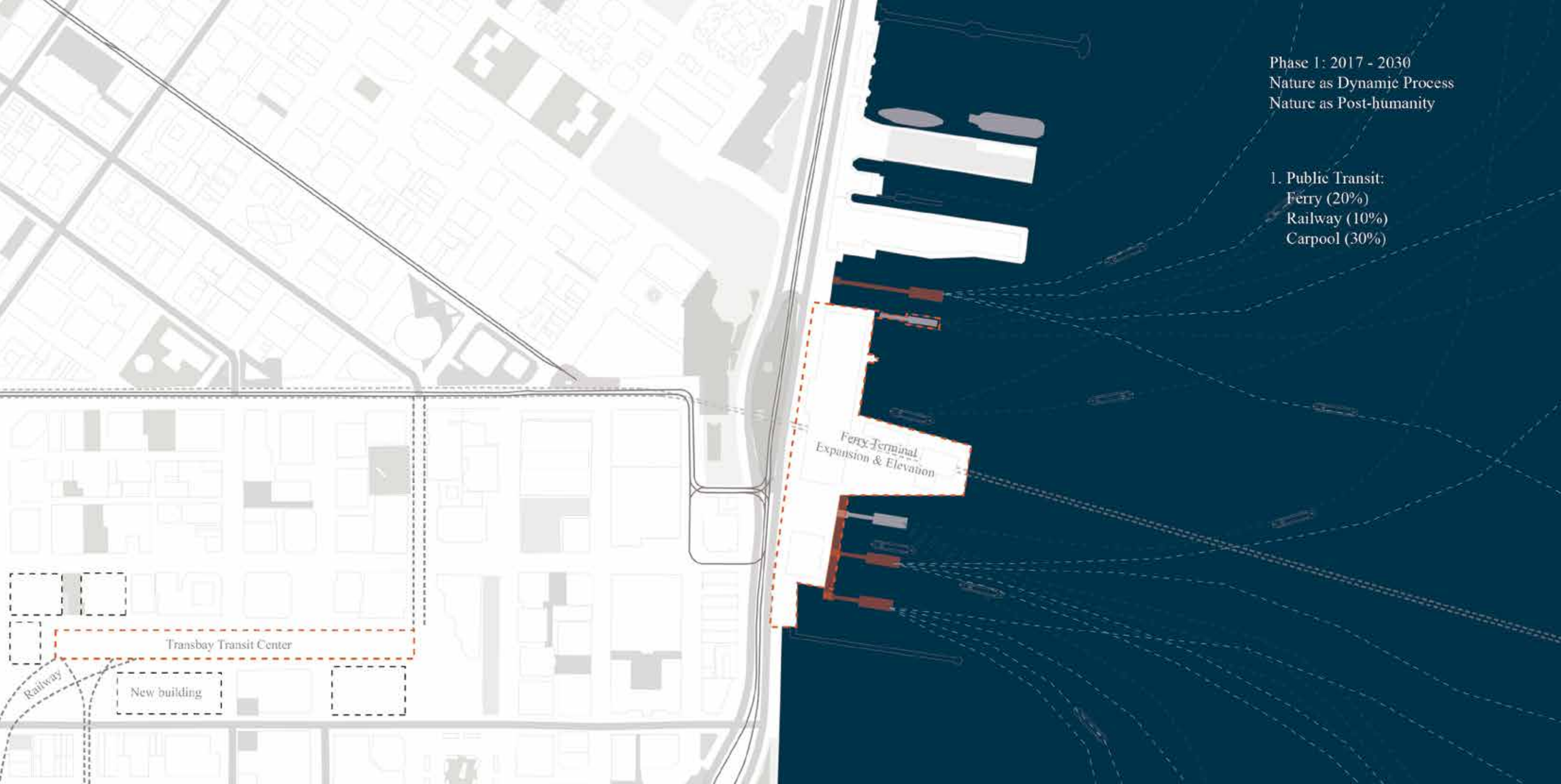


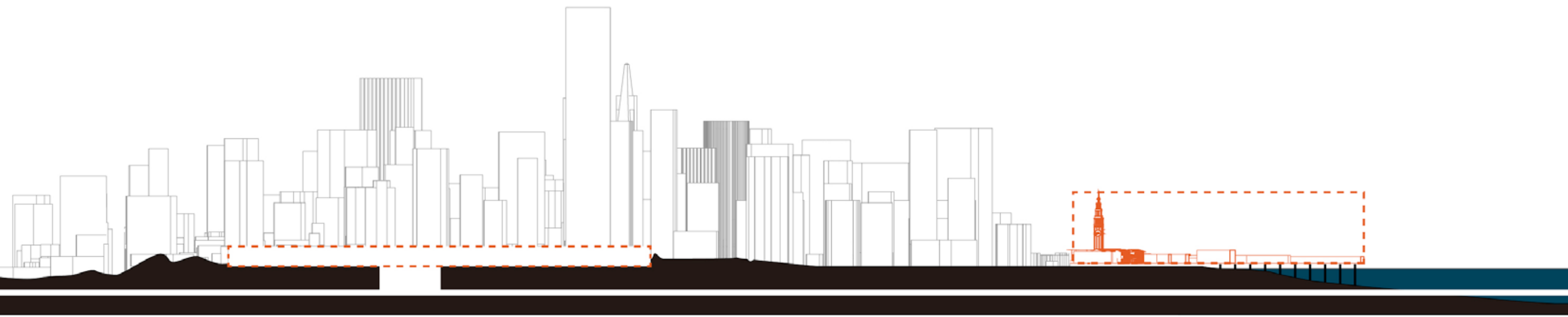
Occupation of piers


Phase 0: Current Situation
Nature as Functional Component
Park
Square
Building
Green
Vacancy
Vacancy

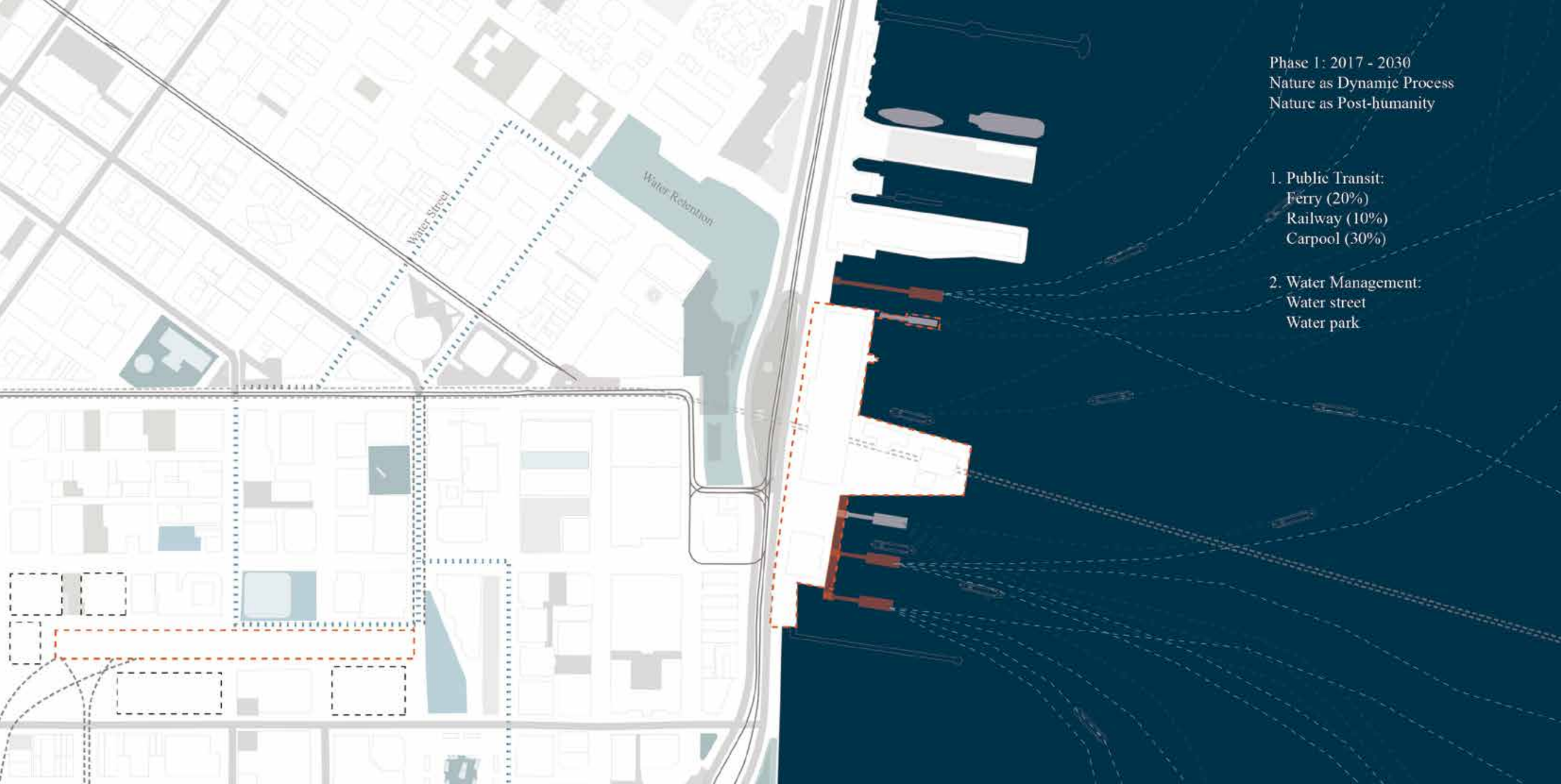


2017


Phase 1: 2017 - 2030
Nature as Dynamic Process
Nature as Post-humanity
1. Public Transit:
Ferry (20%)
Railway (10%)
Carpool (30%)
Ferry Terminal
Expansion & Elevation
Transbay Transit Center
Railway
New building



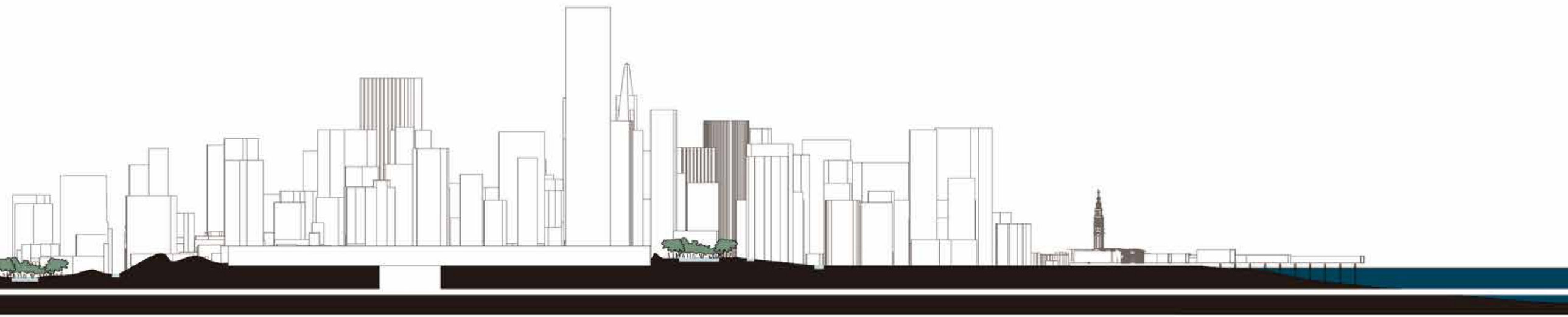
2020



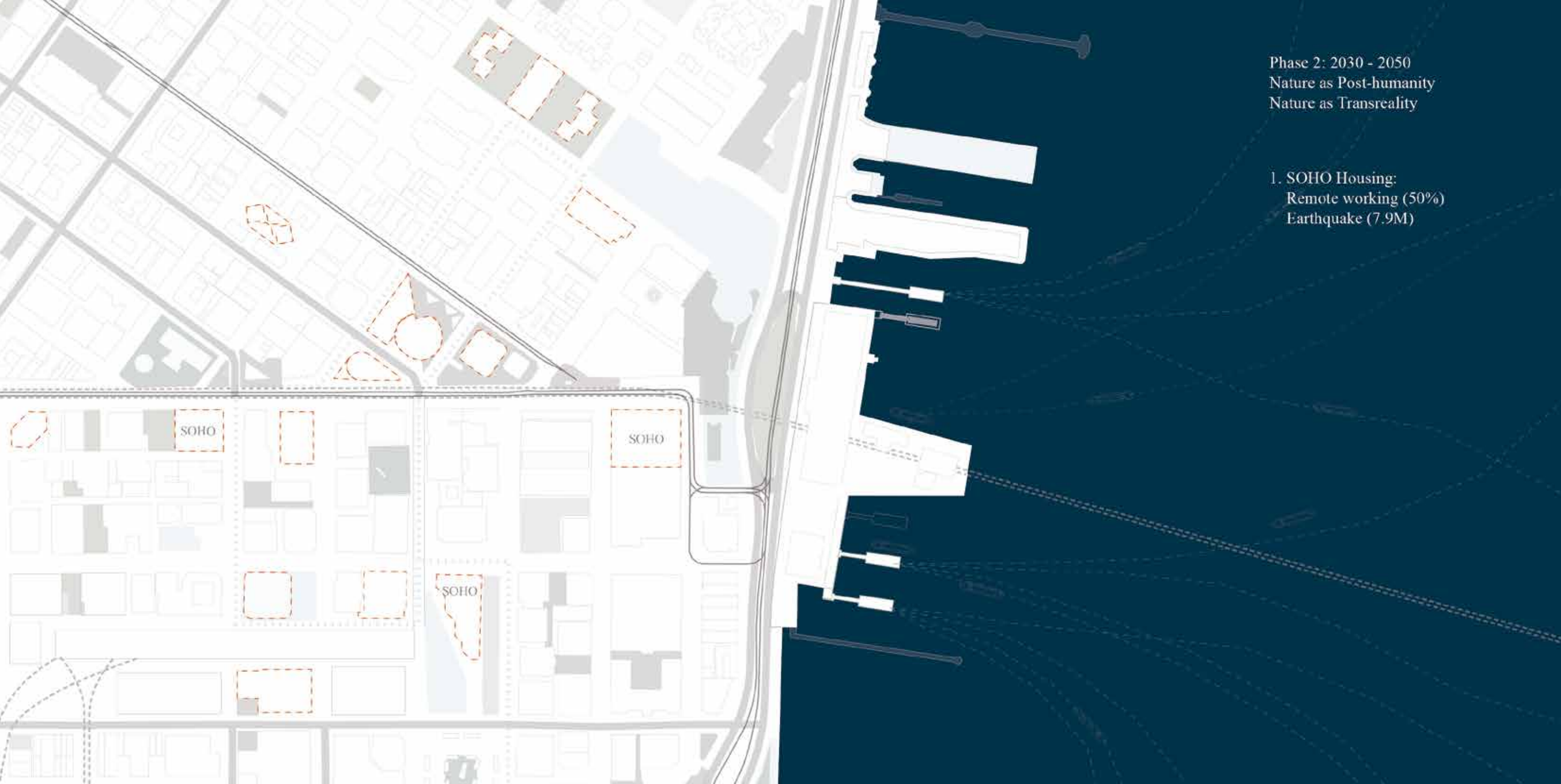
Phase 1: 2017 - 2030
Nature as Dynamic Process
Nature as Post-humanity

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

2. Water Management:
   Water street
   Water park

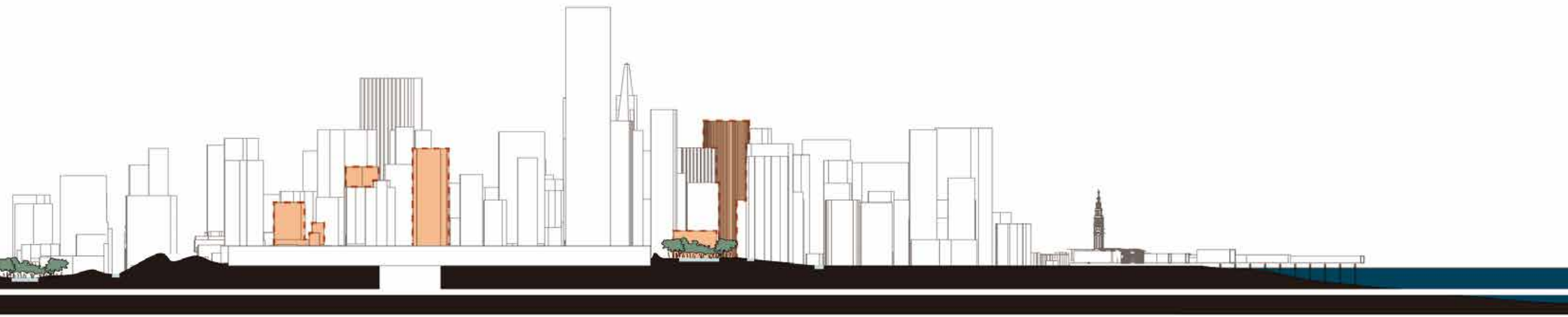


2025



Phase 2: 2030 - 2050
Nature as Post-humanity
Nature as Transreality

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

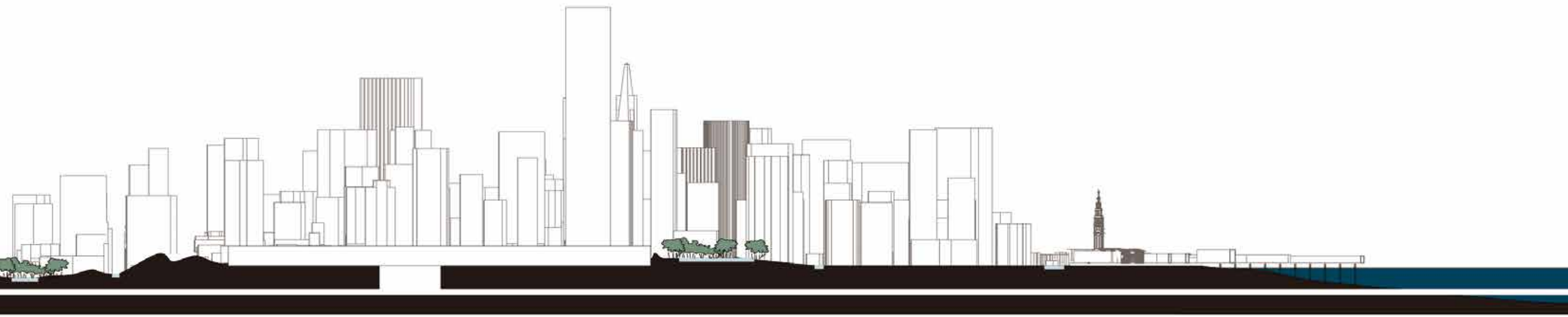


2035

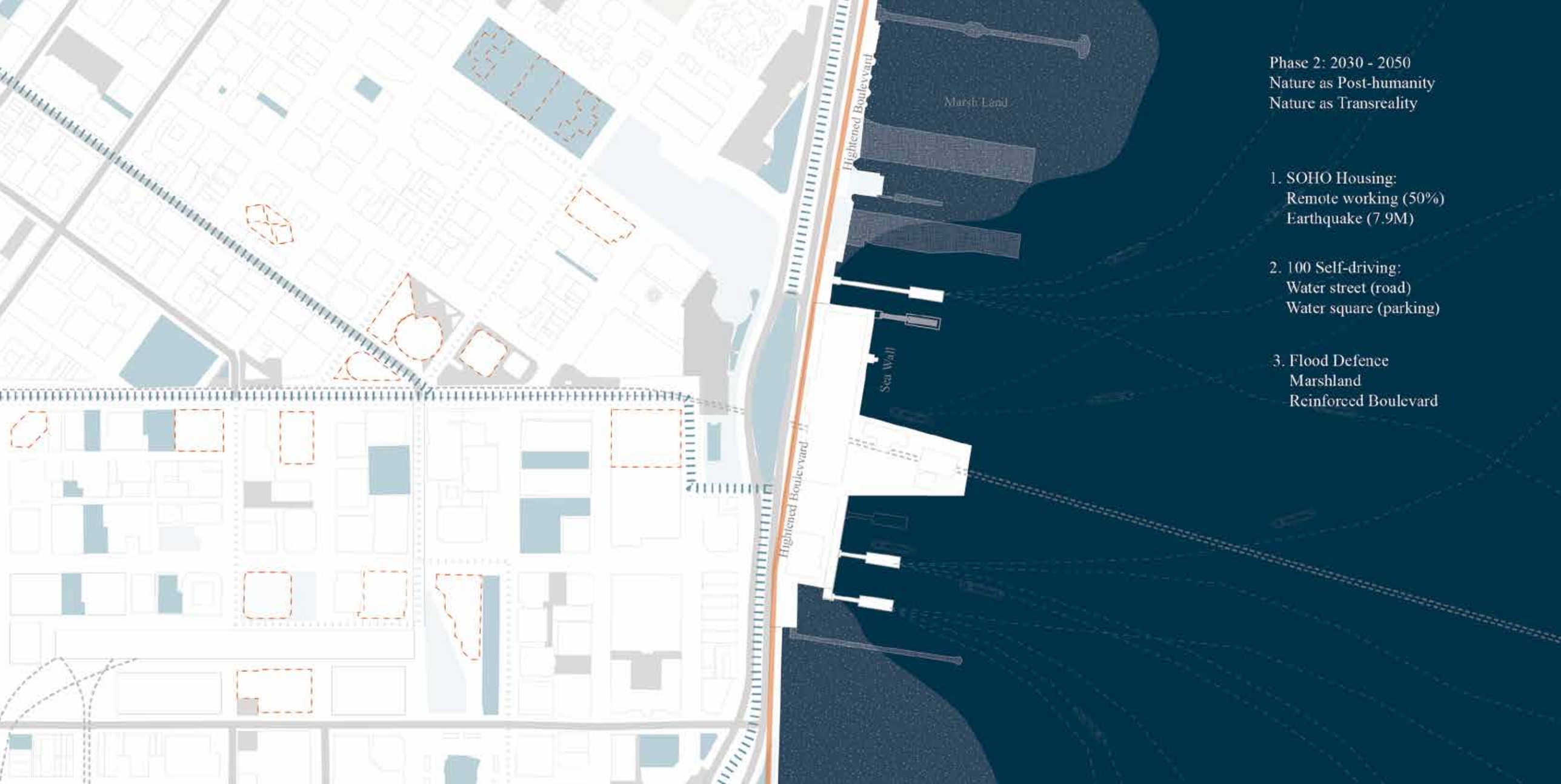
Phase 2: 2030 - 2050
Nature as Post-humanity
Nature as Transreality

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

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



2040

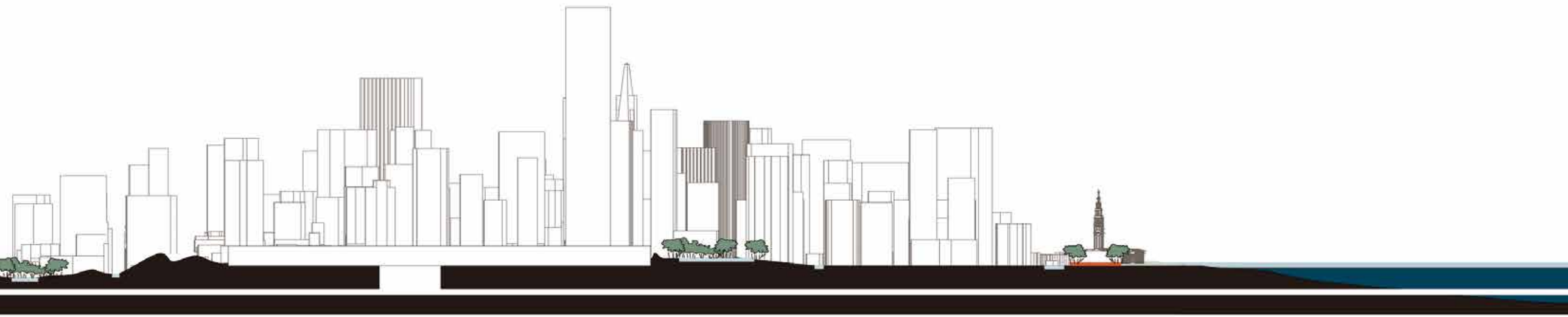


Phase 2: 2030 - 2050
Nature as Post-humanity
Nature as Transreality

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

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

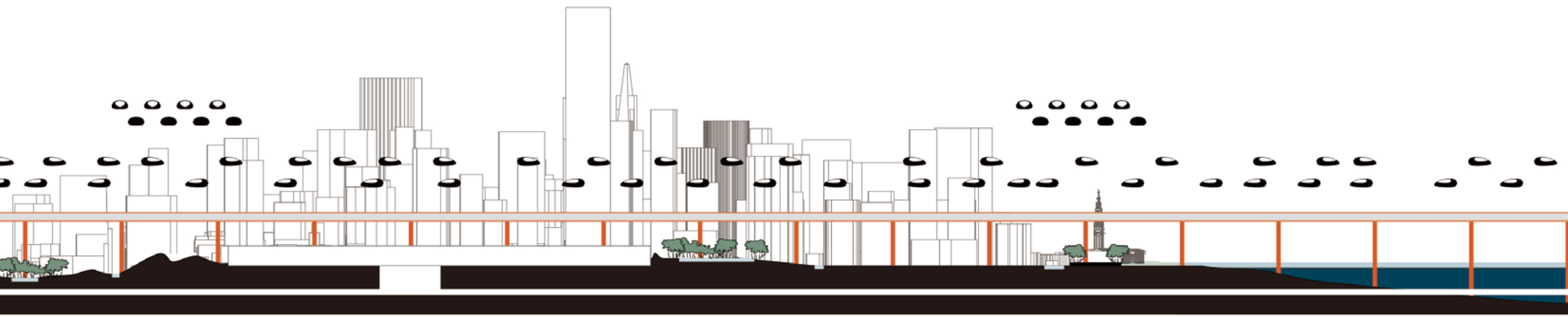
3. Flood Defence
   Marshland
   Reinforced Boulevard



2050

Phase 3: 2050 - 2070
Nature as Trans-reality
Nature as Eco-programme

1. New Trasnportation:
   Digitalisation
   Flying cars
   Hyperloop

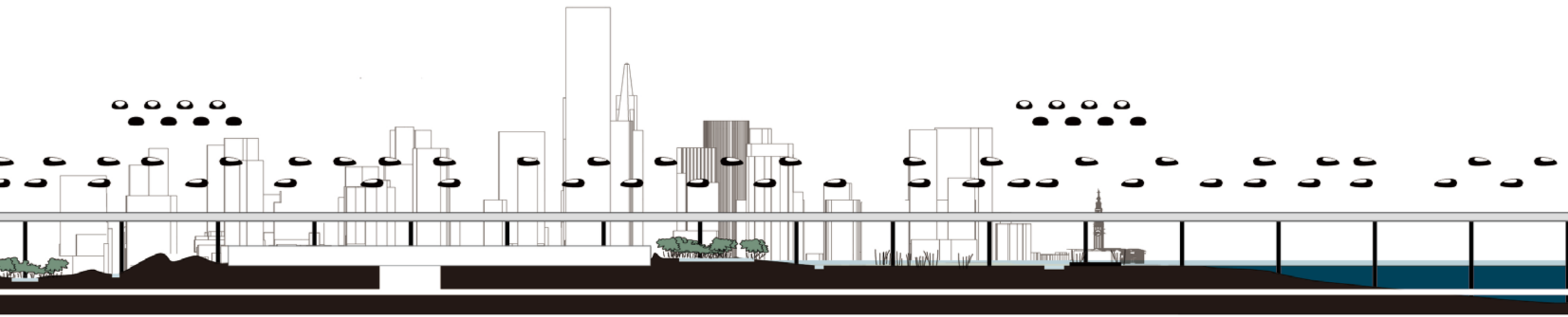


2060

Phase 3: 2050 - 2070
Nature as Trans-reality
Nature as Eco-programme

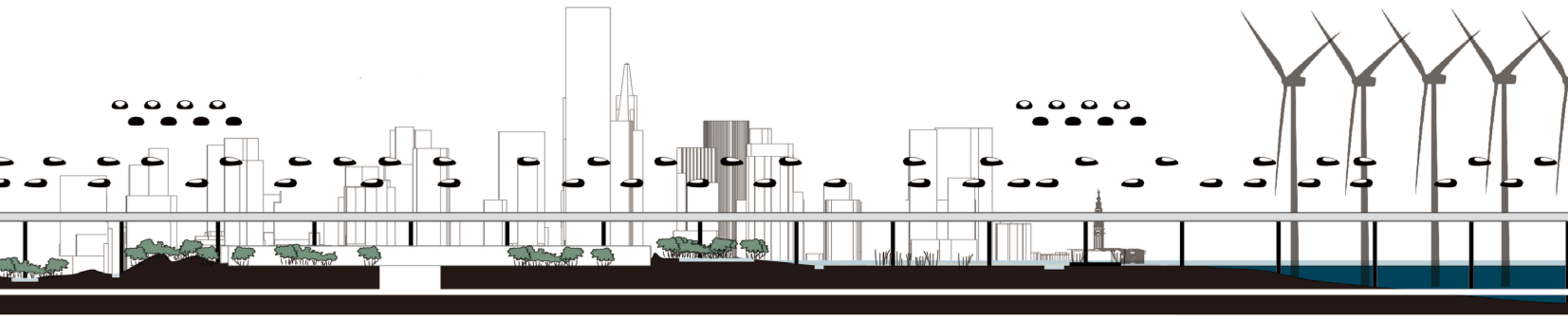
1. New Trasnportation:
   Digitalisation
   Flying cars
   Hyperloop

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



2065

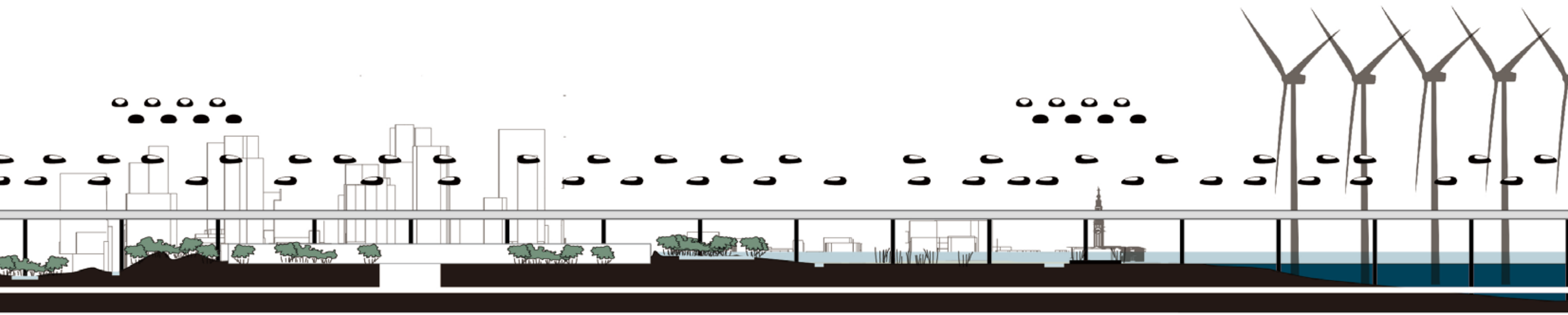

Phase 3: 2050 - 2070
Nature as Trans-reality
Nature as Eco-programme
1. New Trasnportation:
Digitalisation
Flying cars
Hyperloop
2. Water Defence:
Unexplorement (40%)
Building demolish (20%)
Tidal Marshland
3. Self-sufficiency:
Trees
Windturbines
Trees
Growing
Windturbine
Hyperloop



2070

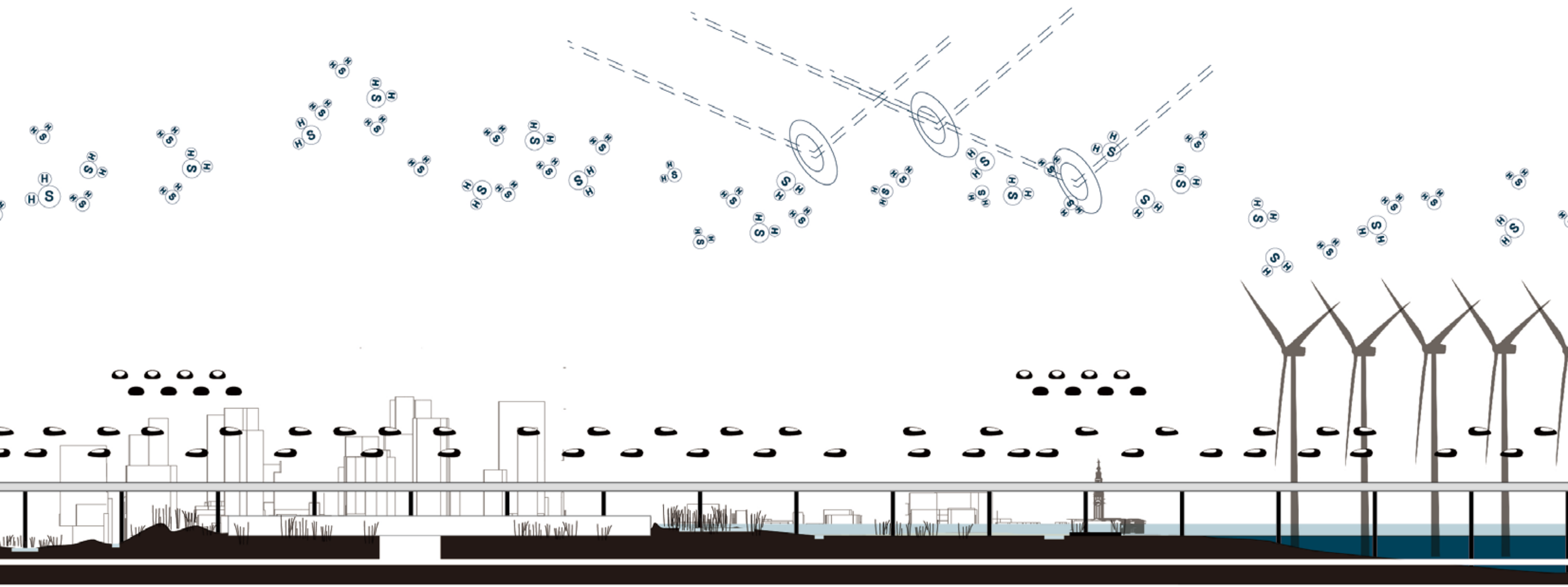
Phase 4: 2070-2100
Nature as Trans-reality
Nature as Eco-programme
Nature as Post-humanity

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



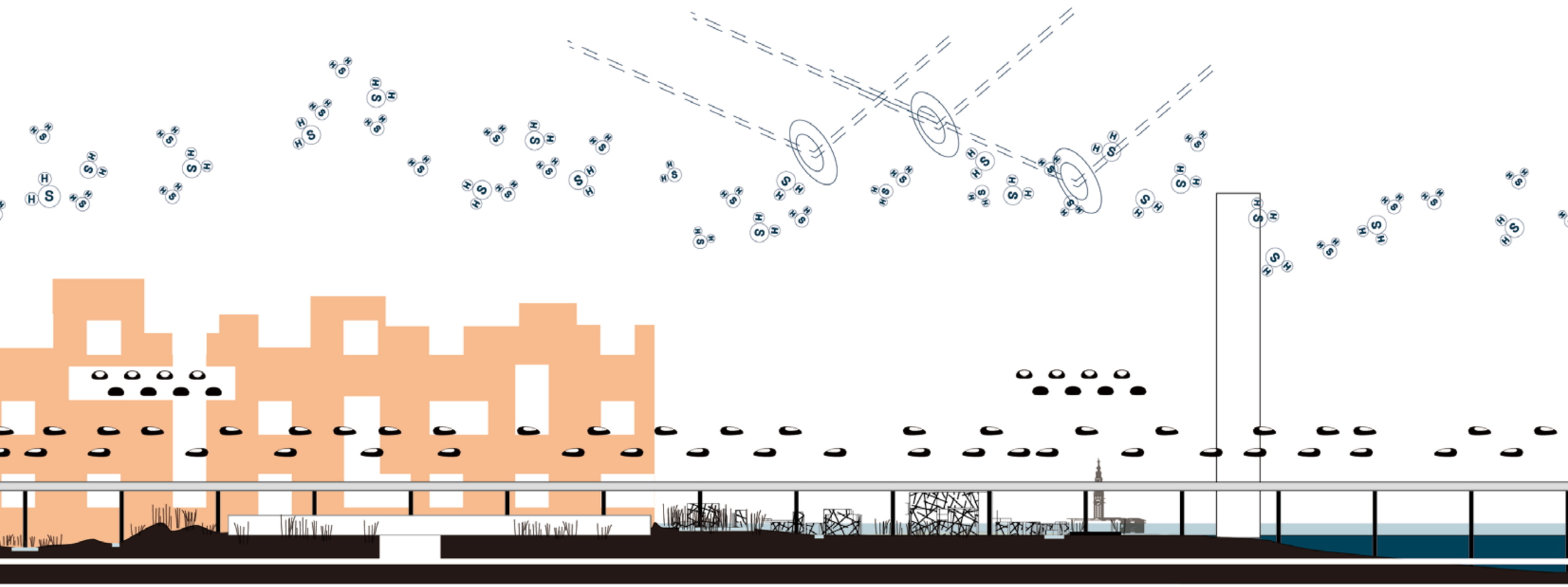
2080


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:
Spieces extinction

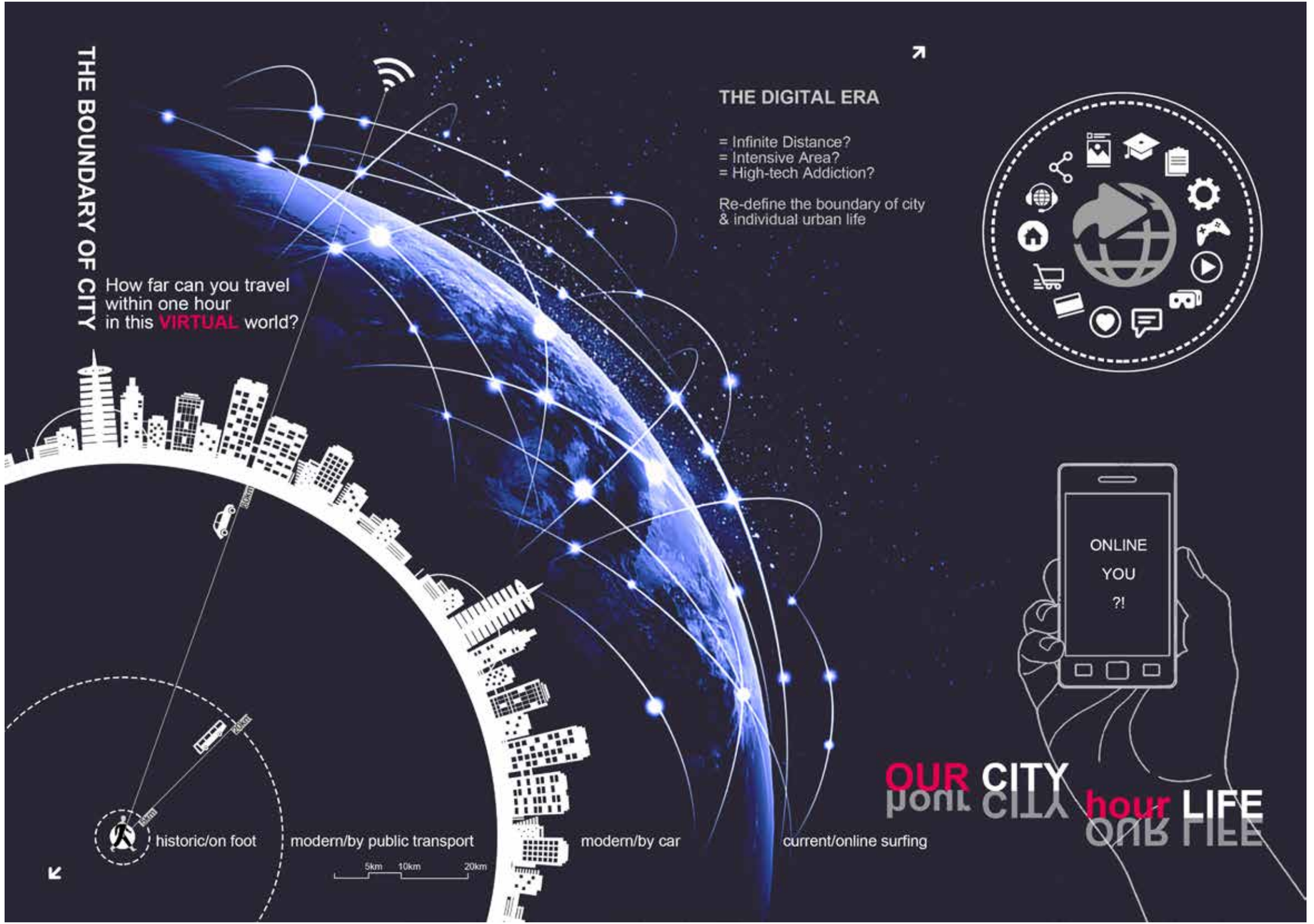


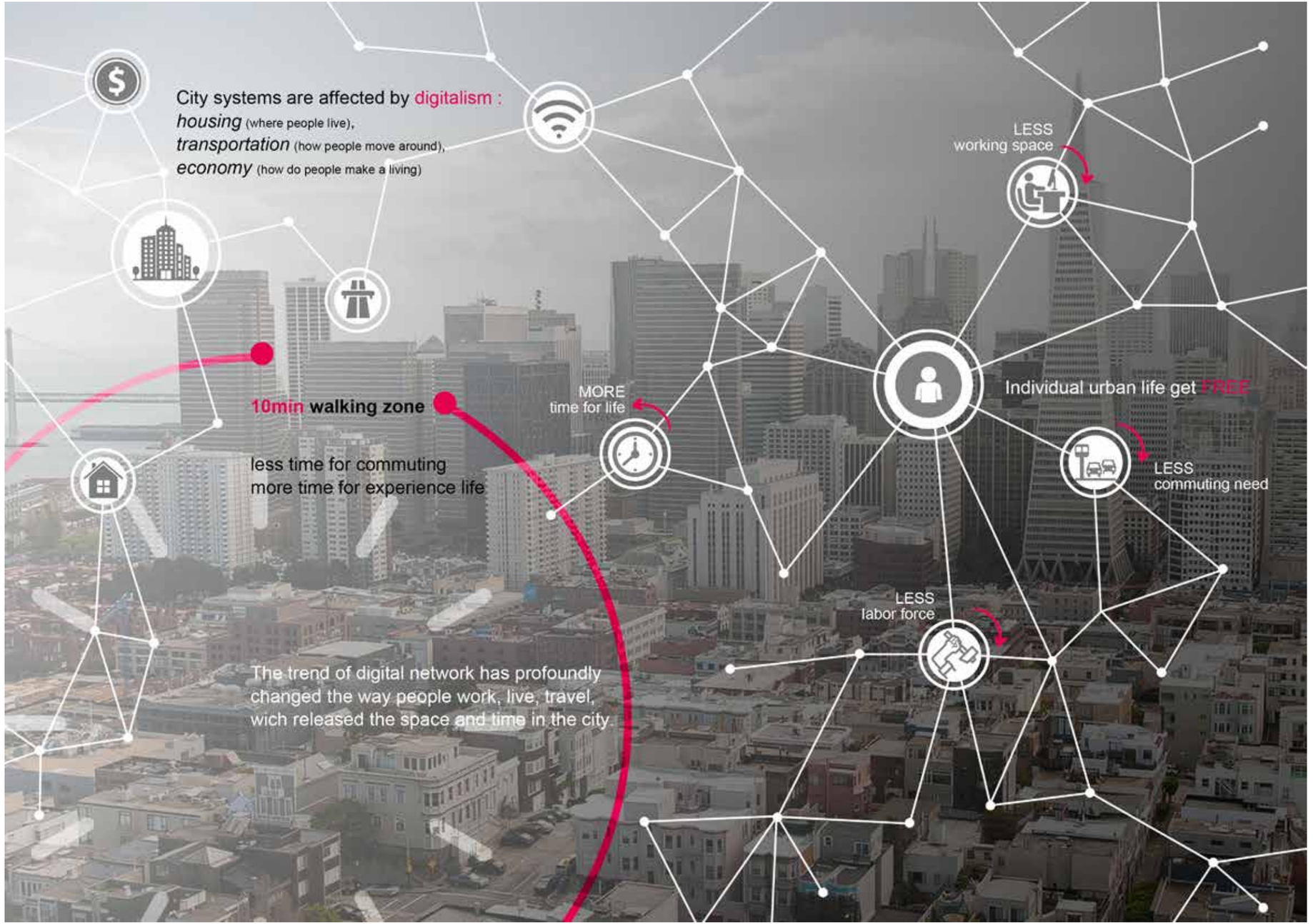
2090


Continunous City
Ruins
Isolated Tower
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:
Spieces extinction
3. Mixed living:
Continunous 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 hour LIFE
historic/on foot
modern/by public transport
modern/by car
current/online surfing
5km
10km
20km


City systems are affected by digitalism :
housing (where people live),
transportation (how people move around),
economy (how do people make a living)
10min walking zone
less time for commuting
more time for experience life
The trend of digital network has profoundly changed the way people work, live, travel, wich released the space and time in the city.
LESS working space
MORE time for life
Individual urban life get FREE
LESS commuting need
LESS labor force

TARGET CITY SELECTED

San Francisco In Challenge

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

The United States | San Francisco Bay | San Francisco

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

1.5m SLR+3m Storm Surge in 2100

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.

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. Safeforce
30. Robert Half International
31. Well Fargo
42. VMware
51. Adobe
55. Mckesson Corporation
95. Datastax

(flexjob.com, 2017)

Emerging Facts:

+ June 2017, Automattic announced to close its headquarter 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

#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

#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

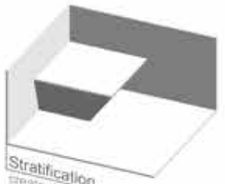
#3 Encourage Ecommerce

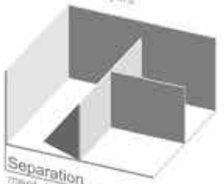
[ACTIONS]
+ Reduce e-business taxes and provide small loans to yong starters

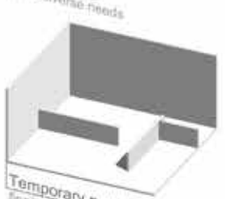
[ACTORS]
Government, young starers, private enterprises

1 Office Transformation

SPACE-MAKING PRINCIPLES



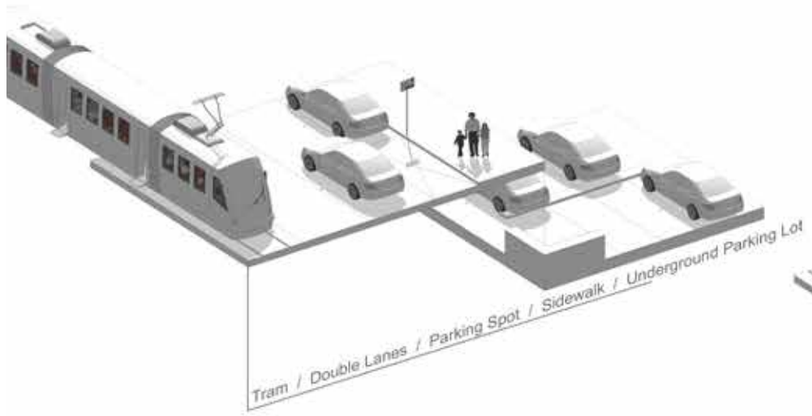


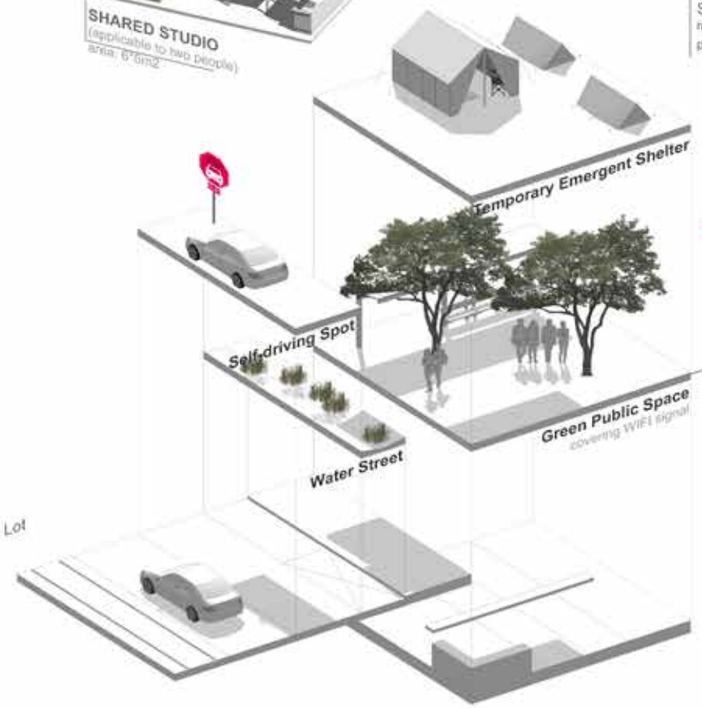


FROM STRATEGY TO DESIGN PRICIPLES

AFFORDABLE HOUSING SAMPLE

2 Smart Transportation

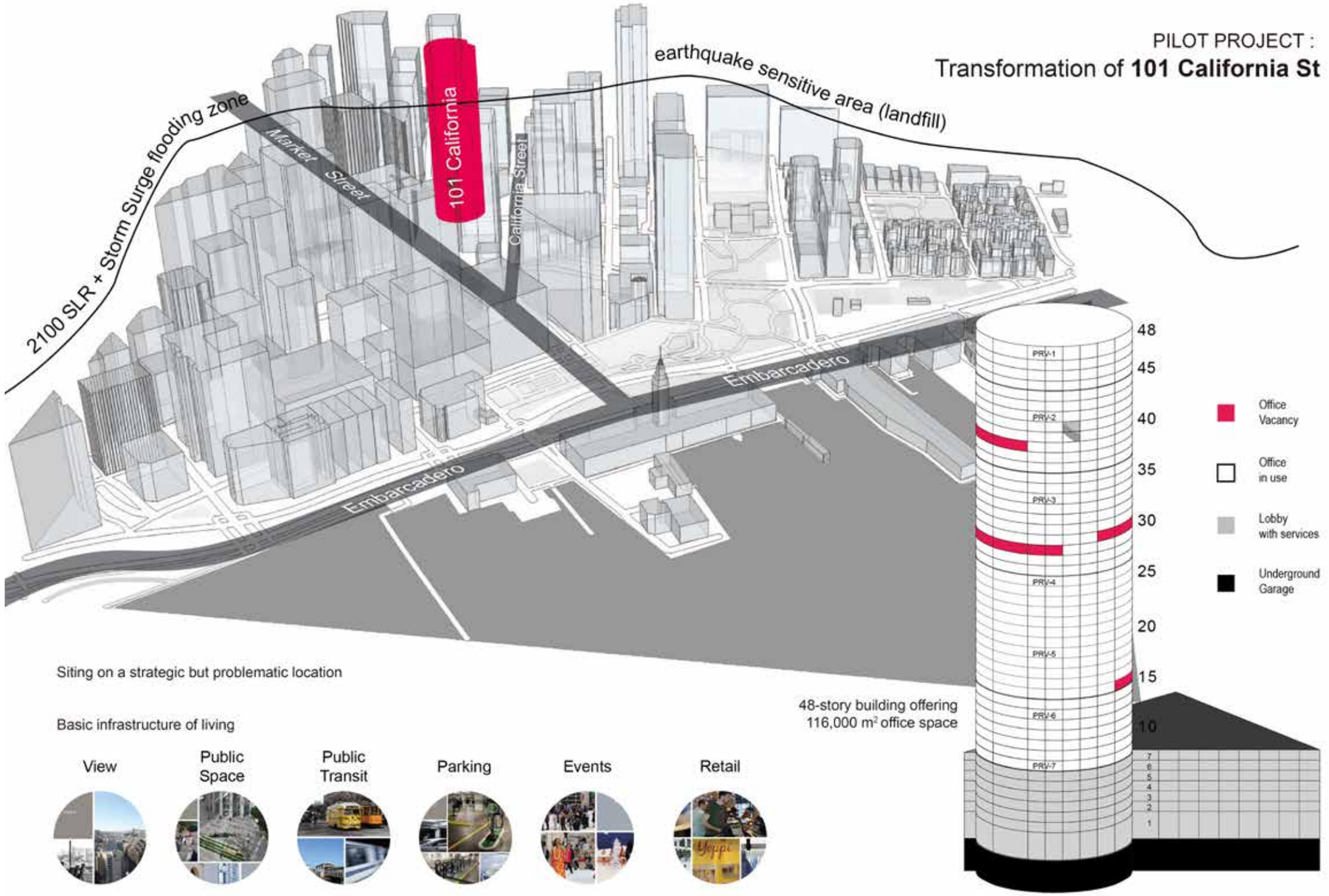




3 Ecourage E-Commerce

PILOT PROJECT :

Transformation of **101 California St**



Siting on a strategic but problematic location

48-story building offering 116,000 m² office space

Basic infrastructure of living

View

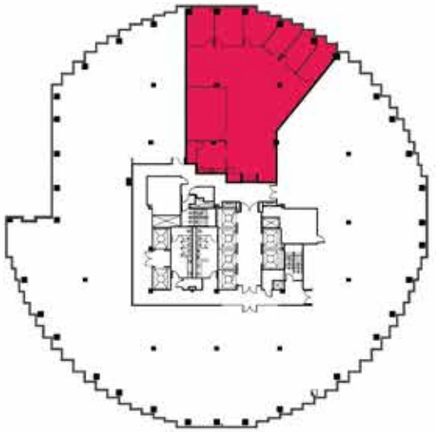
Public Space

Public Transit

Parking

Events

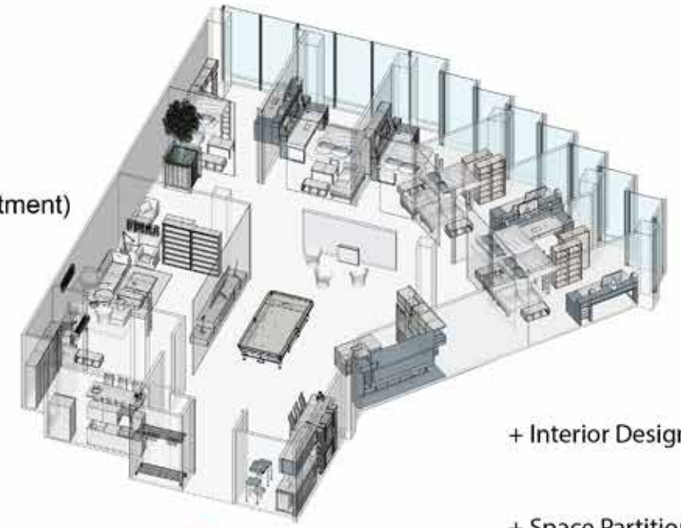
Retail



OFFICE TRANSFORMATION DESIGN

+ transfer into affordable housing
+ provide different living units (studio/apartment)
+ e-livingroom as shared space

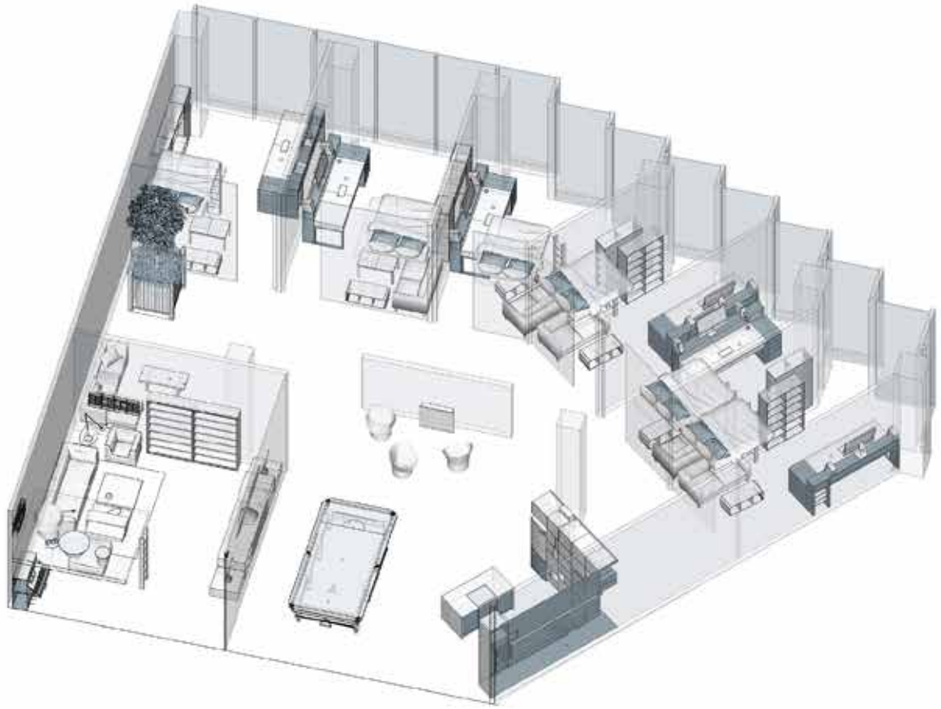
Floor Plan of 39F / office vacancy

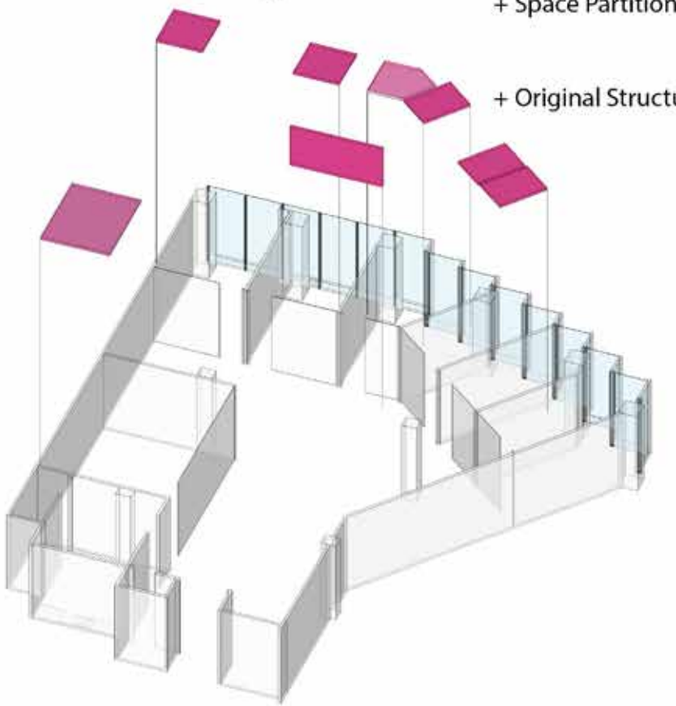


+ Interior Design

+ Space Partition

+ Original Structure






GREEN WATER STREET
SELF-DRVING SPOT
CURRENT ROAD SITUATION
AVENUE WITH WIFI
SMART TRANSPORTATION DESIGN
+ self-drving service with spot
+ green water street to store extra rainfall
+ more open space for Temporary shelter
+ green avenue with WIFI covering