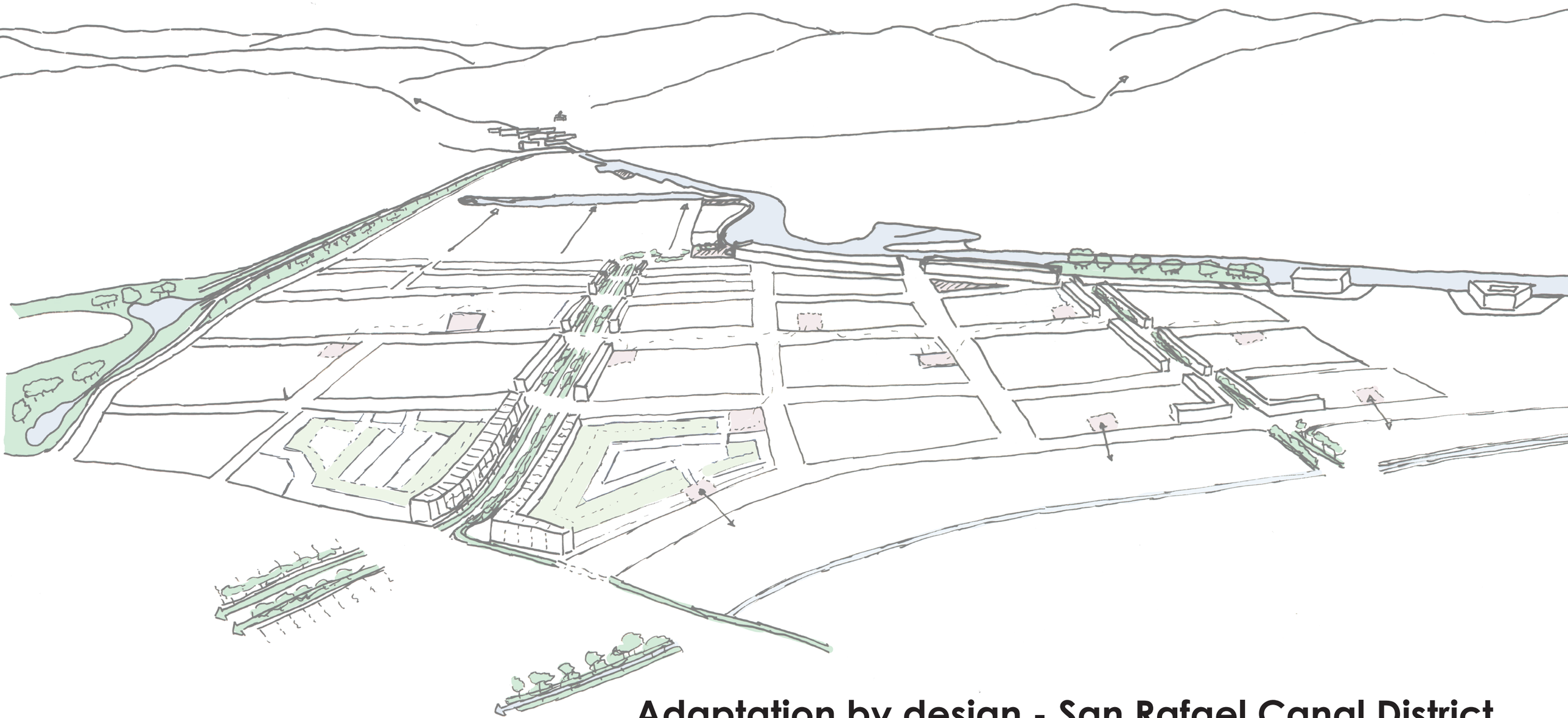
P5 Presentation

Pim Monsma

30-01-2018



Adaptation by design - San Rafael Canal District

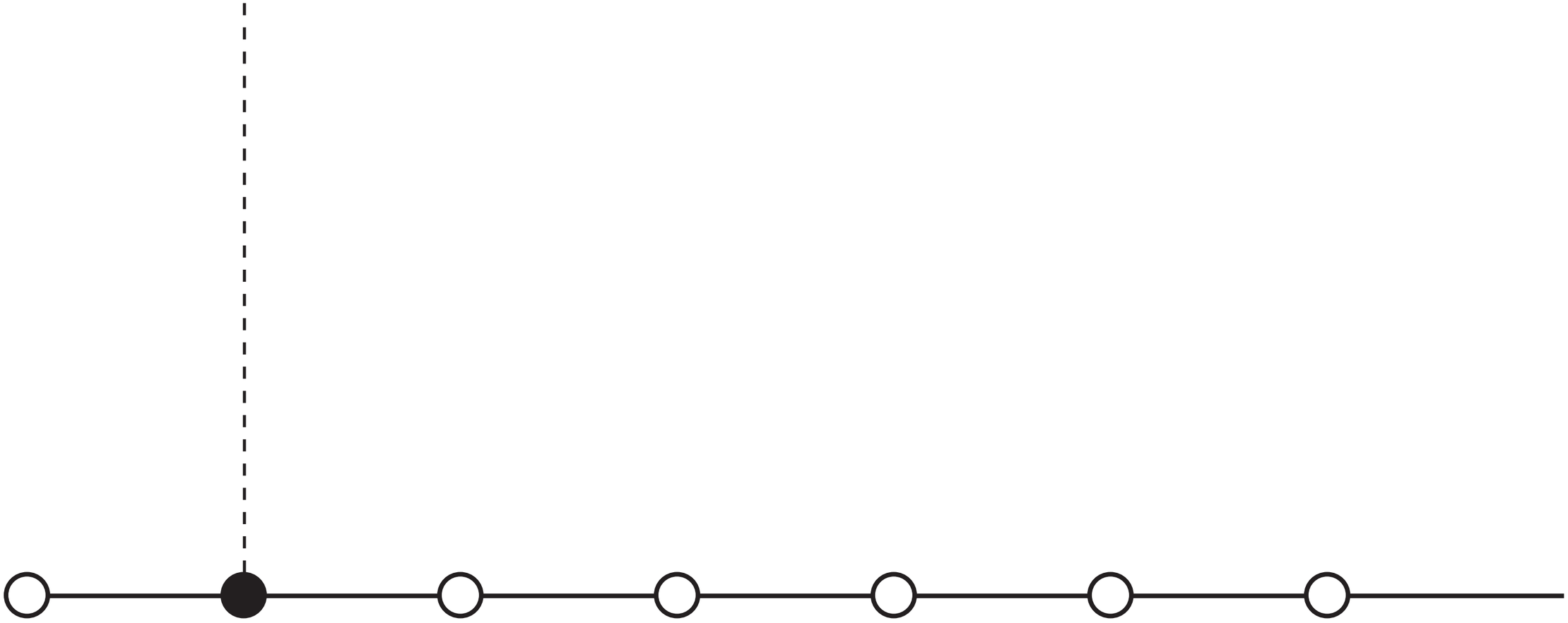
‘keeping water out, and people in’

Introduction

- The delta problem
- Resilience by design: San Francisco Bay Area
- Project Location
- Problem statement

Mobility

- Historic development
- Public transport
- Trends and future
- Interventions

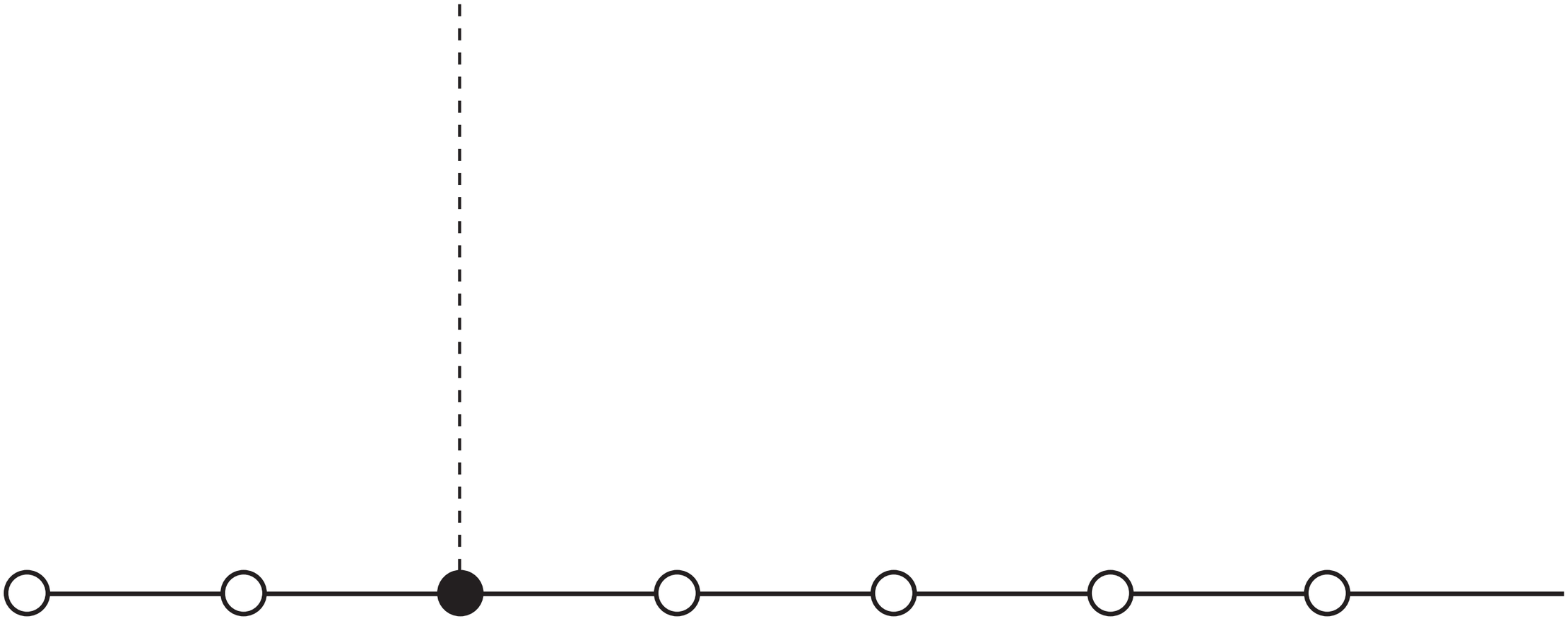


Introduction

Mobility

Urban patterns

- Historic development
- The real flood problem
- Spatial Quality
- Interventions



Introduction

Mobility

Urban patterns

Social-economic development

- Housing crisis
- Social threats
- Interventions

Introduction

Mobility

Urban patterns

Social-economic development

Intergration

- Reasons to invest
  - Developers
  - San Rafael
- Phasing

Introduction

Mobility

Urban patterns

Social-economic development

Intergration

Conclusion

- Research question
- Lessons from San Rafael

Introduction

Mobility

Urban patterns

Social-economic development

Intergration

Conclusion

Questions

Introduction

A global problem

- 40 million - 140 million (2017)
- ~50% in developed countries
- Economic in origin
- Social-economic development
- Social-economic problem

‘Earth’s city lights’ - NASA
S: http://visibleearth.nasa.gov/view.php?id=55167

Bangladesh - August 2007
http://uk.reuters.com/article/uk-bangladesh-floods/bangladesh-flood-death-toll-nears-500-idUKDHA3025220070815

Brazil - June 2010
http://www.bbc.co.uk/news/10376778

Pakistan July 2010
http://www.abc.net.au/news/2010-07-31/residents-flee-pakistans-flash-floods/922116

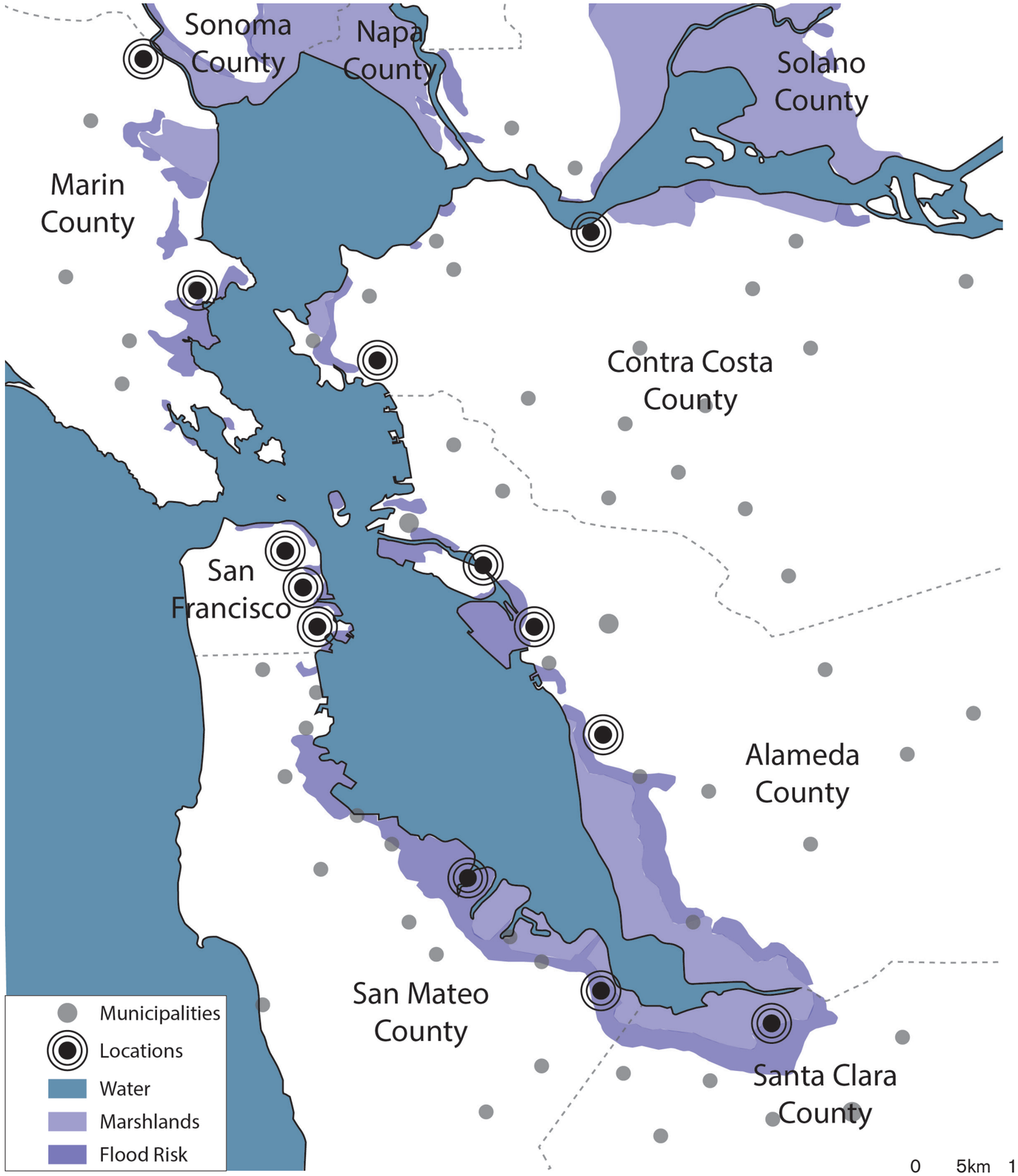
Egypt - October 2015
http://america.aljazeera.com/articles/2015/10/26/climate-change-to-increase-alexandria-flooding.html

India - August 2016
http://www.abc.net.au/news/2016-08-24/india-floods-over-300-dead-force-villagers-into-camps/7779284

South China - July 2017
https://www.aol.com/article/weather/2017/07/06/too-much-rain-chinas-floods-roil-hydropower-corn-supplies/23019343/

- Not just a third world problem
- The most vulnerable people

Resilience by design:
San Francisco Bay Area



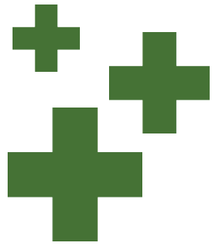
- 13 possible design locations
- 200.000 people in flood-zones
- Familiar global pastern
- What is Resilience?

Resilience: The ability to recover

High quality housing units
Small households

Income:
$80.000,-

Net. Worth:
$400.000,-

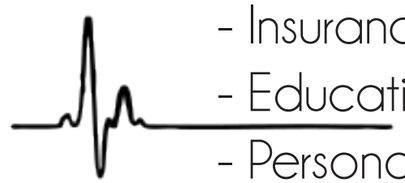


+ Health
+ Insurance
+ Education
+ Personal network

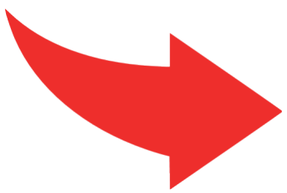
Small housing units
Multi-family households

Income:
$10.000,-

Net. Worth:
$5.000,-



- Health
- Insurance
- Education
- Personal network

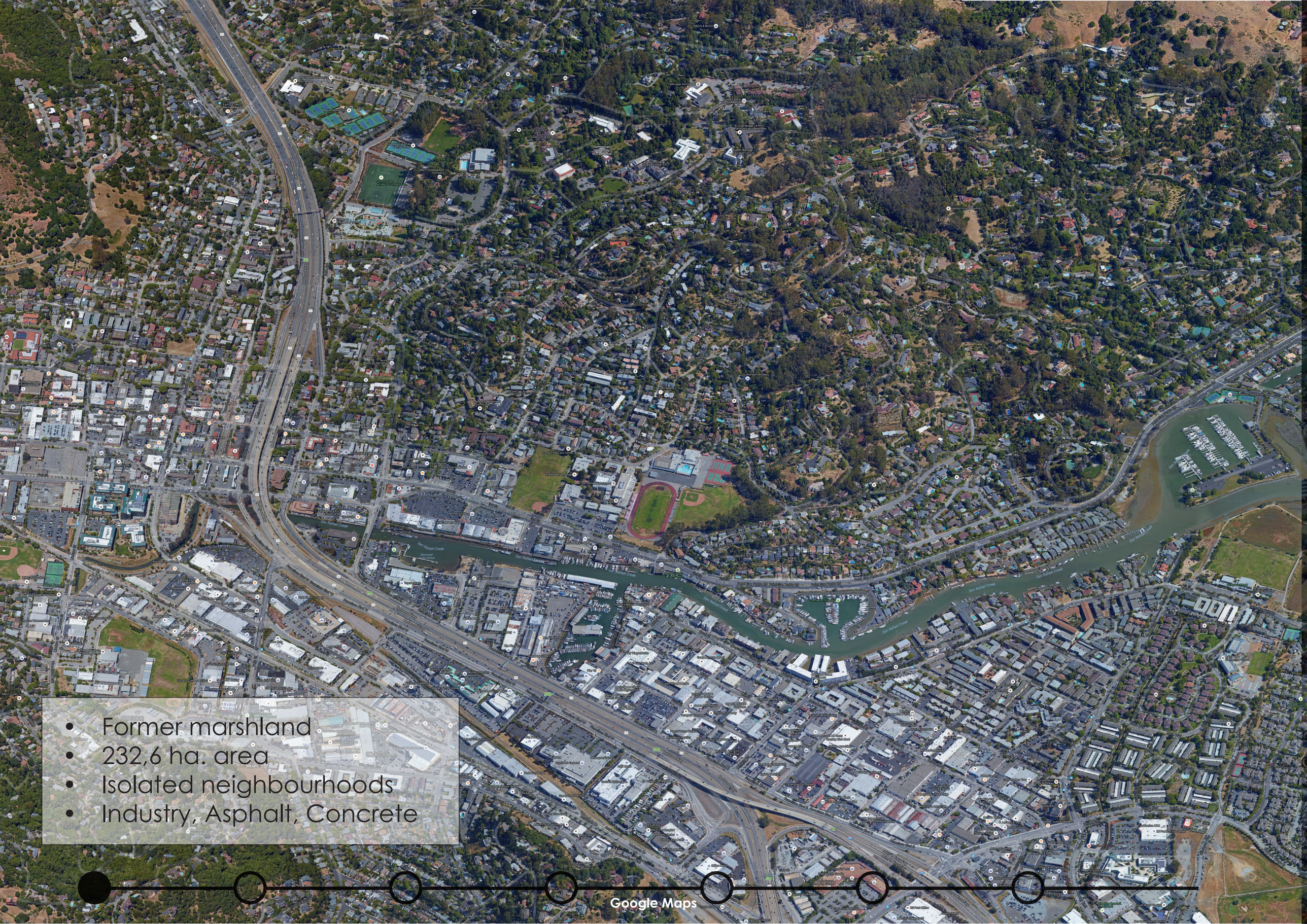


- Strong regional economy
- Highest pressure real-estate
- A struggle for survival

- San Rafael - Marin County
- Population 59.162
- 13.2% poverty

- San Rafael - Canal District
- Population ~ 7965
- 13.2% poverty

0 500 1km 2km



- Former marshland
- 232,6 ha. area
- Isolated neighbourhoods
- Industry, Asphalt, Concrete

- ~8000 people on 32.5 ha.
- 271 people/ha. (= Shanghai)
- San Rafael: 13,7 p./ha.
- Hispanic population

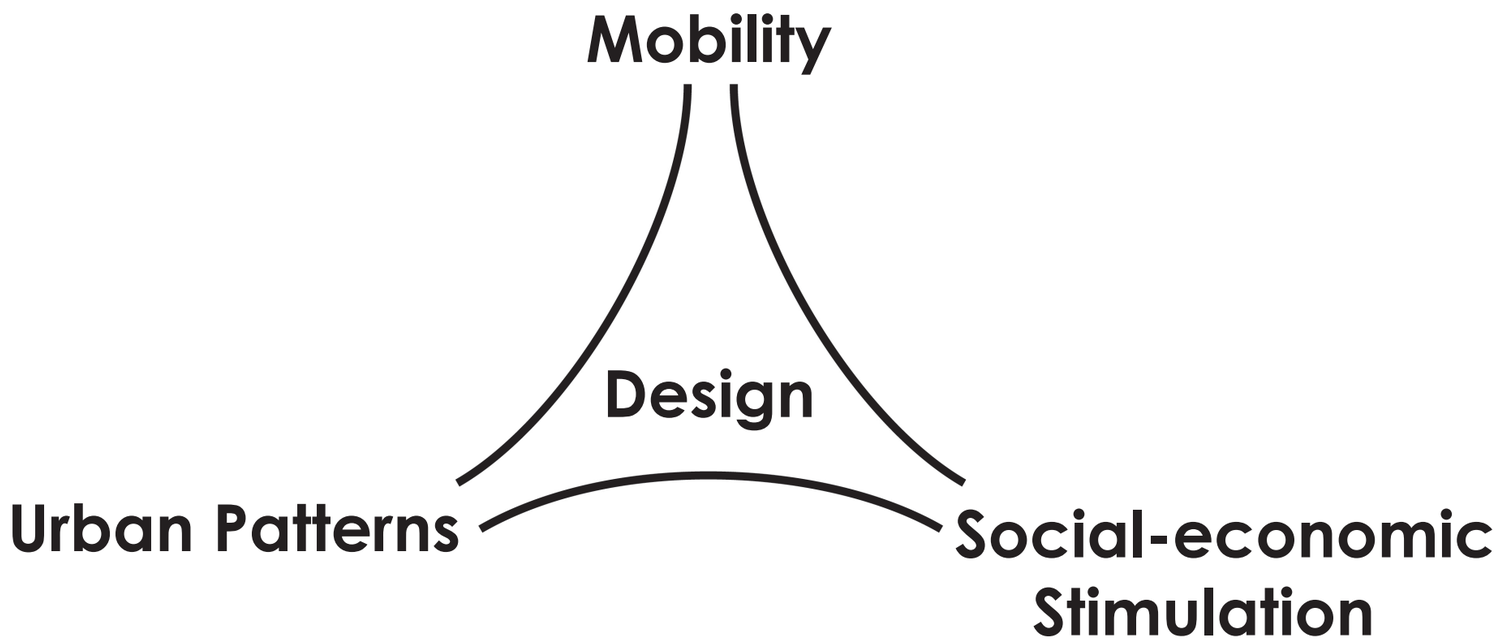
San Rafael Canal District:

- 232,6 ha. former marshland
- Flood-risk area
- Poor spatial quality
- Social segregation

Main research question

Can a spatial strategy, created out of the urgency of flood prevention, contribute to social-economic improvement?

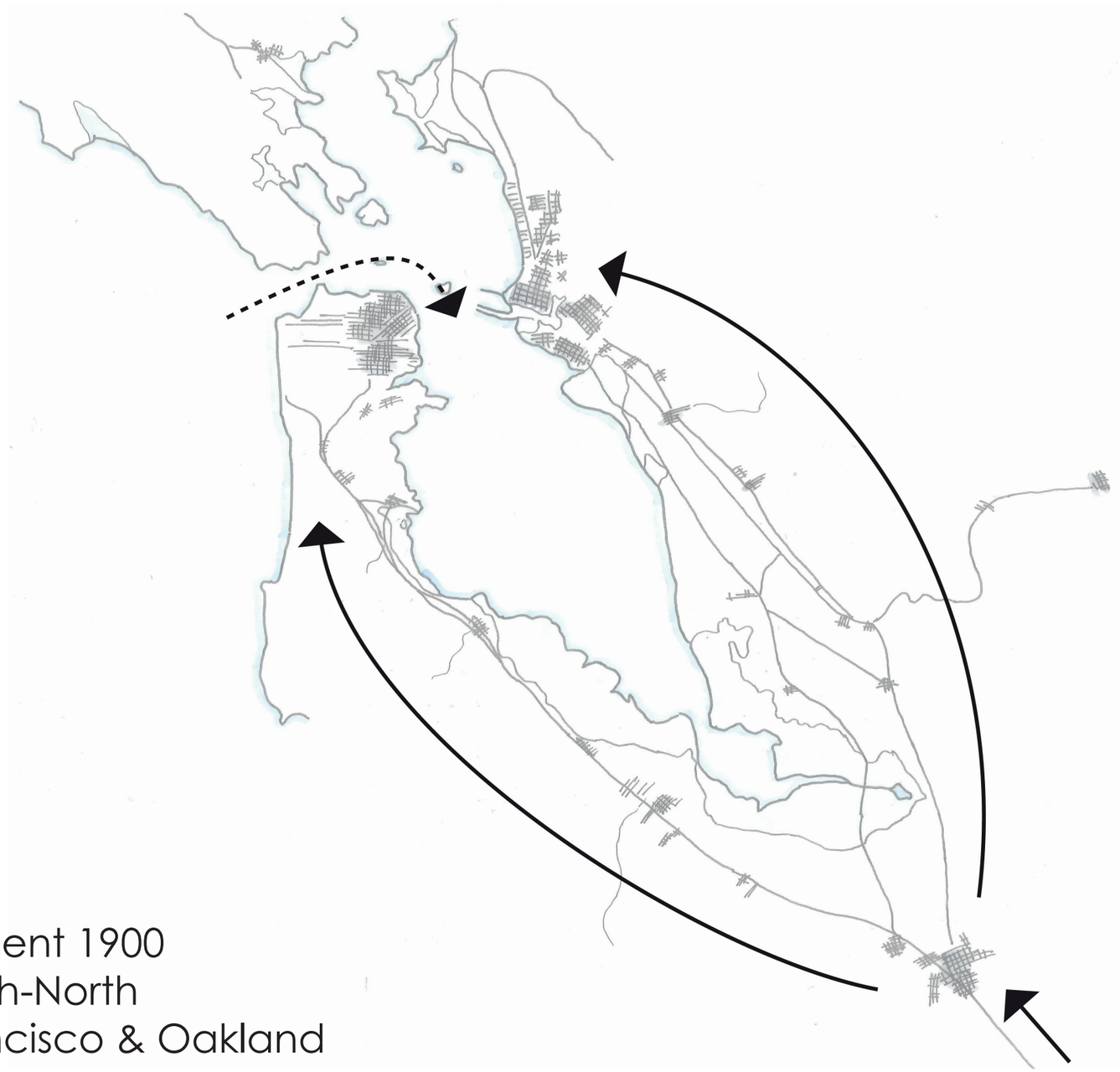
Approach: 3 pillars



Main research question

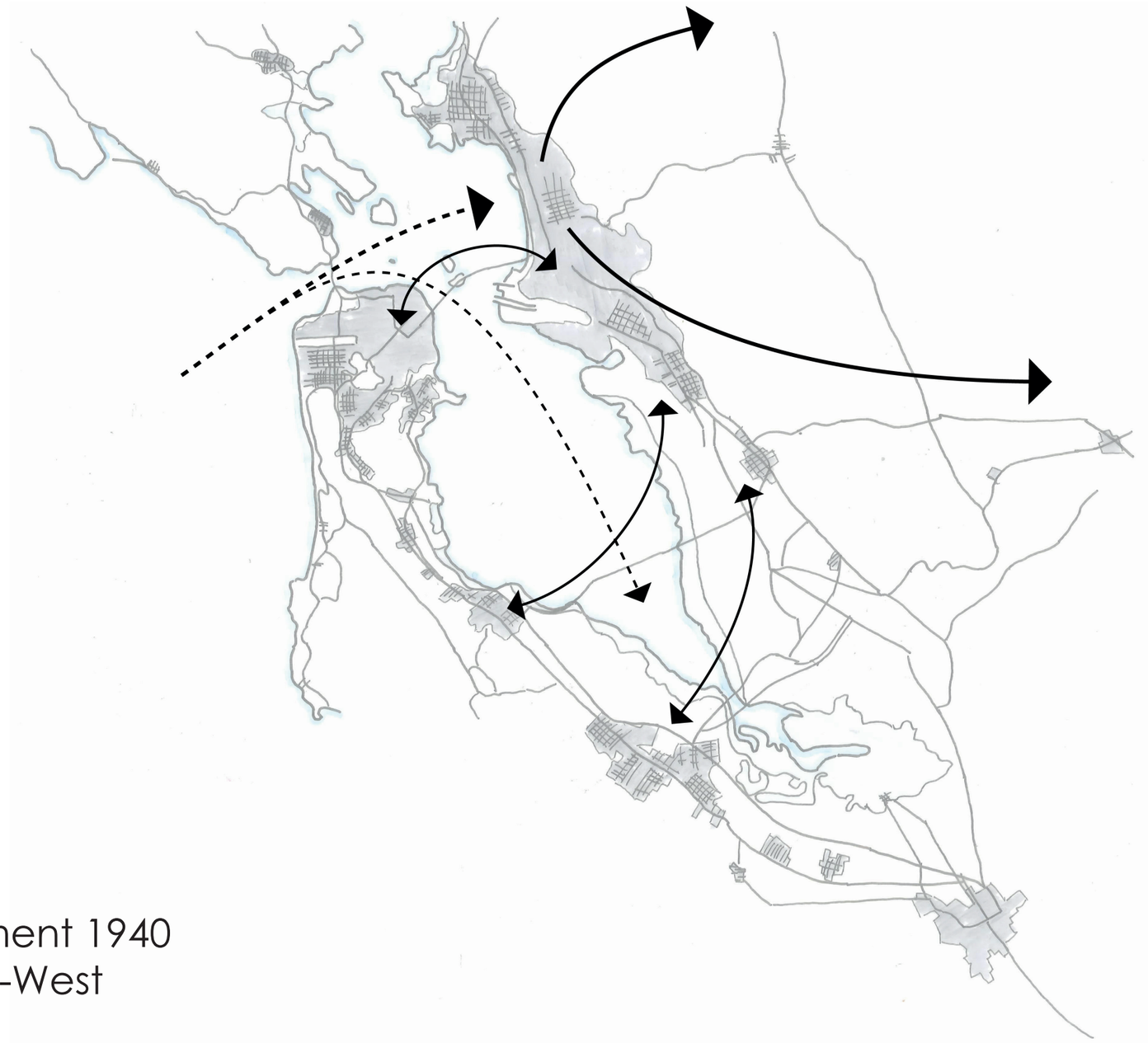
Can a spatial strategy, created out of the urgency of flood prevention, contribute to social-economic improvement?

Mobility



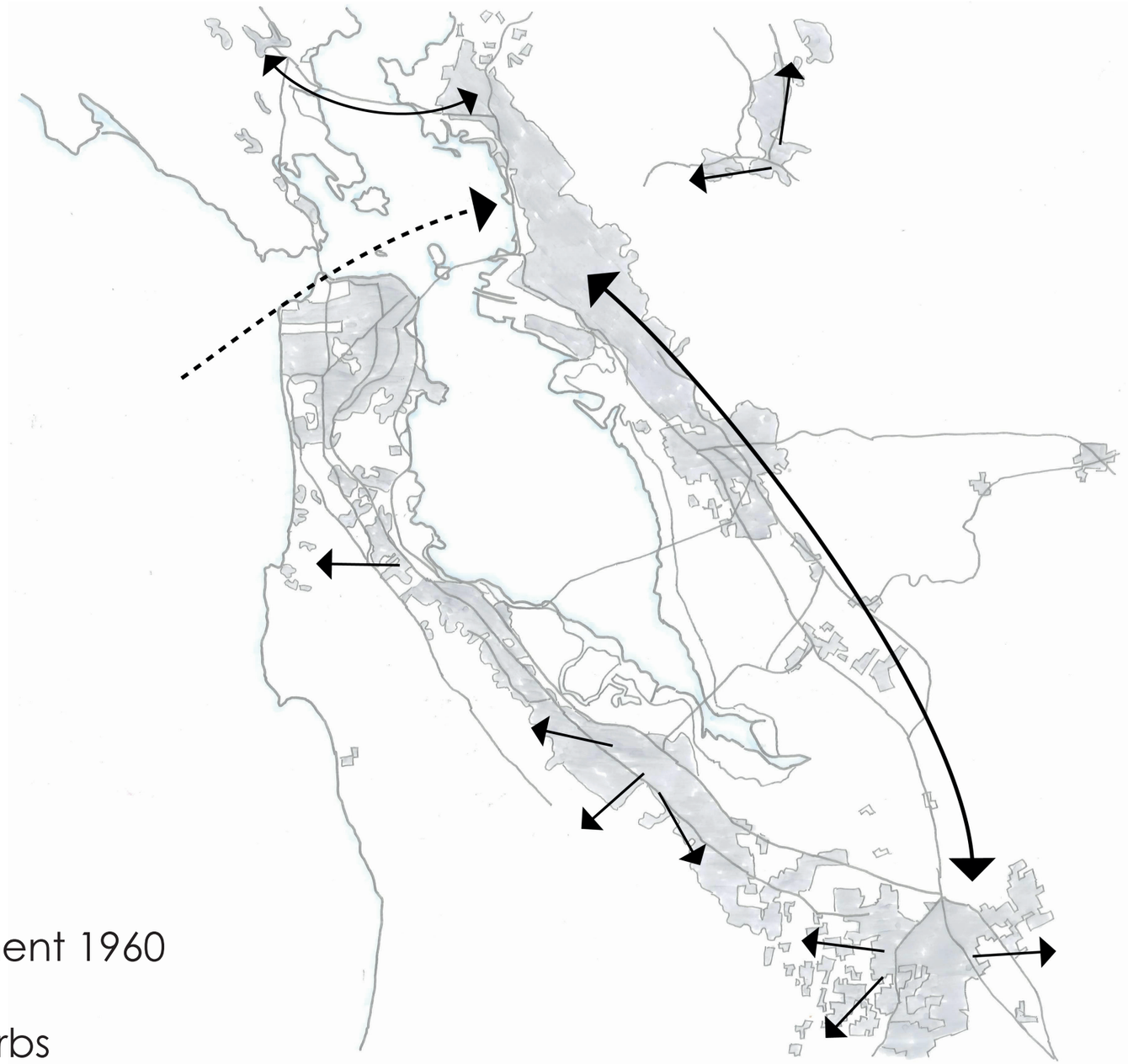
- Historic development 1900
- Connections South-North
- Focus on San Francisco & Oakland

0 5km 10km



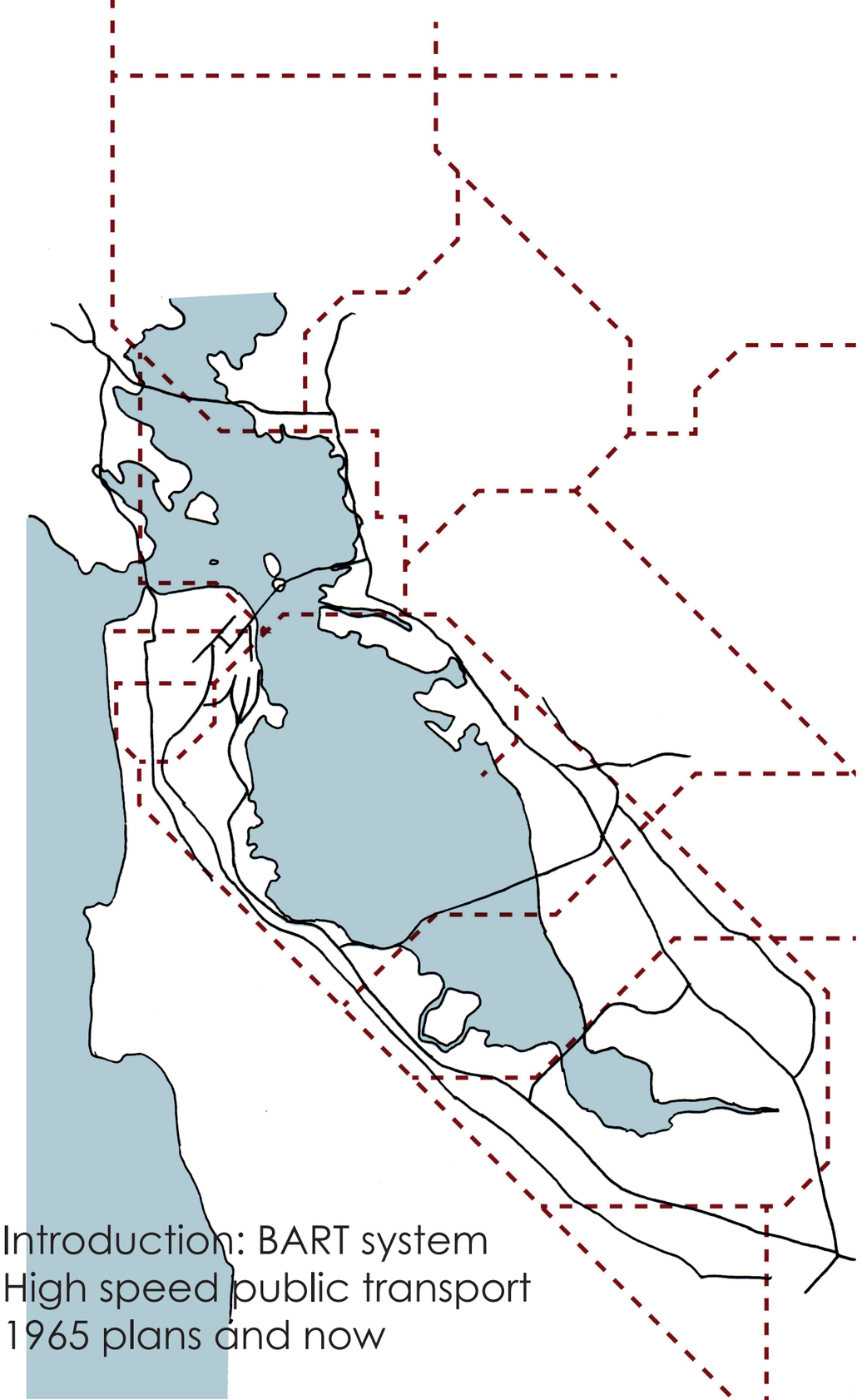
- Historic development 1940
- Connections East-West
- New city cores

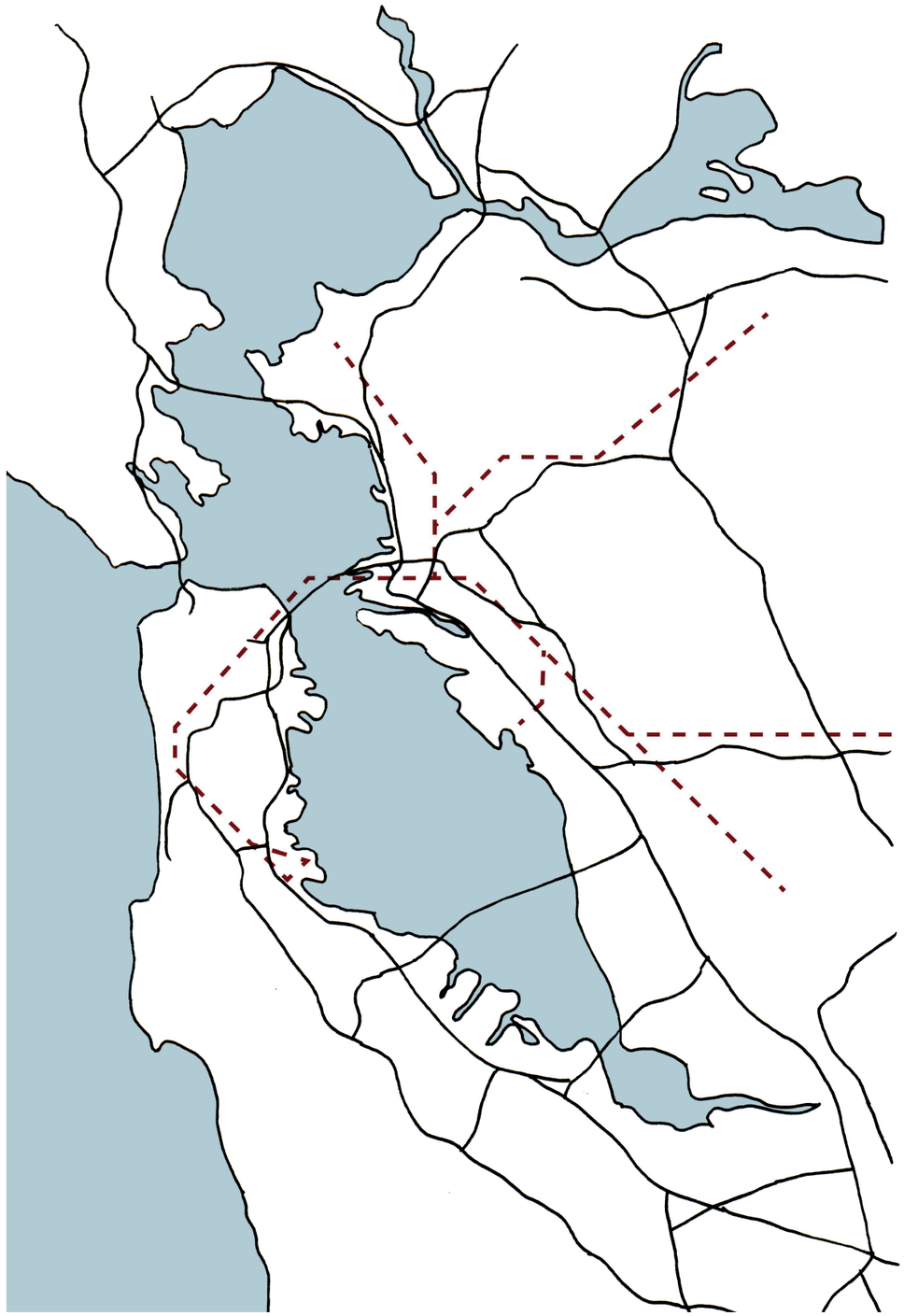
0 5km 10km



- Historic development 1960
- Urban Sprawl
- Dawn of the suburbs

0 5km 10km





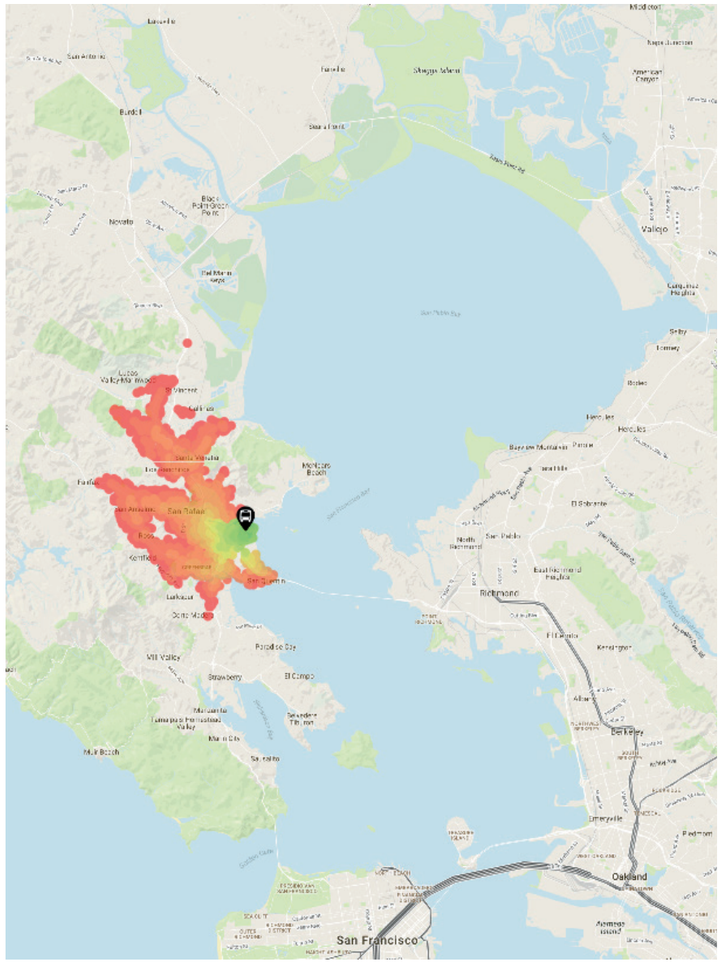
Main Roads

BART system (design)

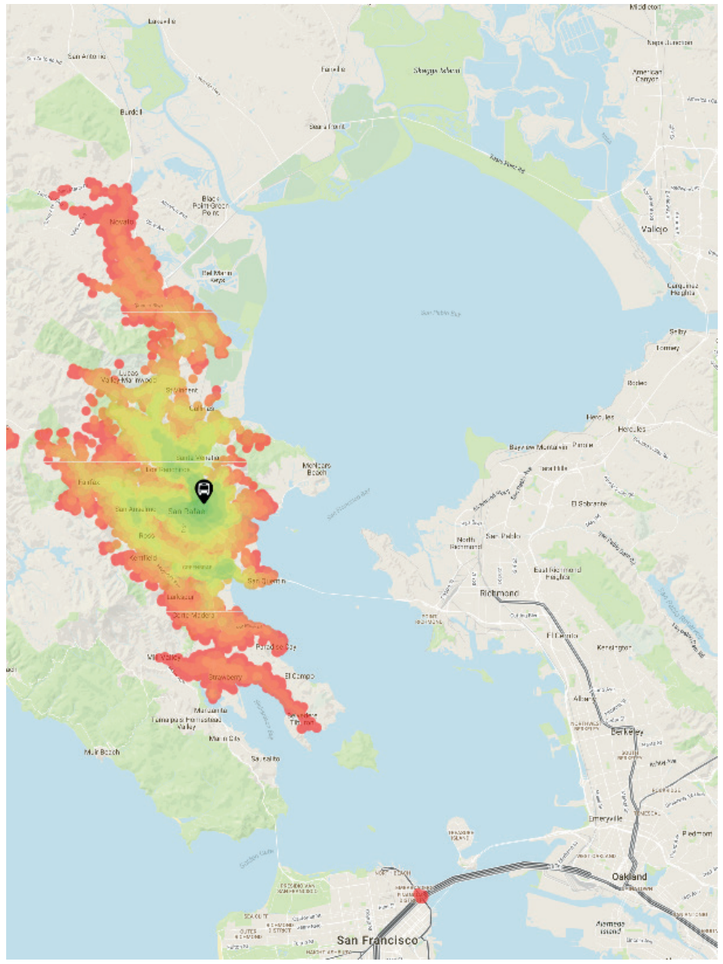
Bay water

0 5km 10km

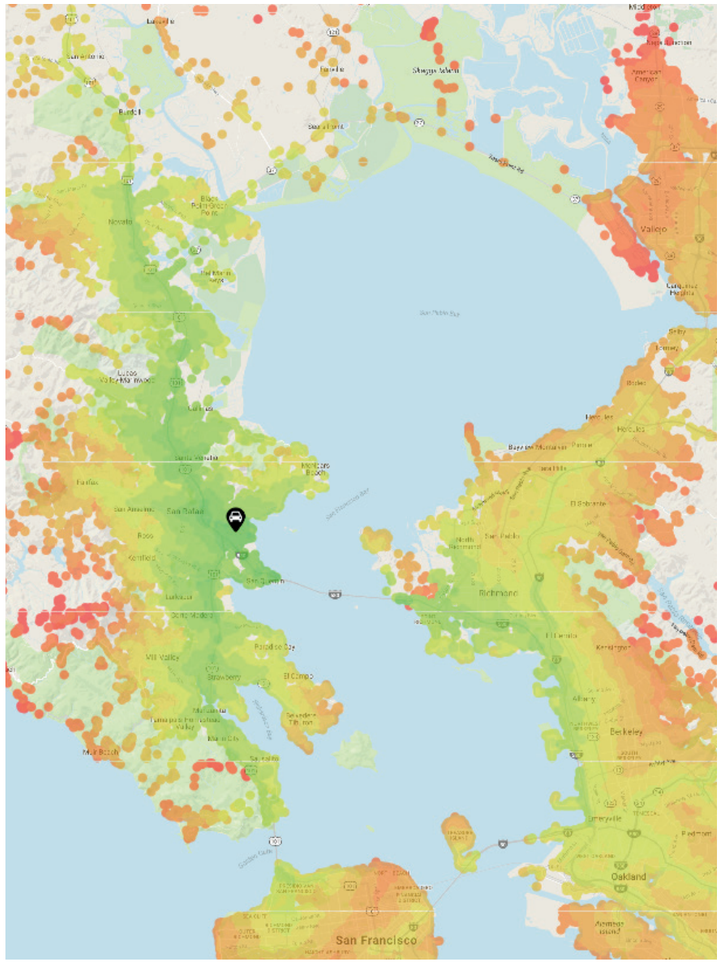
- Introduction: BART system
- High speed public transport
- 1965 plans and now



Commute Times
60 min < 5 min



Commute Time San Rafael
S: http://trulia.com/local



10 km

- Car unaffordable
- Lack of parking space
- Reliance on public transport

Downtown

Canal district

Main roads

SMART rail

New BART connection

Water connections

Municiple border

San Rafael watershed

Bay water

0 500 1km 2km

Downtown

Canal district

Main roads

SMART rail

New BART connection

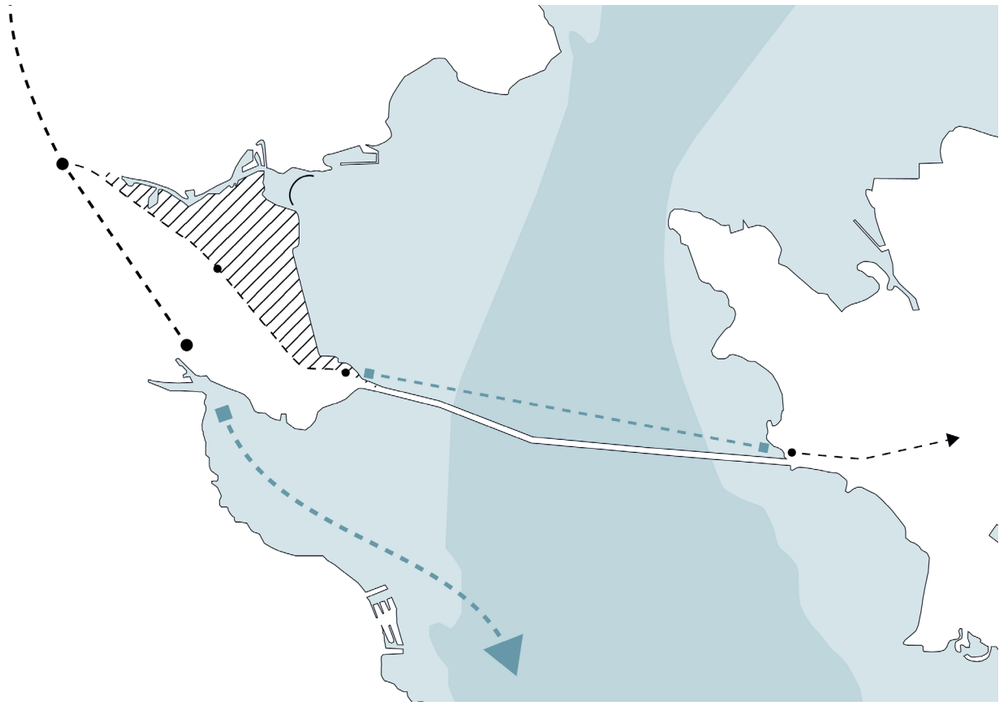
Water connections

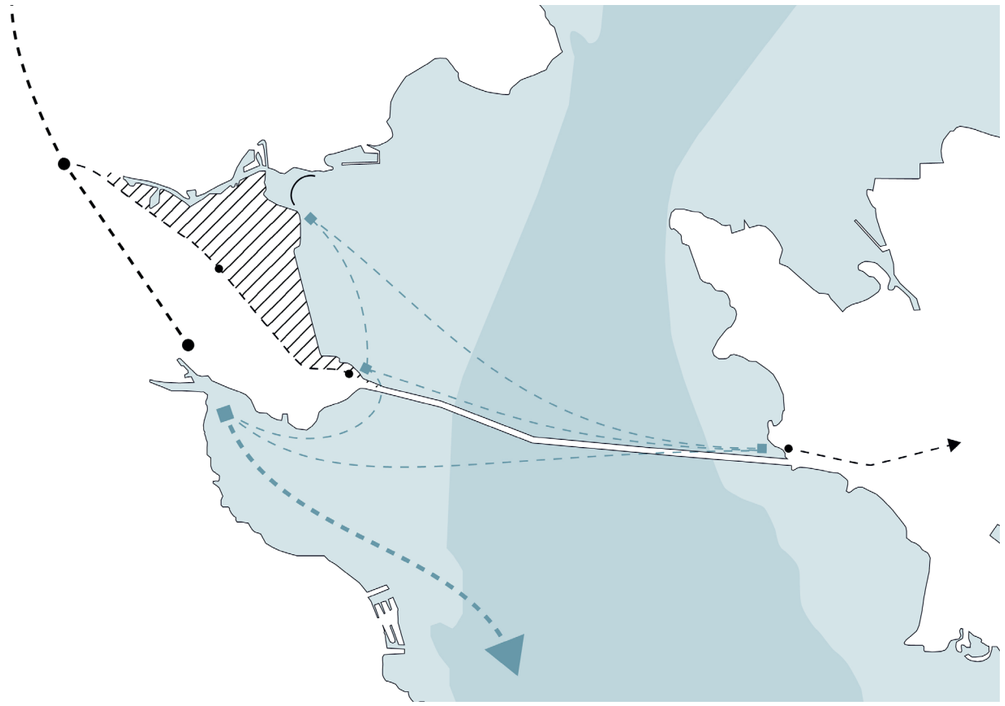
Municiple border

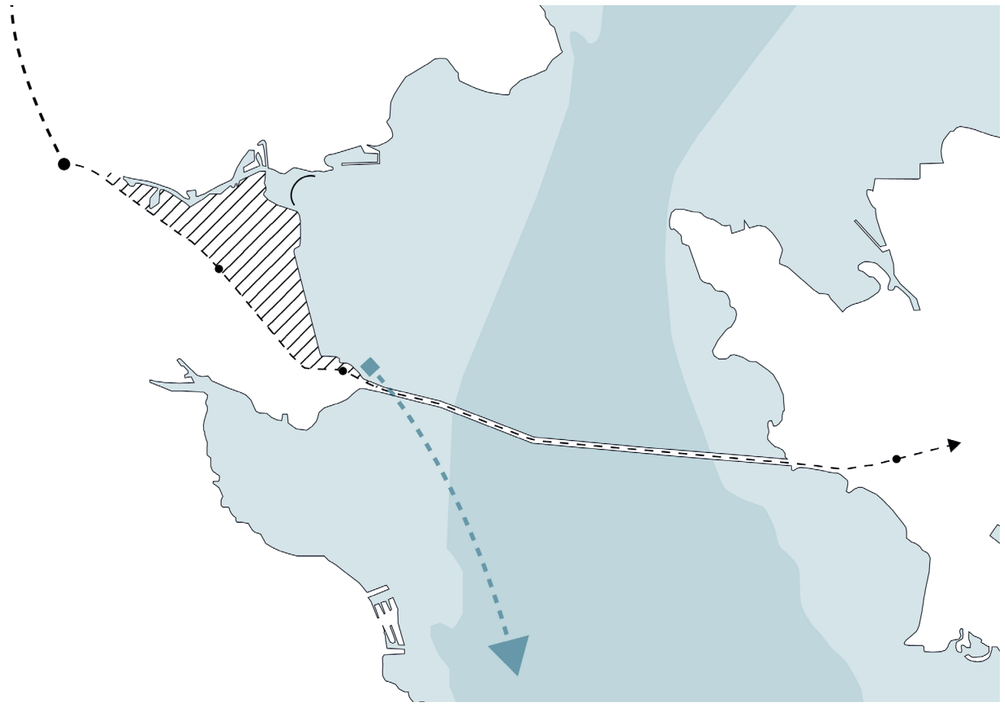
San Rafael watershed

Bay water

0 500 1km 2km







- Alternative ferry connection
- Water taxi system
- Relocated ferry system

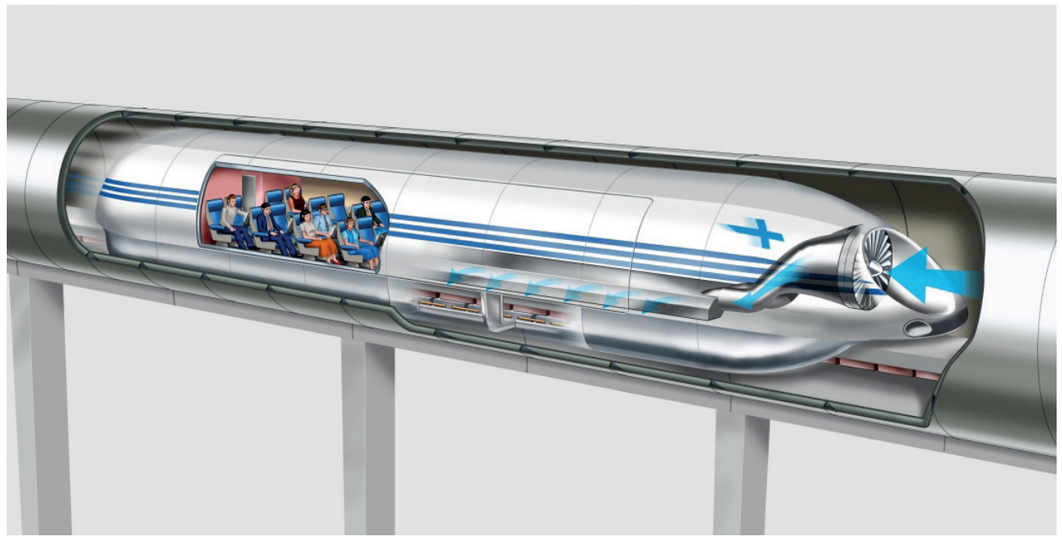
Downtown

Canal district

Transport Hub

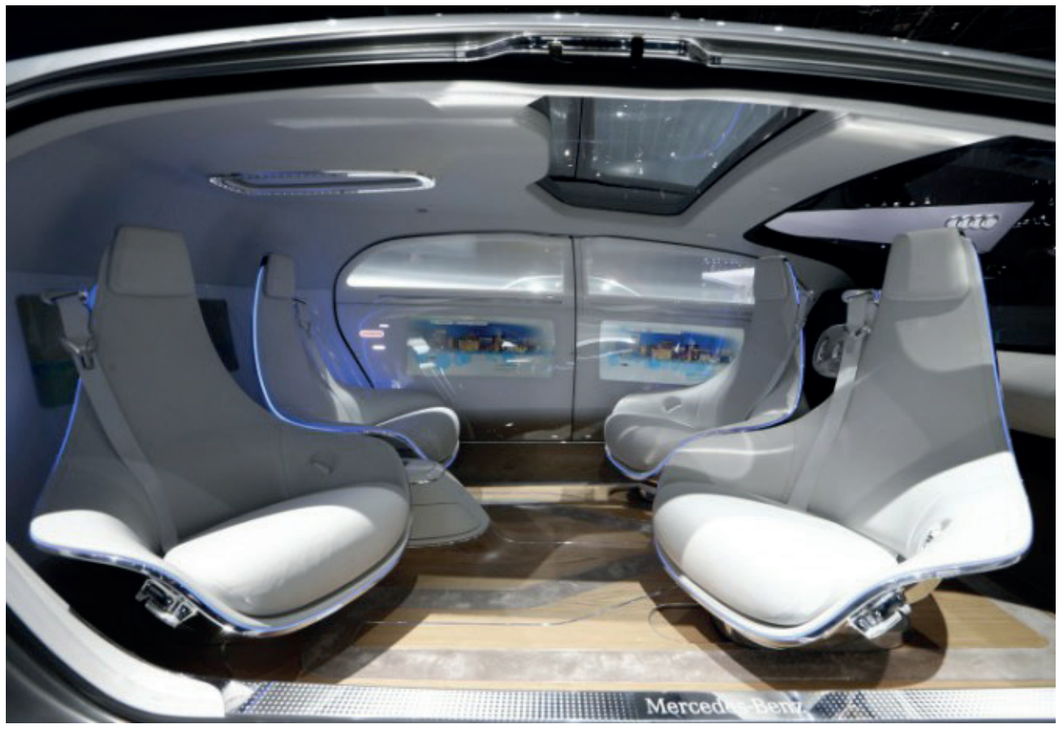
- New entrance hubs
- Increasing mobility
- Connected with the bay
- Connection with downtown

Uber self driving cars
S: https://www.engadget.com/2016/09/18/
inhabitat-week-in-green/



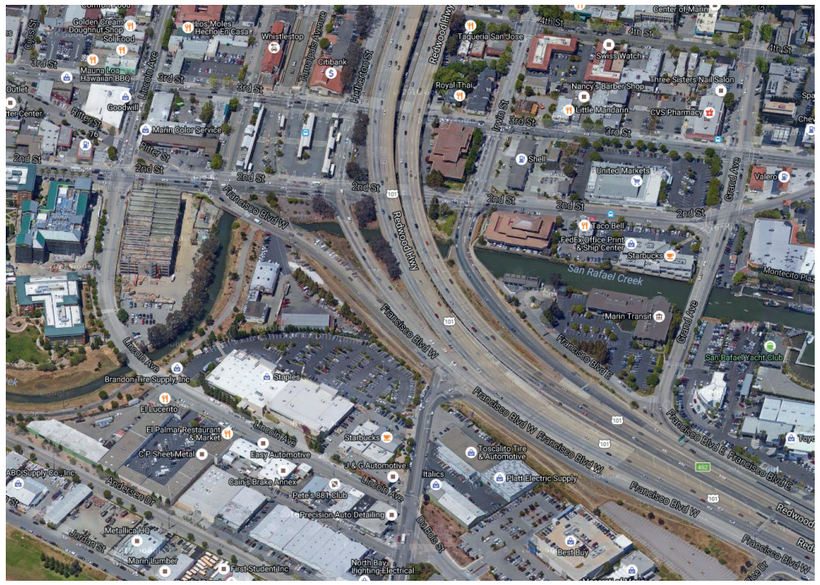
Hyperloop
s: http://uincar.ru/news/events/5508-transportnaya-sistema-budushchego-
hyperloop-ot-sozdatelya-tesla.html

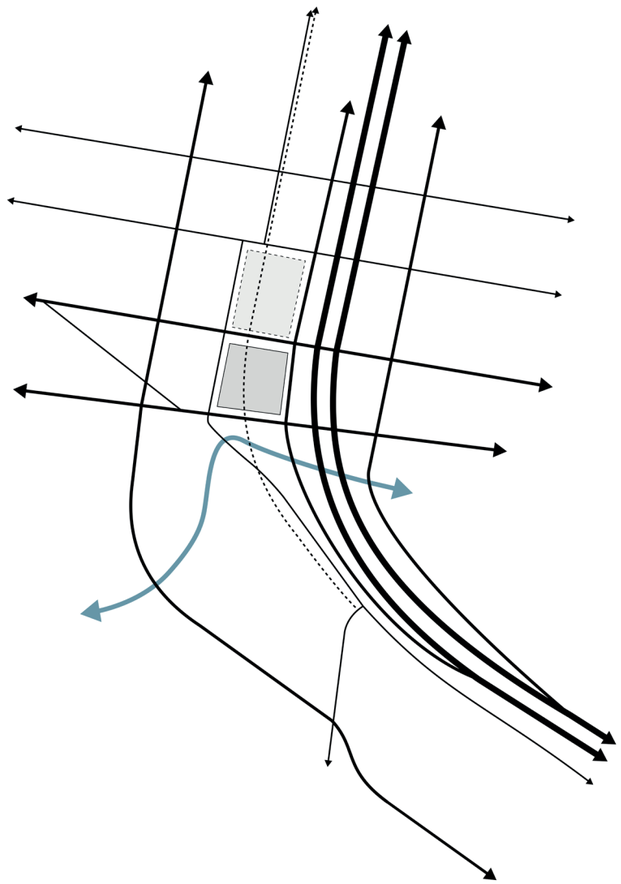
- Oil depletion in ~2050
- Silicon Valley - creative class
- Uber, Google, Lyft, Testla, Facebook
- Hyperloop public transport
- Change in road usage

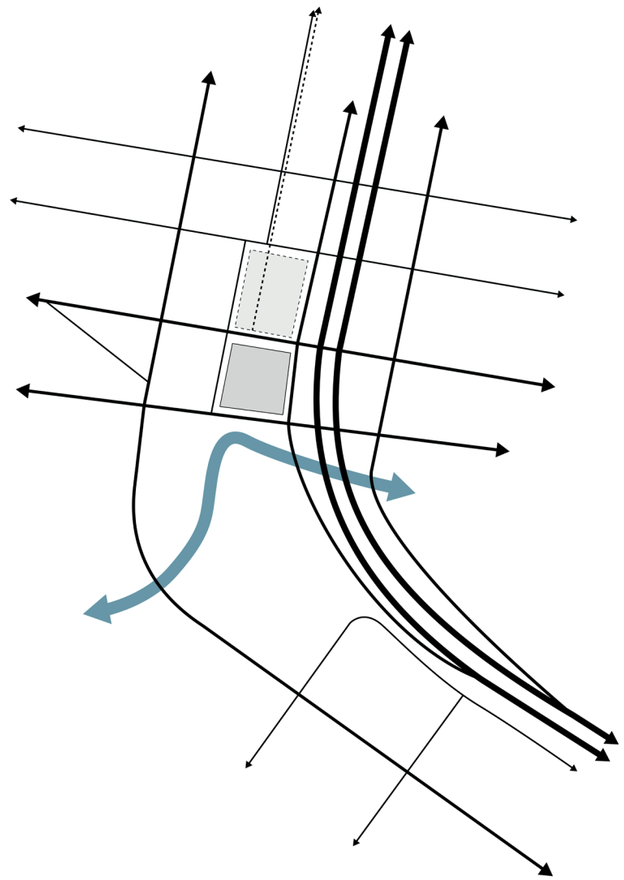


The Mercedes concept
s: https://streets.mn/2015/09/10/
will-self-driving-cars-solve-congestion/

- Transformation of the highway
- Reduced emission / sound
- Double use of space
- Room for water management options







- Remnanat tracks
- Former road structures
- Restructured road
- Room for the canal water
- Connection to the Canal District

Secondary roads

Main roads

Highway

San Rafael creek - San Rafael Canal

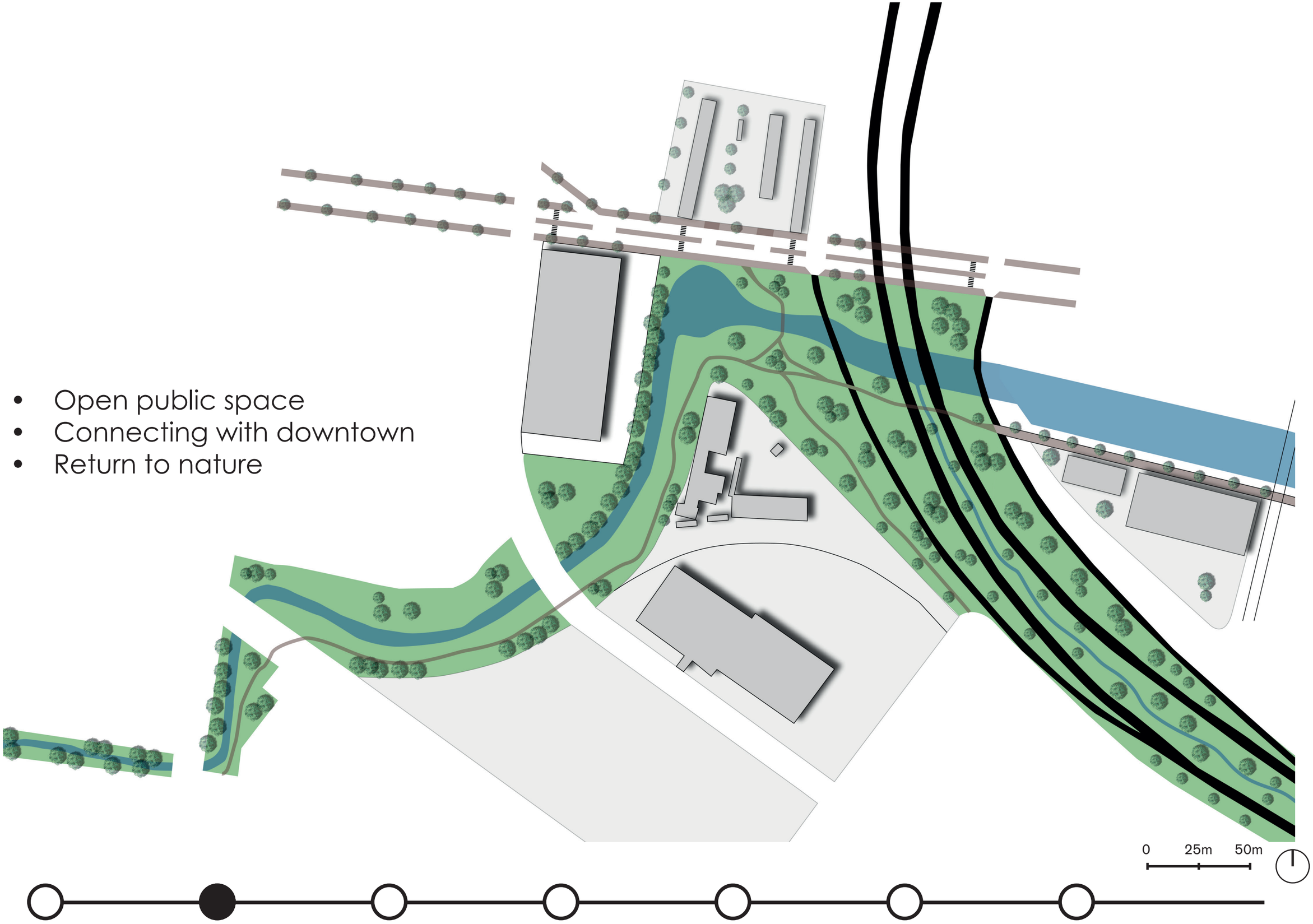
Railway (remnants)

(new) San Rafael railway station

San Rafael bus station

0 100m 200m

- Open public space
- Connecting with downtown
- Return to nature

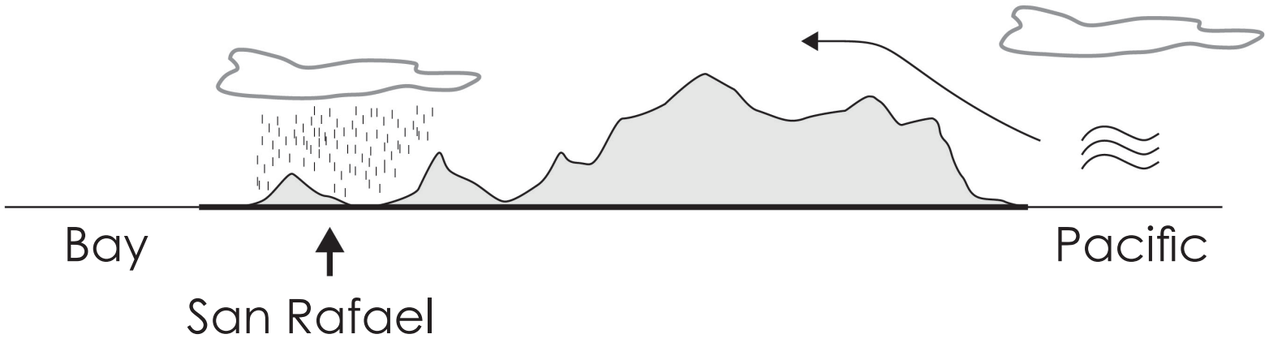


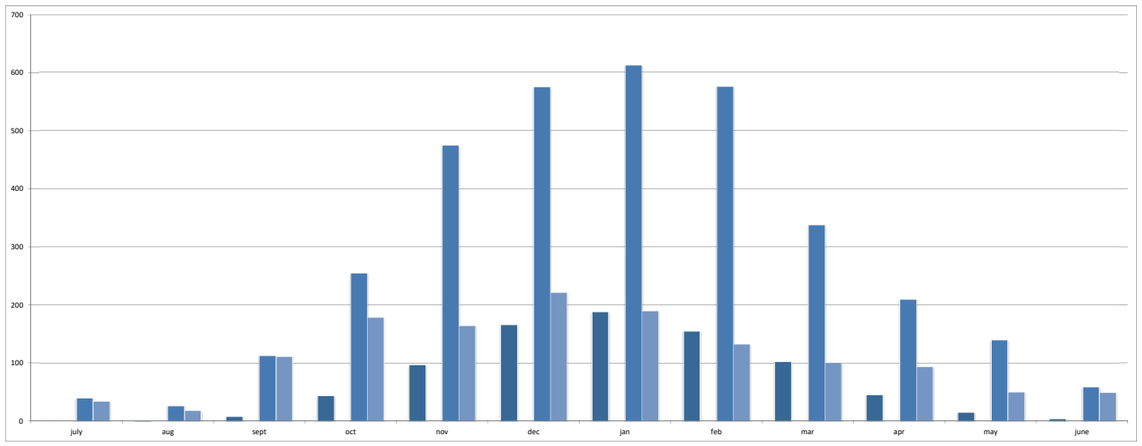
Urban patterns

'Sight from Mount Tamalpais'
S: http://www.westkueste-usa.de/2009/mn_Mount_Tamalpais.htm

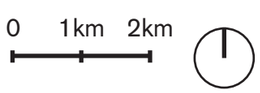
Trip advisor
S: https://www.tripadvisor.nl/
Tourism-g33037-San_Rafael_Marin_County_California-Vacations.html

- Marin county > 90% hills
- Richmond - San Rafael bridge (1956)
- Housing need in the 60's
- Now protecting the marshlands



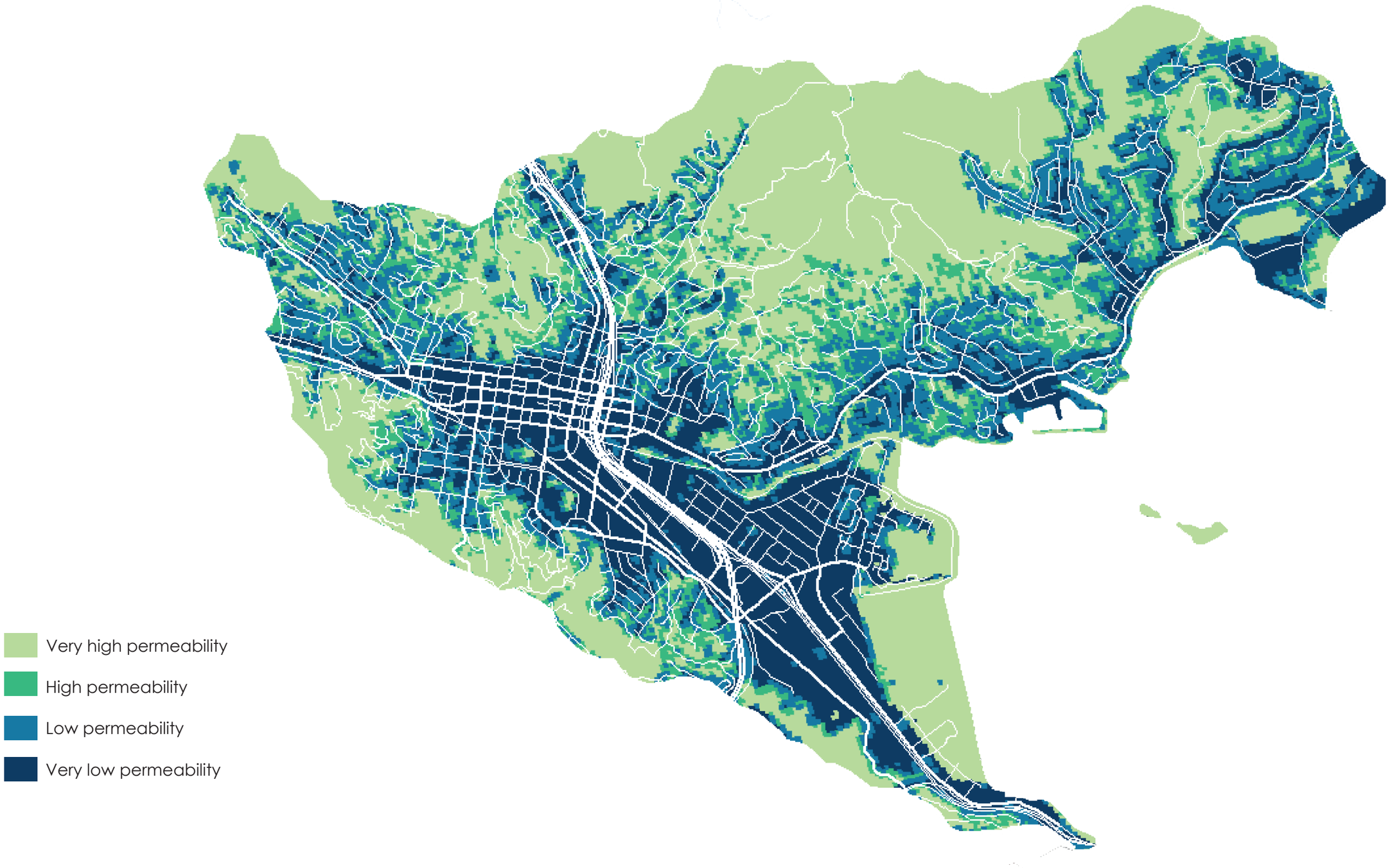


- Exceptional local climate
- Urban heat island effect
- Short extreme rainfall

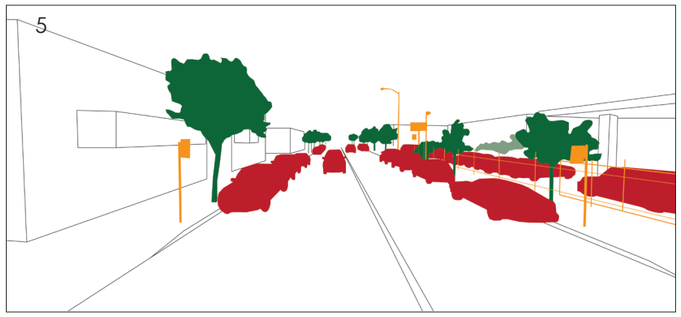


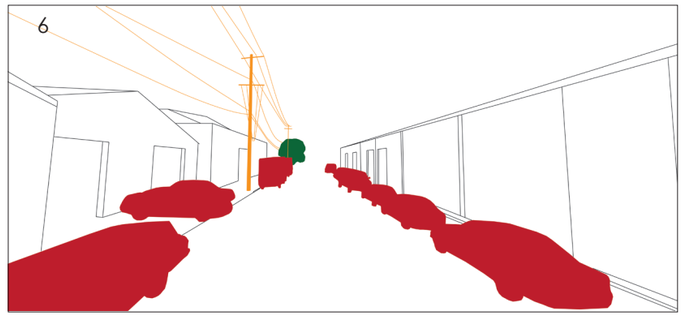
- Northern flood-zone = Marshland
- Southern flood-zone = Canal district

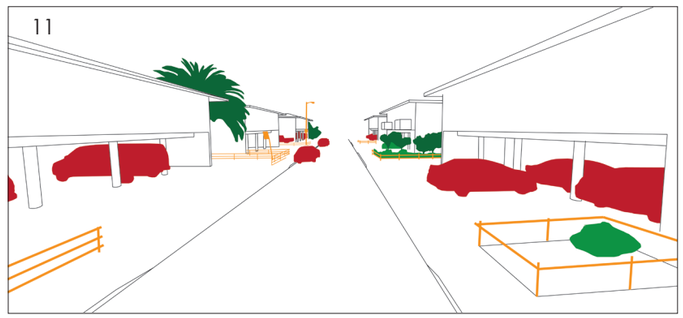
0 500 1km 2km

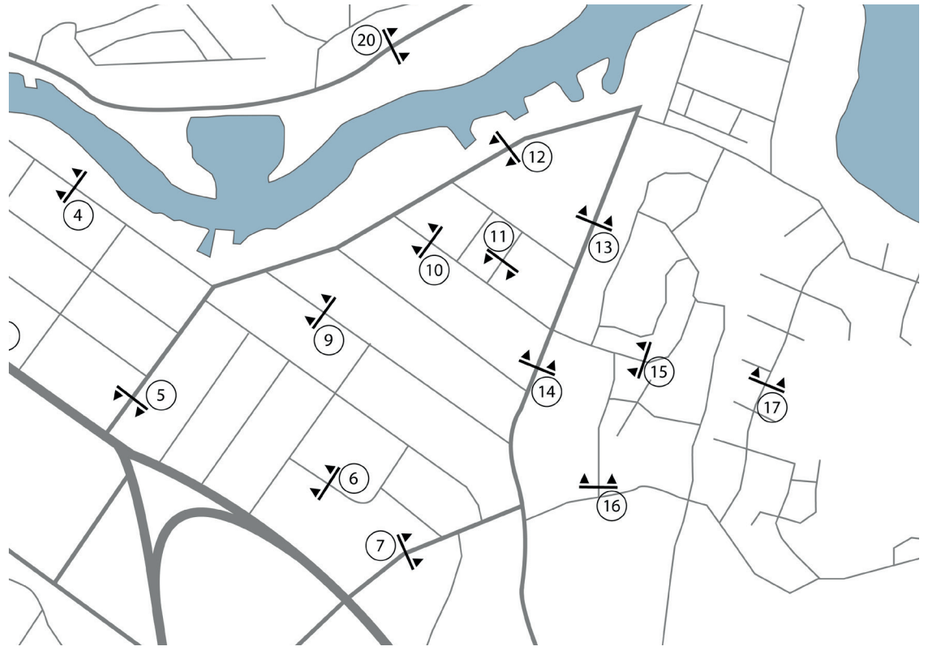


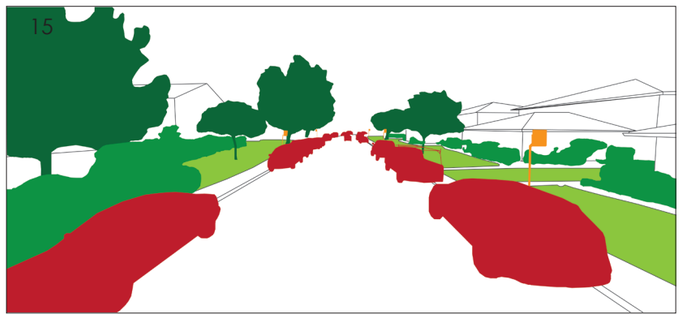
- Permeability is almost an exactly copy of the flood map
- Completely paved canal district

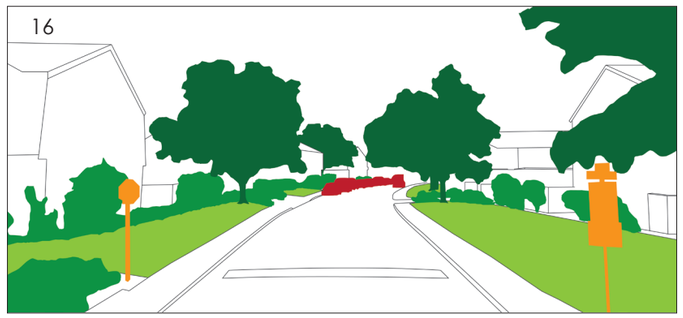


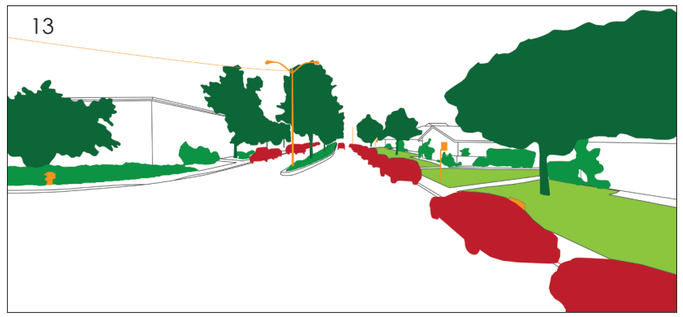










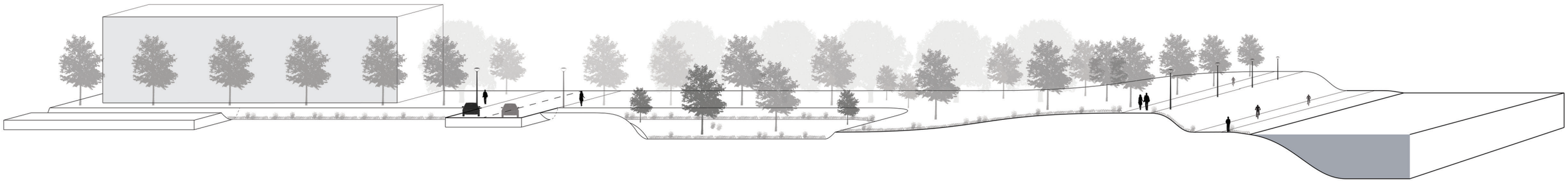


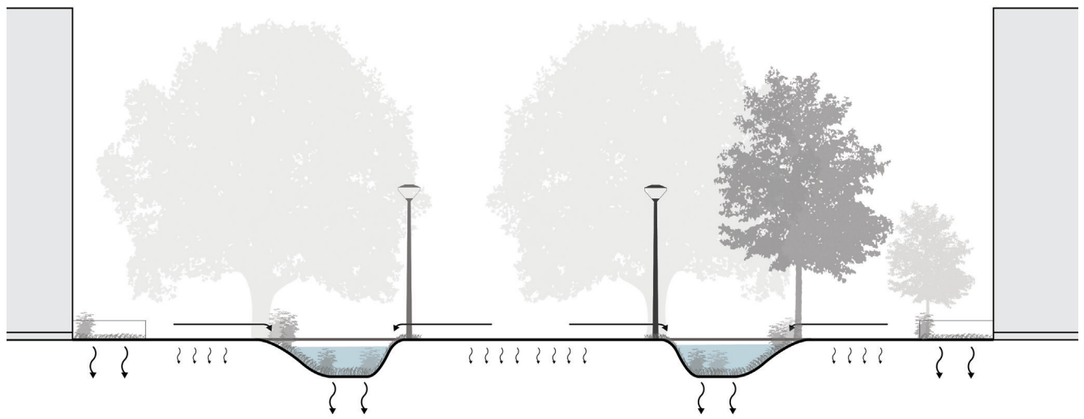
- Lack of spatial quality in the canal district neighbourhoods
- Quality in creating permeability

Open water
Marshlands
Flood hazzard
Infiltrate
Store and release
Infiltrate and store
Green wadi network
Run-off from peaks
Run-off prevention
Canal-bay sepperation

- Close the canal
- Prevent run-off
- Increase permeability

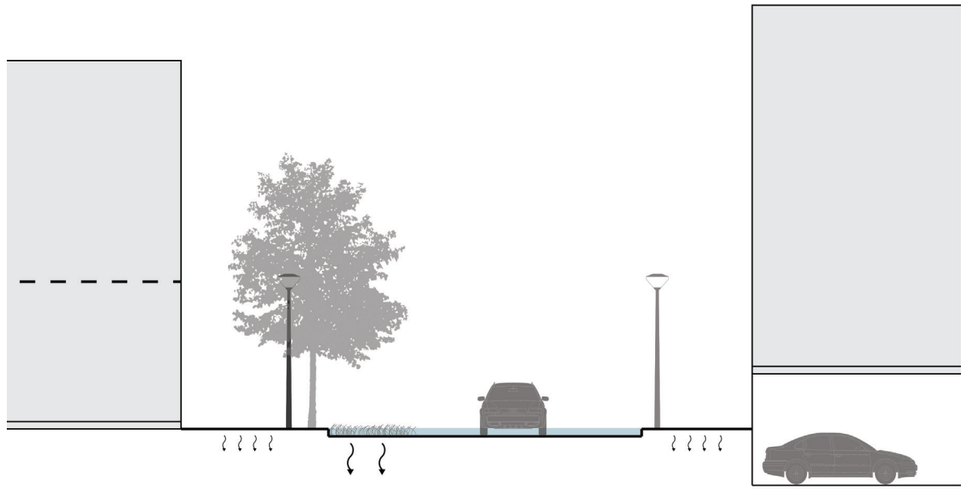
0 0.2 0.4km

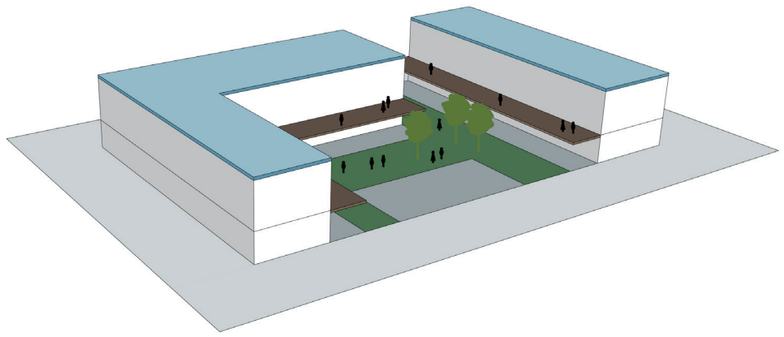


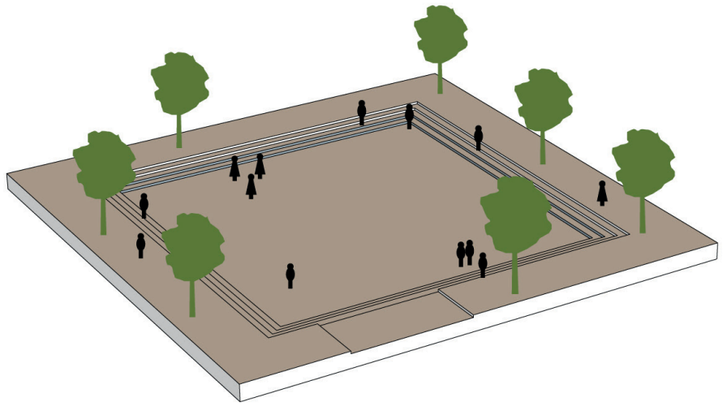


- Network of wadi’s (draught!)
- Feeding the extisting marshlands
- Sweet water vegetation

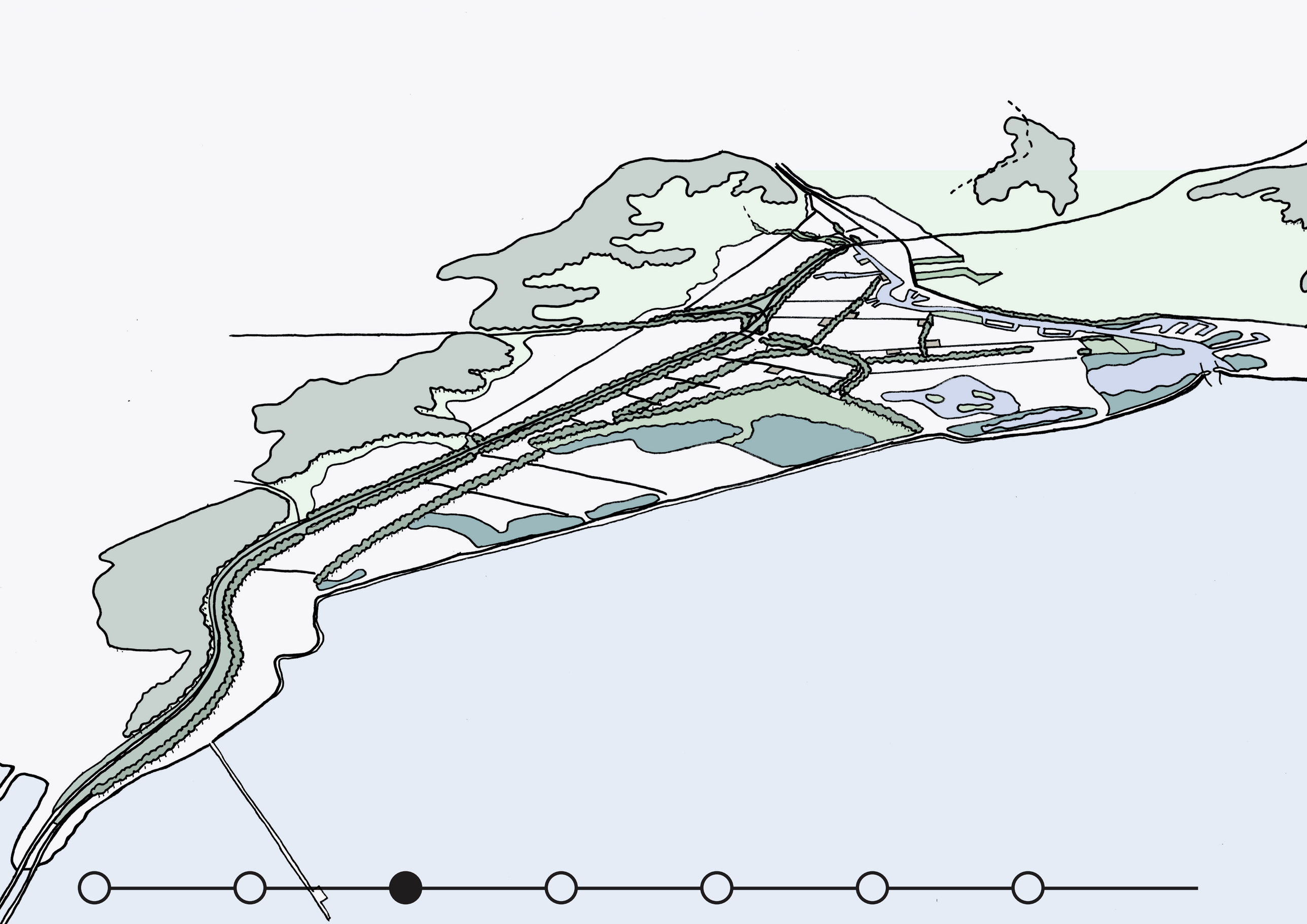
TTE Infiltration systems
S: http://www.ttesysteem.nl/projecten/parkeerplaatsen.html



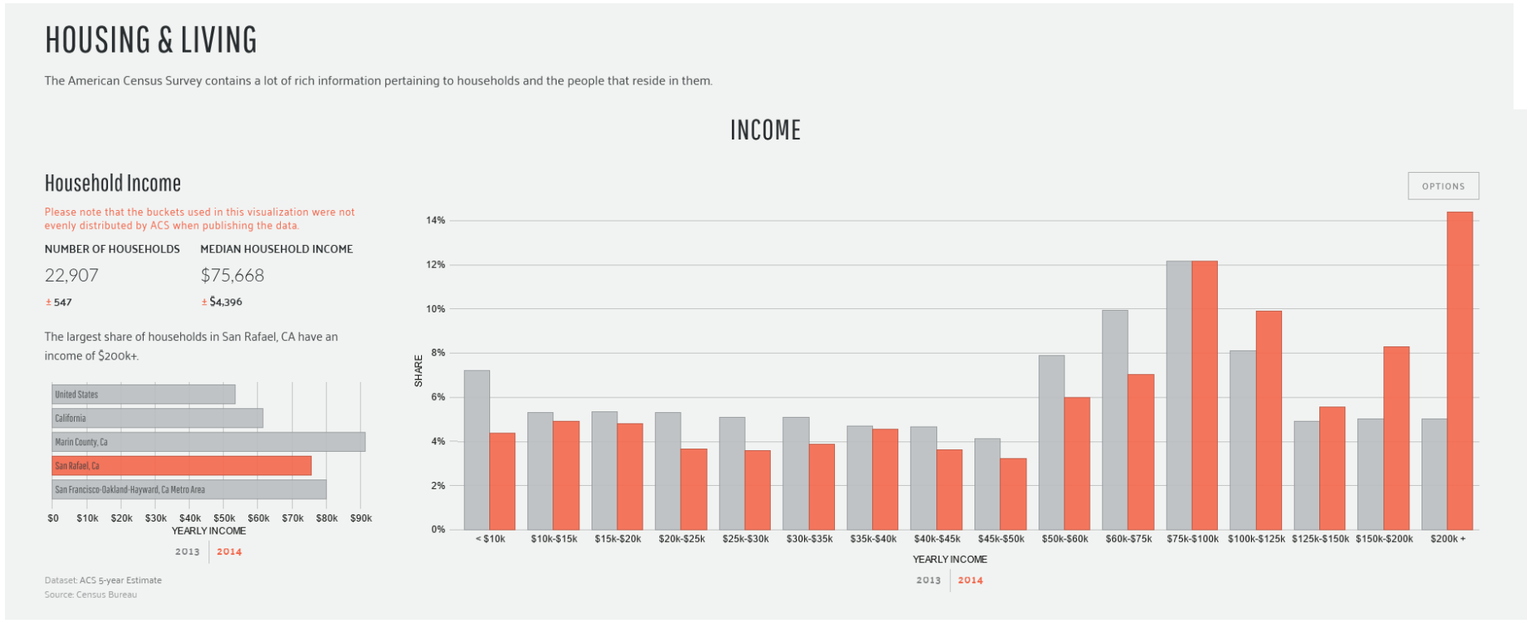


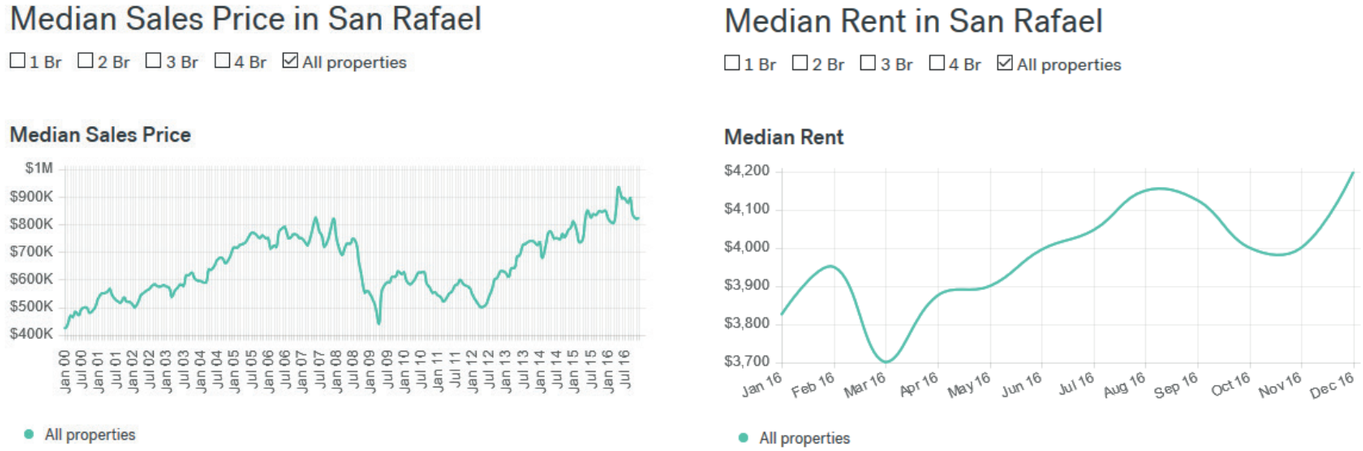


- Restore the infiltration capacity of the marshland
- Quality increase through materialisation
- Public and open spaces through guidlines



Social-economic development

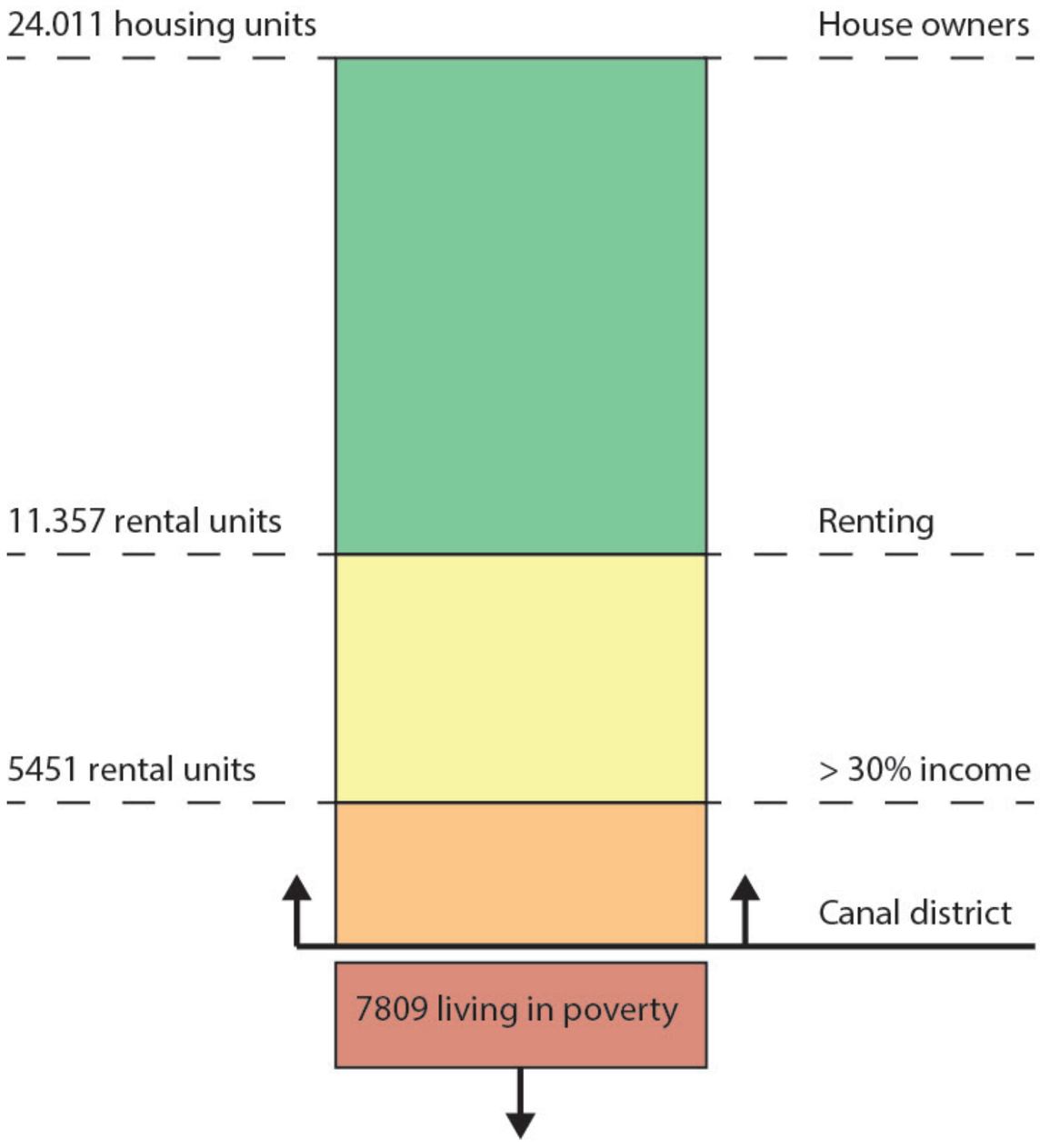




'Real Estate Data for San Rafael'

S: http://trulia.com

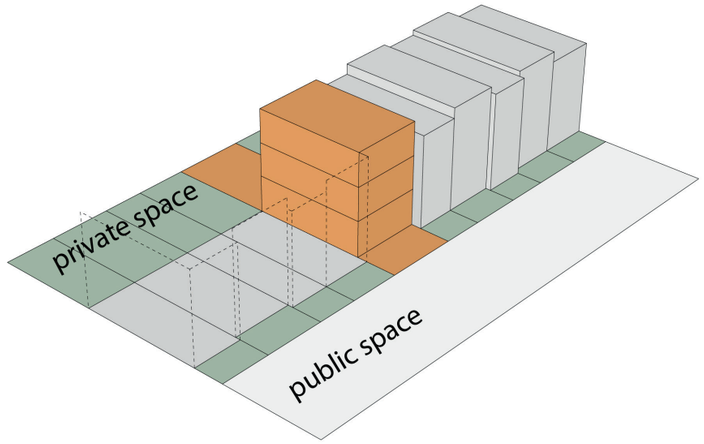
- Median house value: $714.900
- Median Household income: $77.294
- Income Canal district p.p.: $8.788

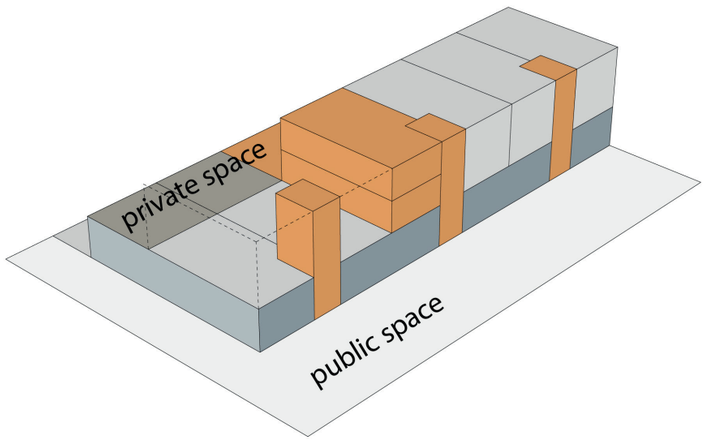


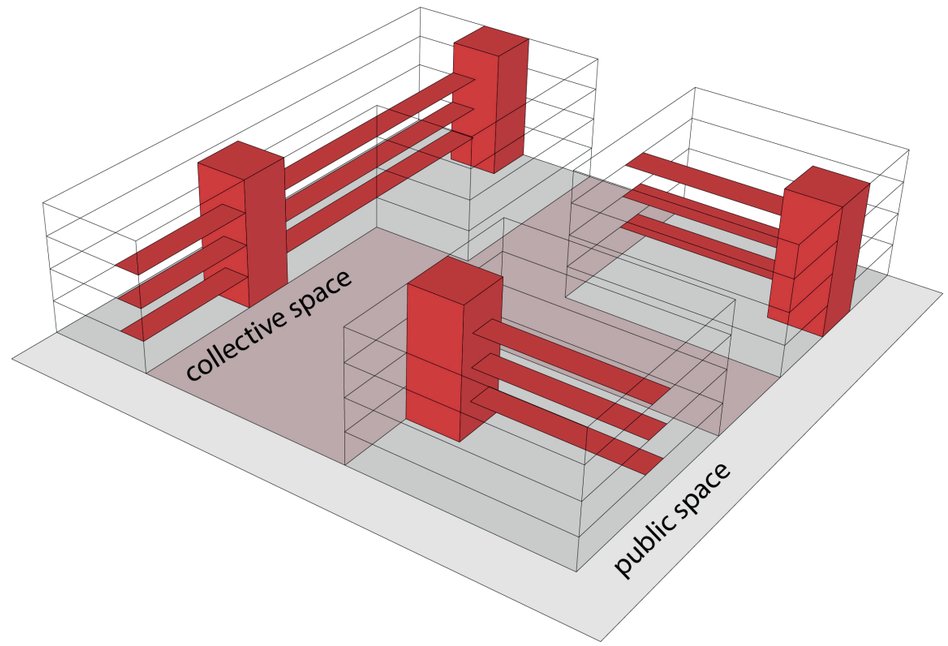
- Only house owners are safe
- Marin county: >30% income = social housing
- There are no social housing units available

3 systems for social housing:

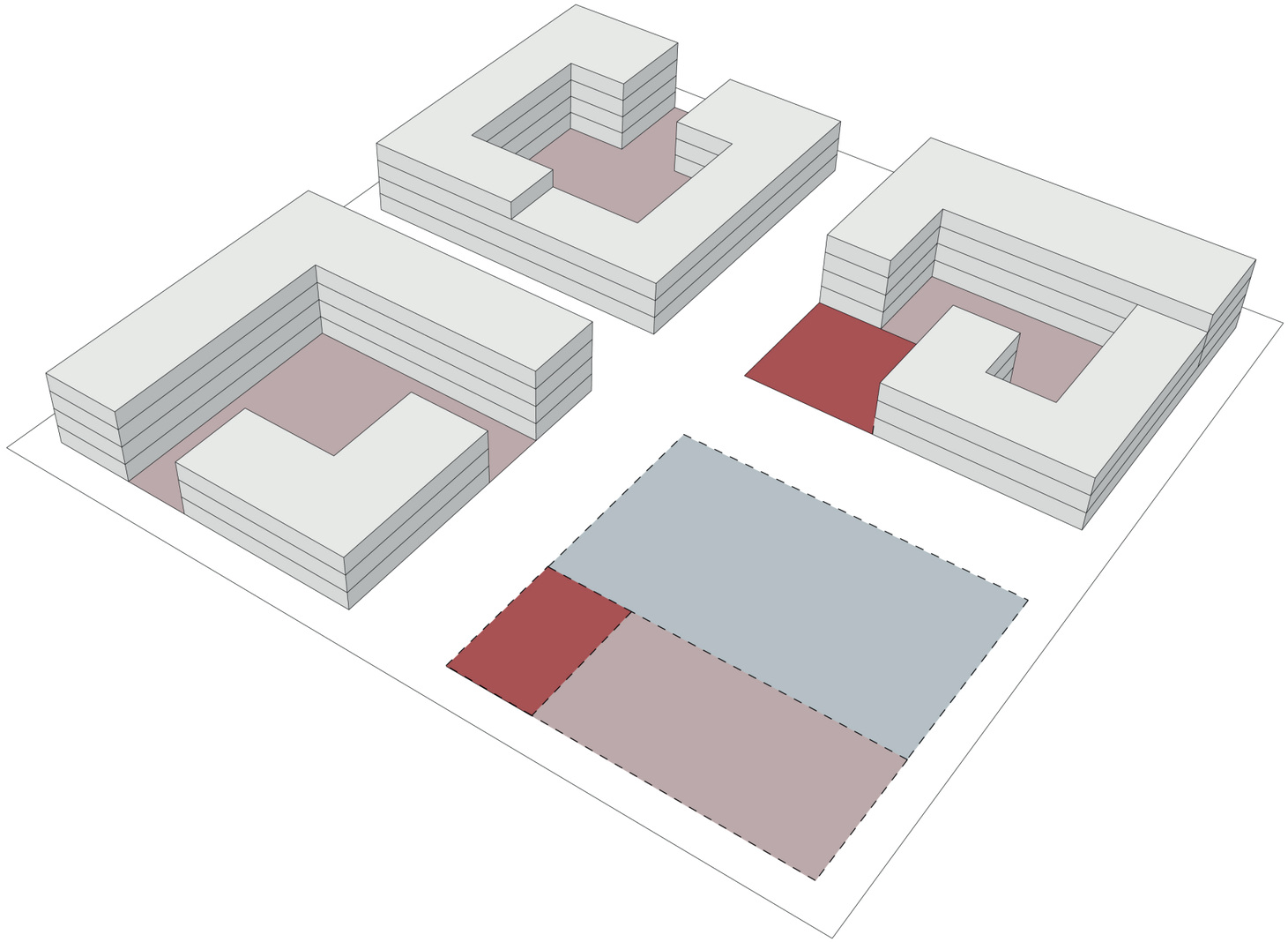
- Voucher system
- Rent under market value
- Build social housing units

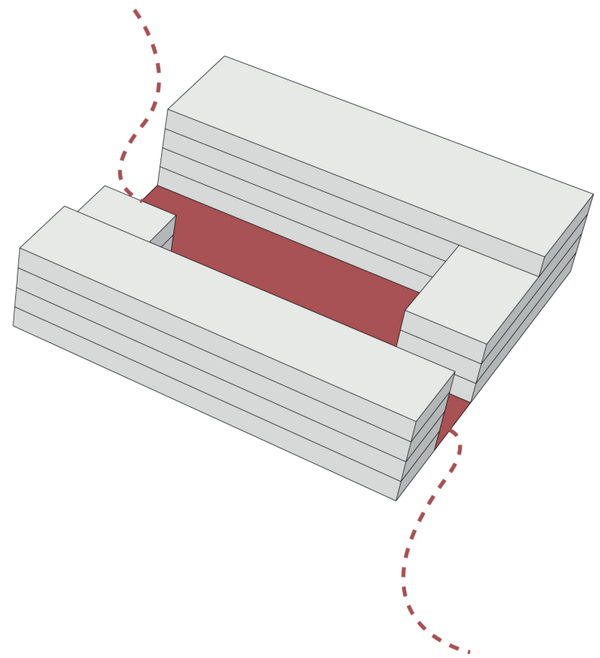






- Allow for a variaty of housing units for the free sector
- Private spaces and connections to public space
- Create social housing unites through policy guidlines
- Developing units in 1:1 ratio

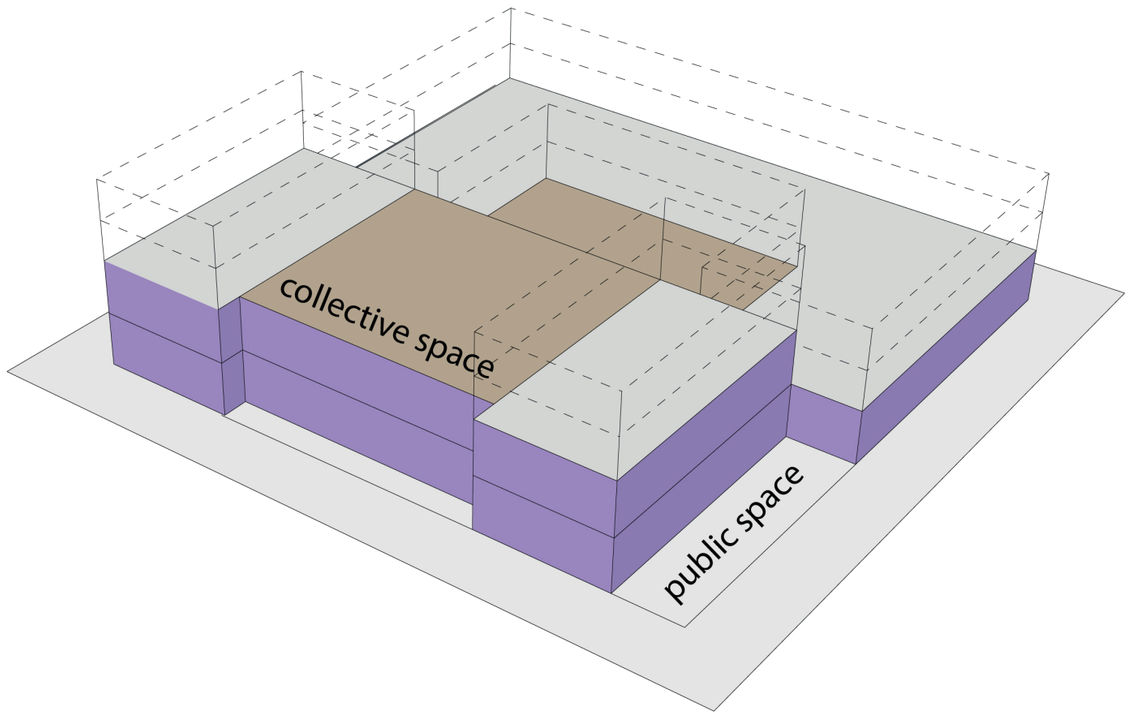


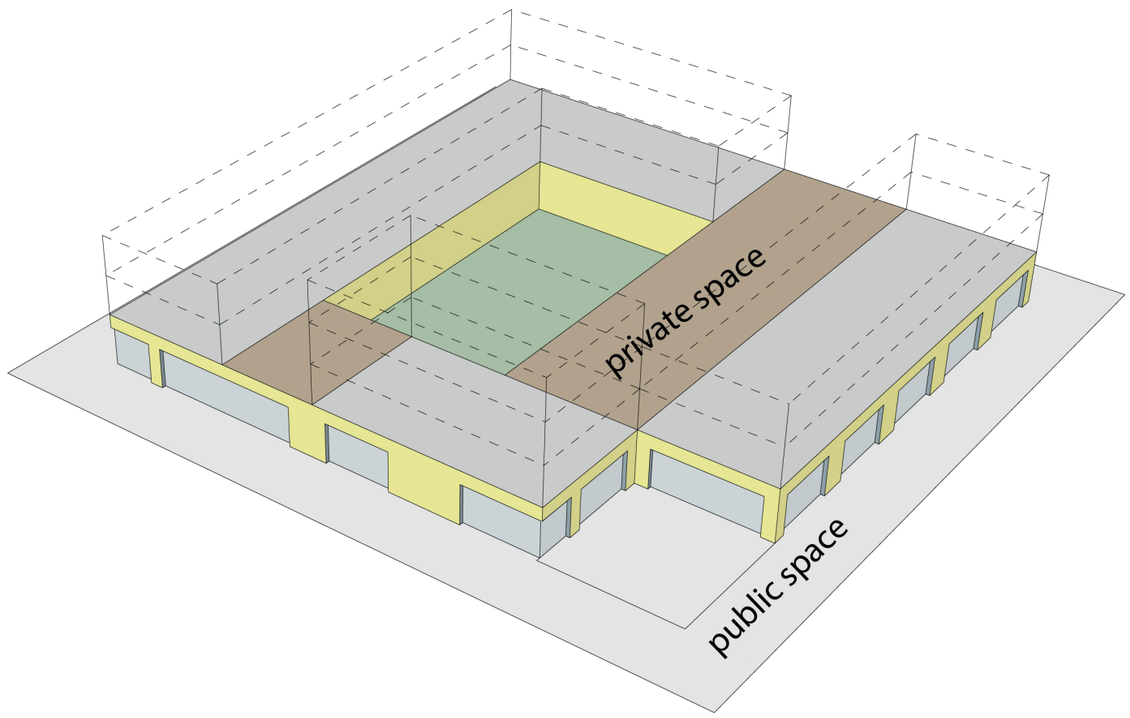


- Additional design rules for open space
- Collective area’s and public space
- Public space network through the area

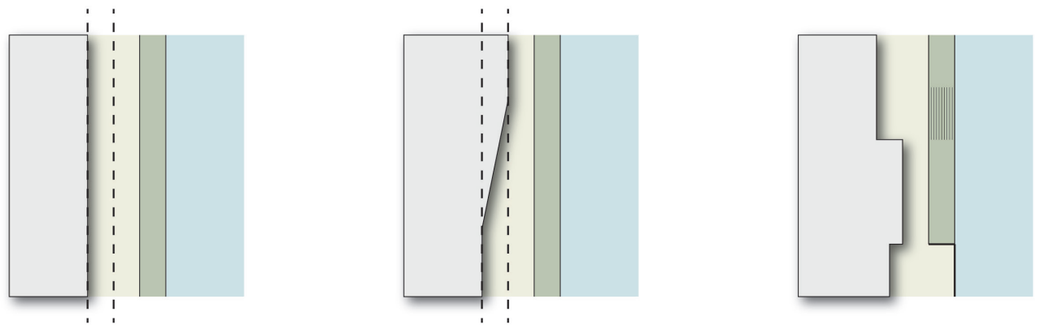
High quality streets
Main green structure
Network of public spaces
Public spaces throug policy
Design public spaces
High free sector intrest
Open water
Highway park

0
200m

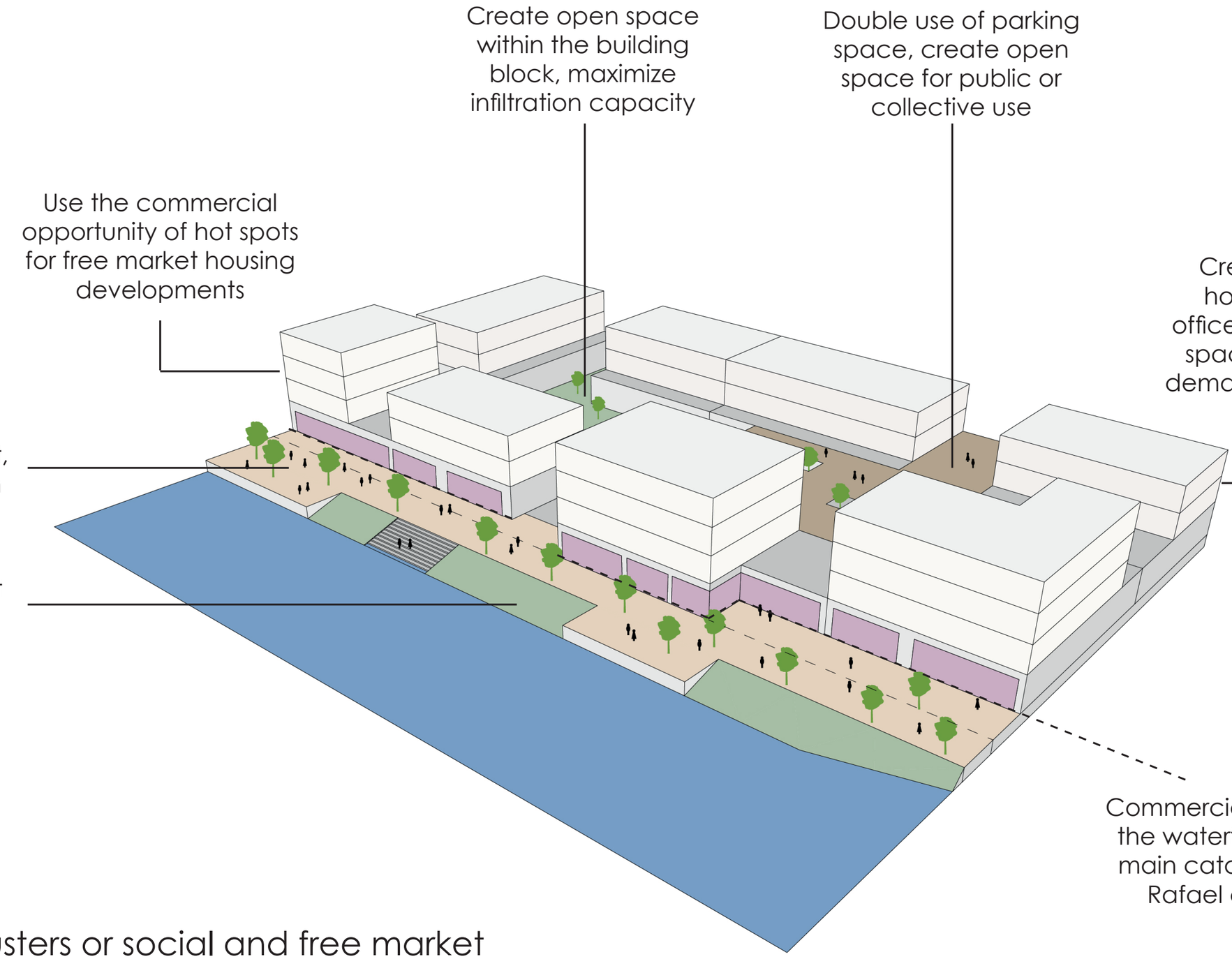




- Guiding rules for office blocks
- Guiding rules for commercial block
- Shaping the open space through guide lines




High quality streets
Main green structure
Public transport hubs
Public transport
Highway structure
Designed public spaces
Commercial potential
Buisness potential
Open water
Highway park
0
200m



- Create clusters or social and free market housing, without forcing interaction
- Open spaces for a mixed population

Intergration

Open water

Dry marshland

Wet marshland

existing plots

‘Highway park’

Public waterfront

New / aternative plots

Buildig suggestions

New / alternative roads

Highway connection

0 500

With the prospect of value increase, developers will contribute to flood defense through public space investments

Economic opportunities for commercial industries are used as a catalyst for real estate developments

Water defense measures are required to keep the canal district from flooding

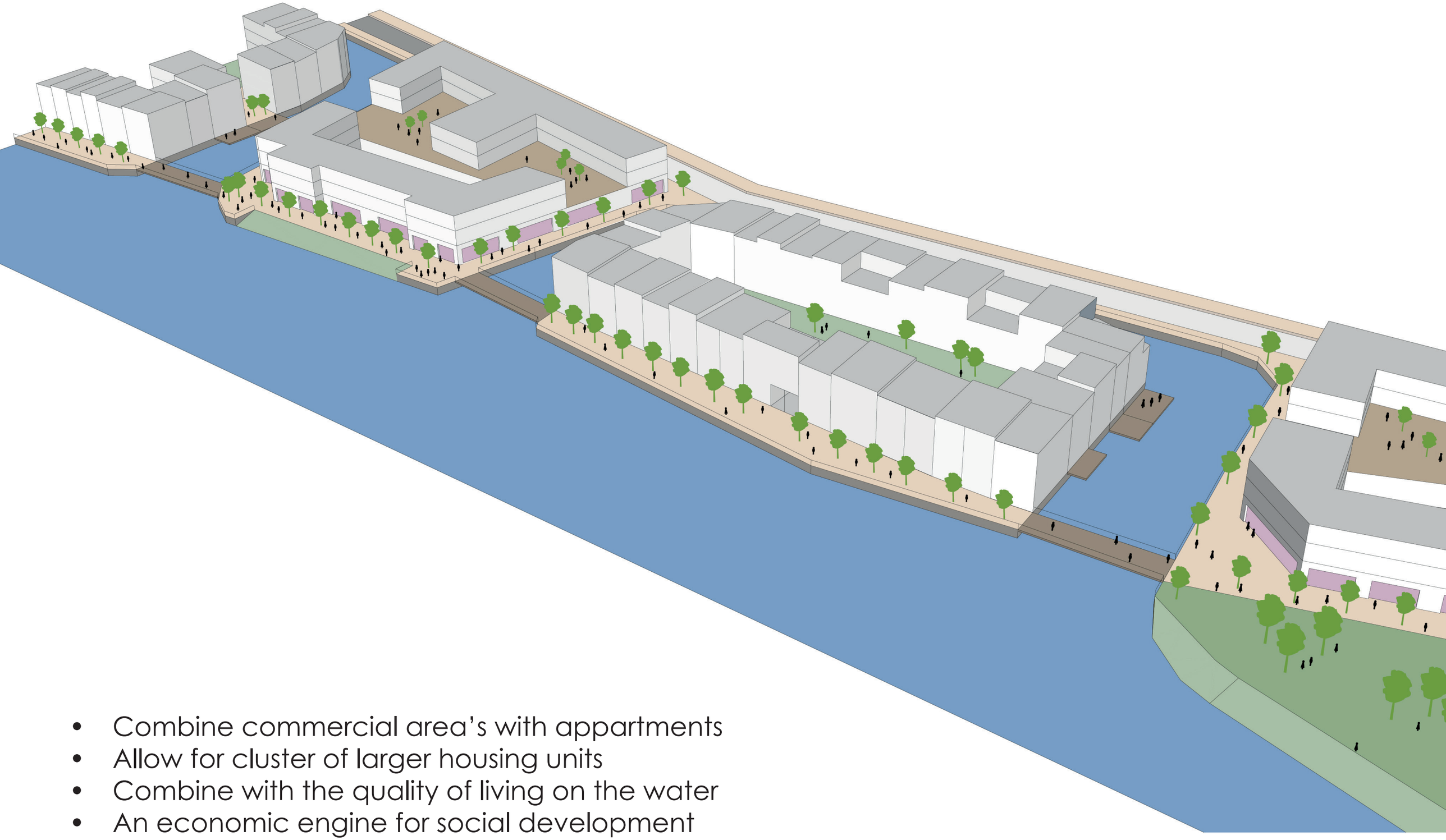
Waterfront Development

Policy changes support affordable housing developments in San Rafael

Real estate developers comply with new governance policies resulting in more affordable housing units

The mix of classes attract much needed facilities like education, healthcare and general facilities

- Low ground prices because of flood risk
- High real estate pressure
- Water protection is an investment
- Waterfront development as economic engine
- Development profits redirected to social housing



- Combine commercial area’s with appartments
- Allow for cluster of larger housing units
- Combine with the quality of living on the water
- An economic engine for social development

The ‘Rafael’ theatre
S: https://nl.pinterest.com/pin/267049452877468685/

Downtown plaza
S: https://nl.pinterest.com/pin/267049452874087417/

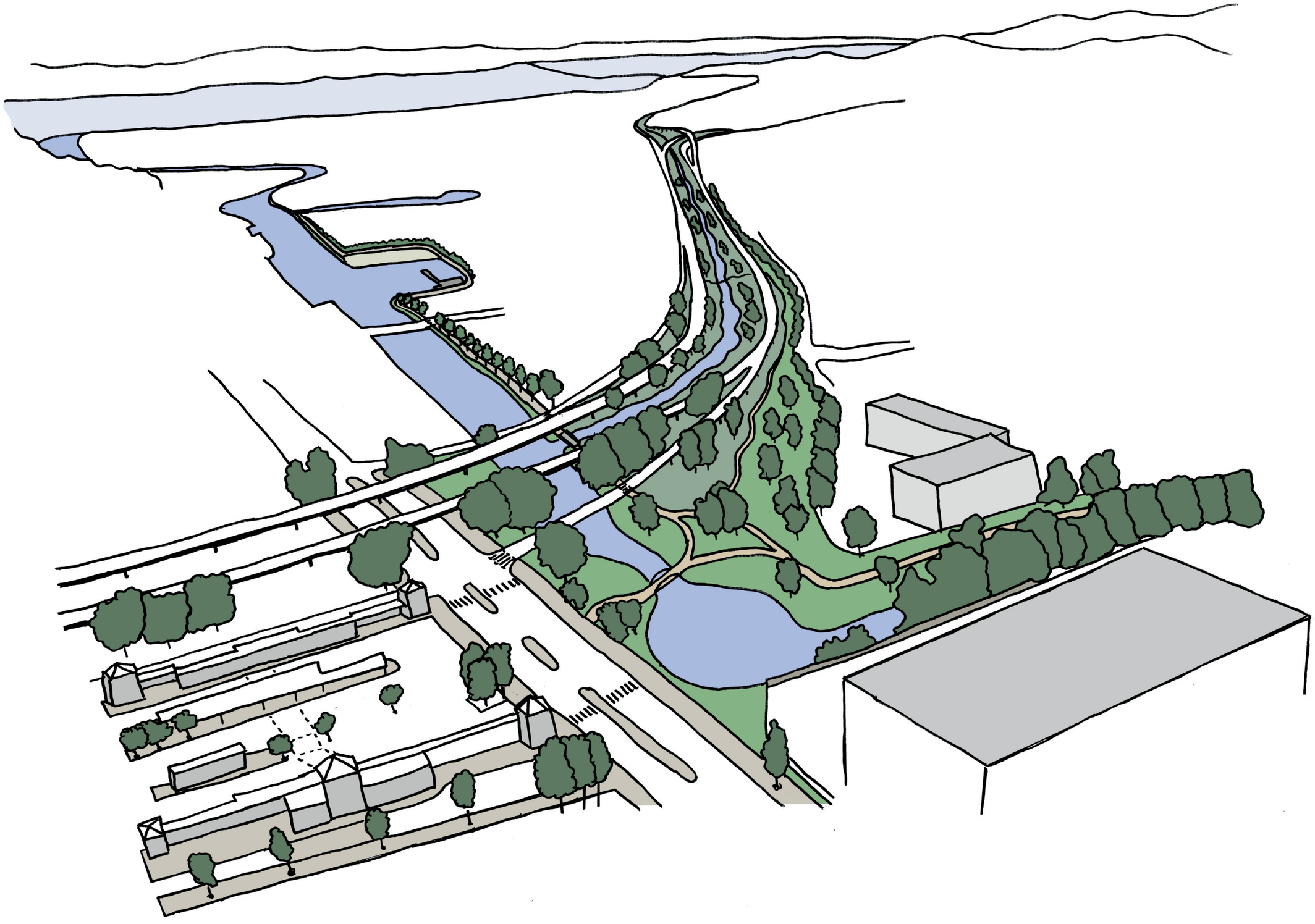
San Rafael ‘mission’
S: http://drclue.com/san-rafael-ca-downtown/

Lowrie Yacht Harbor
S: http://marinas.com/view/marina/
4065_Lowrie_Yacht_Harbor_San_Rafael_CA_United_States

San Rafael Canal
Field trip

San Francisco Bay
Field trip

- San Rafael: A harbor town without water in the city center, disconnected from water
- Bring back the water connection, connect with the bay



P1 - High impact

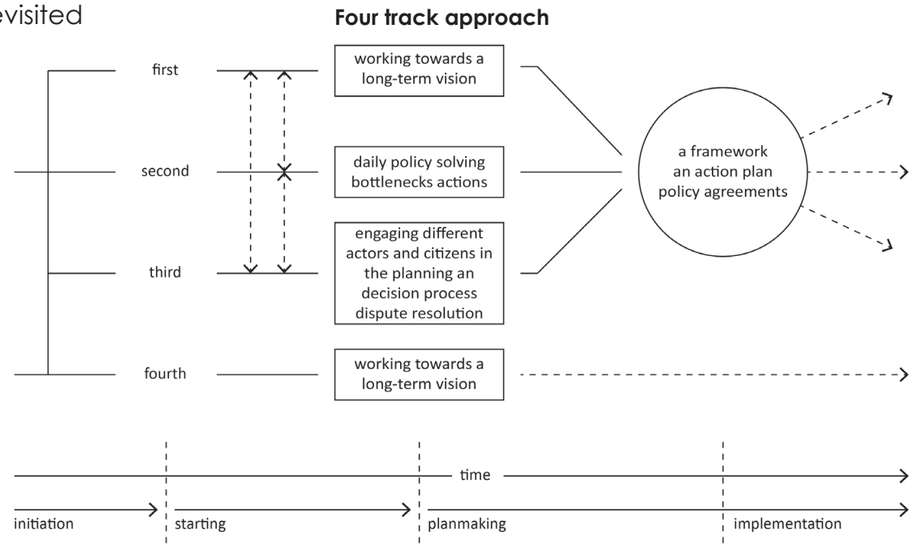
P2 - Closing off the bay

P3 - Relocation / New development

P4 - High speed transport

P5 - New rules for developments

P6 - Infrastructure revisited

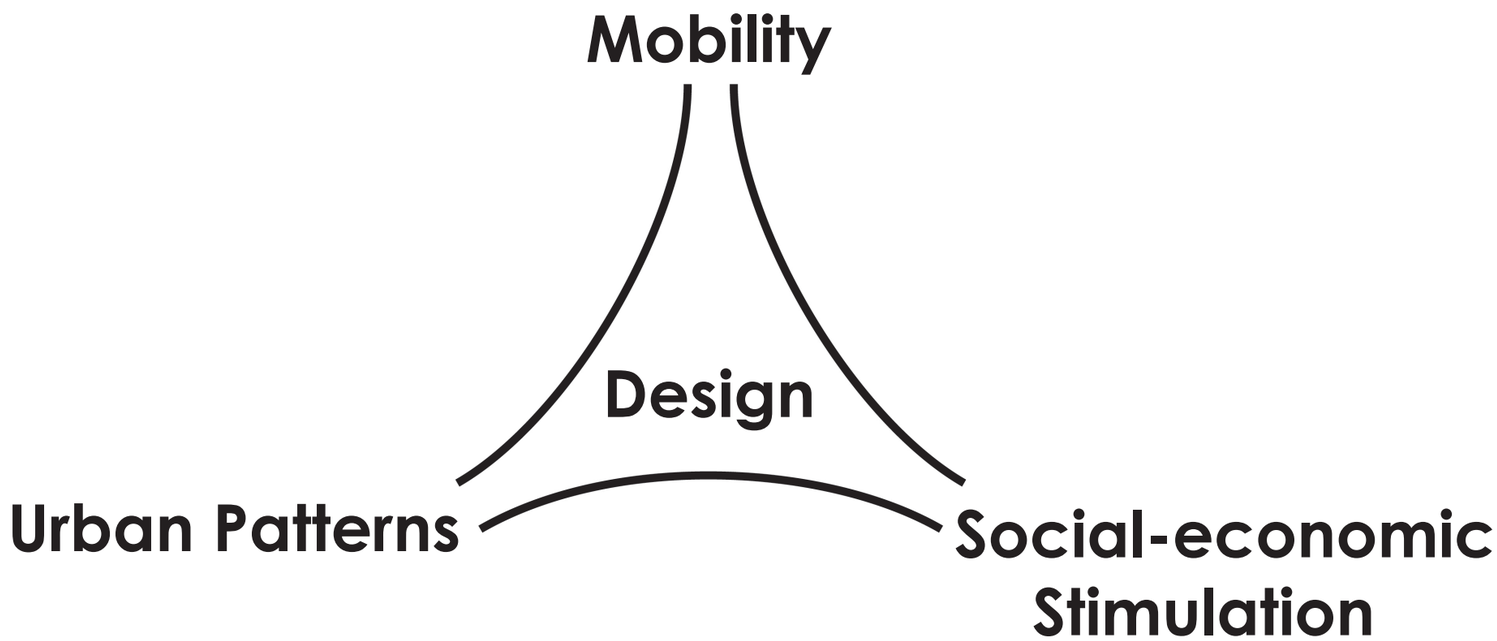


S: (Oosterlynck, et al., 2013)

0 500m

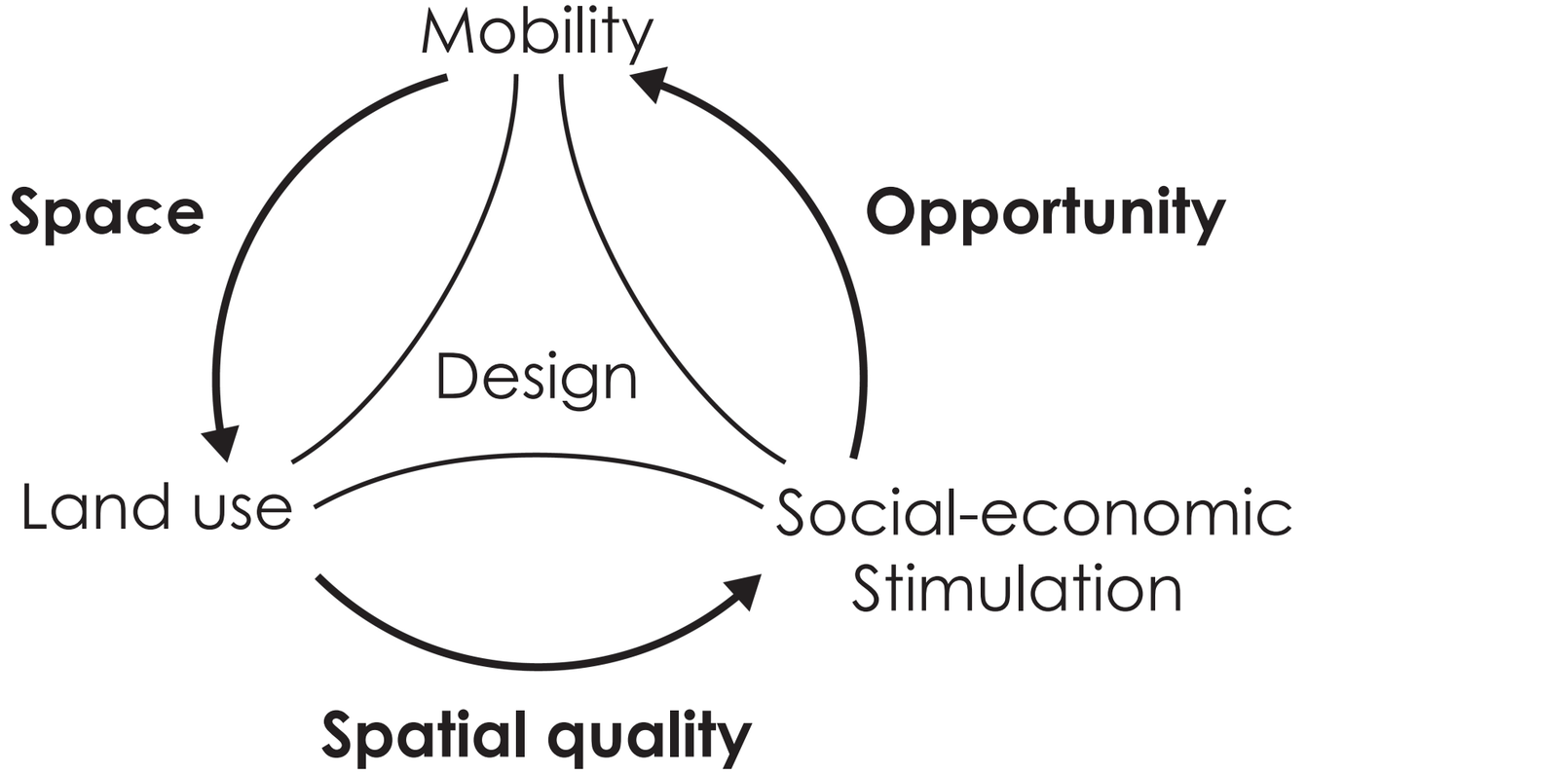
Conclusion

Approach: 3 pillars



Main research question

Can a spatial strategy, created out of the urgency of flood prevention, contribute to social-economic improvement?

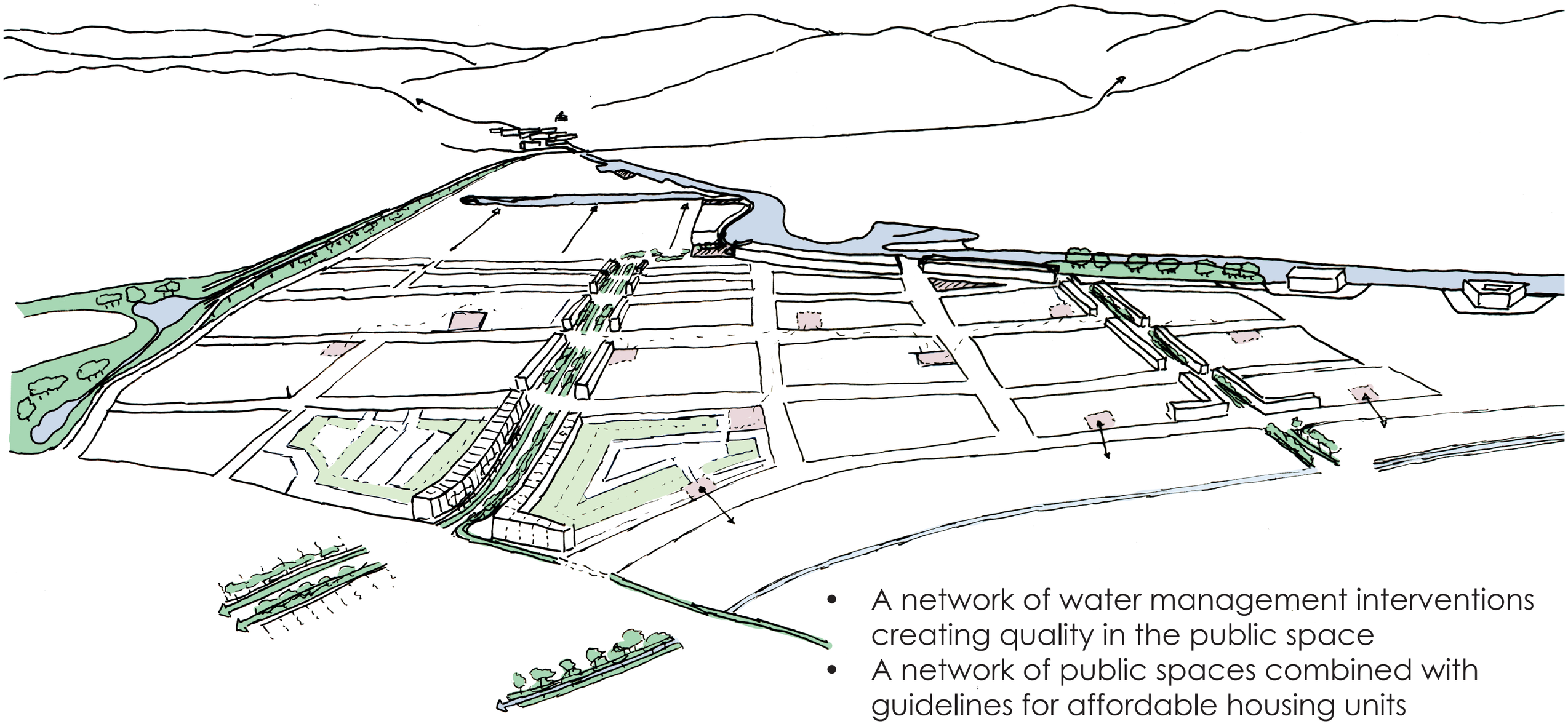


- The three factors strengthen each other
- A public system will only work when it has the right capacity,
  by protecting the lower social-economic residents, this capacity will be realized.
- In turn this new system will work both ways, connect and attract, opportunity from both sides
- Changing mobility creates more possibilities for alternative land-use,
  which is an step towards a higher spatial quality.

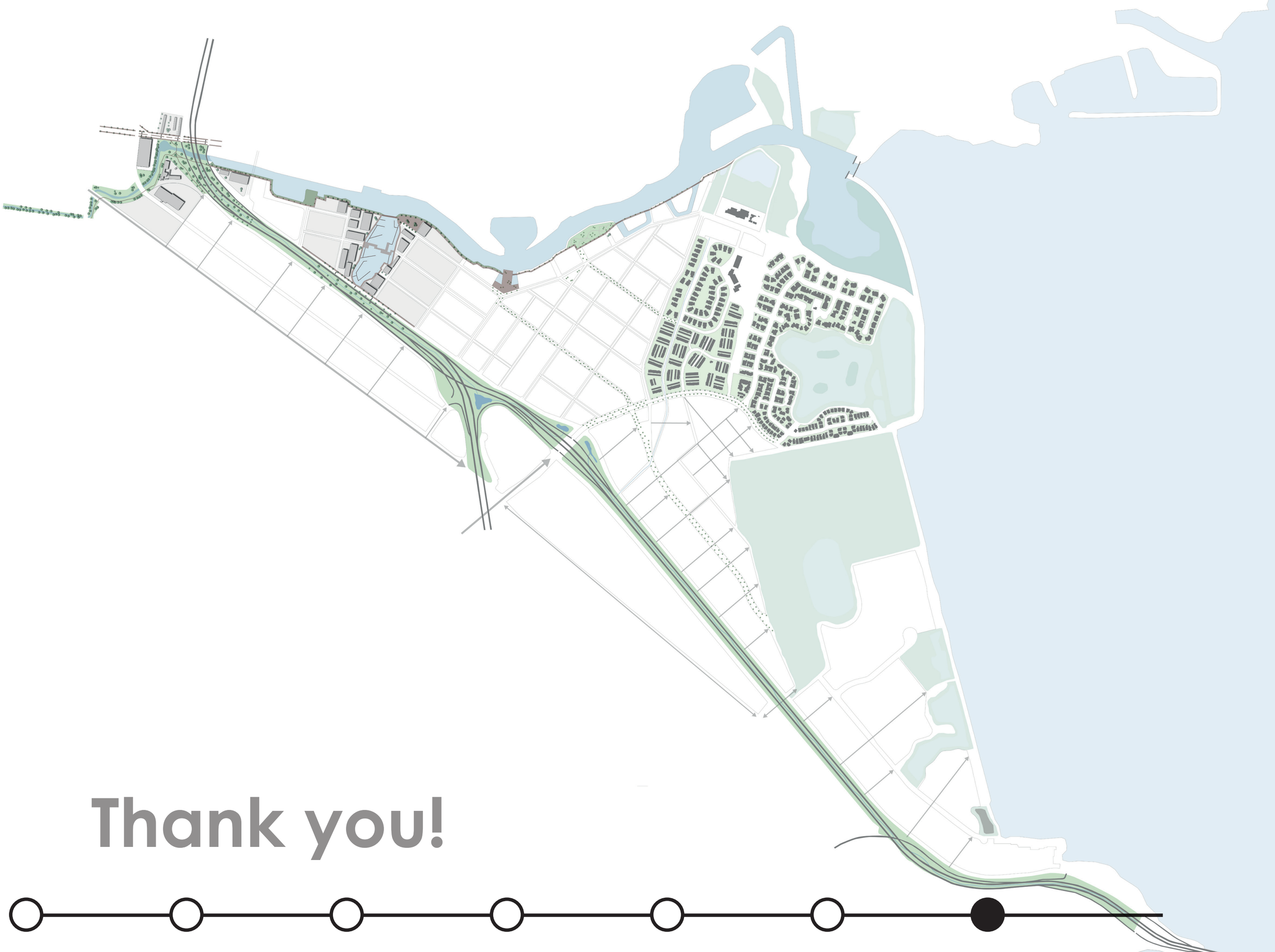
Main research question

Can a spatial strategy, created out of the urgency of flood prevention, contribute to social-economic improvement?

- A lot of flood prevention works as a stimulation for spatial quality, transforming an neighborhood alone will not create social-economic improvement.
- By attacking a mixture of different people into an neighbourhood, opportunity for social-economic improvement does present itself.
- Creating a neighbourhood with a high density and a mixed program will create an attraction for a more diverse population.
- By tackling the water problem, the neighborhood is able to redevelop itself. By protecting the resident's in this redevelopment, through spatial polices, social-economic improvement should be possible.



- A network of water management interventions creating quality in the public space
- A network of public spaces combined with guidelines for affordable housing units
- A patchwork of small scale interventions to protect the area for future flooding



Thank you!