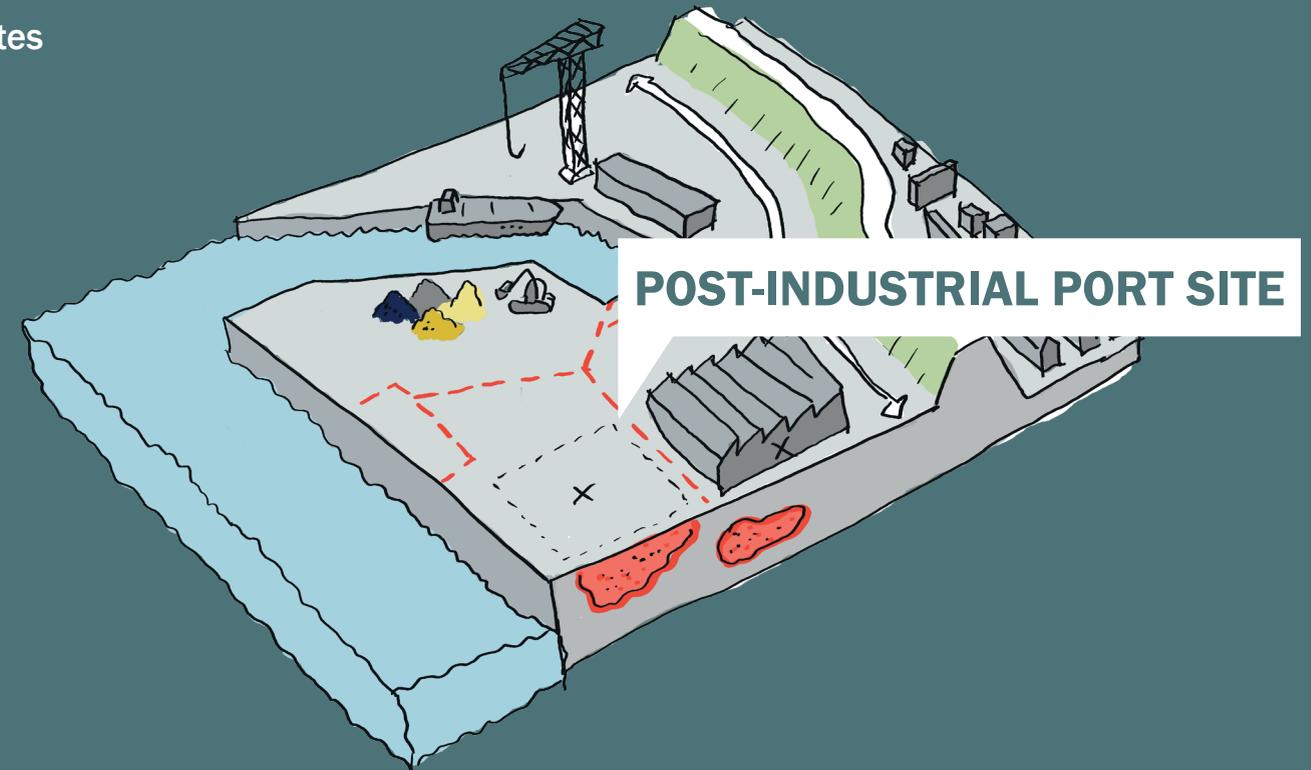


CLIMATE ADAPTIVE DELTA CITIES

A strategy for climate adaptive redevelopment of post-industrial port sites to establish the transition to a resilient Rhine-Meuse delta region facing the uncertain effects of the climate crisis.

The case of De Staart in Dordrecht



P5 Presentation

Jasmijn Ponssen

First Mentor: Arie Romein

Second Mentor: Claudiu Forgaci

Delegate Board of Examiners: Herman de Wolff

14 January 2022

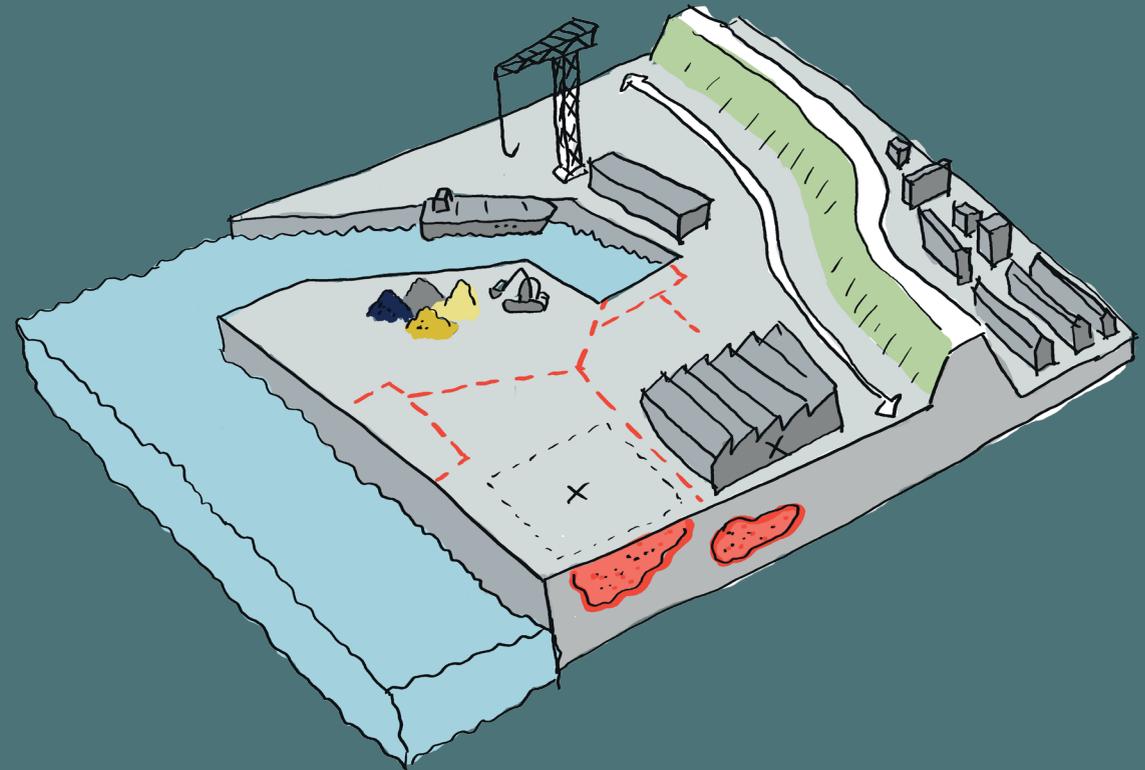
1. CONTEXT

2. PROBLEM

3. CHANGE PROCESSES

4. STRATEGY

5. DESIGN SIMULATION



A strategy for climate adaptive redevelopment of post-industrial port-sites

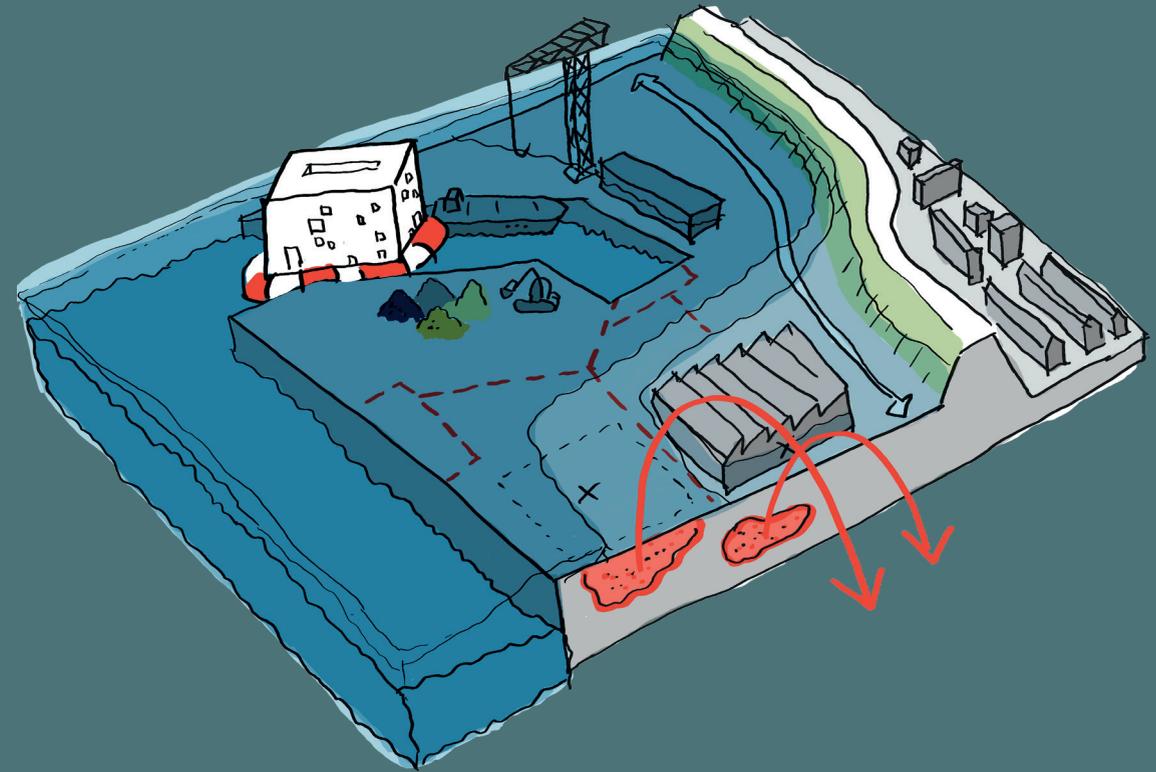
1. CONTEXT

2. PROBLEM

3. CHANGE PROCESSES

4. STRATEGY

5. DESIGN SIMULATION



A strategy for climate adaptive redevelopment of post-industrial port-sites

DE STAART, DORDRECHT

PAPENDRECHT

MERWEDE

DE STAART

STADSWERVEN

WANTIJ

DORDRECHT CENTRE

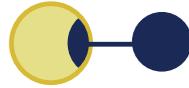


CITIES AND PORTS GROWING TOGETHER

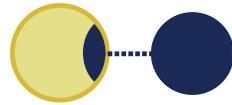
Primitive city port
medieval - 19th century



Expanding city port
19th - early 20th century



Modern industrial port
mid-20th century



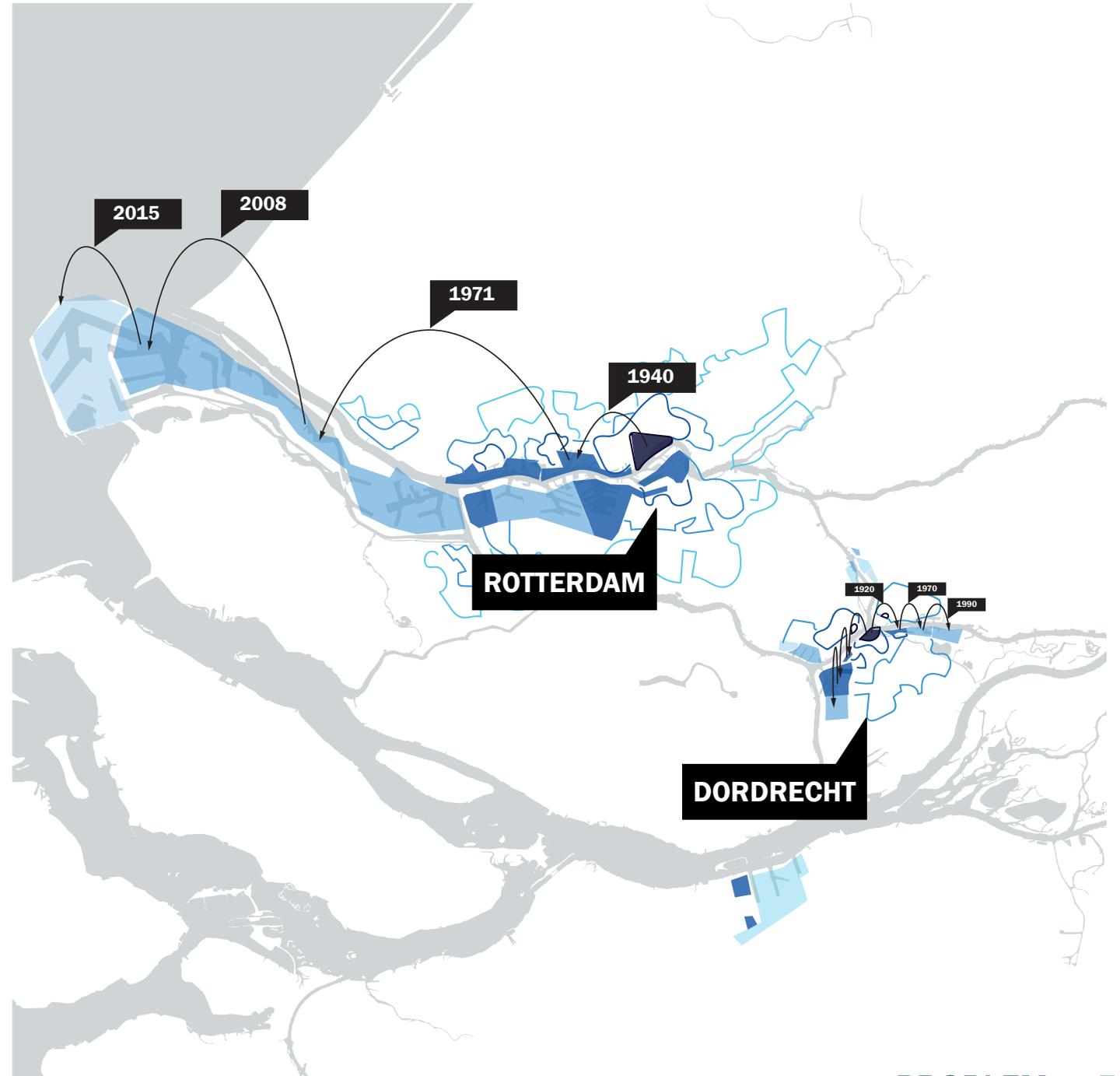
Retreat from the waterfront
1960s - 1980s



Redevelopment of the waterfront
1970s - 1990s



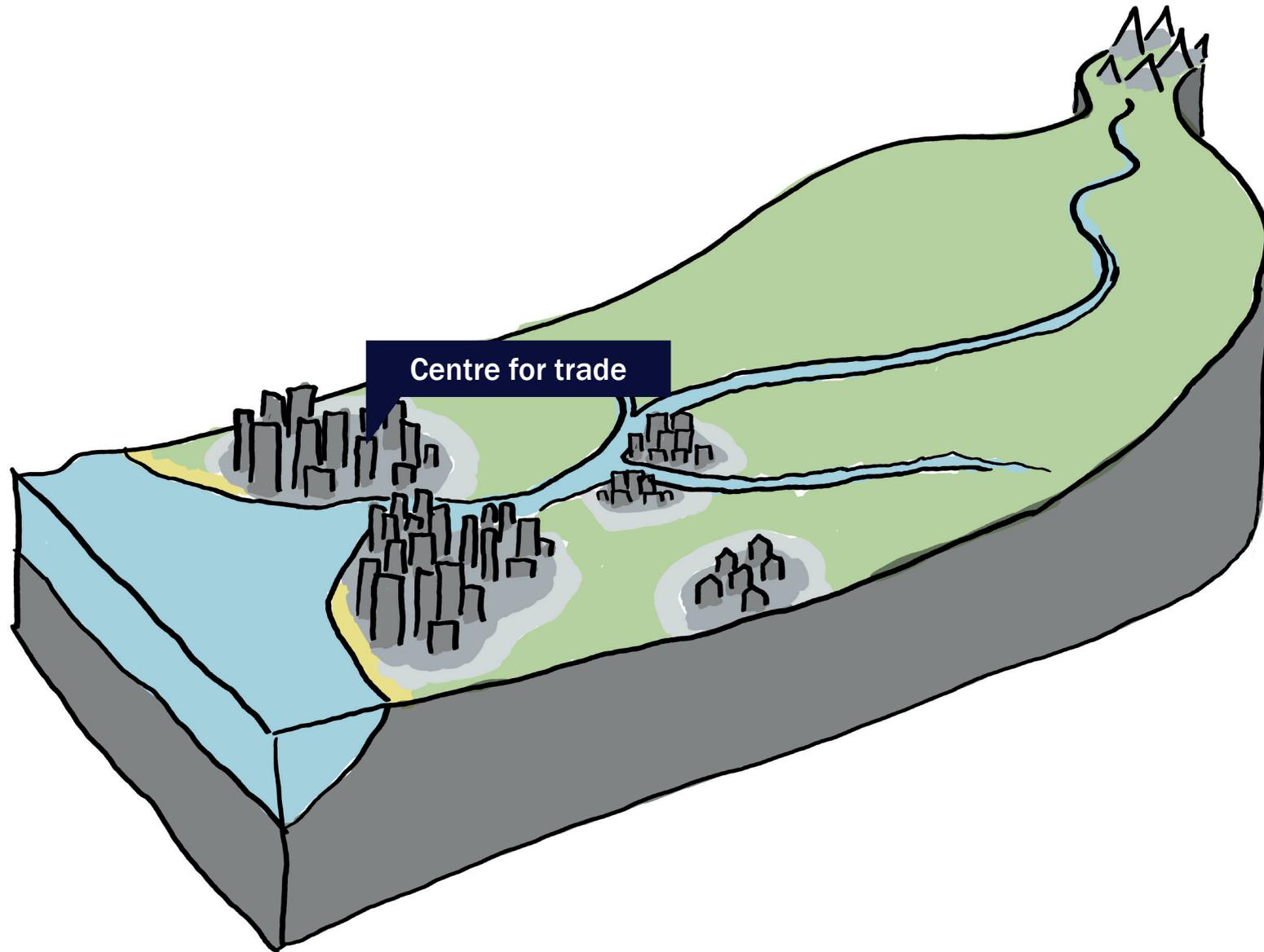
Renewal of port/city links
1990s / 2000+



top: Adapted from Hoyle, 1989
 right: Own illustration

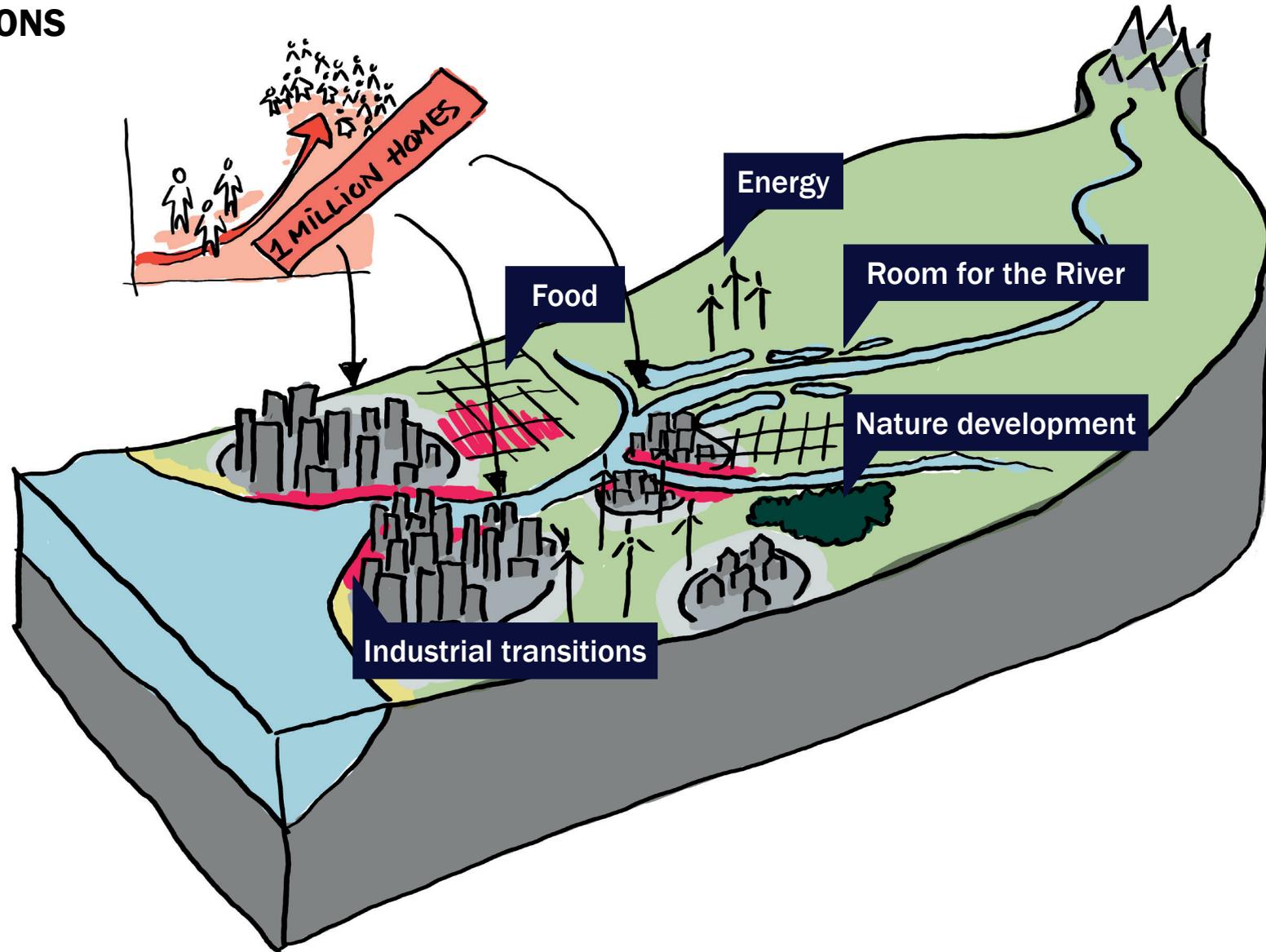
DELTA REGION

Rhine-Meuse delta region



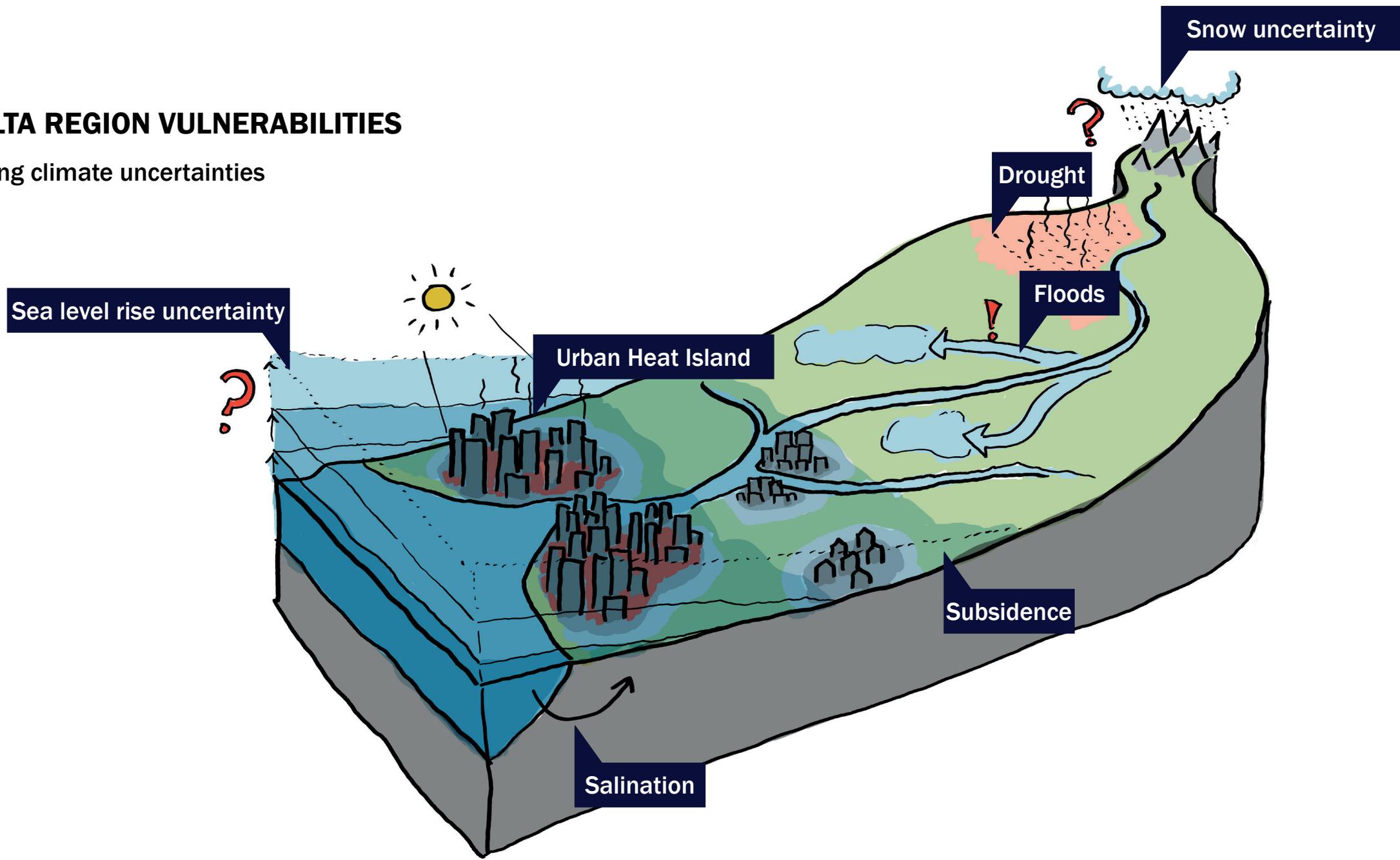
DELTA REGION AMBITIONS

A full delta



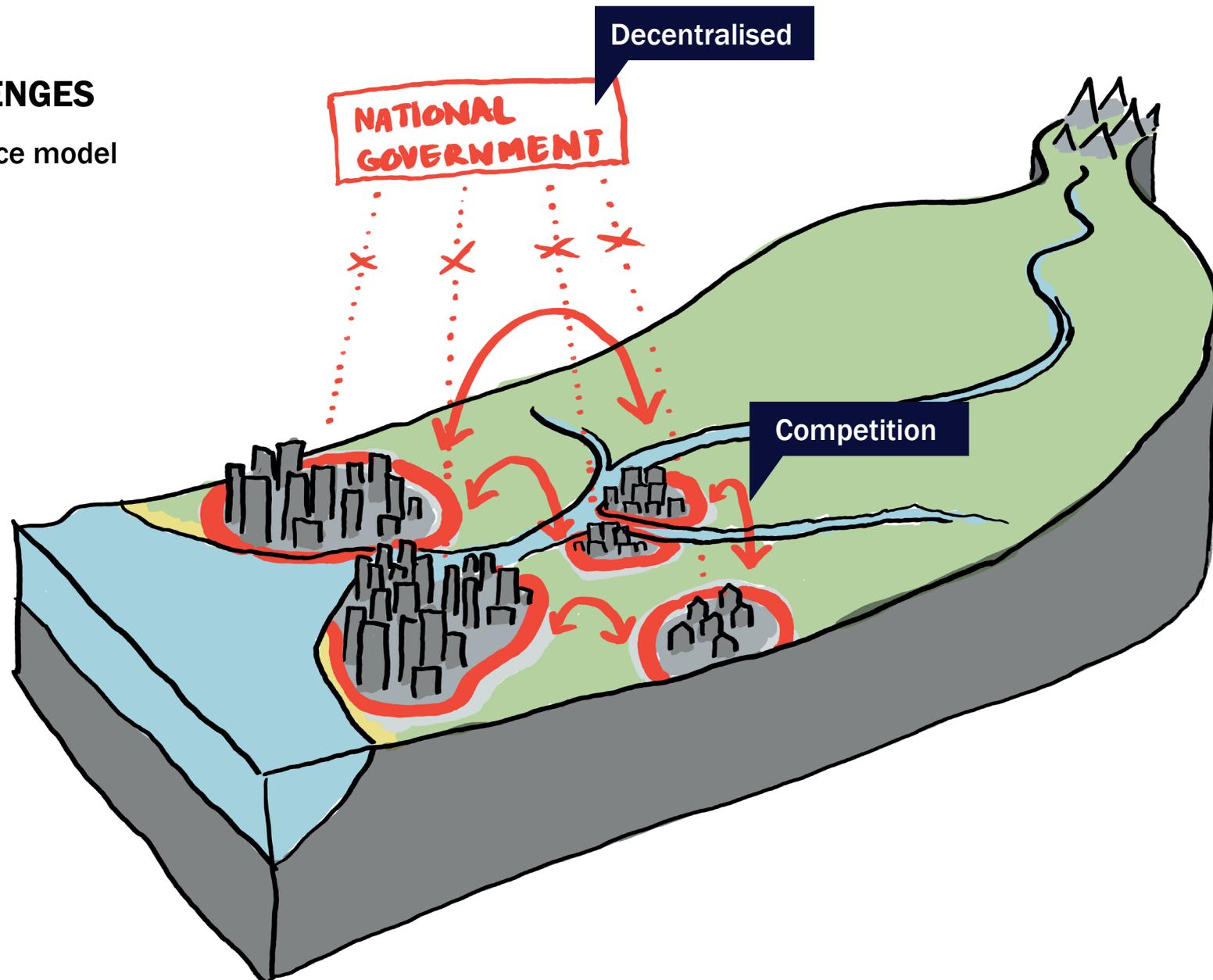
DELTA REGION VULNERABILITIES

Facing climate uncertainties



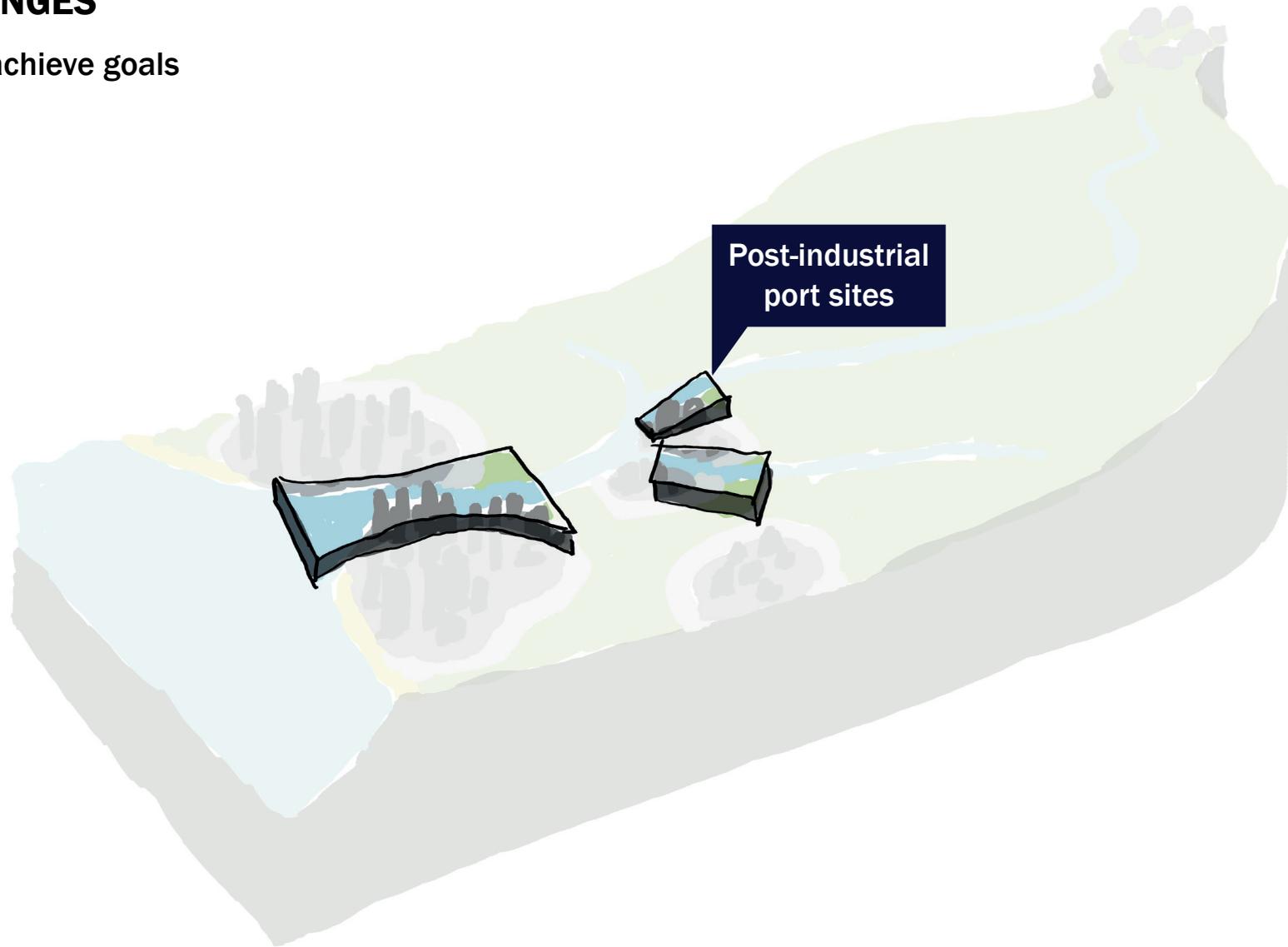
DELTA REGION CHALLENGES

In a decentralised governance model



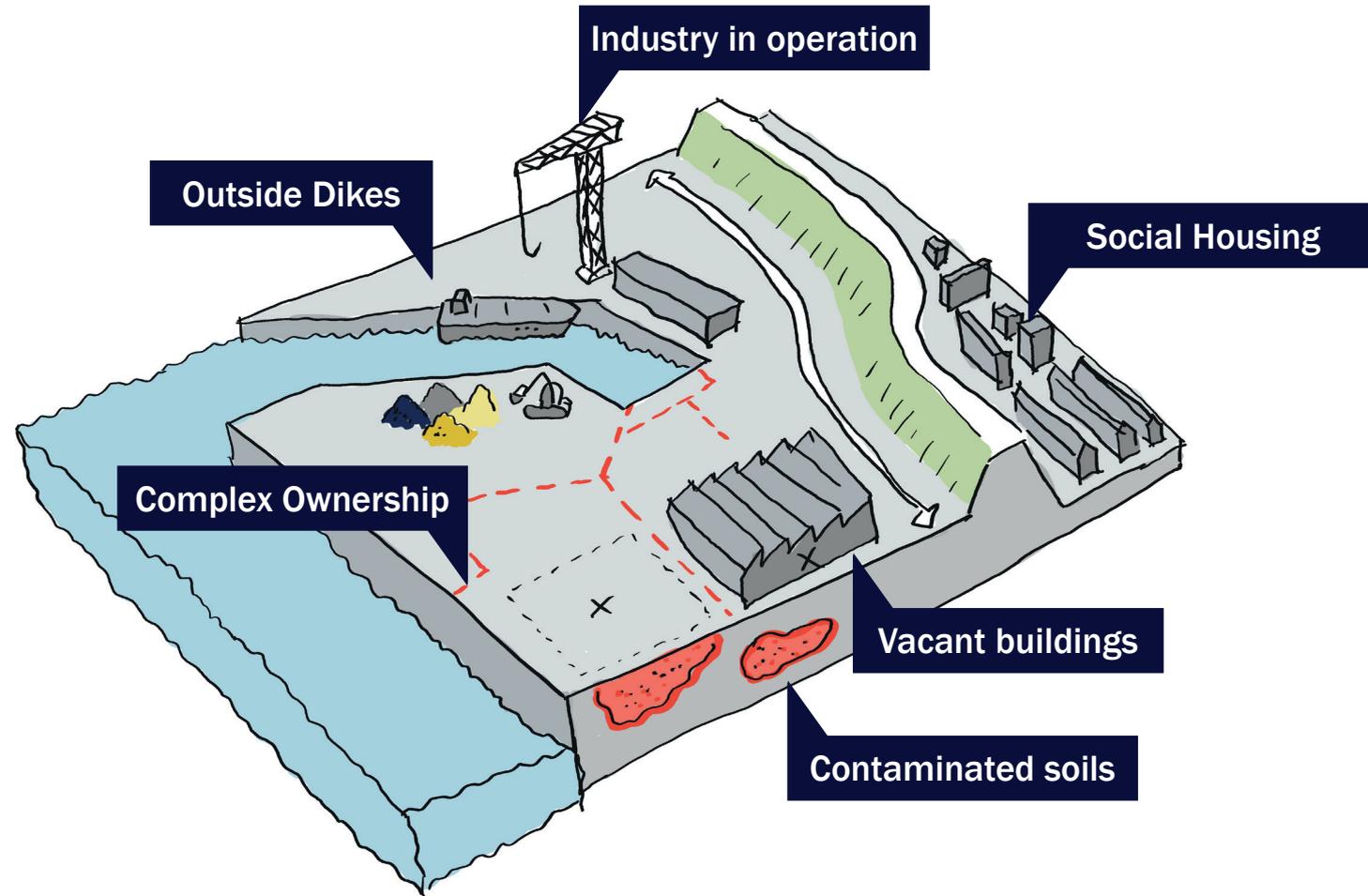
DELTA REGION CHALLENGES

Redevelopment projects to achieve goals

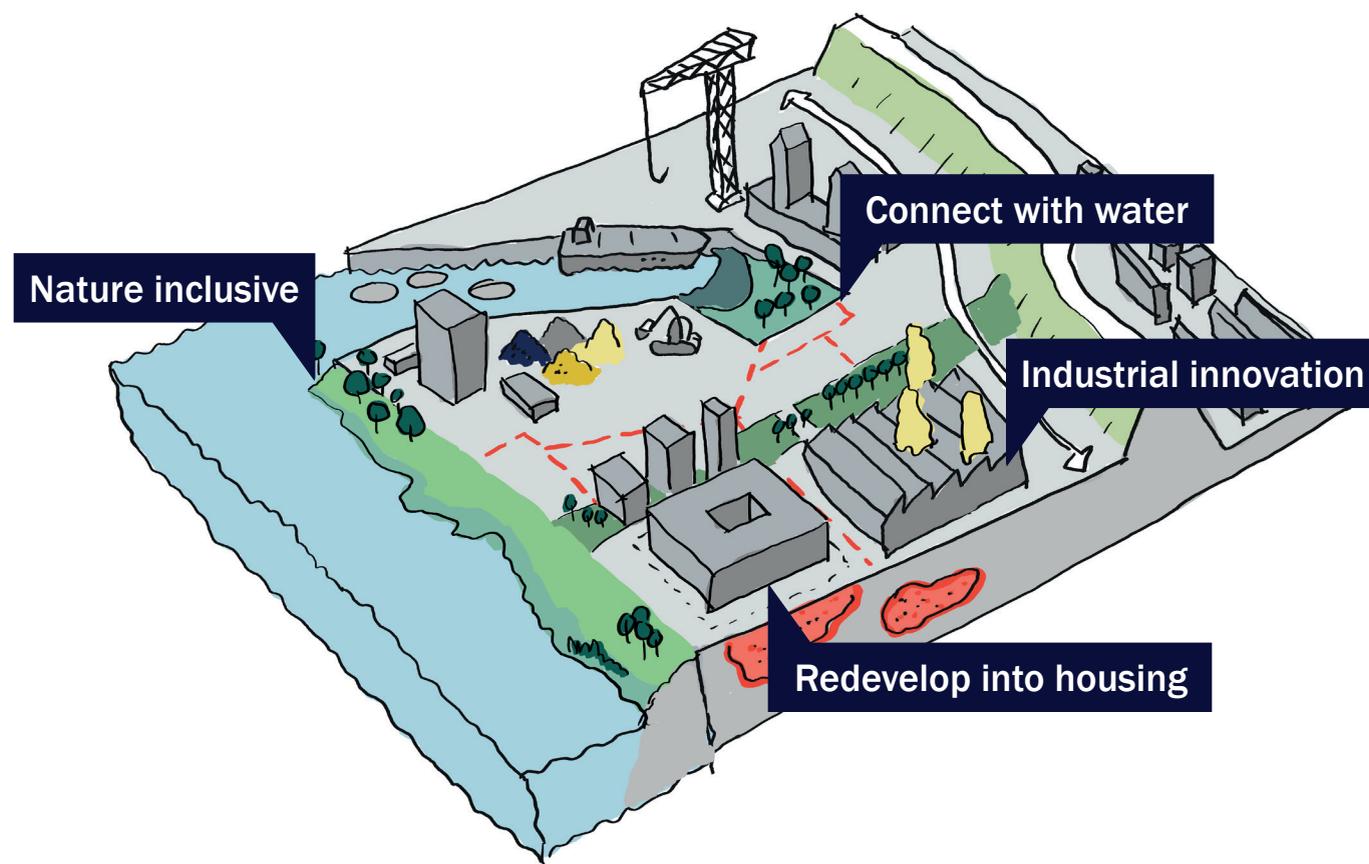


POST-INDUSTRIAL PORT SITES

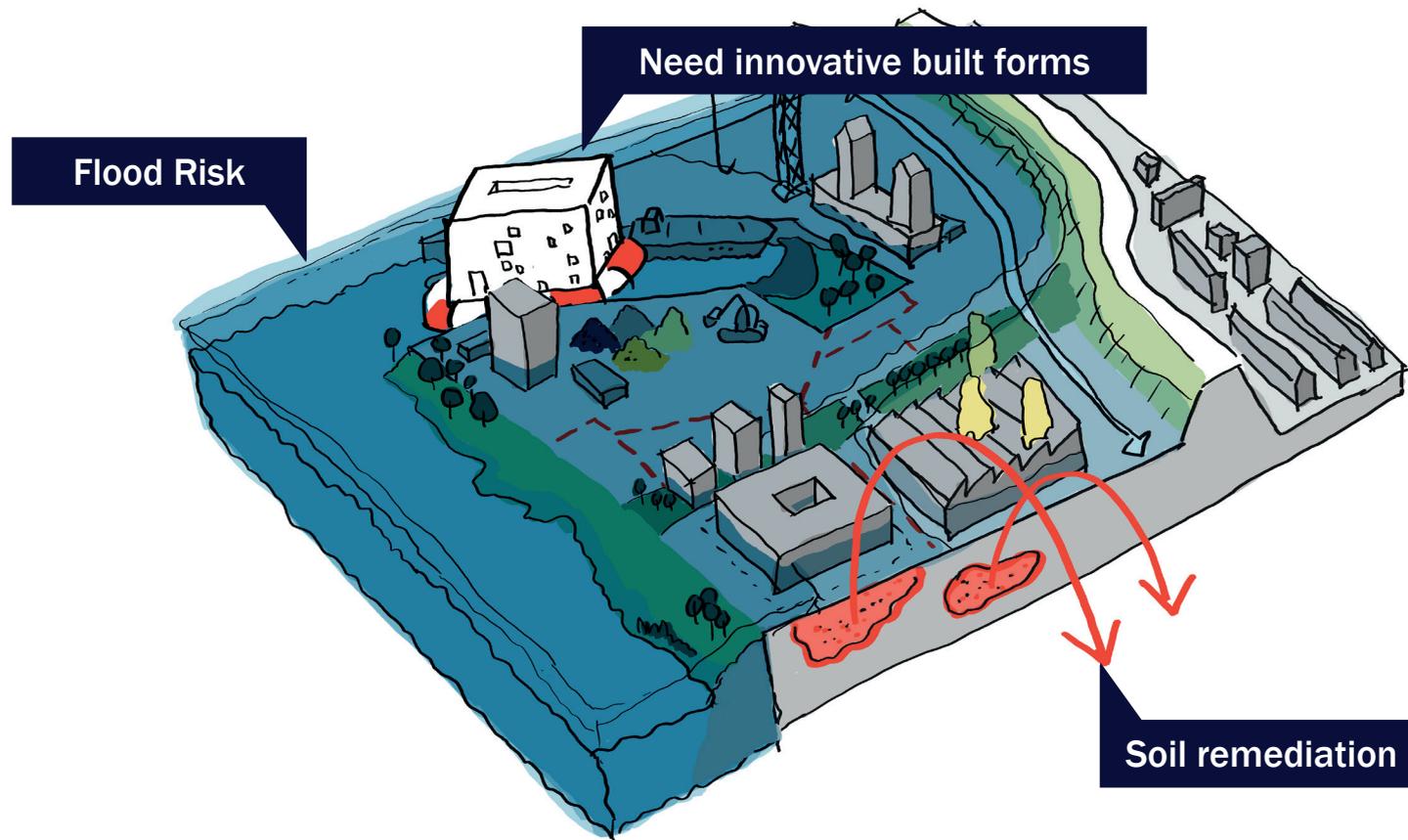
As can be found at de Staart and Merwe-Vierhavens



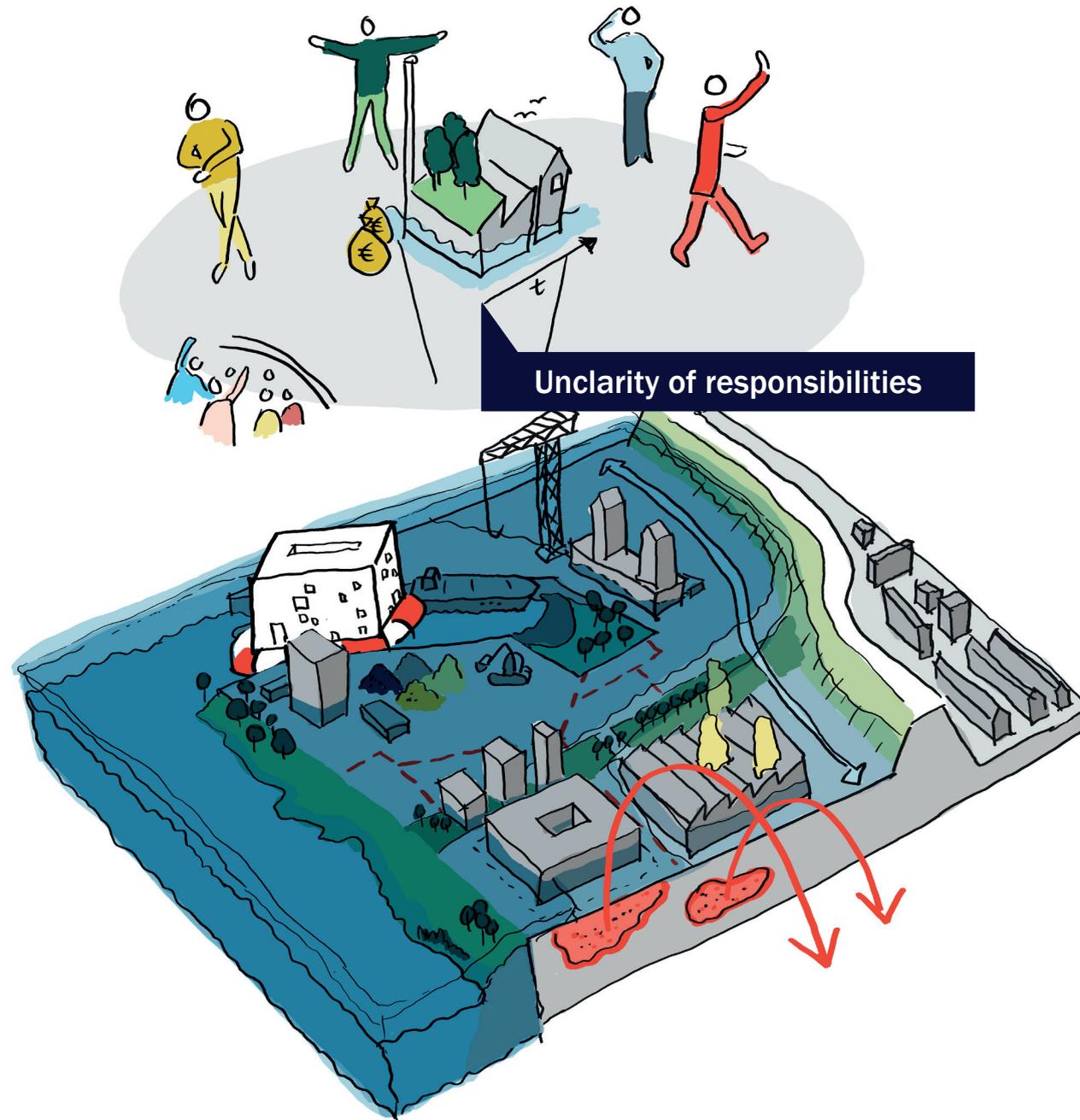
AMBITIONS FOR POST-INDUSTRIAL PORT SITES



CHALLENGES FOR POST-INDUSTRIAL PORT SITES



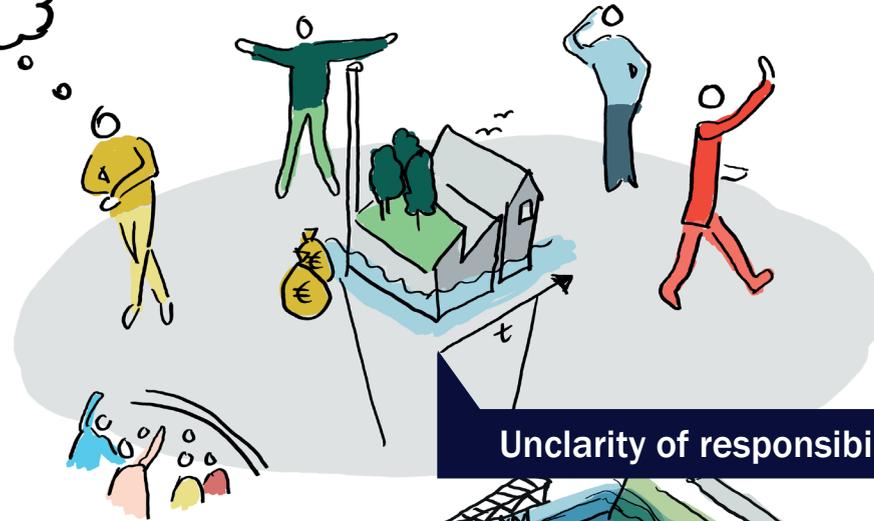
REDEVELOPMENT PROCESS CHALLENGES



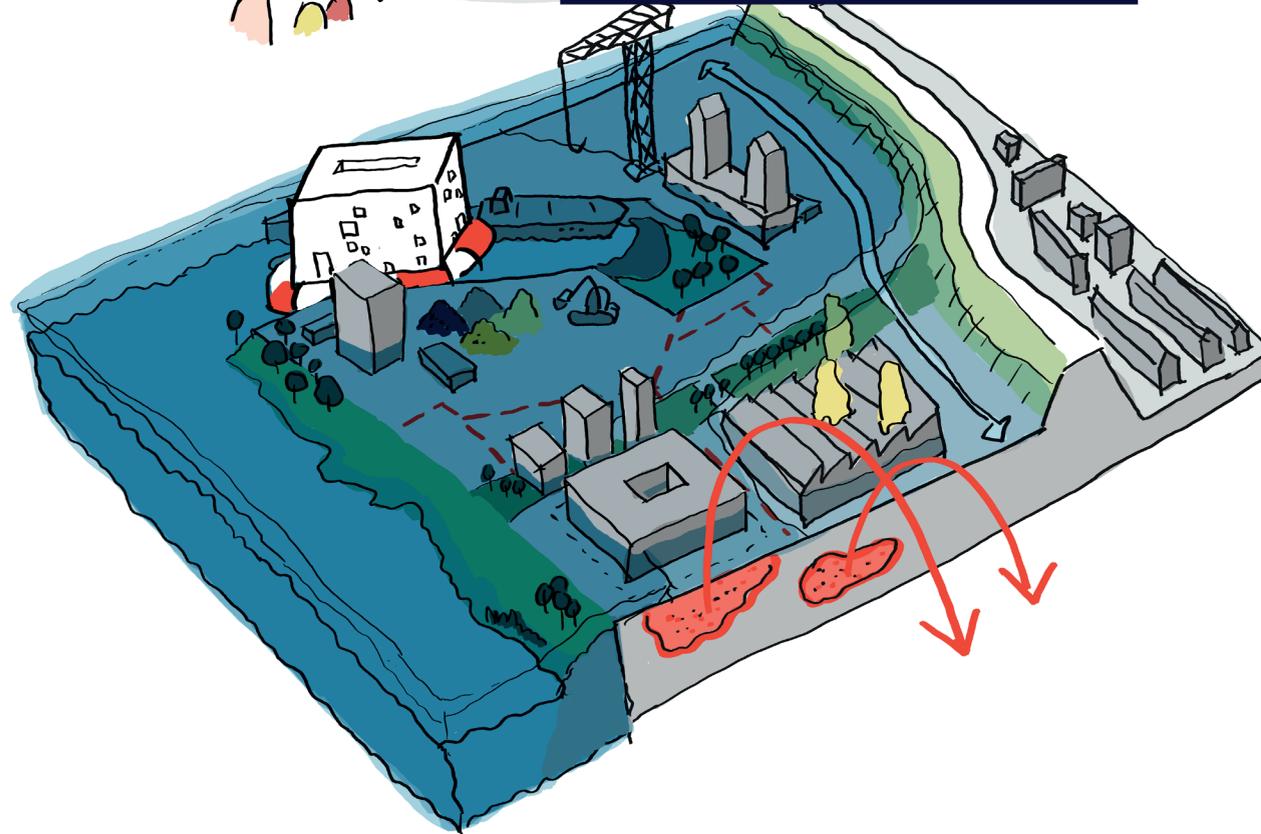
REDEVELOPMENT PROCESS CHALLENGES



Trust in the familiar,
aversion to change



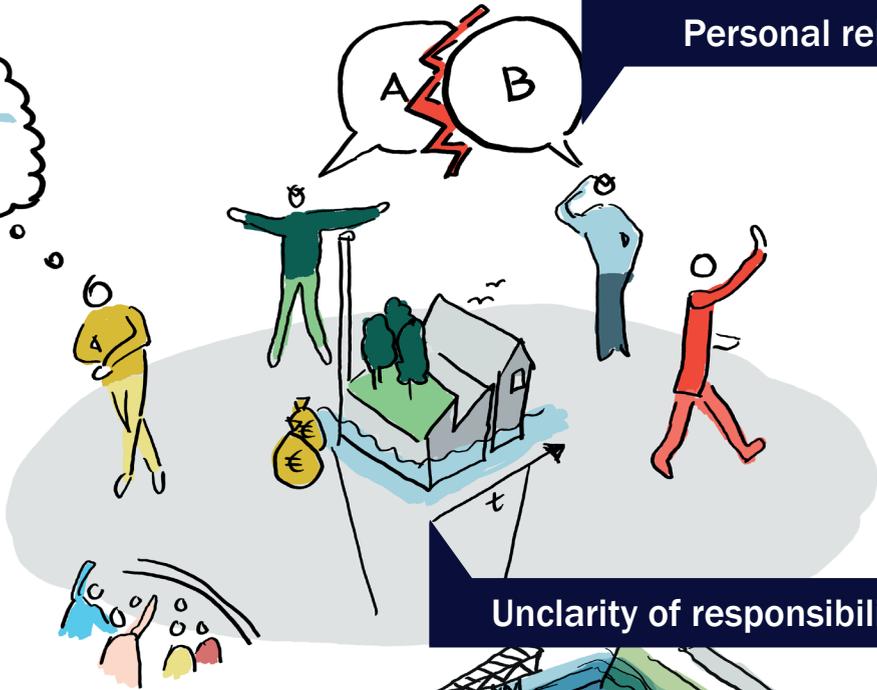
Unclarity of responsibilities



REDEVELOPMENT PROCESS CHALLENGES

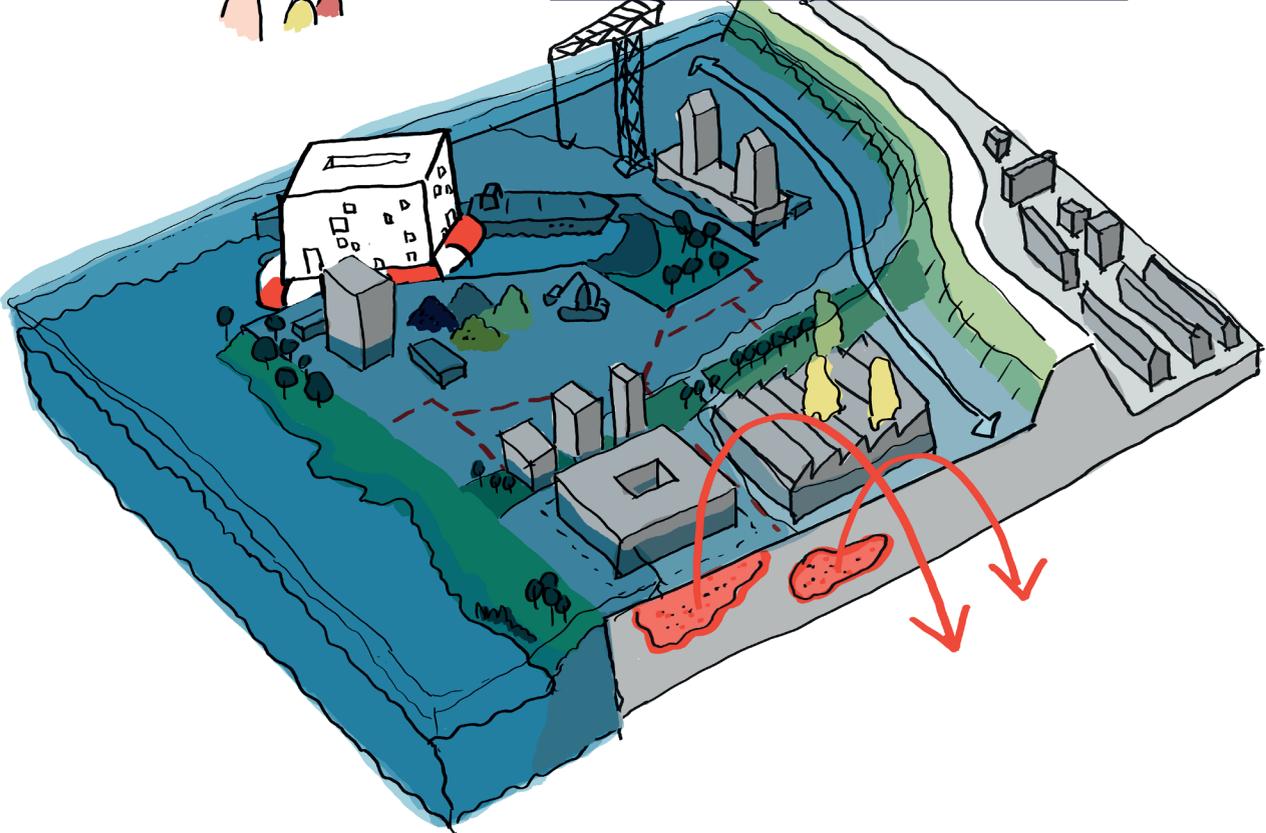


Trust in the familiar, aversion to change

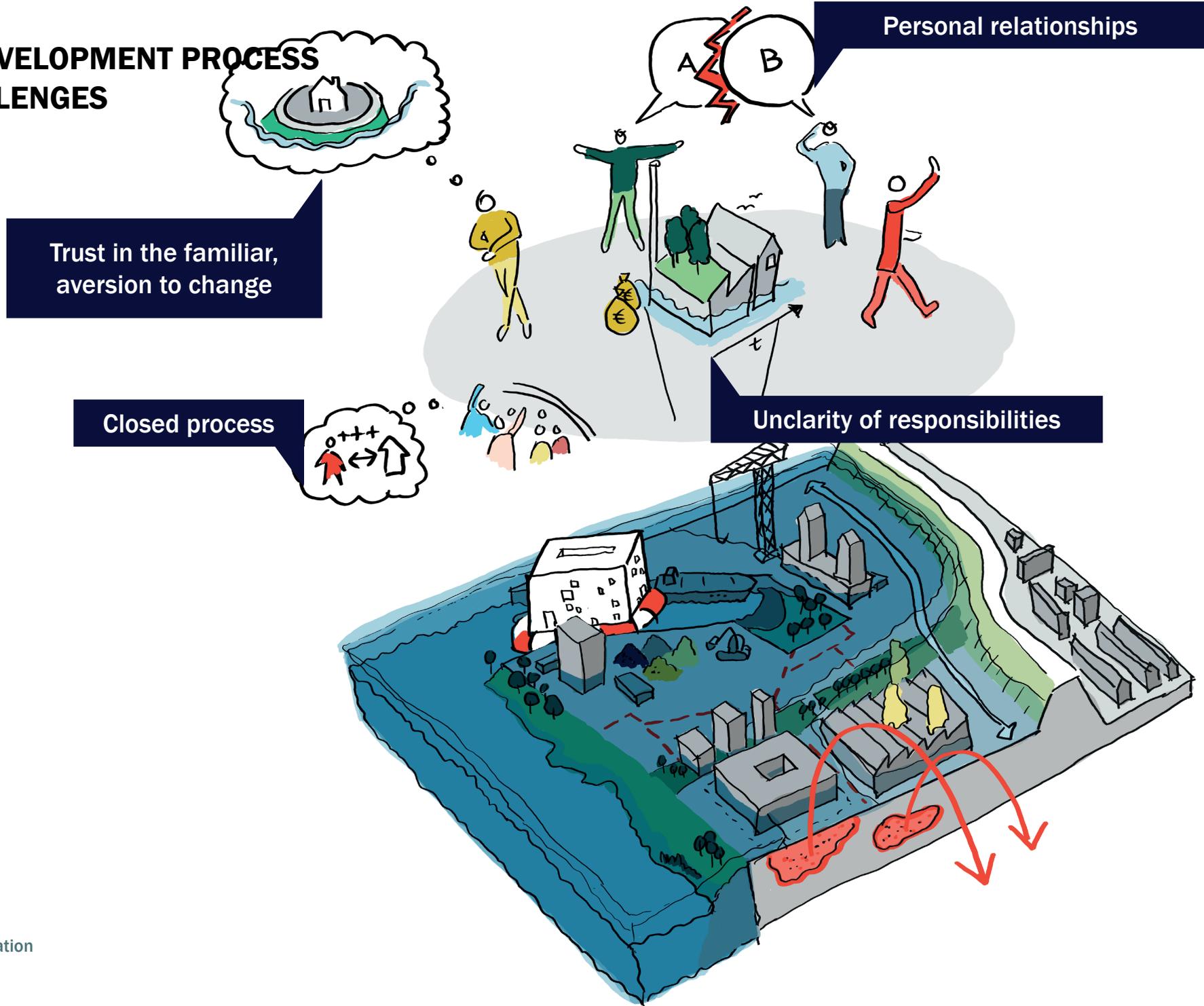


Personal relationships

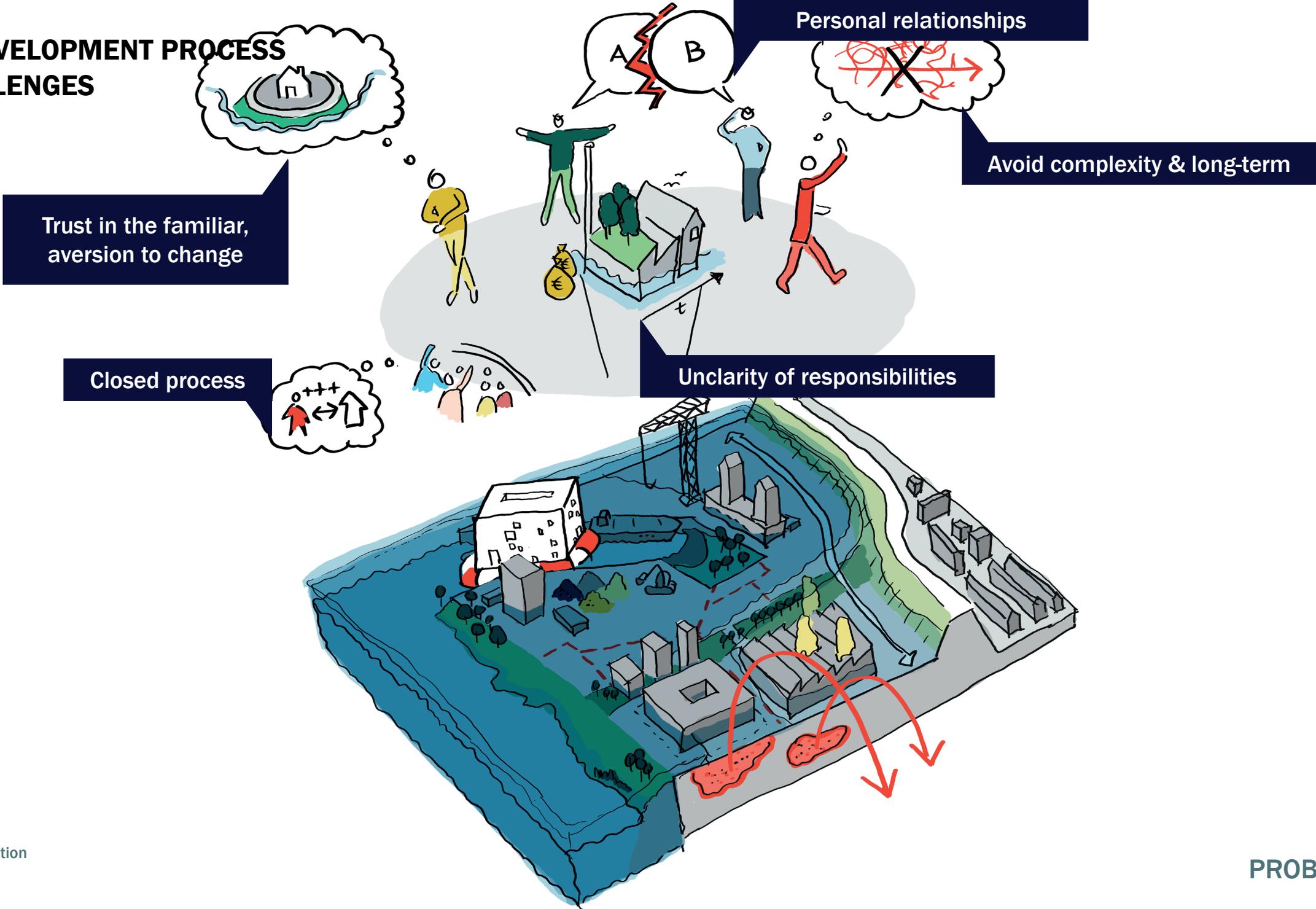
Unclarity of responsibilities



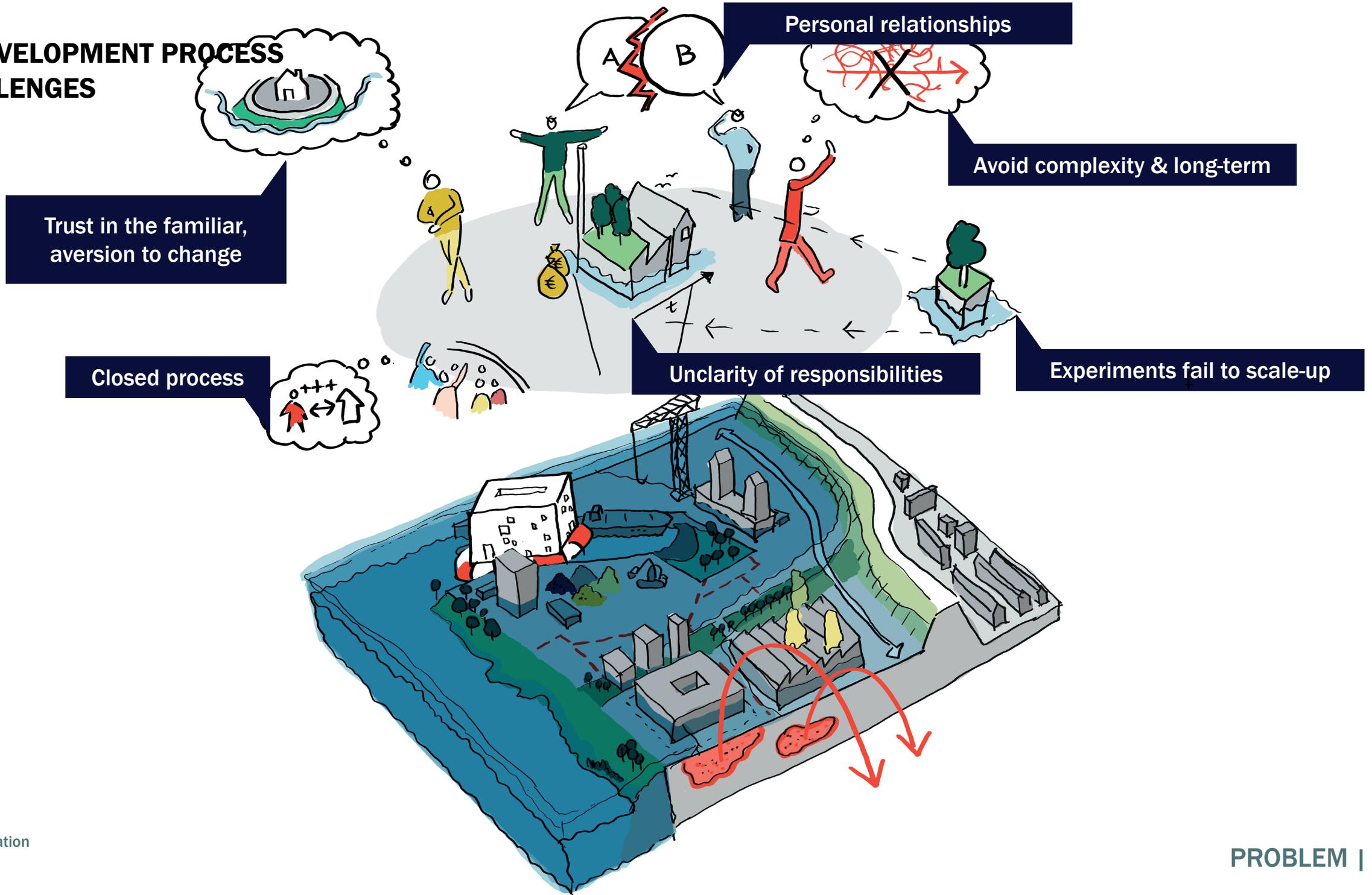
REDEVELOPMENT PROCESS CHALLENGES



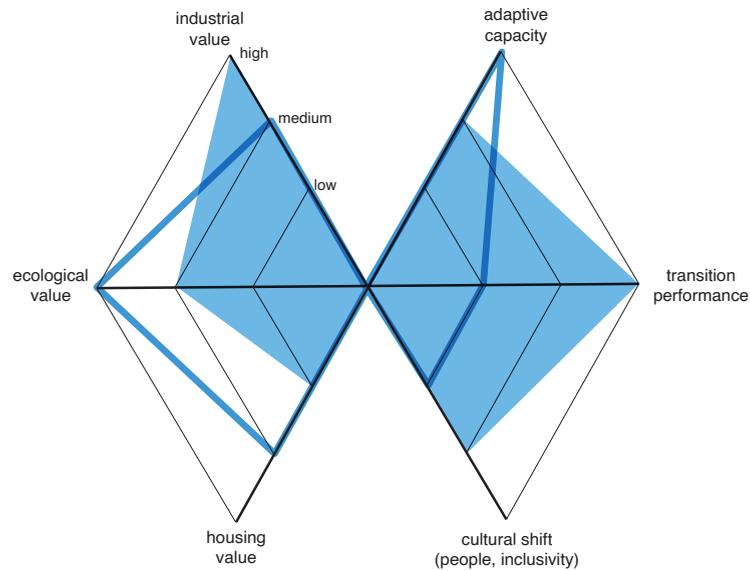
REDEVELOPMENT PROCESS CHALLENGES



REDEVELOPMENT PROCESS CHALLENGES

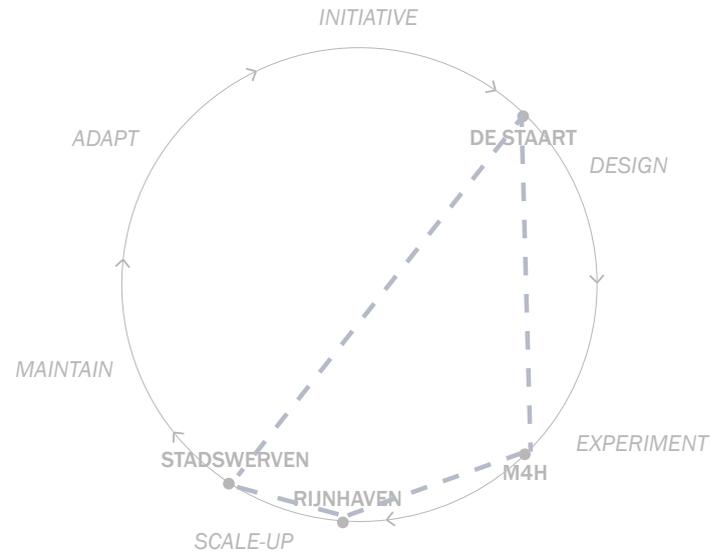


LESSONS COMPARATIVE CASE STUDY RESEARCH



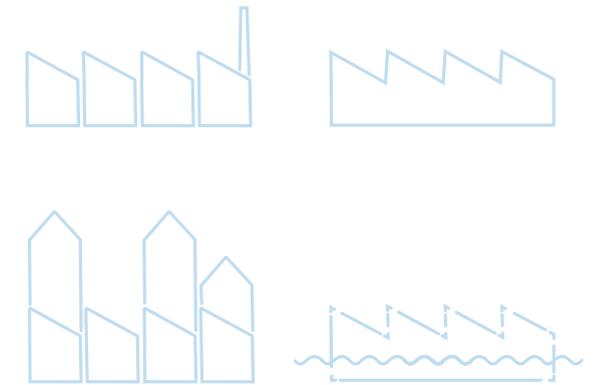
AMBITIONS INCREASING

...But they were often reduced in long-term redevelopment processes



LEARNING BETWEEN PROJECTS

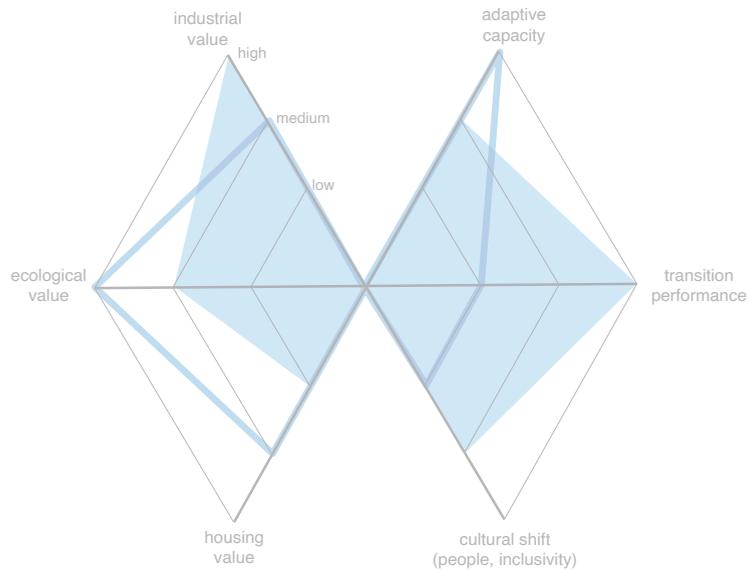
Influence regional transition & other projects



ADAPTABILITY

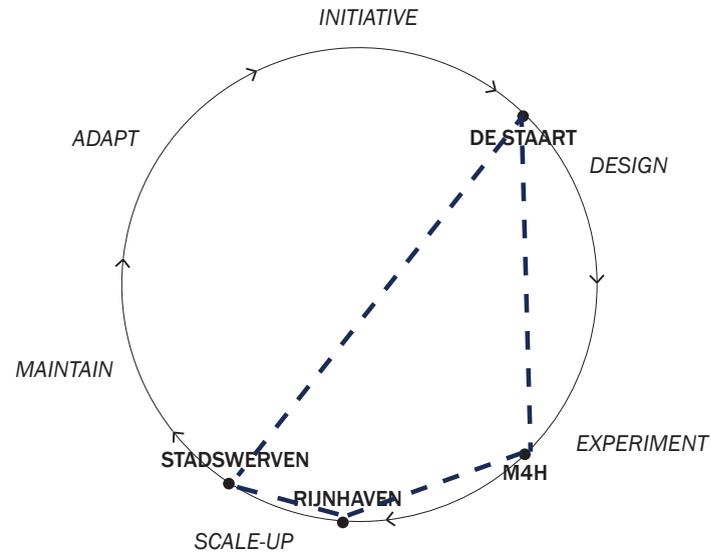
To future contexts, new knowledge and policies should improve

LESSONS COMPARATIVE CASE STUDY RESEARCH



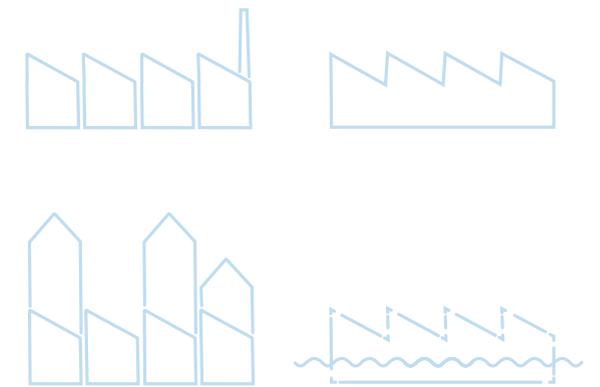
AMBITIONS INCREASING

...But they were often reduced in long-term redevelopment processes



LEARNING BETWEEN PROJECTS

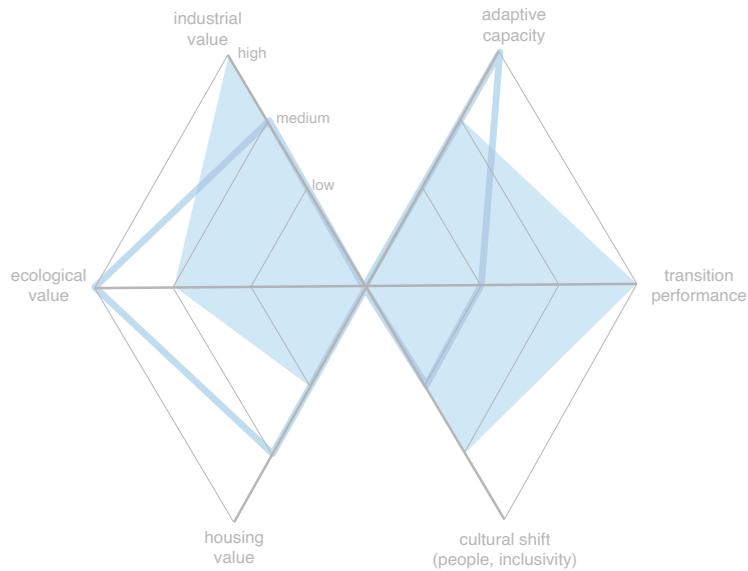
Influence regional transition & other projects



ADAPTABILITY

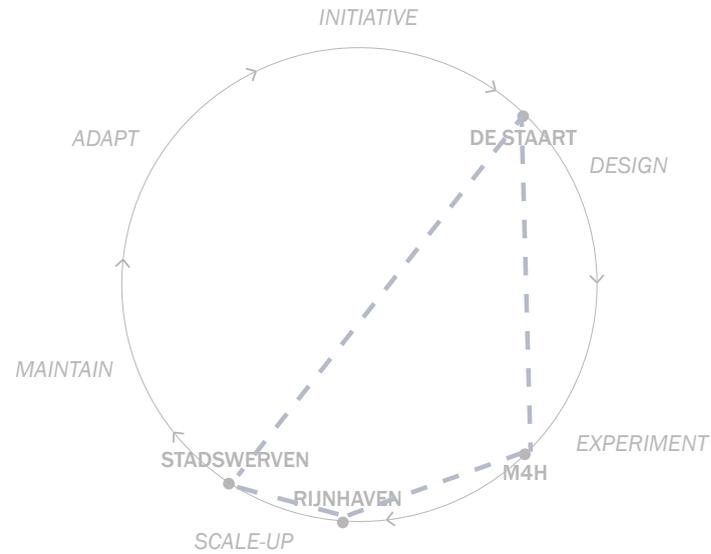
To future contexts, new knowledge and policies should improve

LESSONS COMPARATIVE CASE STUDY RESEARCH



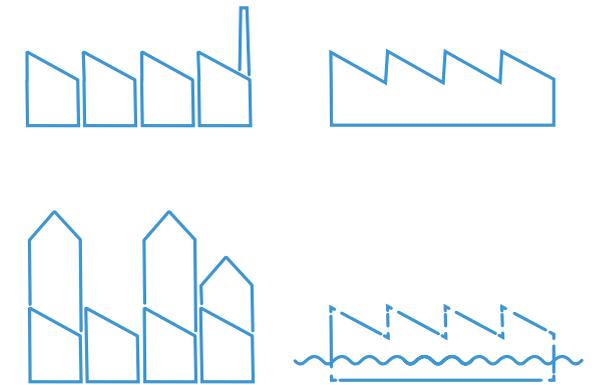
AMBITIONS INCREASING

...But they were often reduced in long-term redevelopment processes



LEARNING BETWEEN PROJECTS

Influence regional transition & other projects



ADAPTABILITY

To future contexts, new knowledge and policies should improve

PROBLEM

Lack of operationalisation & regional integration of climate adaptation ambitions in post-industrial port redevelopment projects

AIM OF THE PROJECT

Transition towards climate adaptive delta cities to establish an evolutionarily resilient region, facing the uncertain future effects of climate change

MAIN RESEARCH QUESTION

How can post-industrial port redevelopments contribute to the transition towards climate adaptive delta cities?

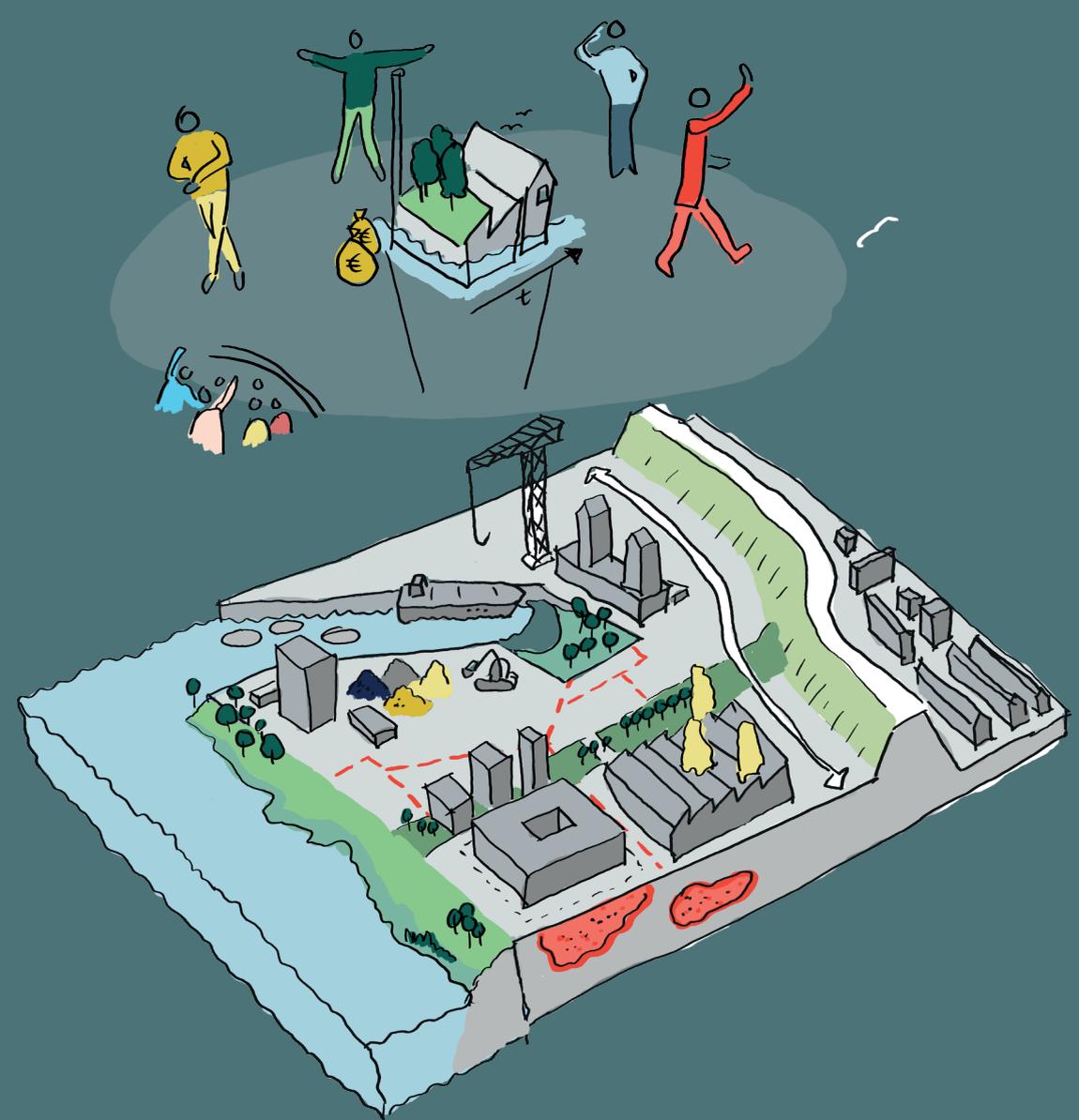
1. CONTEXT

2. PROBLEM

3. CHANGE PROCESSES

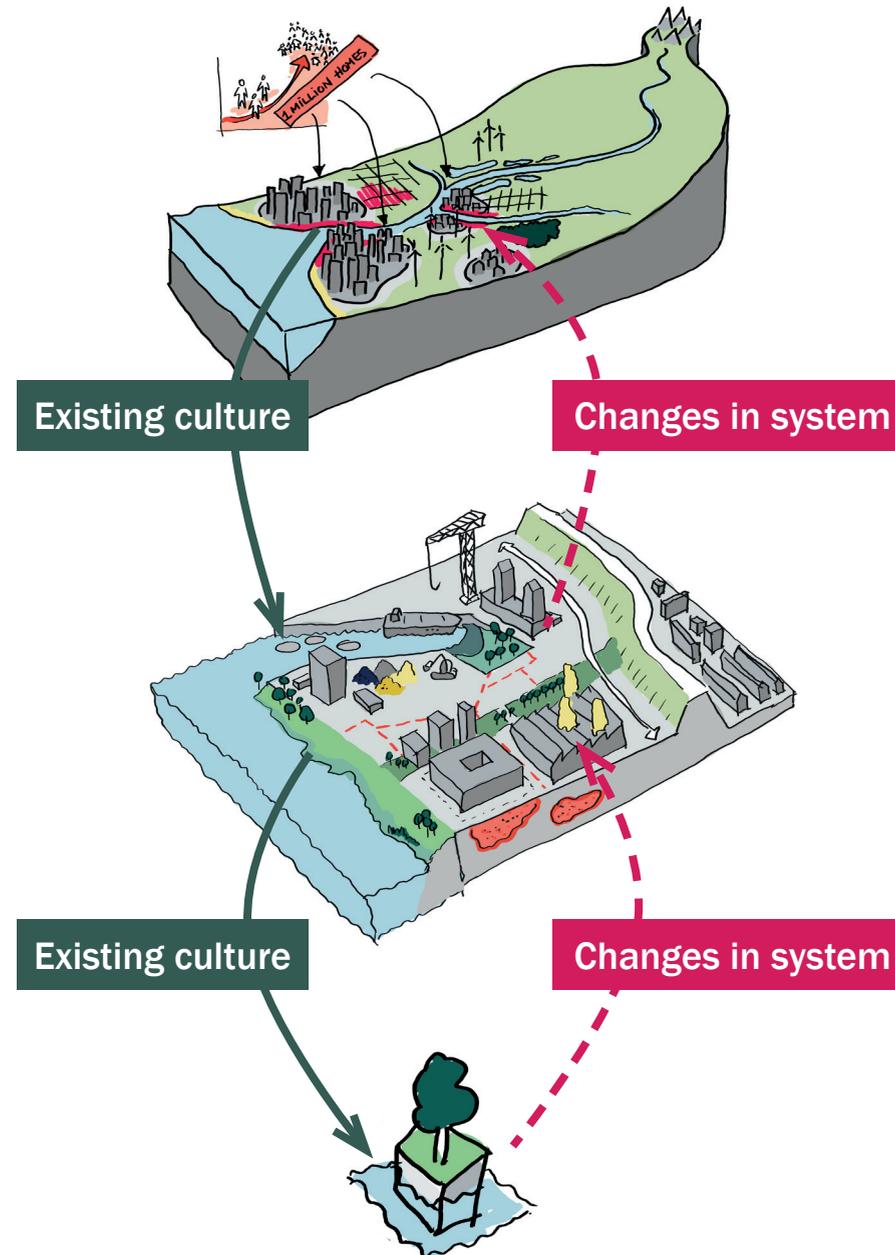
4. STRATEGY

5. DESIGN SIMULATION



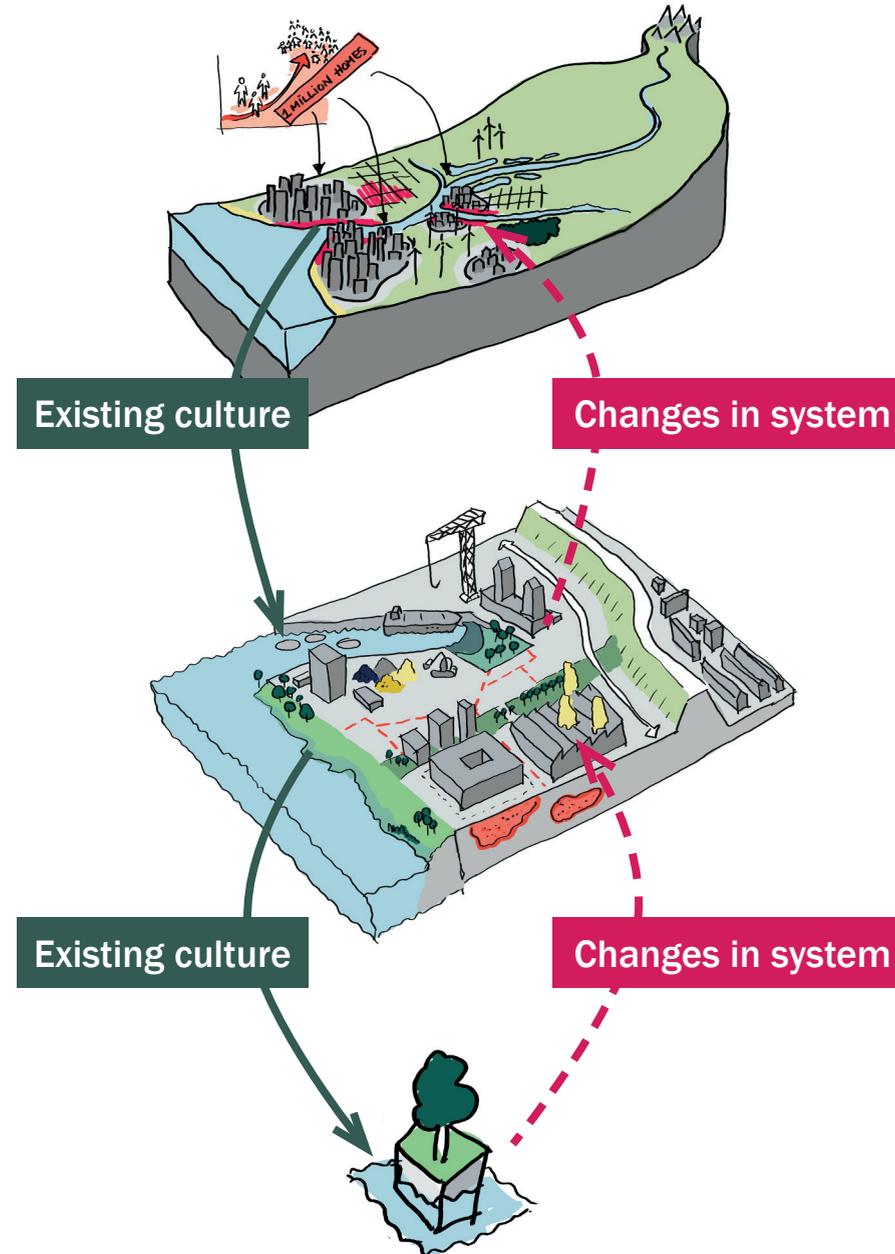
A strategy for climate adaptive redevelopment of post-industrial port-sites

THE NEED FOR A BOTTOM-UP TRANSITION IN A DECENTRALISED SOCIETY



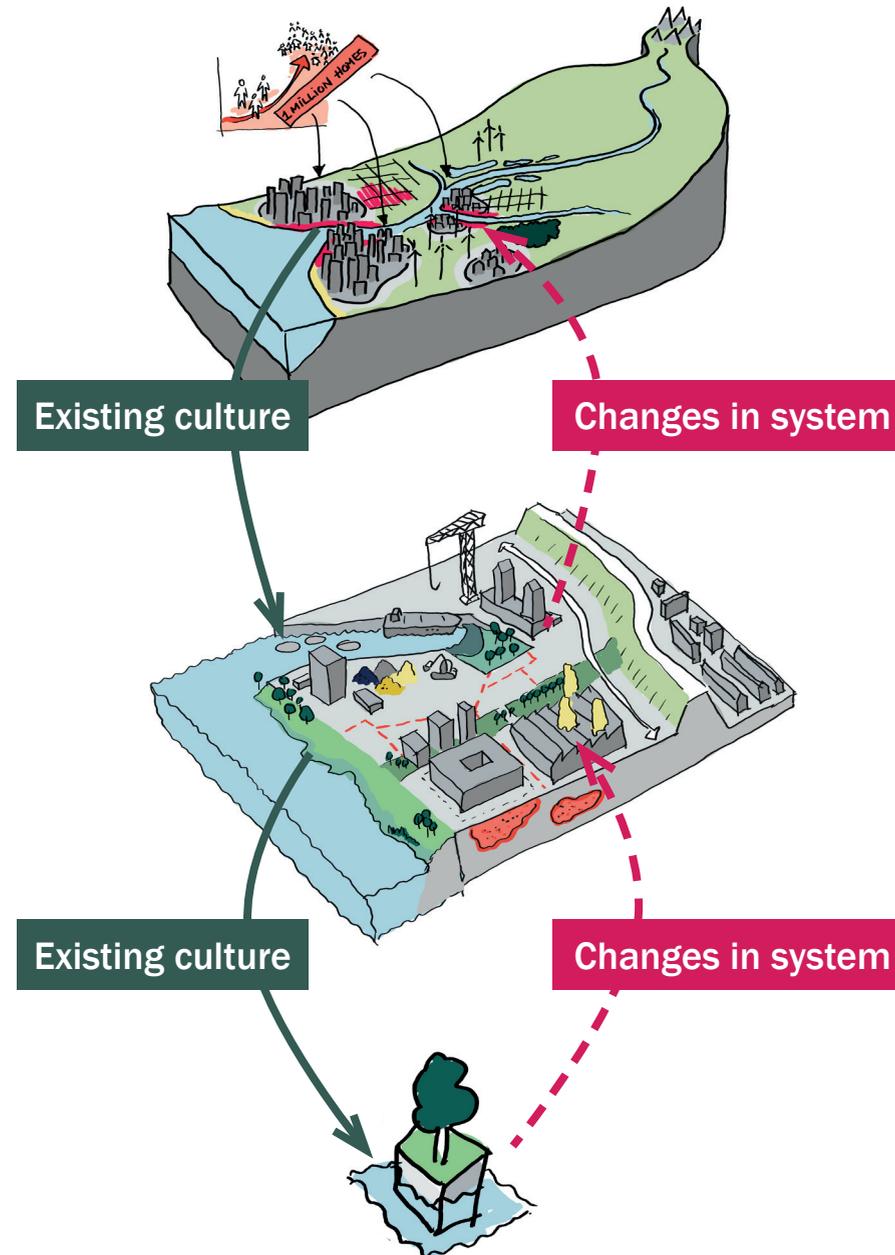
Own illustration, based on Gunderson & Holling, 2002

THE NEED FOR A BOTTOM-UP TRANSITION IN A DECENTRALISED SOCIETY



Dynamic Adaptive Policy Pathways are promising redevelopment strategy

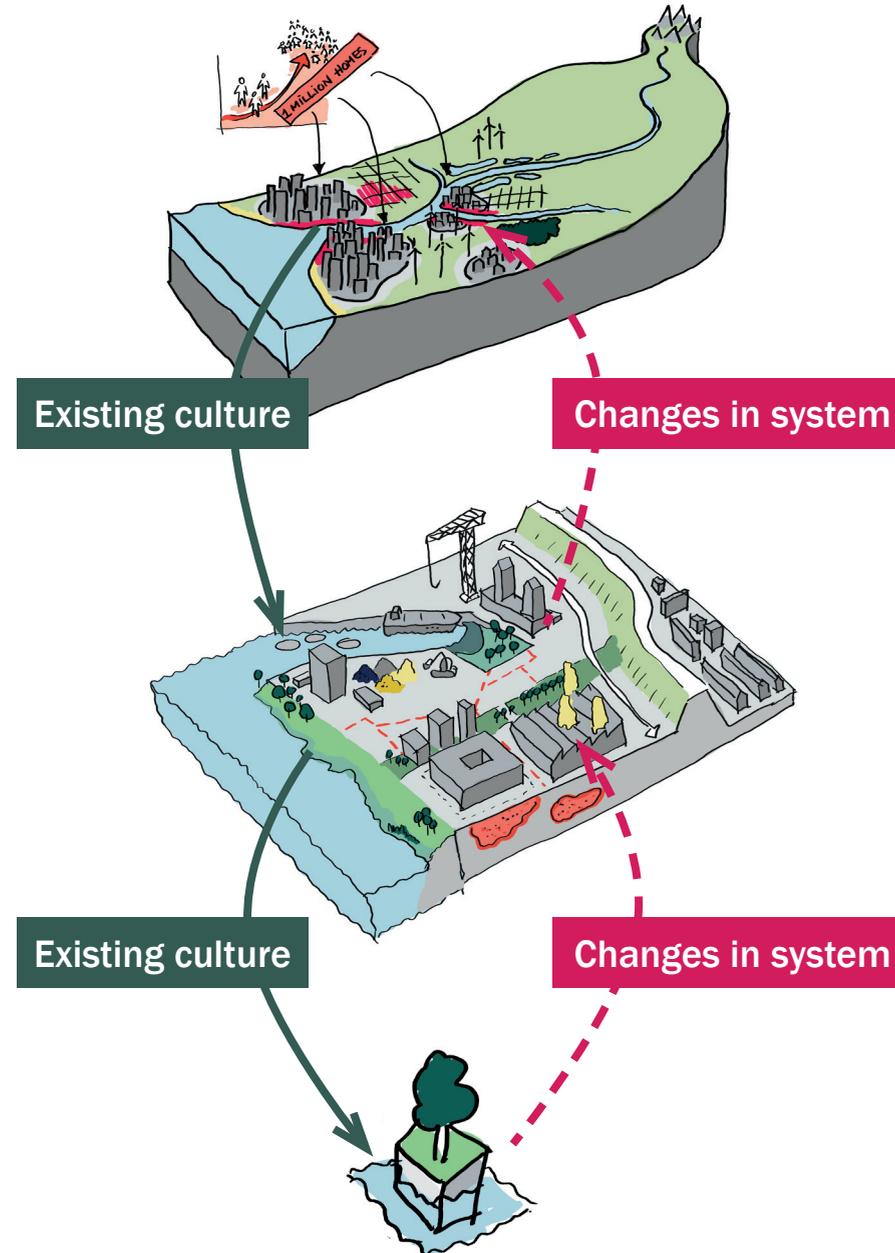
THE NEED FOR A BOTTOM-UP TRANSITION IN A DECENTRALISED SOCIETY



Dynamic Adaptive Policy Pathways are promising redevelopment strategy

Collaborative Design:
change = positive

THE NEED FOR A BOTTOM-UP TRANSITION IN A DECENTRALISED SOCIETY

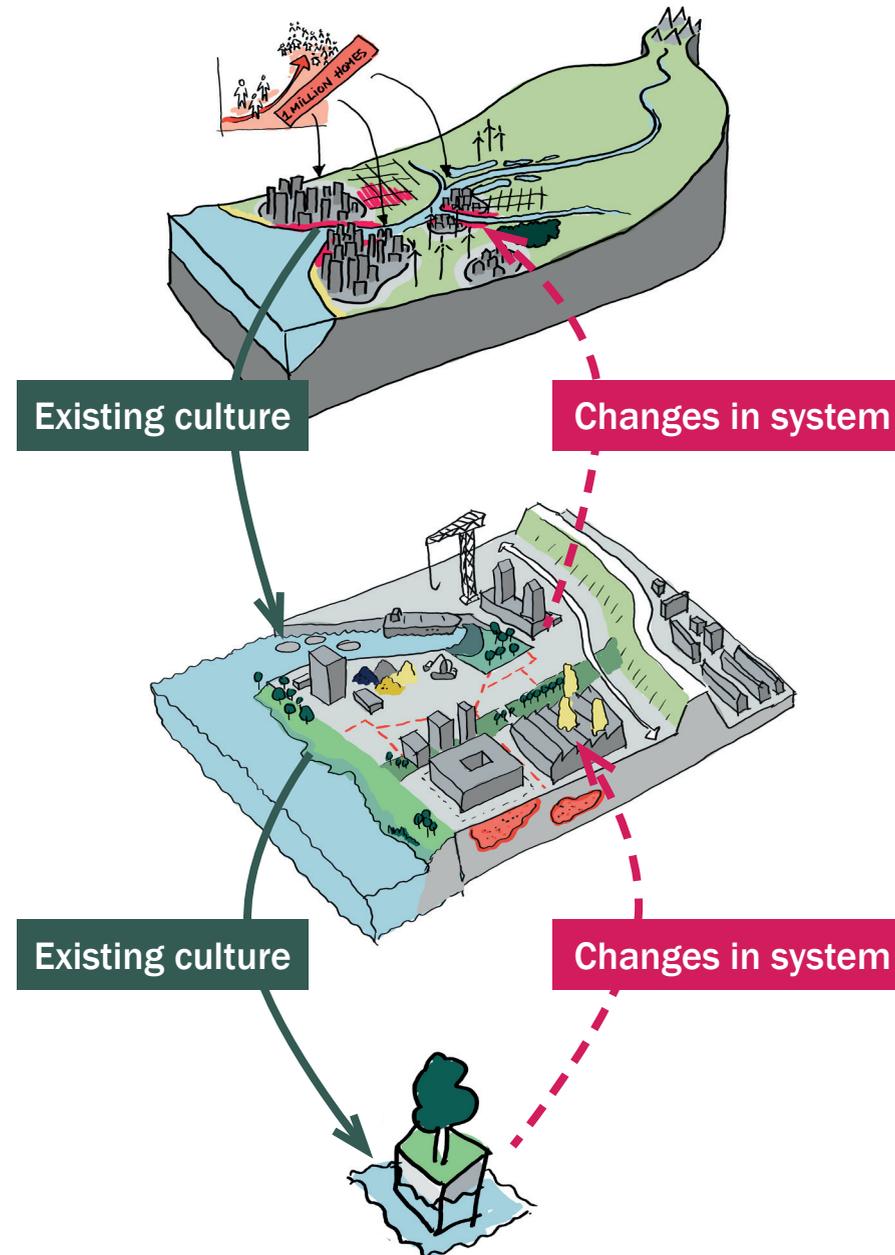


Dynamic Adaptive Policy Pathways are promising redevelopment strategy

Collaborative Design: change = positive

Adaptable: Open to change in deep uncertainty

THE NEED FOR A BOTTOM-UP TRANSITION IN A DECENTRALISED SOCIETY



Dynamic Adaptive Policy Pathways are promising redevelopment strategy

Collaborative Design:
change = positive

Adaptable: Open to change
in deep uncertainty

Grounded Experiments:
to make an impact

Own illustration, based on Gunderson & Holling, 2002

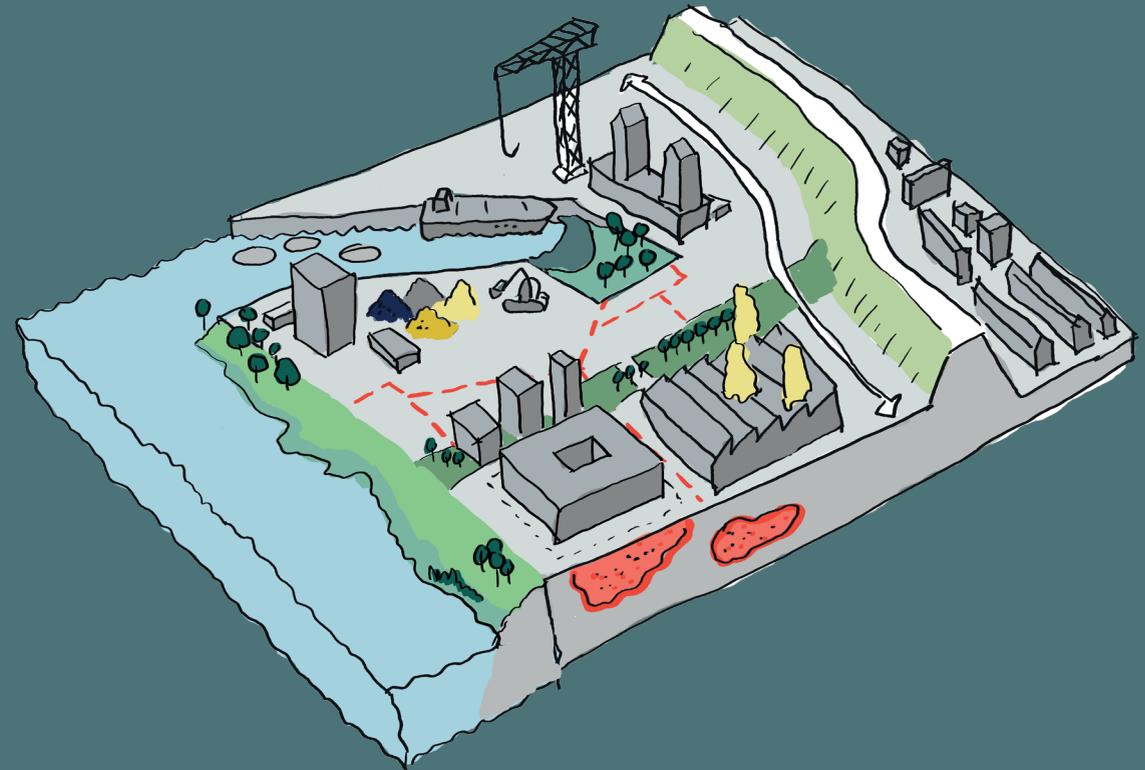
1. CONTEXT

2. PROBLEM

3. CHANGE PROCESSES

4. STRATEGY

5. DESIGN SIMULATION

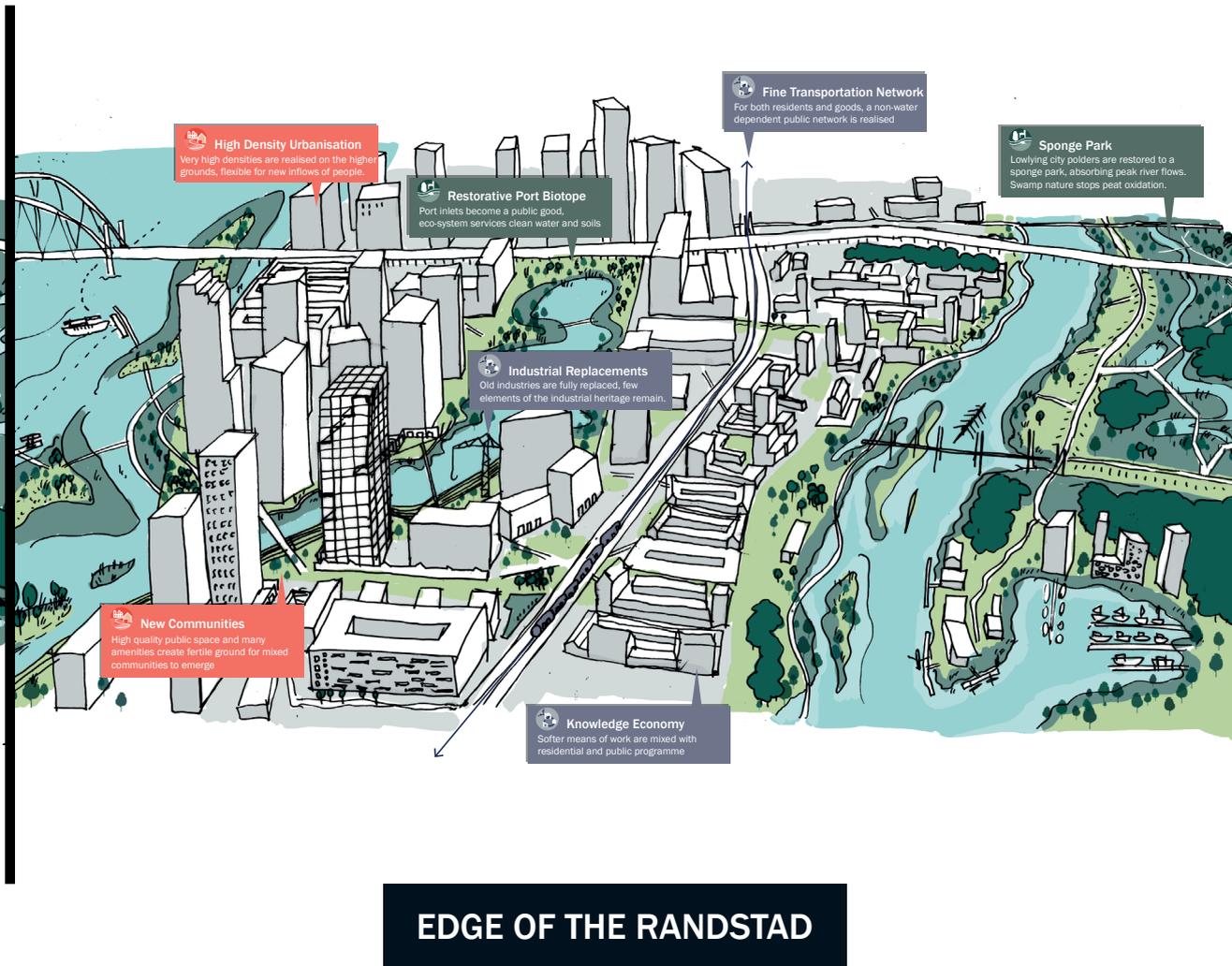


A strategy for climate adaptive redevelopment of post-industrial port-sites

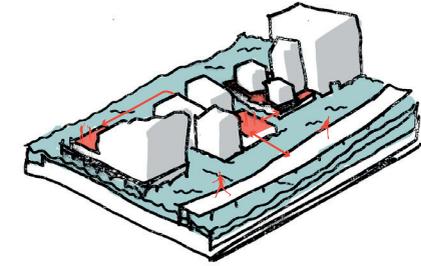
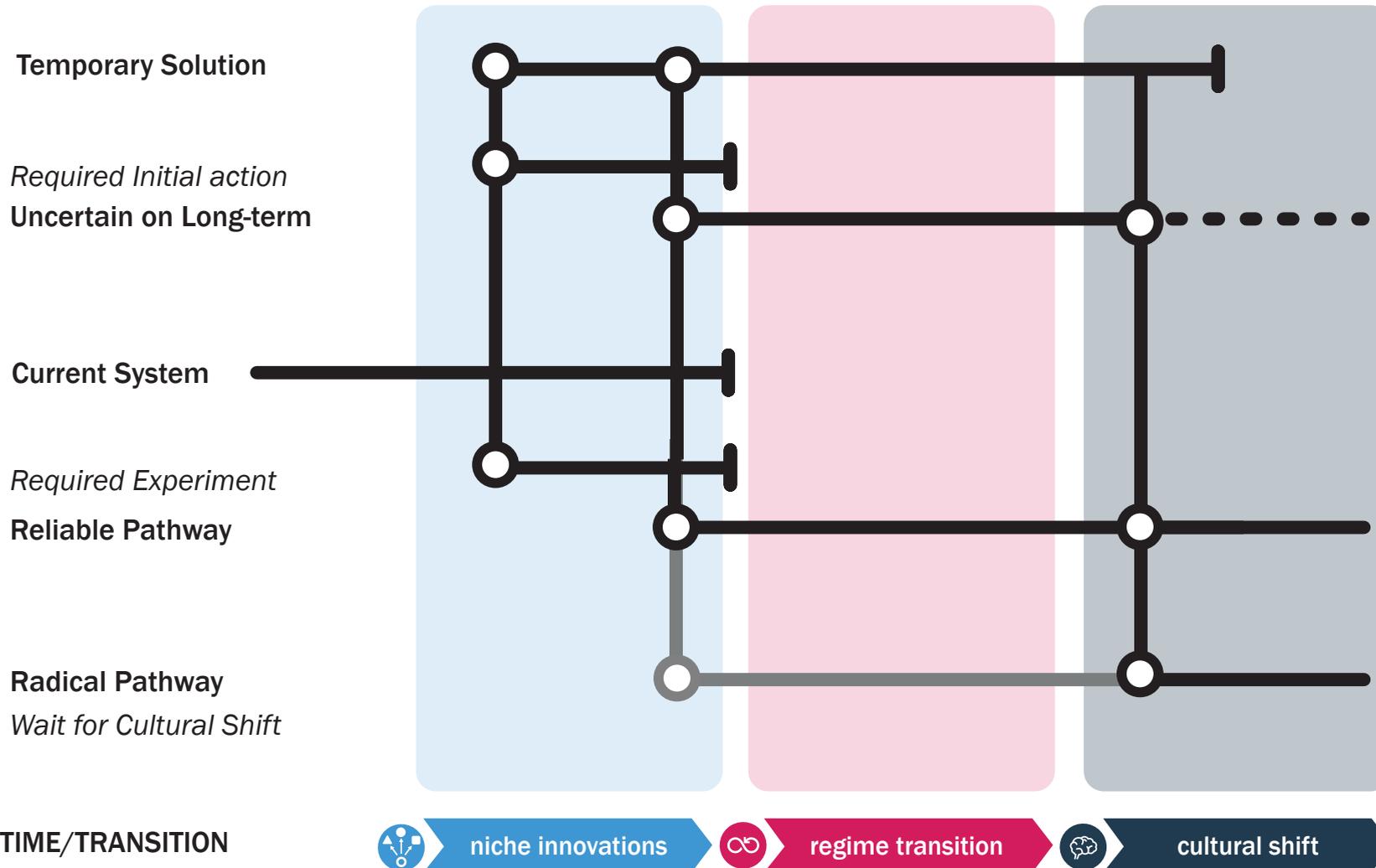
STRATEGY

Dynamic Adaptive Policy Pathways

DYNAMIC ADAPTIVE POLICY PATHWAYS | EMBED UNCERTAINTY



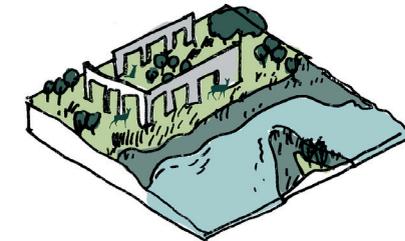
DYNAMIC ADAPTIVE POLICY PATHWAYS | MULTIPLE OPTIONS OPEN



A BUILD WATER RESILIENT BUILDING

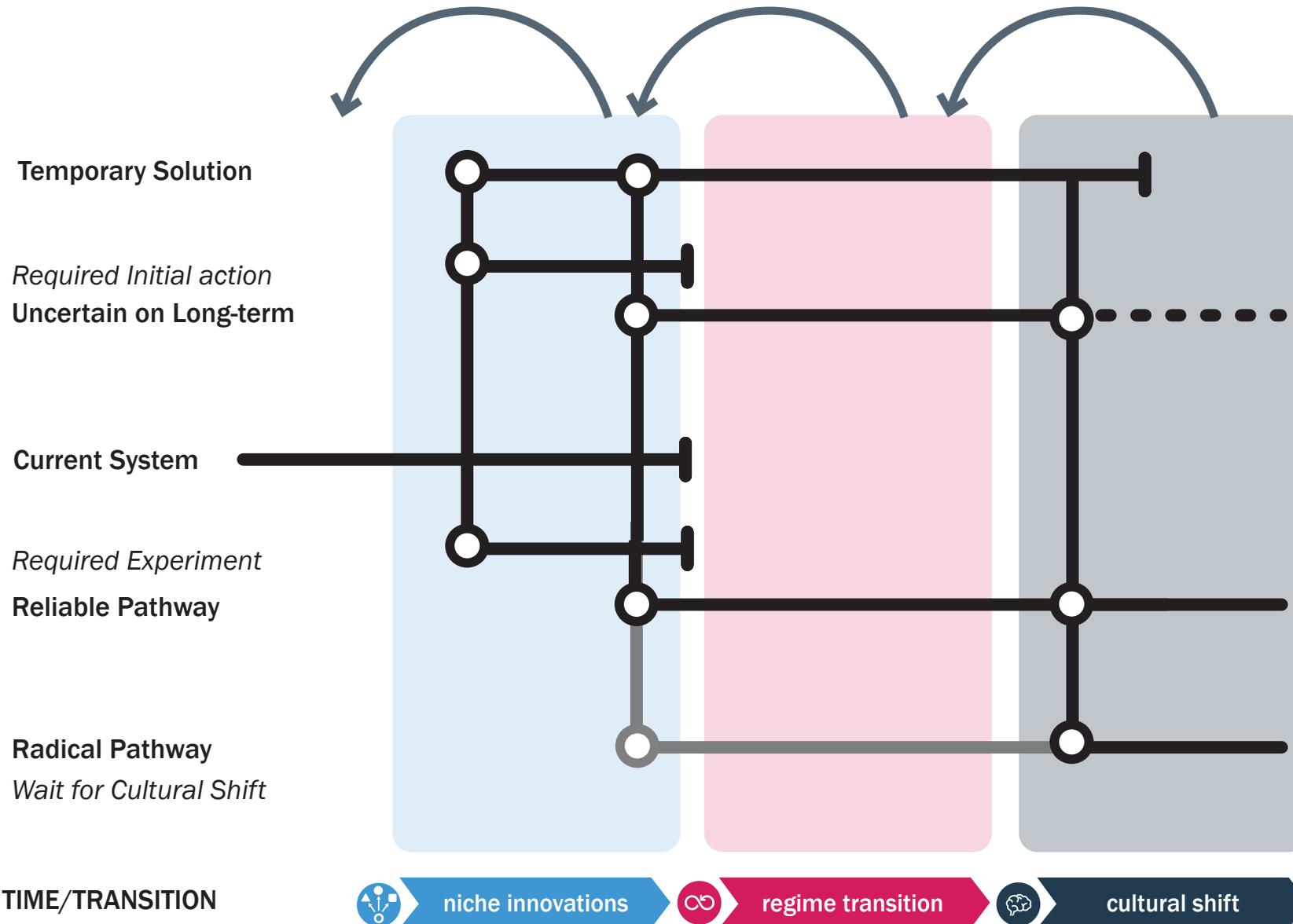


B FLOATING, SELF-SUPPORTING COMMUNITIES

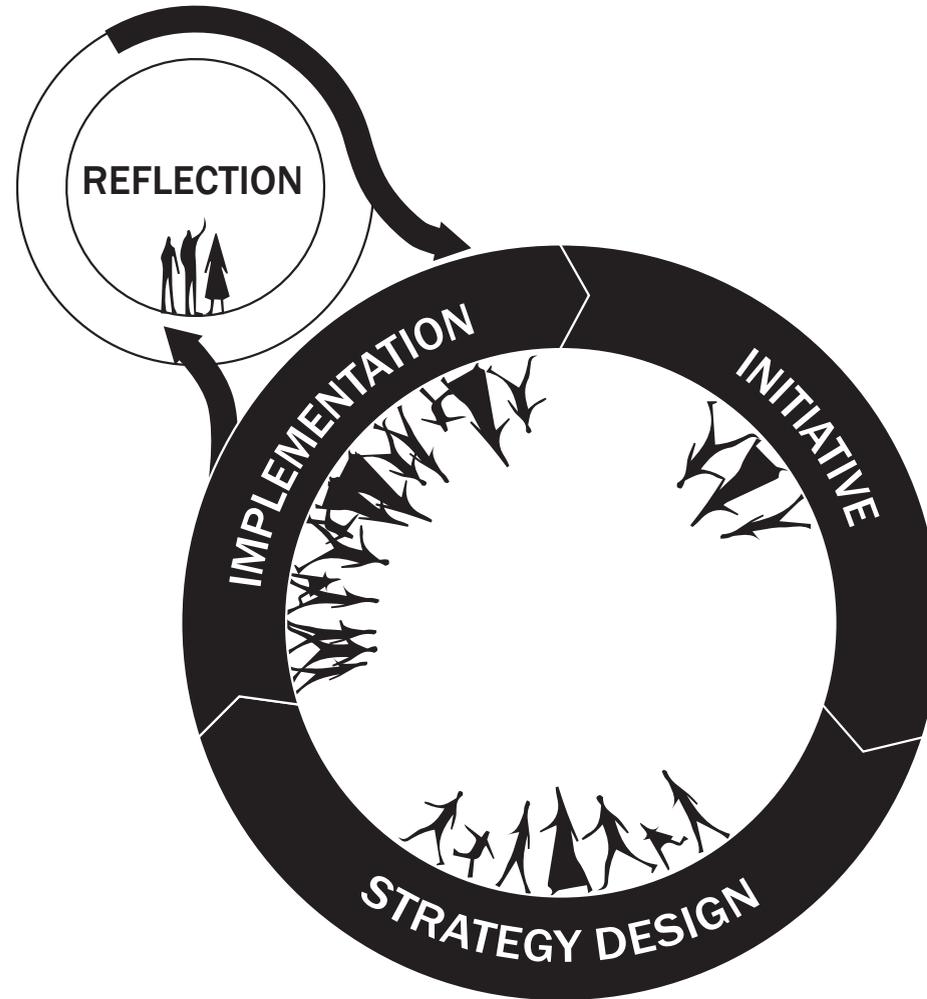


C MOVE ALL OCCUPATION, ECOLOGICAL RECLAMATION

DYNAMIC ADAPTIVE POLICY PATHWAYS | CONNECT SHORT- AND LONG-TERM

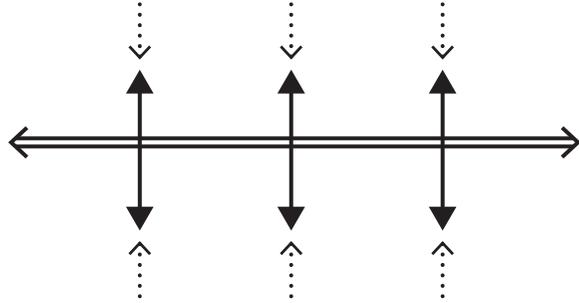


DYNAMIC ADAPTIVE POLICY PATHWAYS | INCLUSIVE

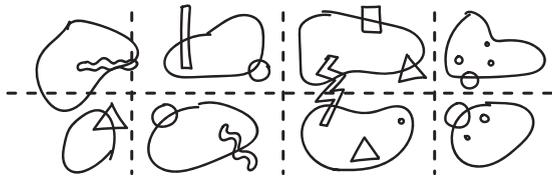


DYNAMIC ADAPTIVE POLICY PATHWAYS | STRUCTURE REDEVELOPMENT

1. SPATIAL FRAMEWORK

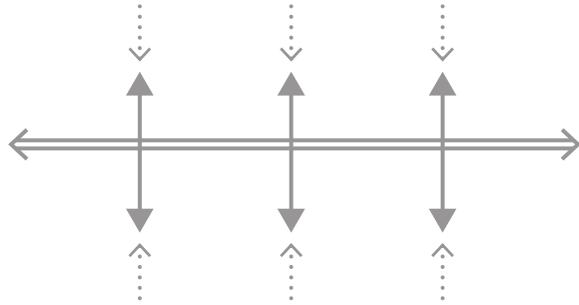


2. DYNAMIC RULES

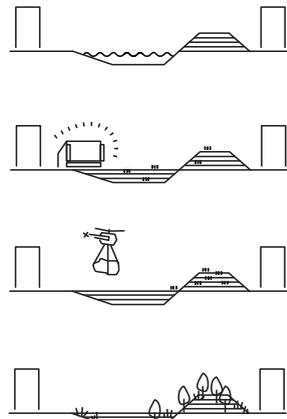
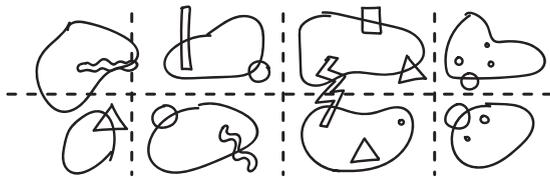


DYNAMIC ADAPTIVE POLICY PATHWAYS | STRUCTURE REDEVELOPMENT

1. SPATIAL FRAMEWORK

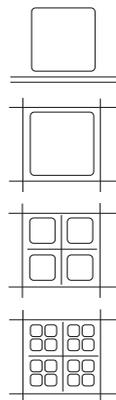


2. DYNAMIC RULES



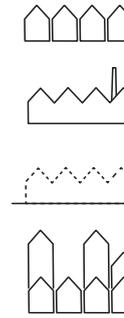
PUBLIC SQUARES AND PARKS

- 1** INCLUDE WATER RESORPTION, FOR EXAMPLE A WATER SQUARE
- 2** INVITING CONDITIONS FOR PUBLIC USAGE, FOR EXAMPLE PLACEMAKING EVENTS.
- 3** UNDERLYING INFRASTRUCTURE FOR EMERGENCY EMBEDDED IN DESIGN
- 4** MAINTAIN OPTIONS TO ADAPT, FOR EXAMPLE MORE INTENSE GREENING SHOULD REMAIN POSSIBLE



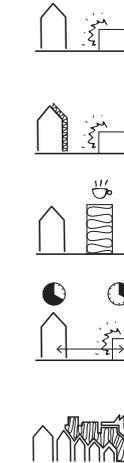
PARCELLATION: HUMAN SCALE & ACCESSIBILITY

- 0** EXISTING, CLOSED LOTS.
- 1** MAINTAIN THE LARGE SCALE OF CURRENT PLOT, BUT MAKE WATERFRONT ACCESSIBLE TO PEDESTRIANS & CYCLISTS
- 2** PREFERABLY, MAKE THE NETWORK FINER ON THE GROUND FLOOR LEVEL
- 3** WHEN POSSIBLE, INTRODUCE A SMALL GRAIN ON THE +3M LEVEL



BUILDING RULES

- 0** EXISTING PROGRAMME
- 1** REDEFINABLE
- 2** DISMOUNTABLE
- 3** EXTENDABLE



MIXING RULES: MULTIPLE OPTIONS

- 1** ACCEPT
- 2** INSULATE BUILDINGS
- 3** PUBLIC BUILDINGS/SOFT INDUSTRIES AS INSULATION
- 4** CO-EXISTENCE, DIFFERENT TIME SCHEDULES
- 5** INSULATING PLANNING OF PLOTS/ AREA



SOIL POLLUTION, REMEDIATION

- 1** EXISTING INDUSTRIES SEIZE SOIL, WATER AND AIR POLLUTION IMMEDIATELY
- 2** VACANT LOTS WITH CONTAMINATED SOILS SHOULD BE REMEDIATED EARLY ON
- 3** NEW DEVELOPMENT IS ECO-REMIEDIATION INCLUSIVE. THE FOUNDATION FOR A HEALTHY REDEVELOPED URBAN AREA

1. CONTEXT

2. PROBLEM

3. CHANGE PROCESSES

4. STRATEGY

5. DESIGN SIMULATION



A strategy for climate adaptive redevelopment of post-industrial port-sites

CO-DESIGN A DAPP MAP

Industry

Industries leave

Bio-based, circular industry replaces current practices

Small-scale industries supports self-sustaining communities

Launch diverse, grounded short-term experiments

Big industries transform to Green Industry

Floodproof operations

Housing

Redevelop industrial sites into housing

Residents from city polders move to higher grounds

Build water resilient buildings (floodable or flood-safe)

Move to the east of NL, demolish/move former cities

Floating, self-supporting communities

Current system

Water

Heighten dikes/barriers

Redevelop (city) polders into tidal nature, in open connection to sea

Make more Room for the River behind dams, using farmland and low-density city polders

Sedimentation in rivers to protect against SLR

Develop smart technology to keep rivers navigable to connect hinterland with the North Sea

Heighten grounds

Build bridges + spaces to access Staart as evacuation grounds

Build water resilient railway connection to East

Build Water resilient streets, +3m

Ecology

Ecological take-over of the area

Remediate soils with tidal nature

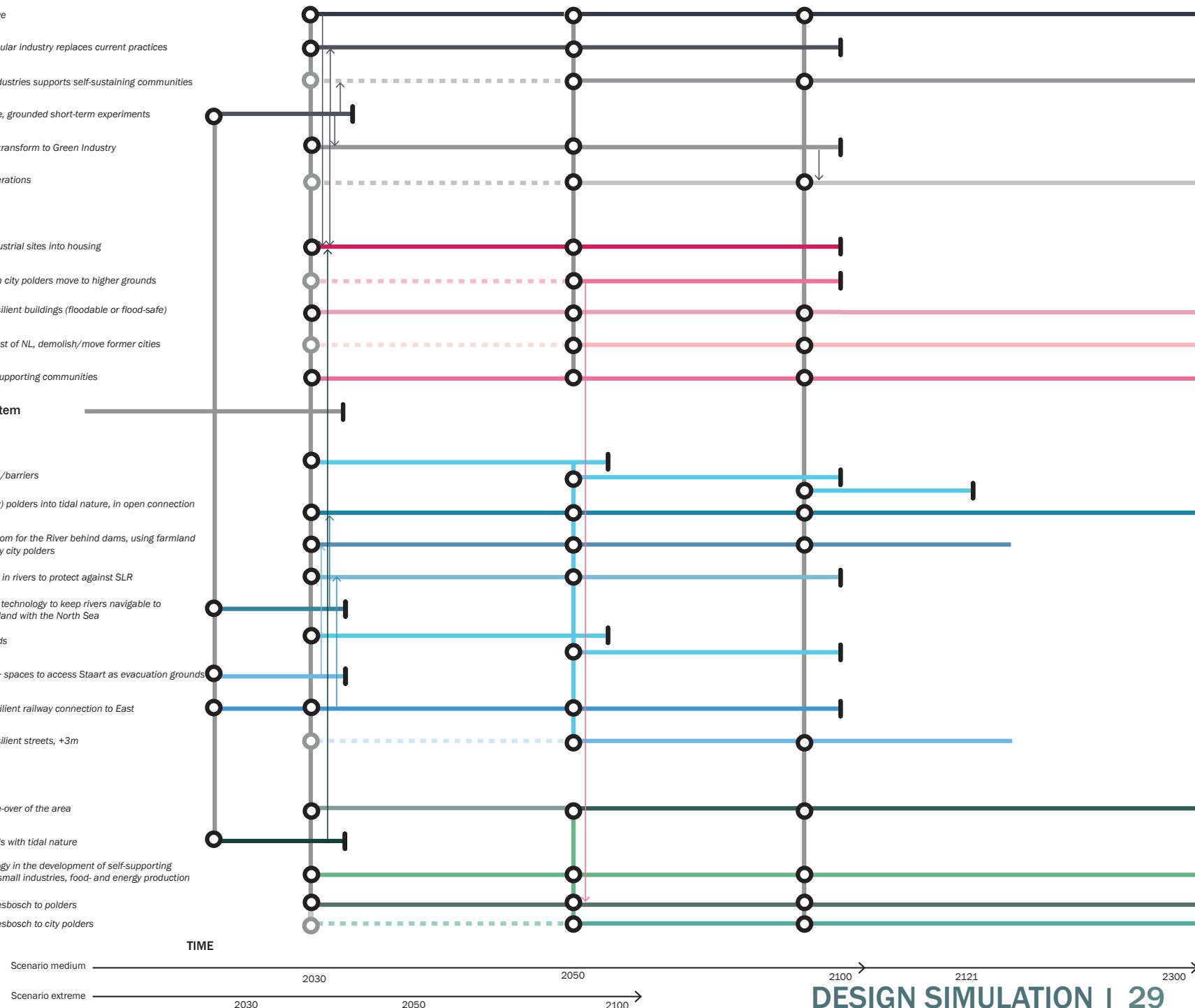
Integrate ecology in the development of self-supporting communities: small industries, food- and energy production

Expand the Biesbosch to polders

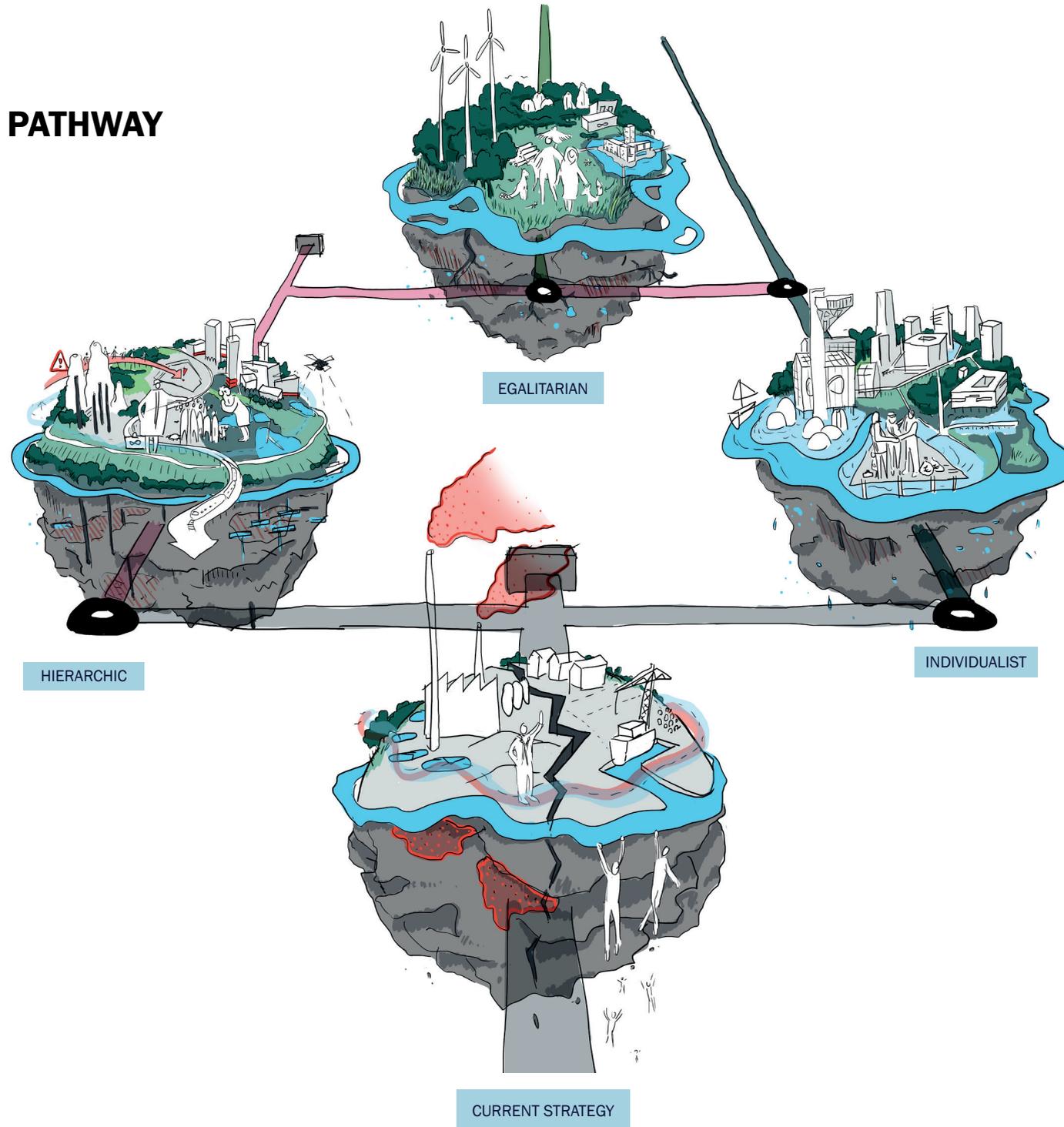
Expand the Biesbosch to city polders

LEGEND

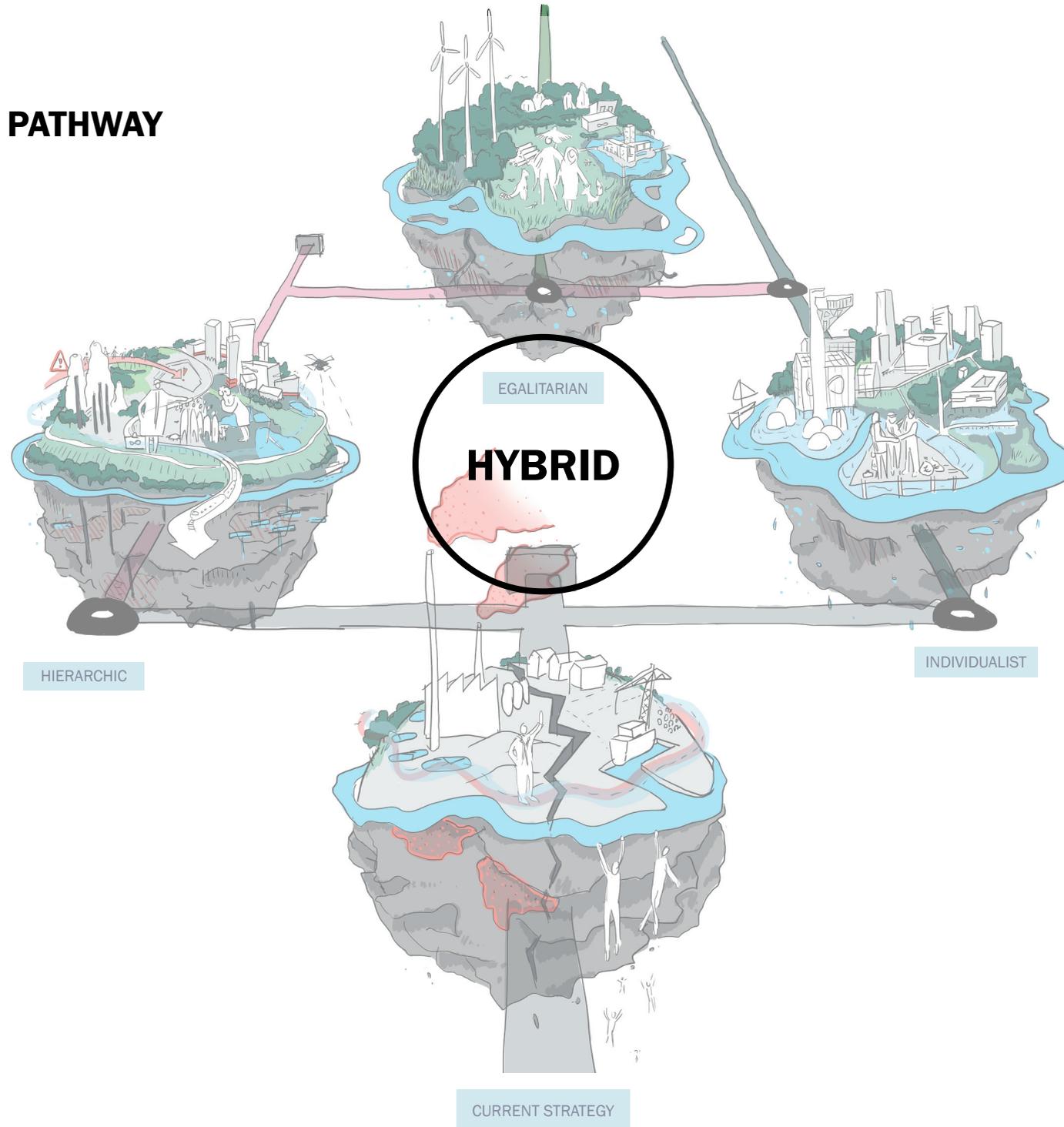
- Action effective in all scenarios
- - - Action not effective in some scenarios
- Tipping point
- Transfer station to new action



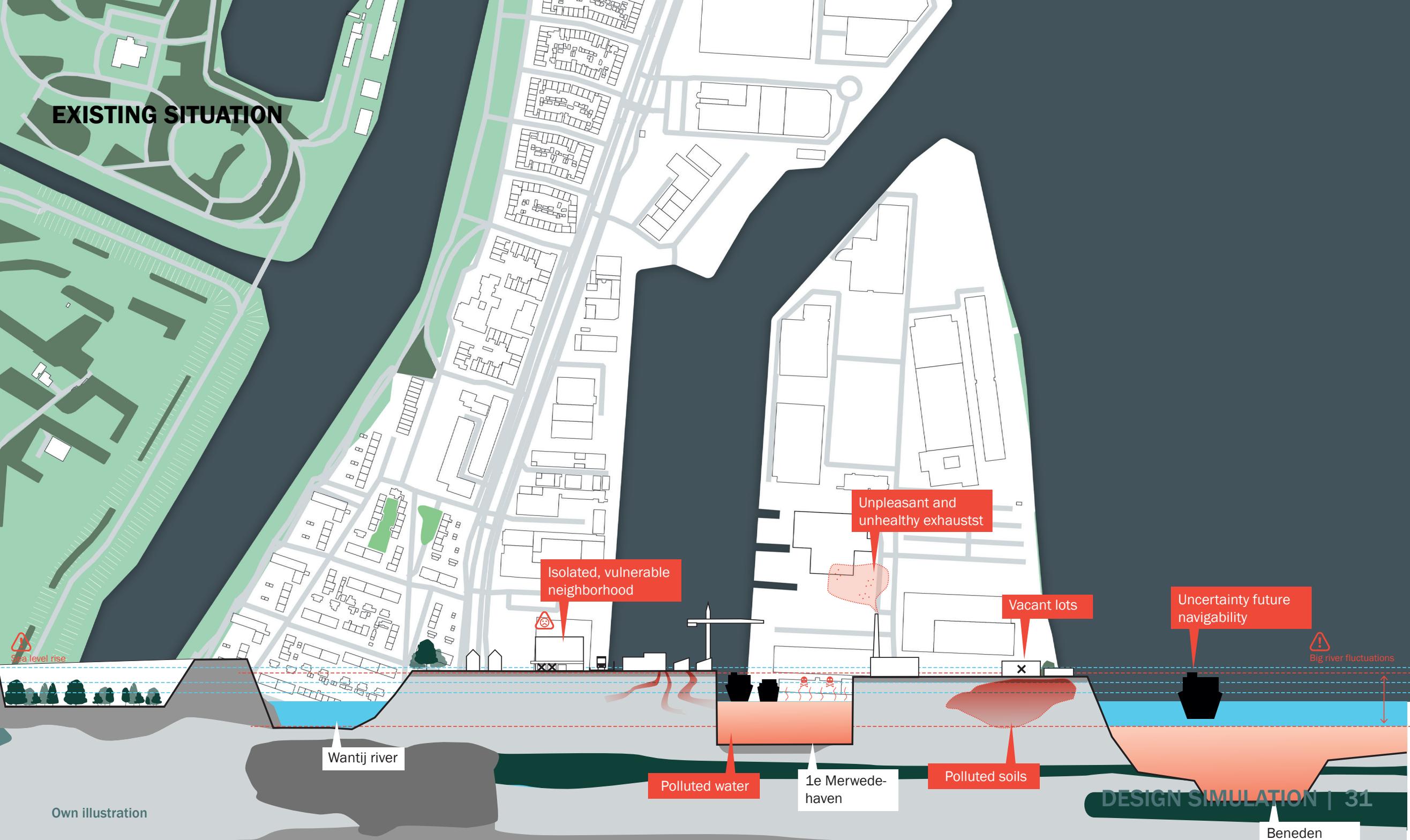
DECIDE ON A PREFERRED PATHWAY



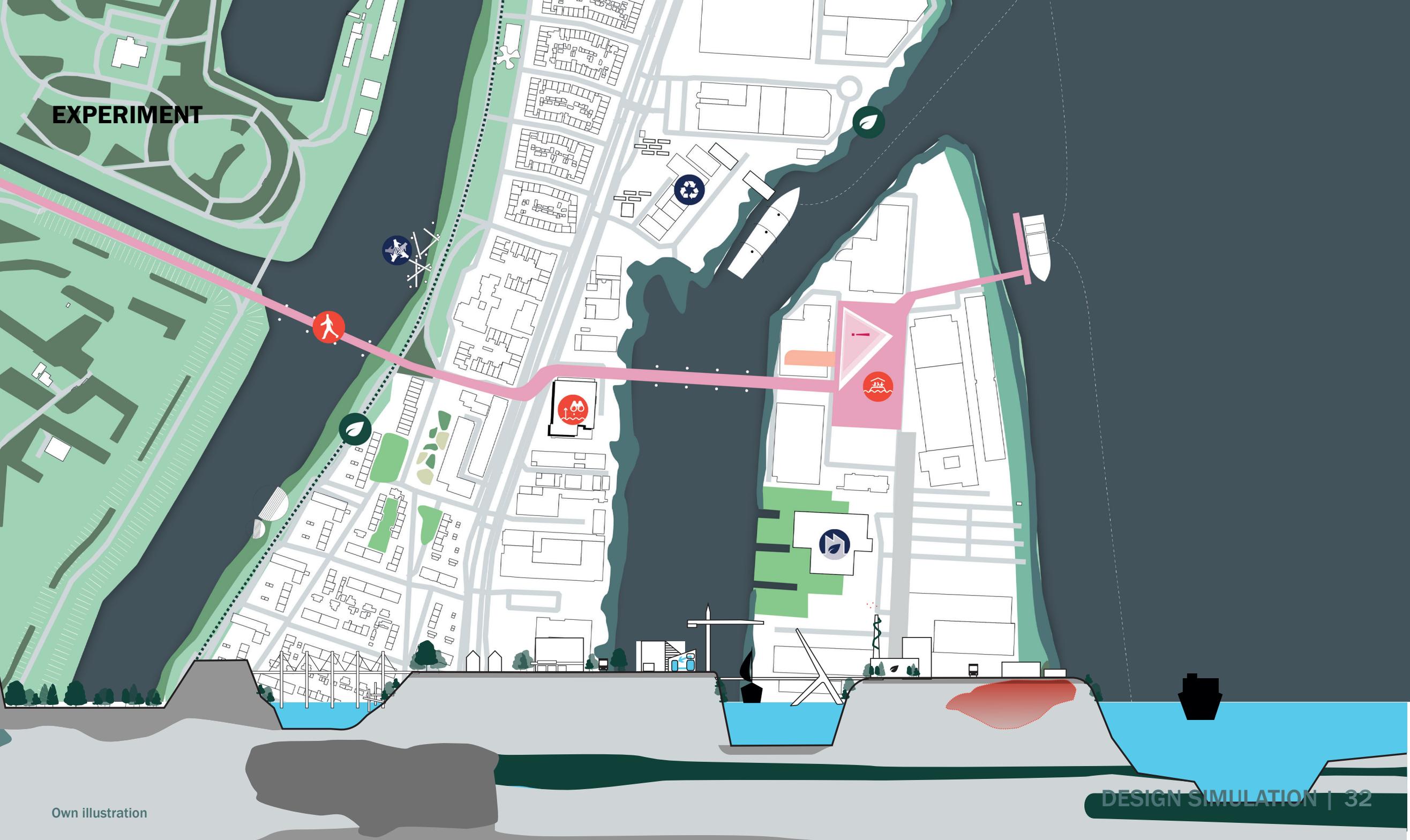
DECIDE ON A PREFERRED PATHWAY



EXISTING SITUATION



EXPERIMENT



EXPERIMENT

**RIVER
PLAYGROUND**

EXPERIMENT

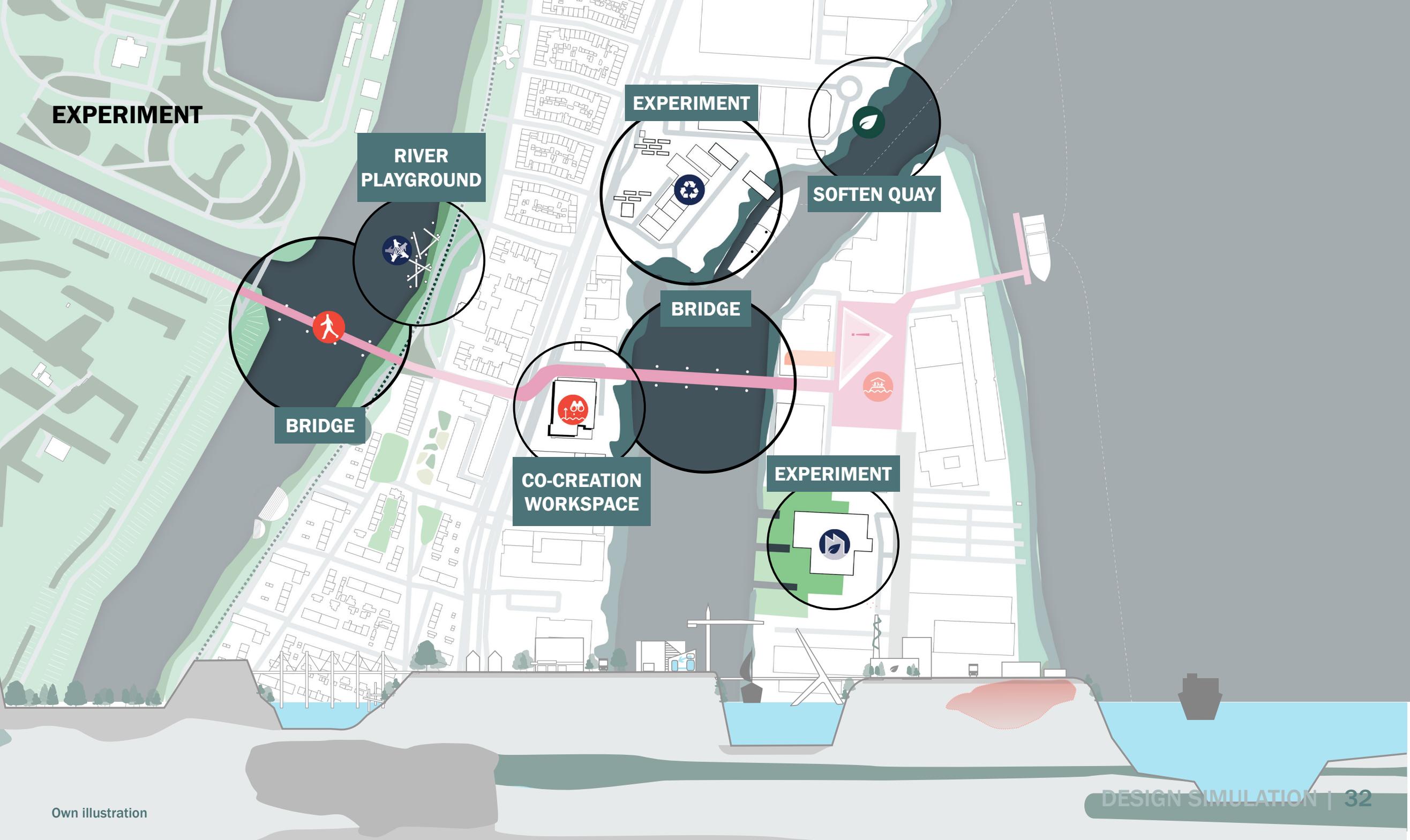
SOFTEN QUAY

BRIDGE

BRIDGE

**CO-CREATION
WORKSPACE**

EXPERIMENT



IMPLEMENT



IMPLEMENT

REDEVELOP

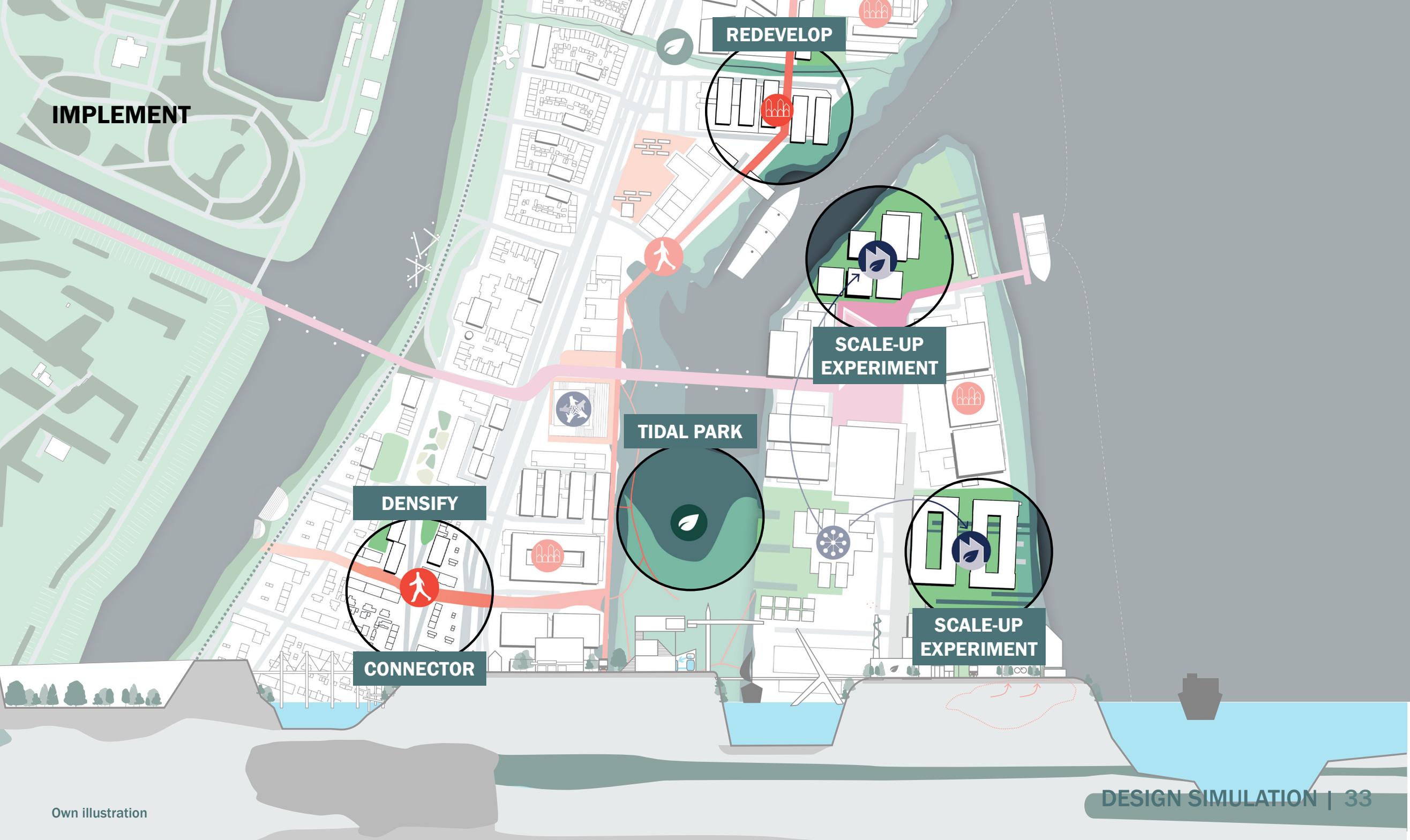
**SCALE-UP
EXPERIMENT**

TIDAL PARK

DENSIFY

**SCALE-UP
EXPERIMENT**

CONNECTOR



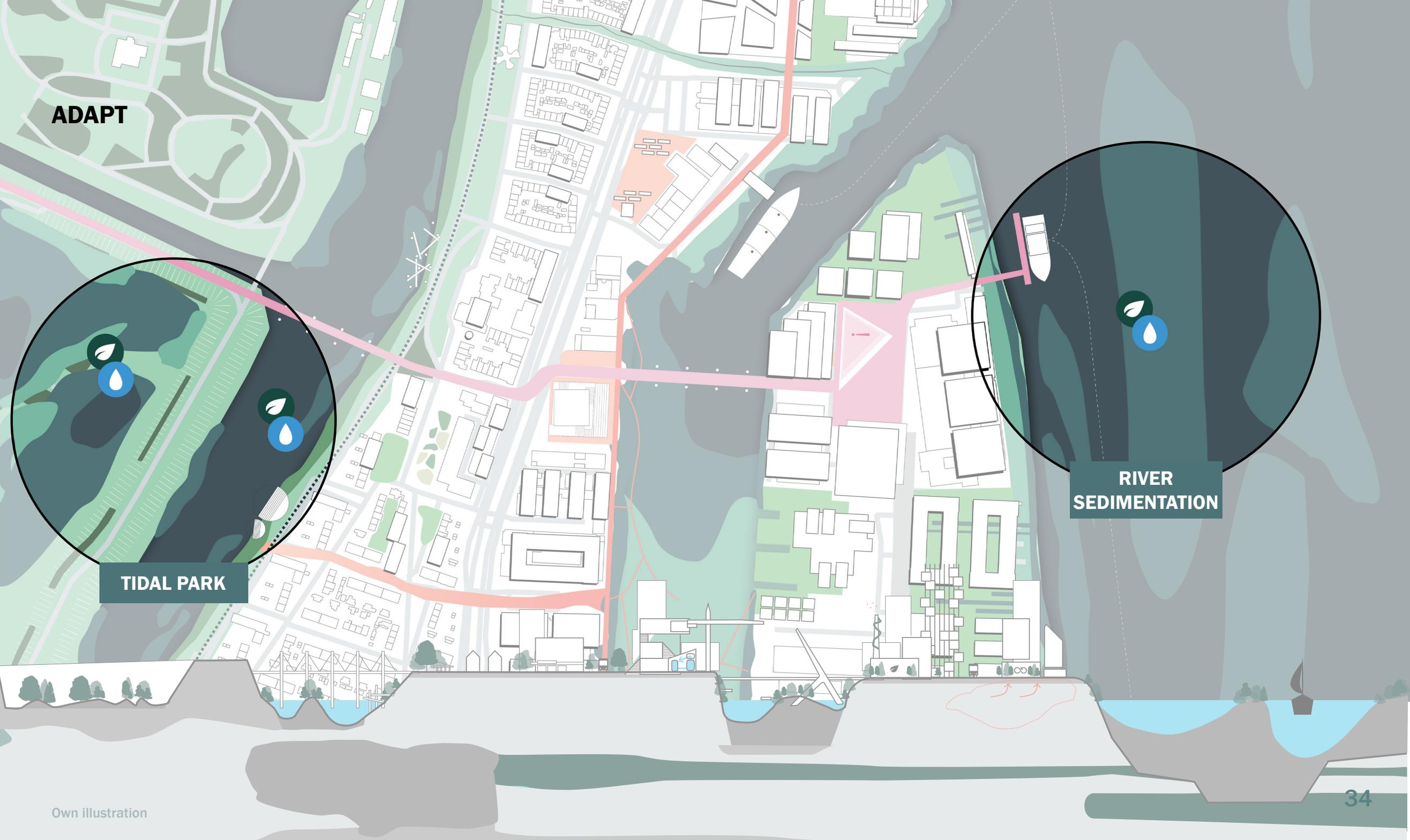
ADAPT



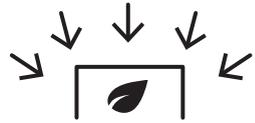
ADAPT

TIDAL PARK

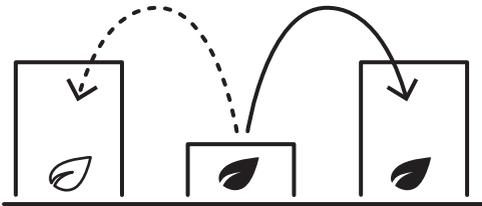
**RIVER
SEDIMENTATION**



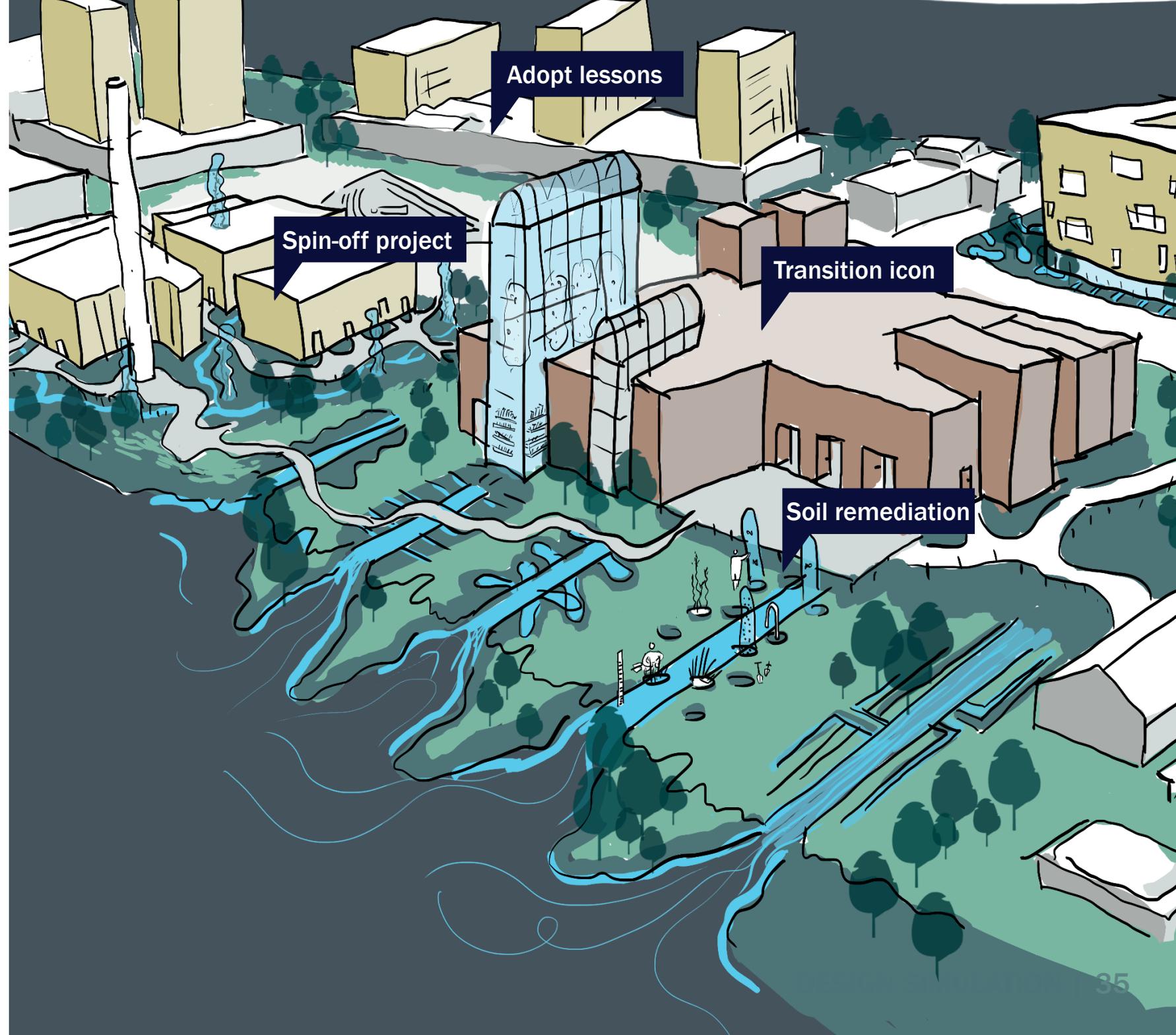
EXPERIMENT



Icon for the transition



Adopt, adapt, spin-off



EXPERIMENT, EDUCATE, PROVE

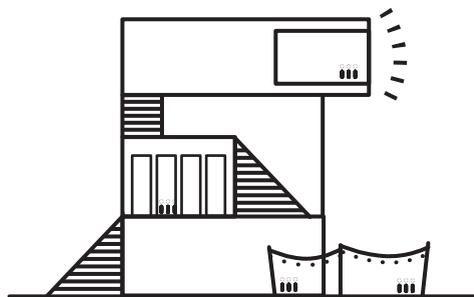
Inspired developer

Activated resident

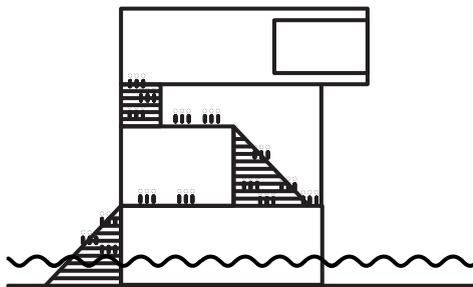
Eco-remediation



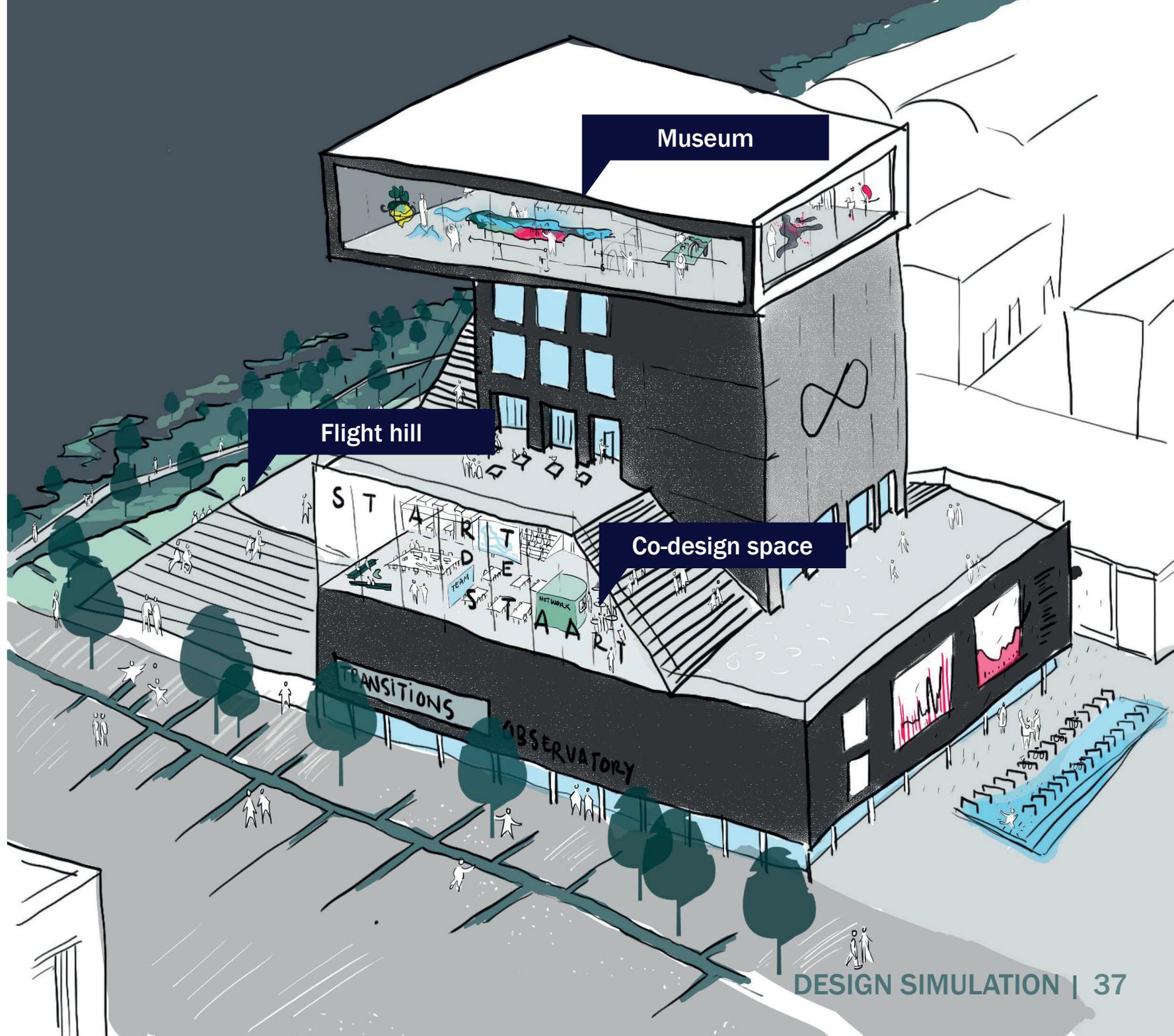
TRANSITION CENTRE



Monitor, inspire, co-create



Awareness, safety

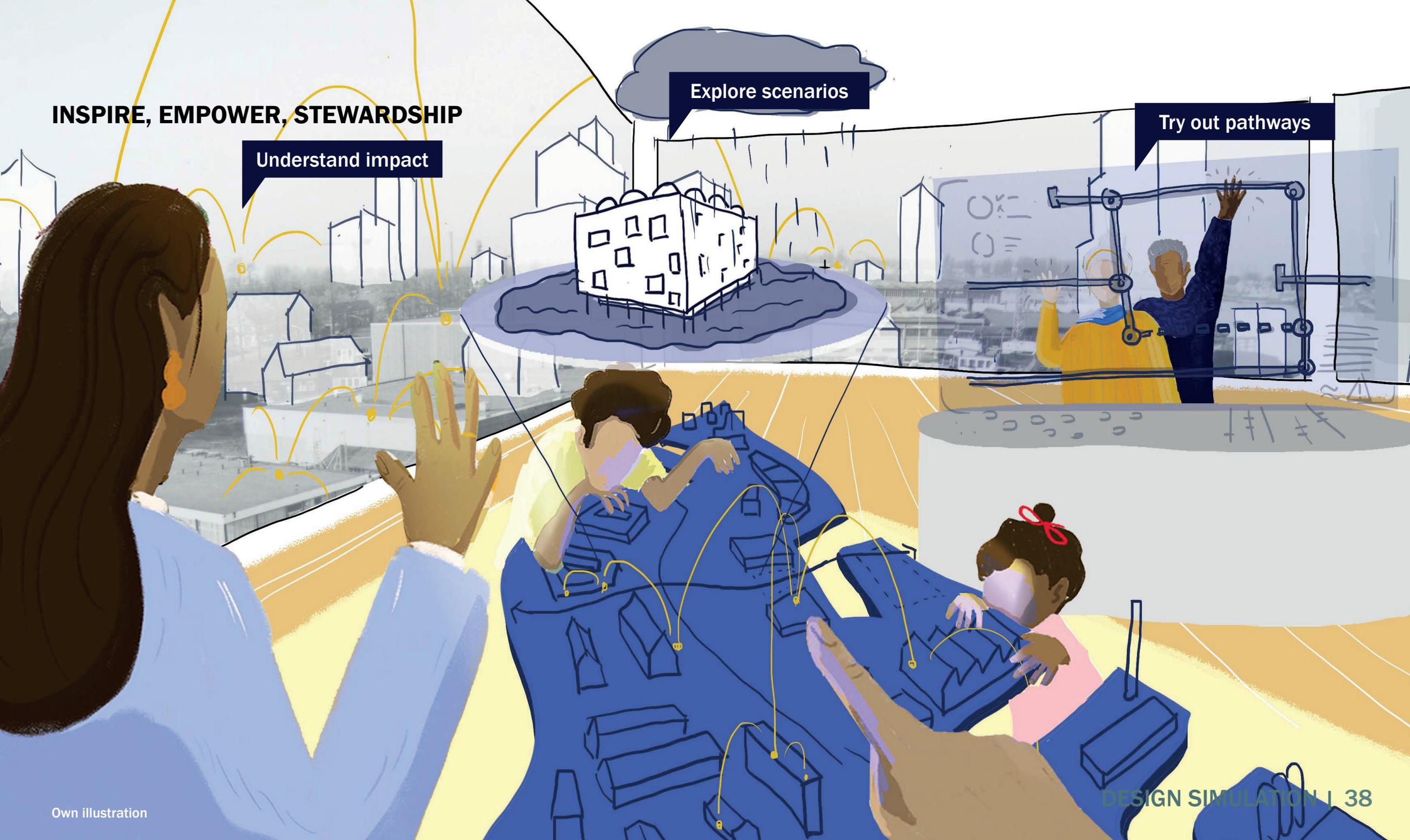


INSPIRE, EMPOWER, STEWARDSHIP

Understand impact

Explore scenarios

Try out pathways

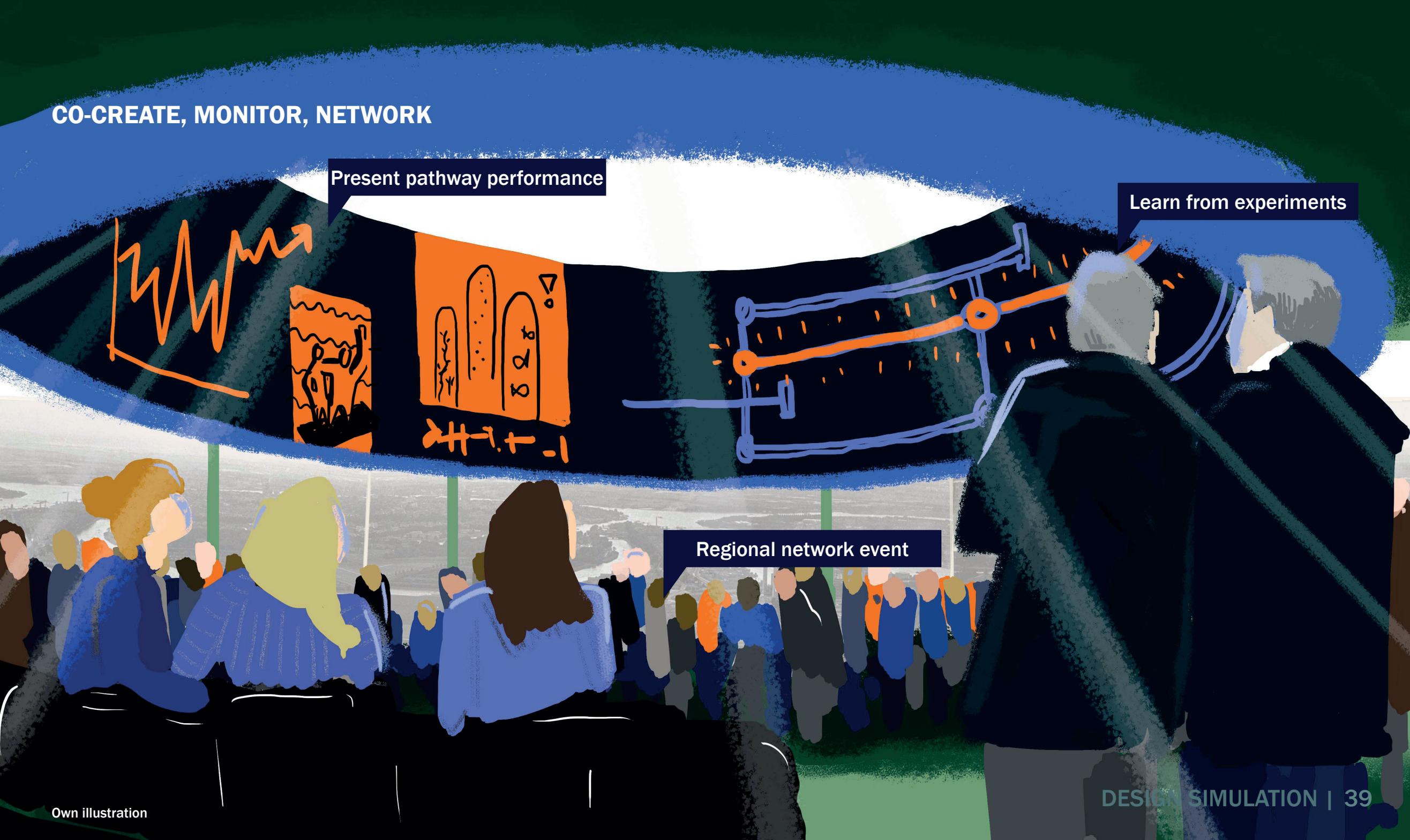


CO-CREATE, MONITOR, NETWORK

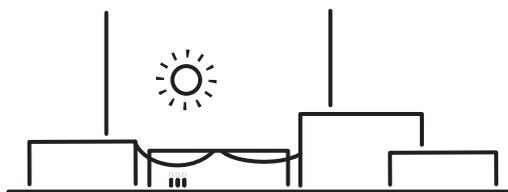
Present pathway performance

Learn from experiments

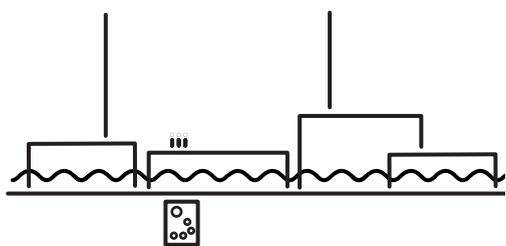
Regional network event



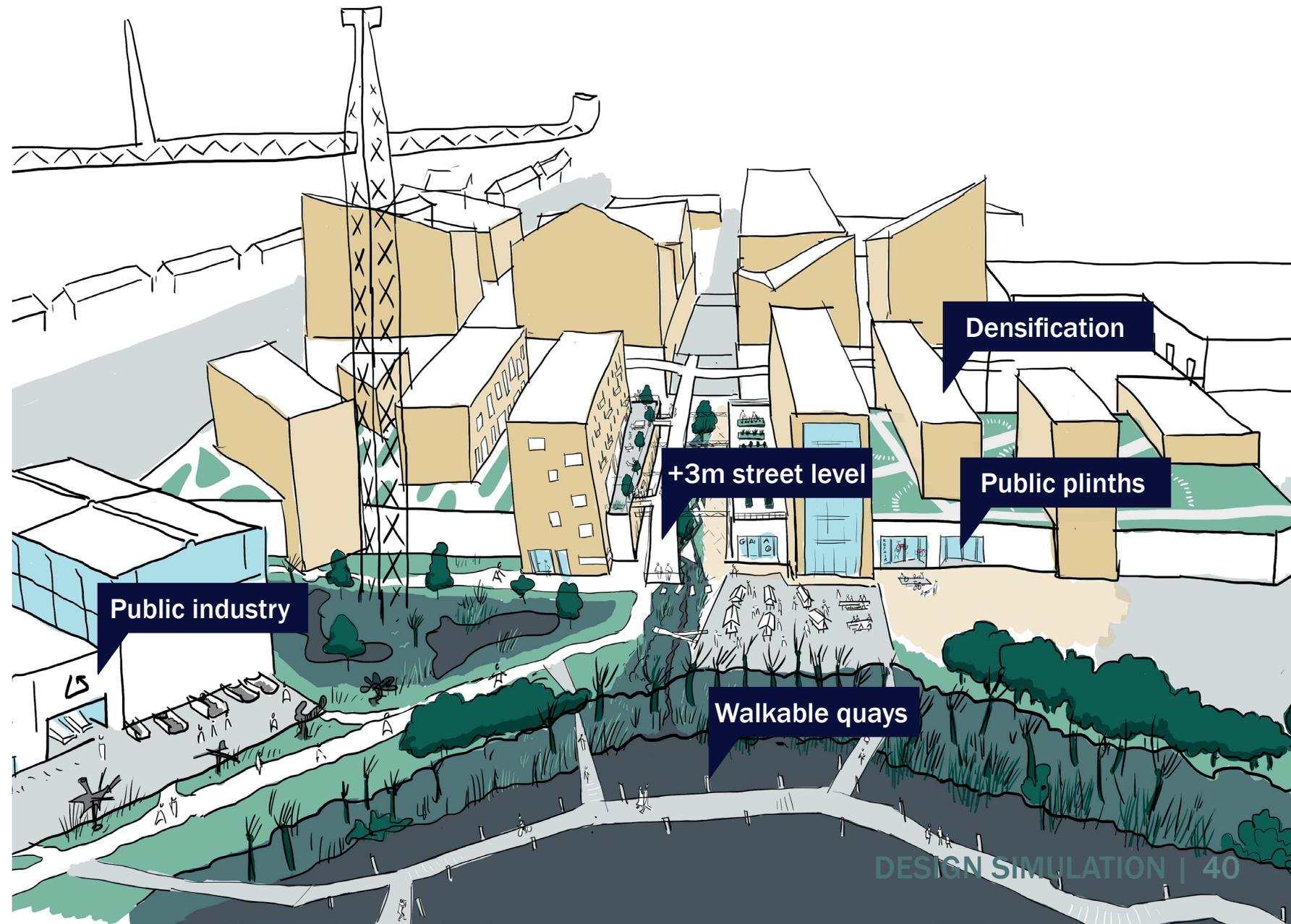
REDEVELOPED INDUSTRY



Shading in hot scenario



Floodable in wet scenario



Densification

+3m street level

Public plinths

Public industry

Walkable quays

REDEVELOPED INDUSTRY

Viewpoint over water

New houses

Lively shops

Recycling industries

Nature inclusive



TIDAL PARK

Transitioned industry

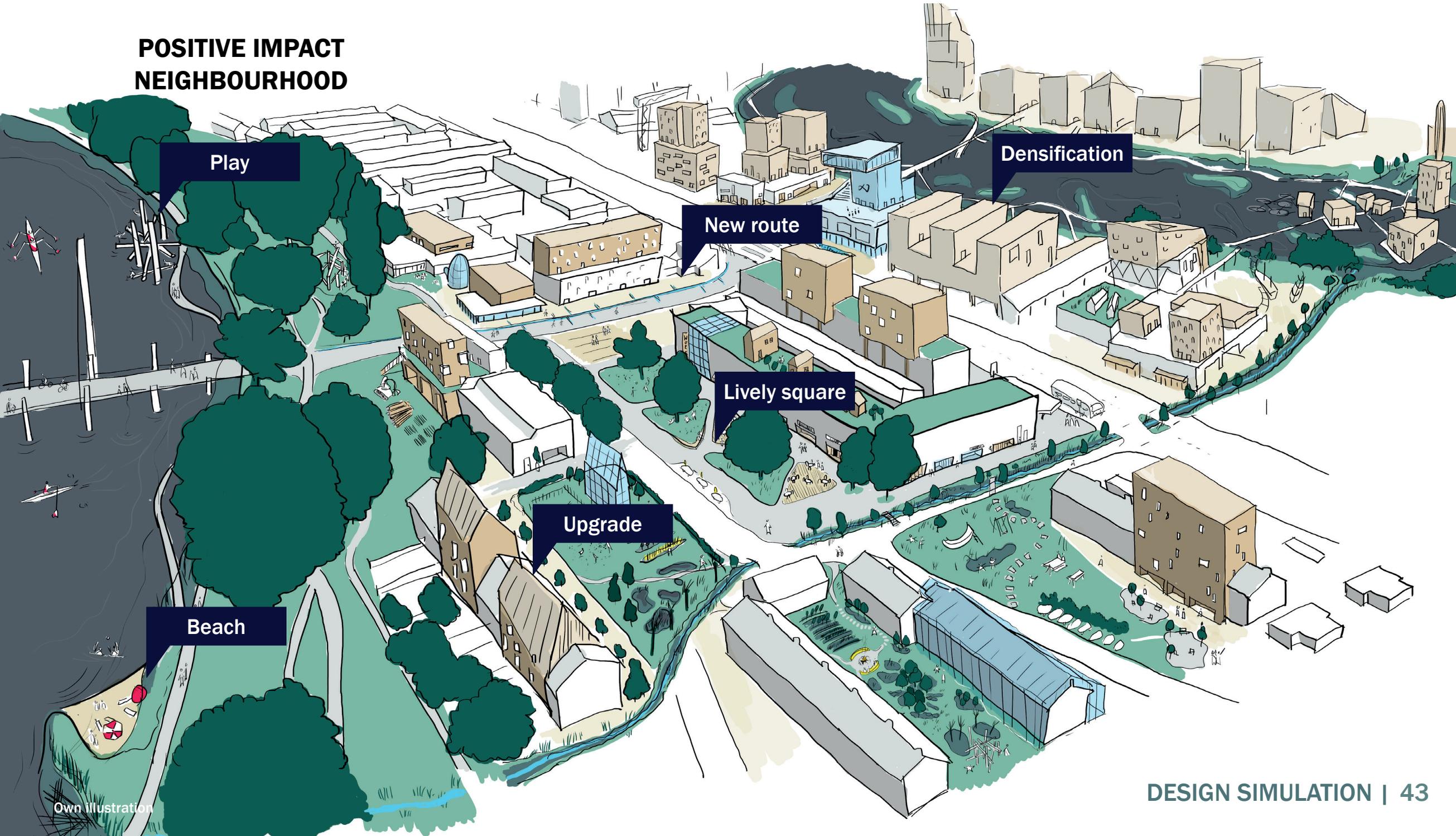
HOEBEE

Nature inclusive quays

Floating path



POSITIVE IMPACT NEIGHBOURHOOD



CONNECT, REVITALISE, ADAPT, DENSIFY



Liveability

Connect with city

Revitalise

Interact

Densify

CONNECT: CITY-STAART; PEOPLE-WATER; INVESTMENTS

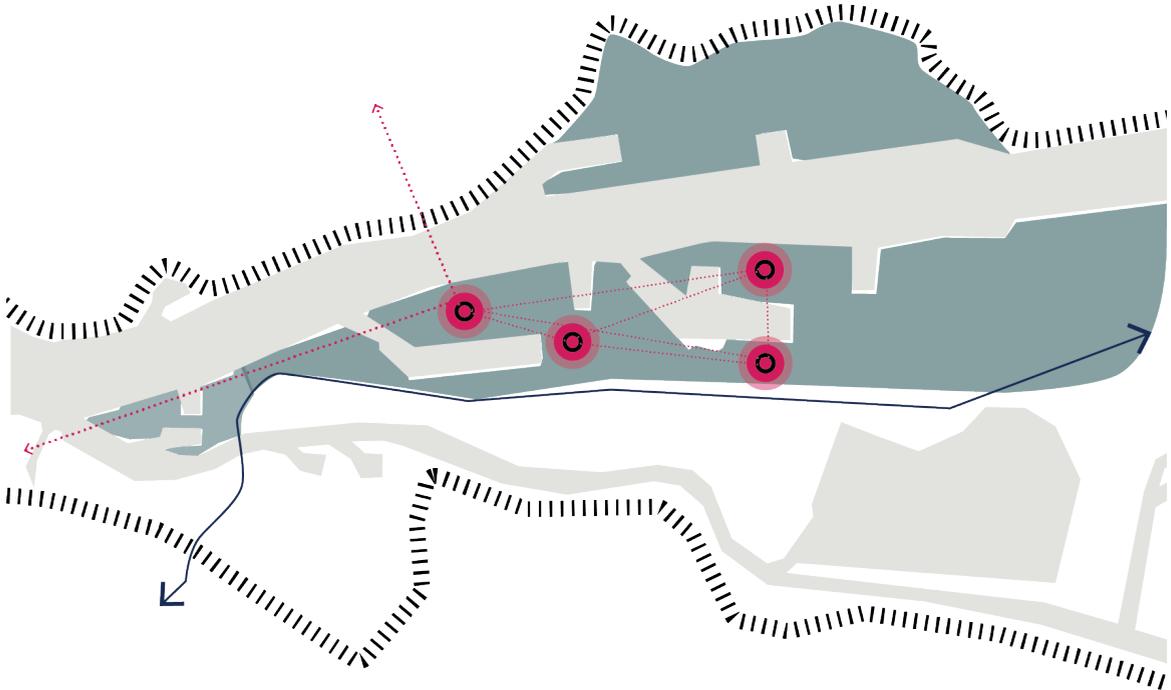
Connector

New relationship
with water

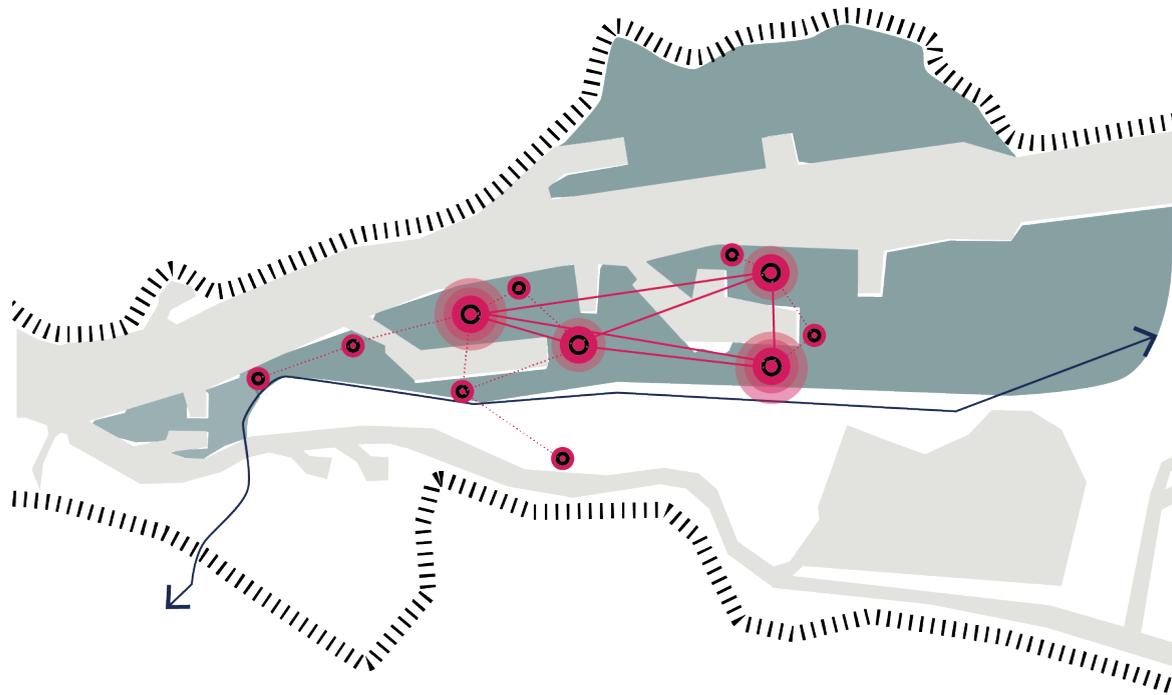
Space to nestle



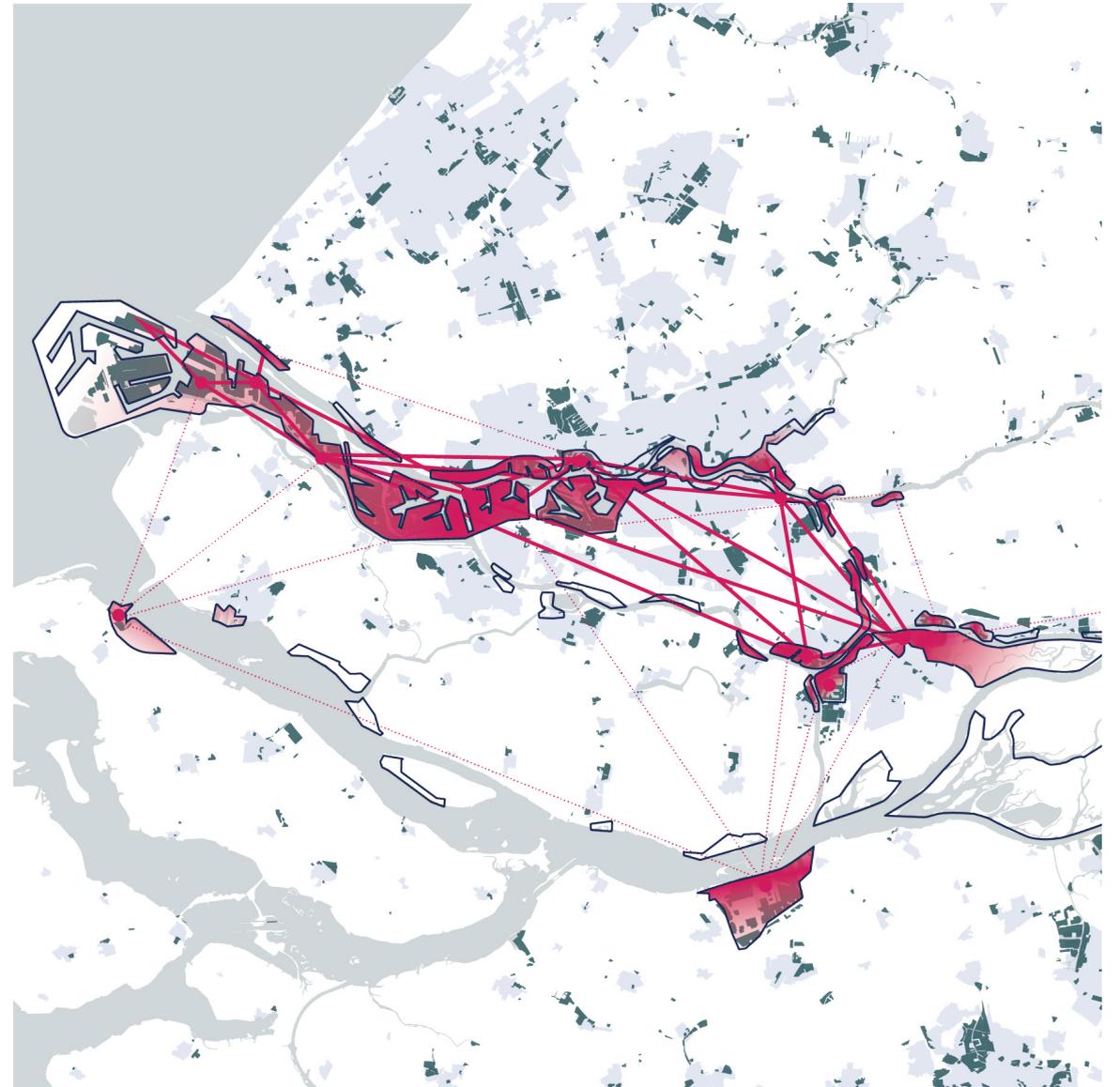
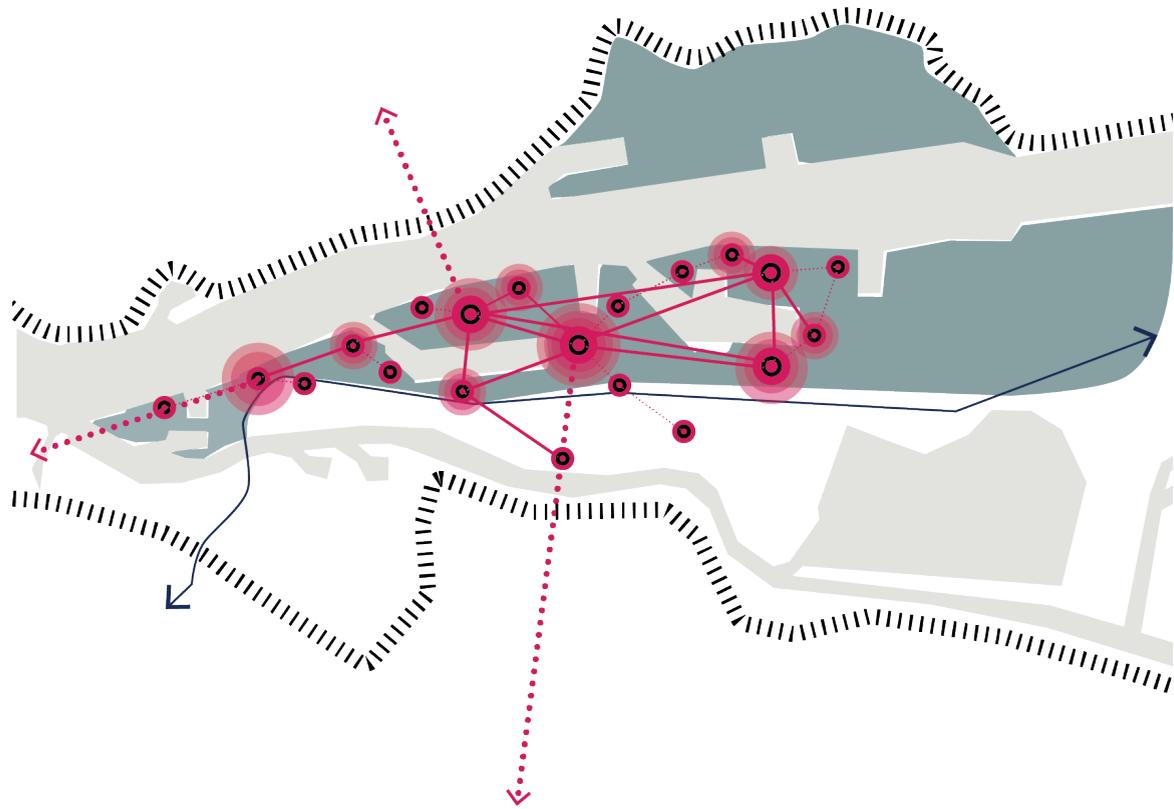
TRANSITION EFFECT | INITIATIVE



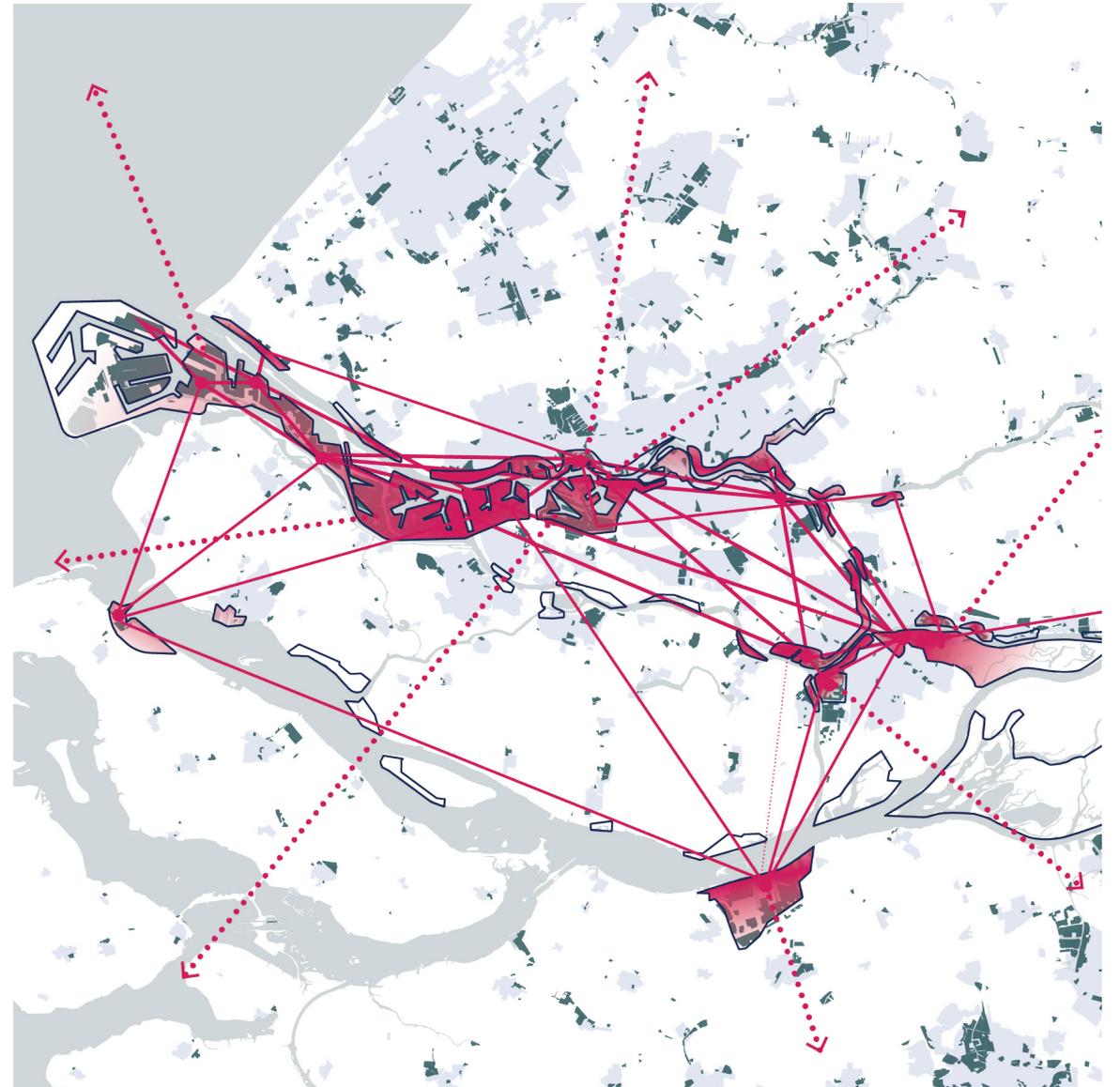
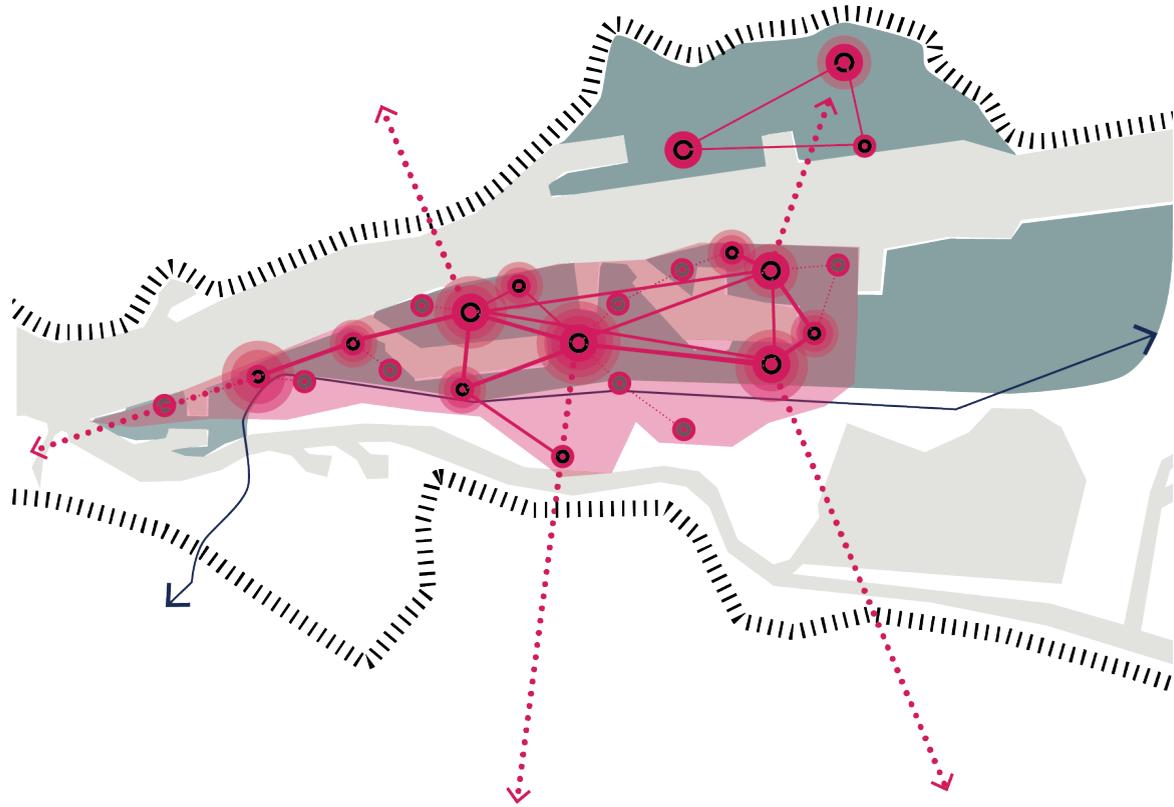
TRANSITION EFFECT | ANCHORING



TRANSITION EFFECT | EXCHANGE



TRANSITION EFFECT | CLIMATE ADAPTIVE DELTA CITY

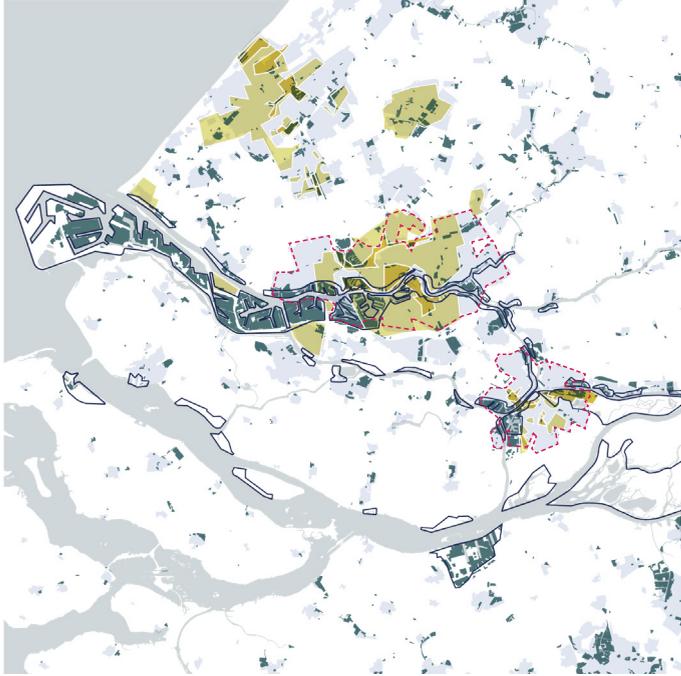


CONCLUSION

- 1. CONNECT SHORT- AND LONG-TERM**
- 2. EMBRACE COMPLEXITY**
- 3. INNOVATE IN PROCESS AND SPACE**
- 4. SMALL PROJECTS ARE VERY IMPORTANT FOR THE TRANSITION**

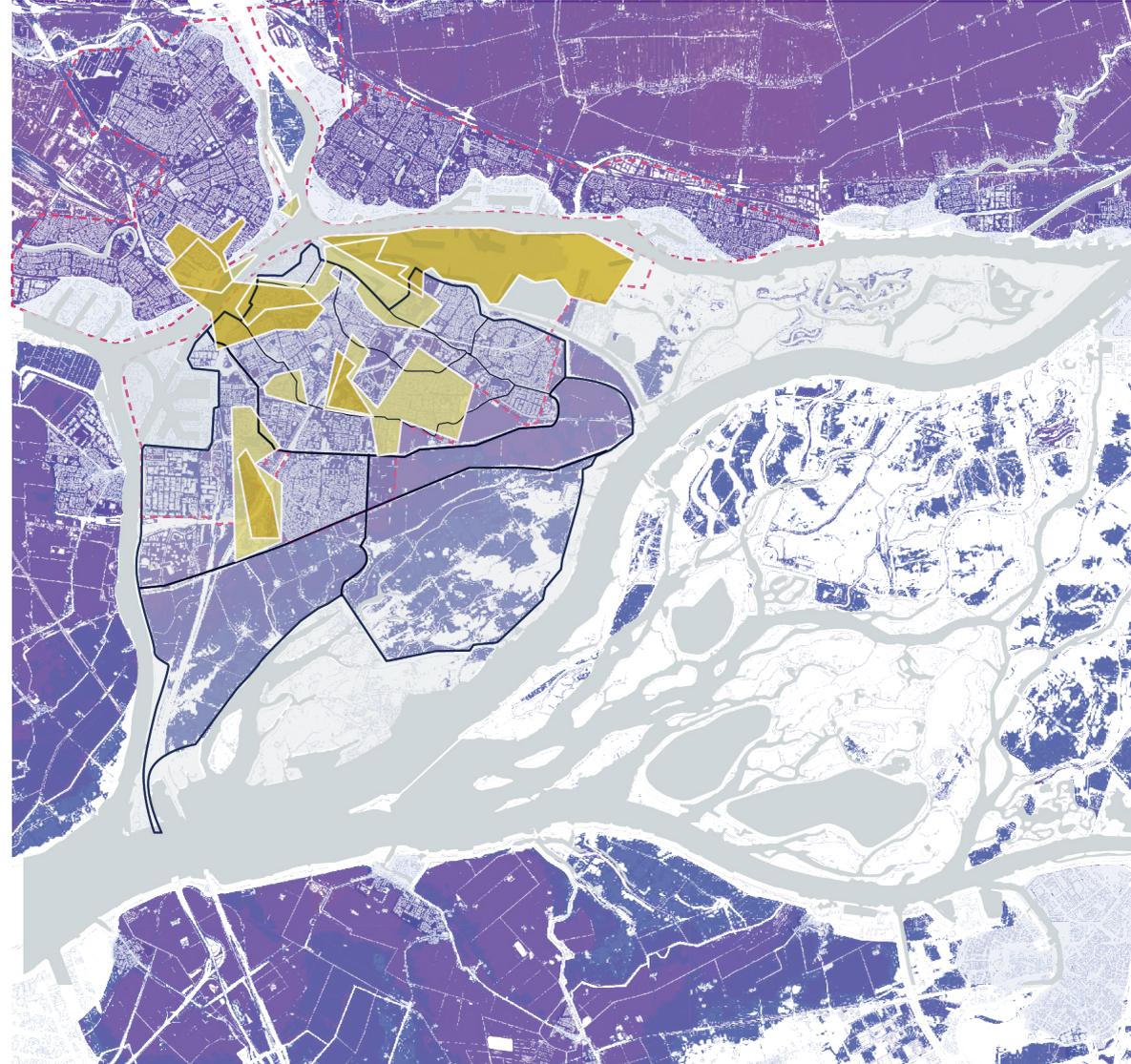
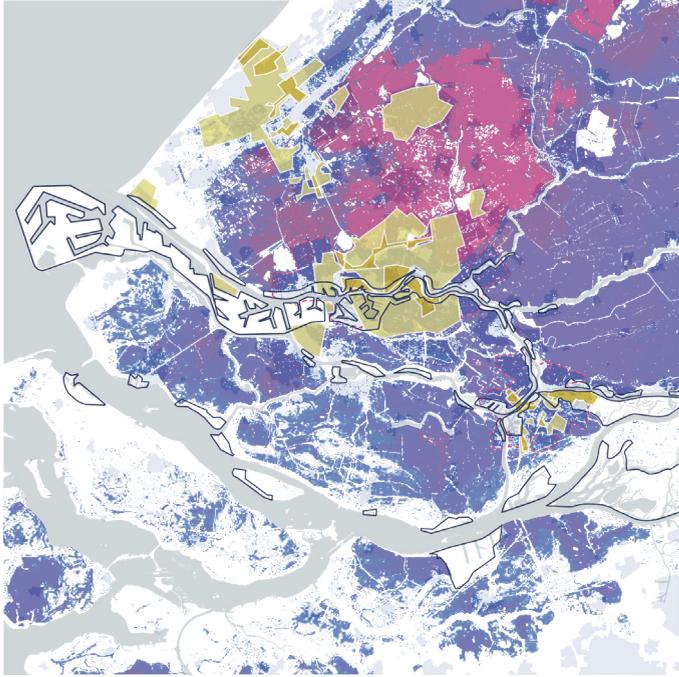
THANK YOU FOR LISTENING!

THE HOUSING MARKET KEEPS ON GROWING... FOR THE FIRST TIME: EXPANDING WITHIN CITY BOUNDARIES



- industry
- ▨ dikes
- unembanked
- big urbanisation ambition
- small urbanisation ambition

NEVERTHELESS, WE ARE URBANISING VULNERABLE PLACES..



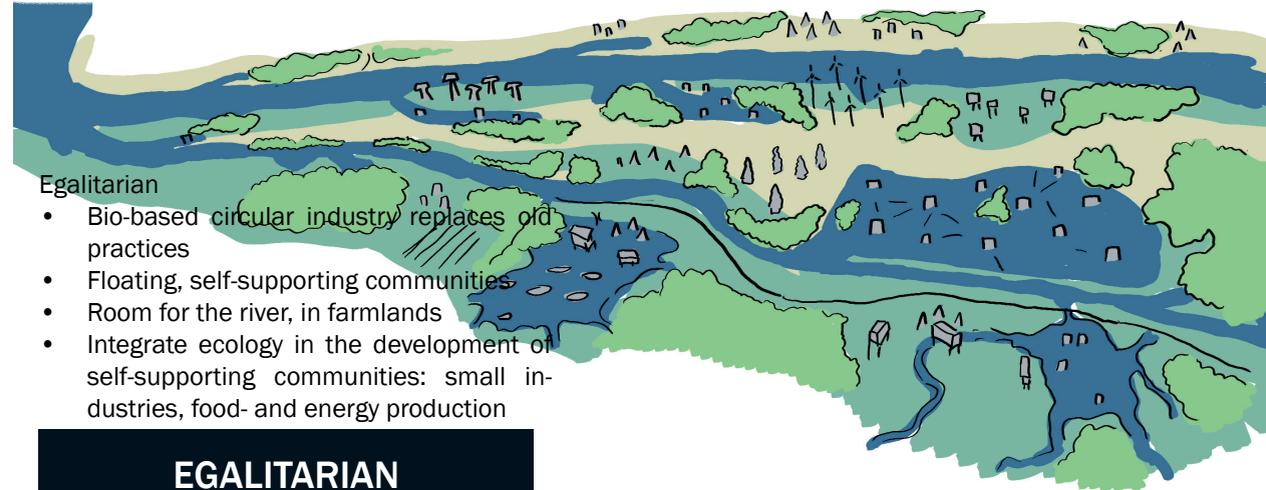
- very low-lying
- low-lying
- very low-lying
- ||| dike structure/
— unembanked areas
- big urbanisation
ambition
- small urbanisation
ambition

DECIDE ON A PREFERRED PATHWAY

Hierarchist

- Industries leave
- Redevelop industries into housing
- Highten dikes/barriers
- Develop polders into tidal nature
- Water resilient railway connection to the coast

HIERARCHIST



Egalitarian

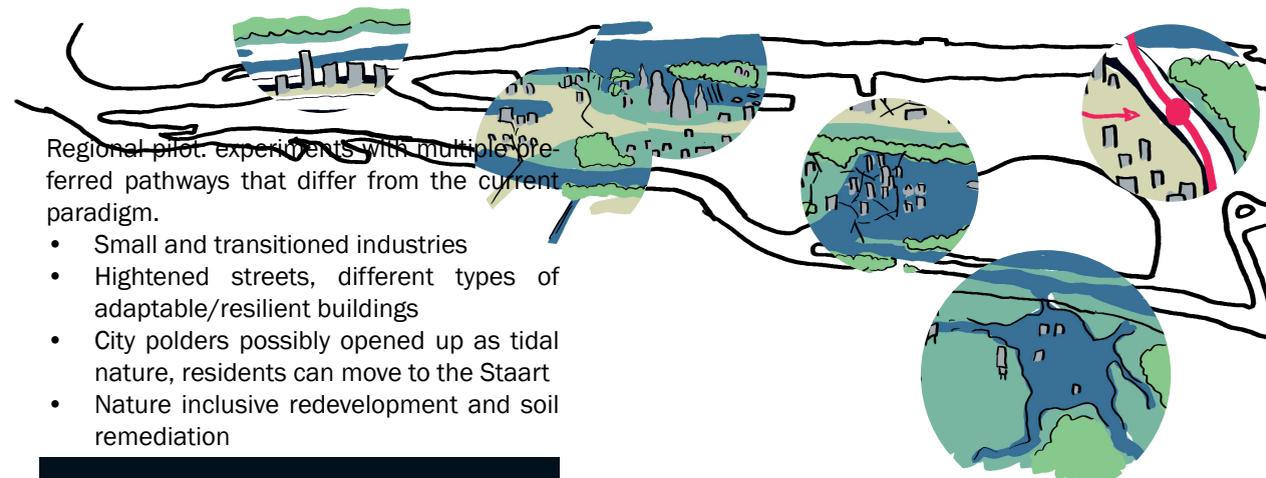
- Bio-based circular industry replaces old practices
- Floating, self-supporting communities
- Room for the river, in farmlands
- Integrate ecology in the development of self-supporting communities: small industries, food- and energy production

EGALITARIAN

Individualist

- Big industries transform to Green Industry
- Build water resilient residential buildings
- City polders redeveloped into tidal park for recreation
- Water resilient street
- Integrate ecology in the redevelopment for branding

INDIVIDUALIST

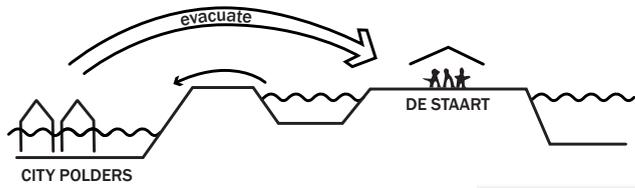


Regional pilot: experiments with multiple preferred pathways that differ from the current paradigm.

- Small and transitioned industries
- Hightened streets, different types of adaptable/resilient buildings
- City polders possibly opened up as tidal nature, residents can move to the Start
- Nature inclusive redevelopment and soil remediation

SELECTED FOR SIMULATION

CONNECT



Daily use & evacuation

