

Water as a Connector

A coherency between strategic planning design in waterfront and urban revitalization

By Renu Ganpat

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ROTTERDAM



HEIJPLAAT



CARNISSE



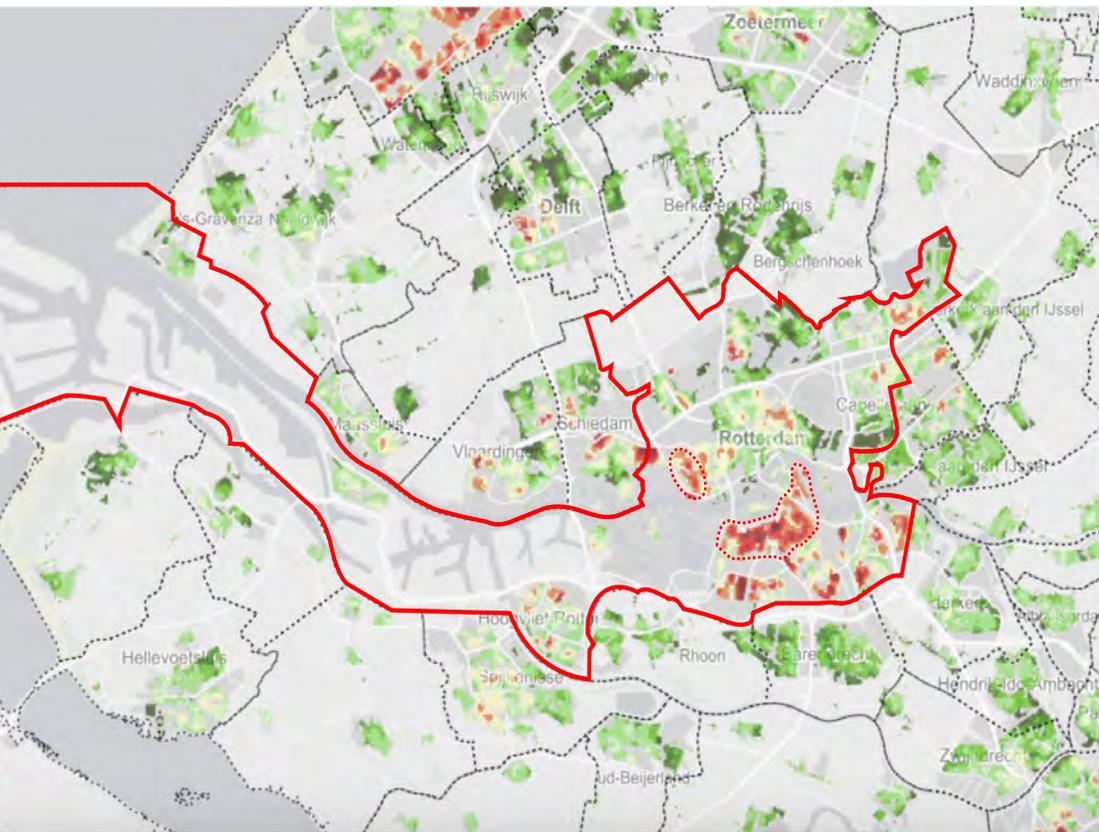
SPOORWEGHAVEN



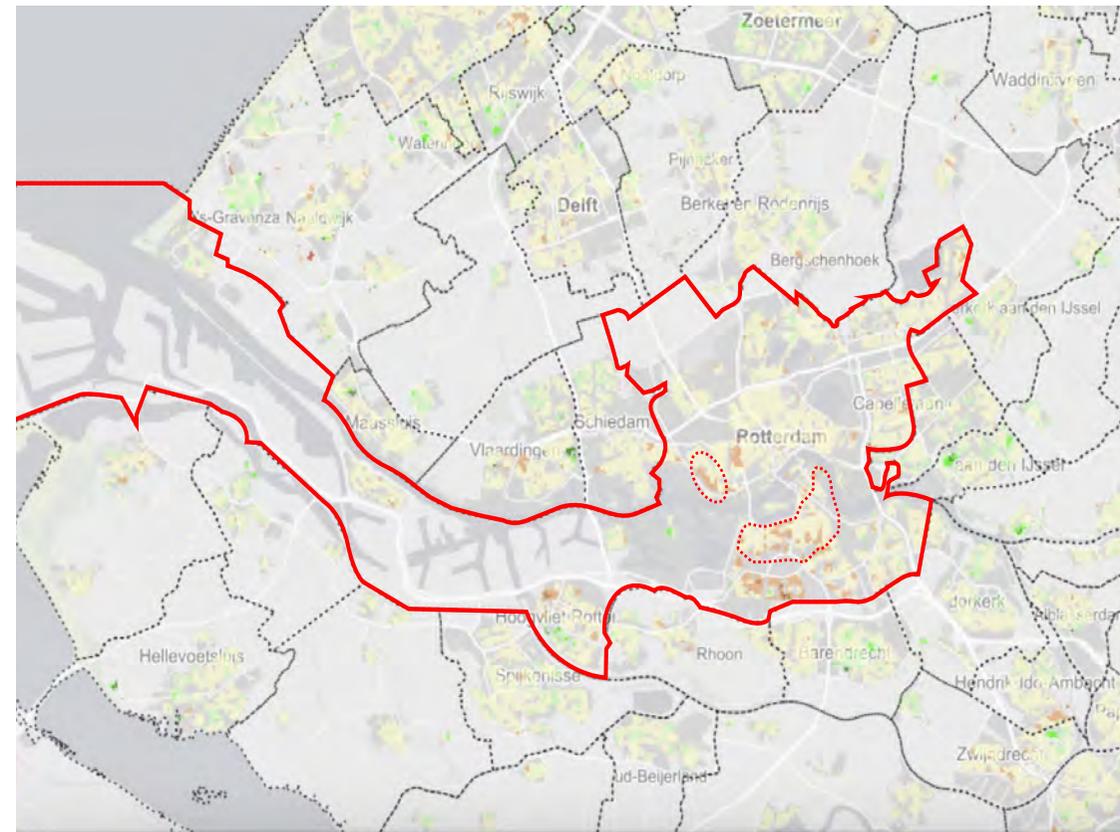


ACHTERSTANDSWIJKEN



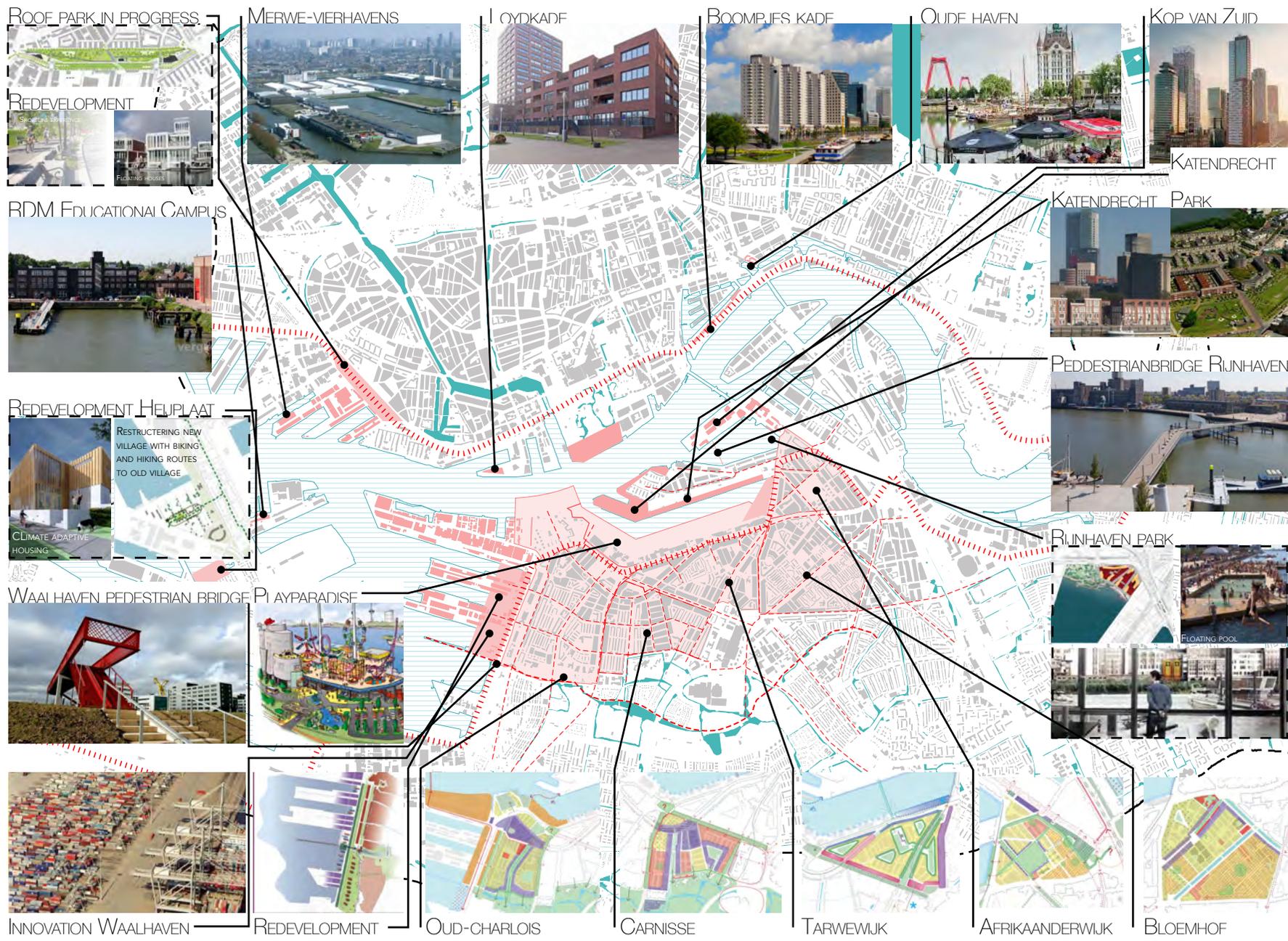


VITALITY SITUATION 2016



VITALITY SITUATION DEVELOPMENT 2014

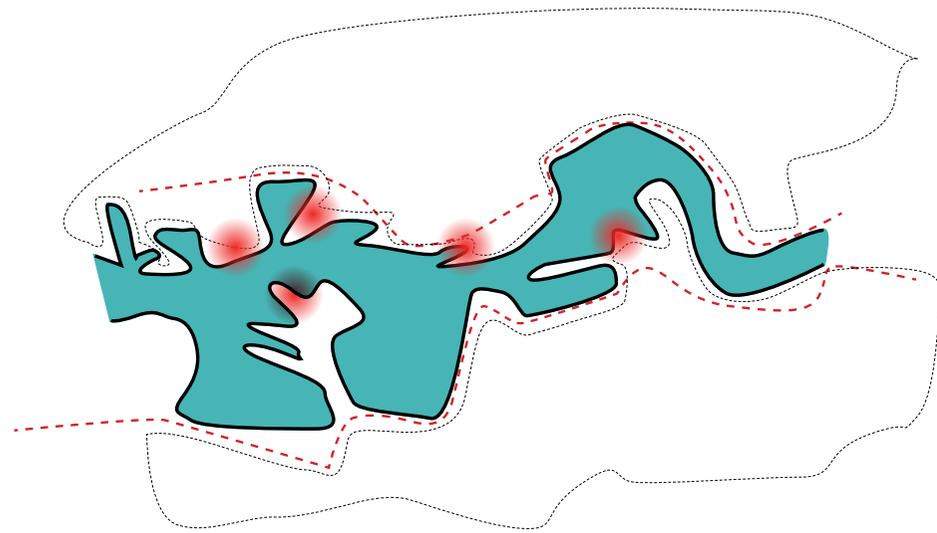




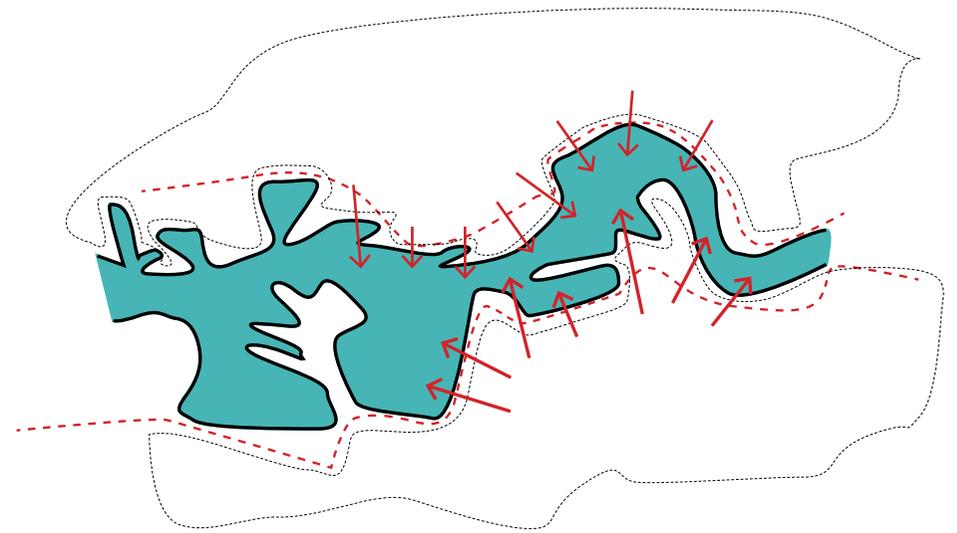
Legend

- Realized plans
 - Future plans waterfront
 - Future plans NPRZ neighborhood
- Main water system, The Maas
 - Inner water systems: canals
 - Primair dike system
- Green-bleu infrastructure
 - Street connection NPRZ neighborhoods
 - Municipality border Rotterdam

TWO DIFFERENT WORLDS



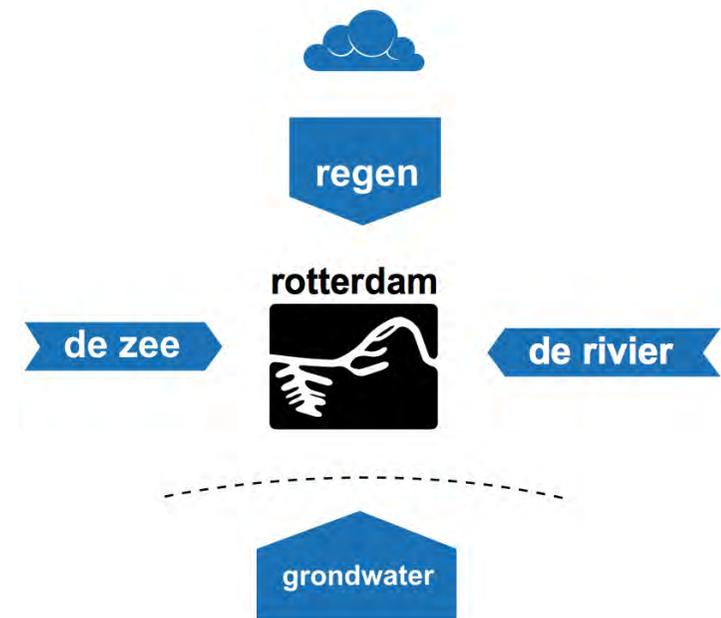
SEGREGATED



INTEGRATED



“Rotterdam, one of the safest delta cities in the world, but still vulnerable due to its location in the Dutch delta.”



Rotterdam is a delta city and located in the delta of the rivers Rhine and Meuse. Via the Nieuwe Waterweg, the city has open links to the sea and is influenced by the tide.

CLIMATE CHANGE



PROBLEM STATEMENT

1.
CLIMATE CHANGE IN TERMS OF WATER



2.
REDEVELOPMENT OF WATERFRONT TO MUCH AIMED FOR THE HIGH INCOME GROUP



3.
DECLINING NEIGHBORHOODS



Climate change in terms
of water problems

Water management

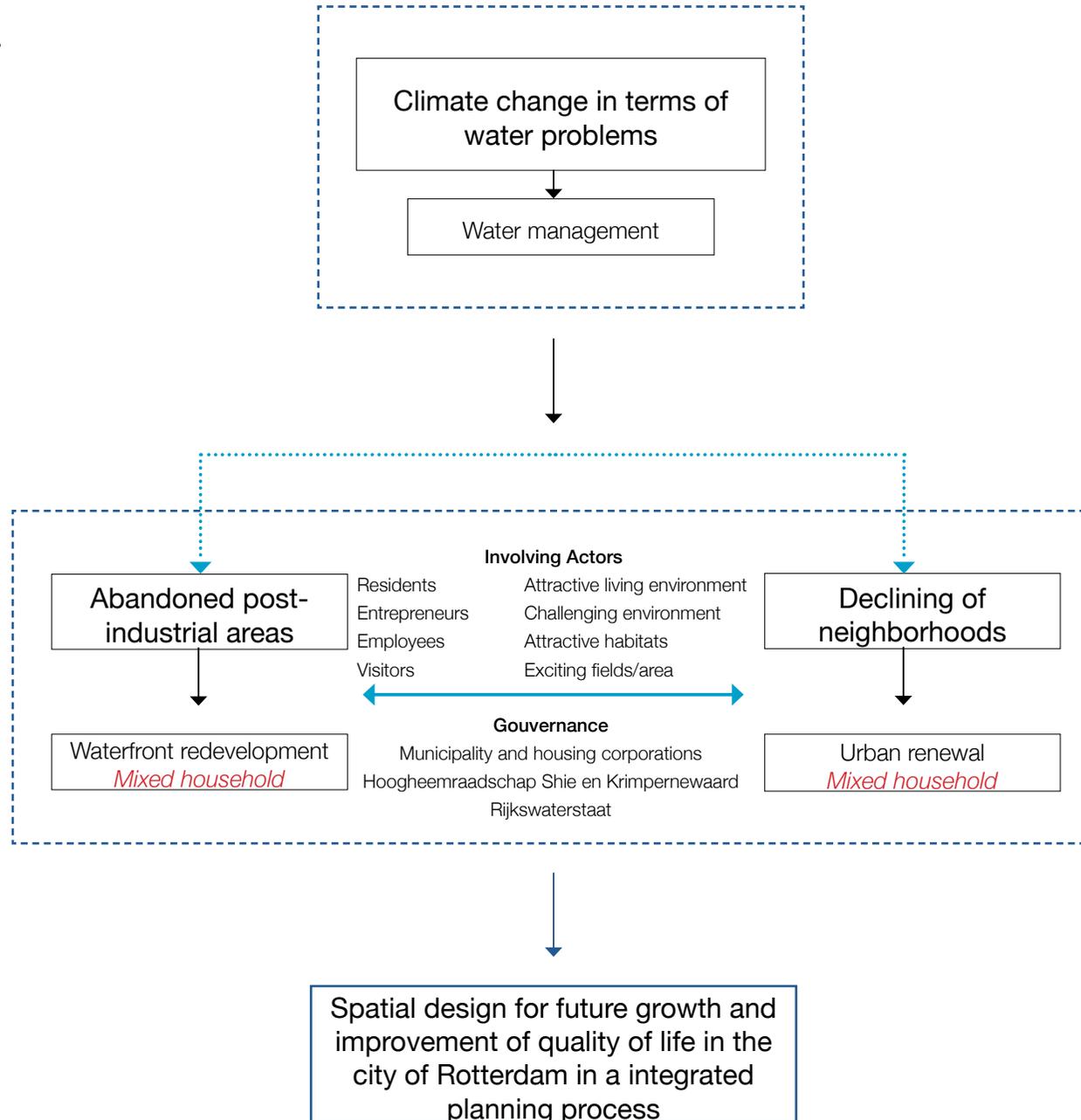
Abandoned post-
industrial areas

Waterfront redevelopment
High income

Declining of
neighborhoods

Urban renewal
Low income

GOAL



RESEARCH QUESTION

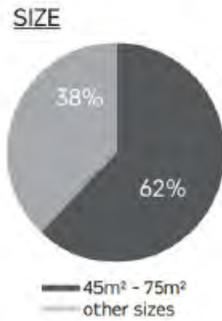
How can we use water in spatial design in such a way that the Rotterdam delta is climate adaptive and the socio-economical processes in waterfront and deprived neighborhood are enhanced as a whole for future growth and improvement of quality of life in the city?

TARWEWIJK

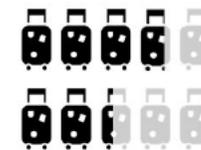




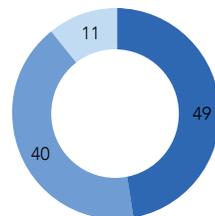
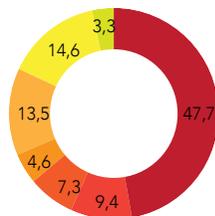
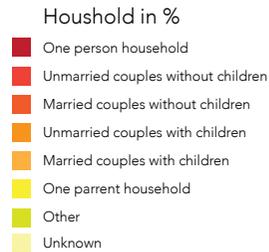
DEMOGRAPHICS



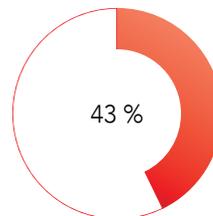
among houses in need for renovation, **900** houses are below standard level



78%
OF IMMIGRANTS IN THE POPULATION OF TARWEWIJK²
X
48%
OF IMMIGRANTS IN THE POPULATION OF ROTTERDAM²

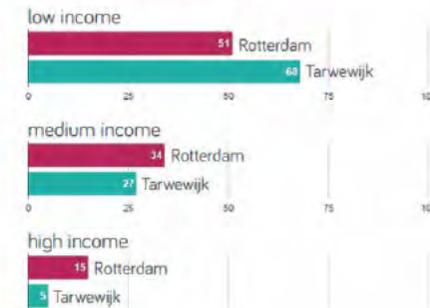


Struggling to get around *19 years and older*



household income (% standardized)

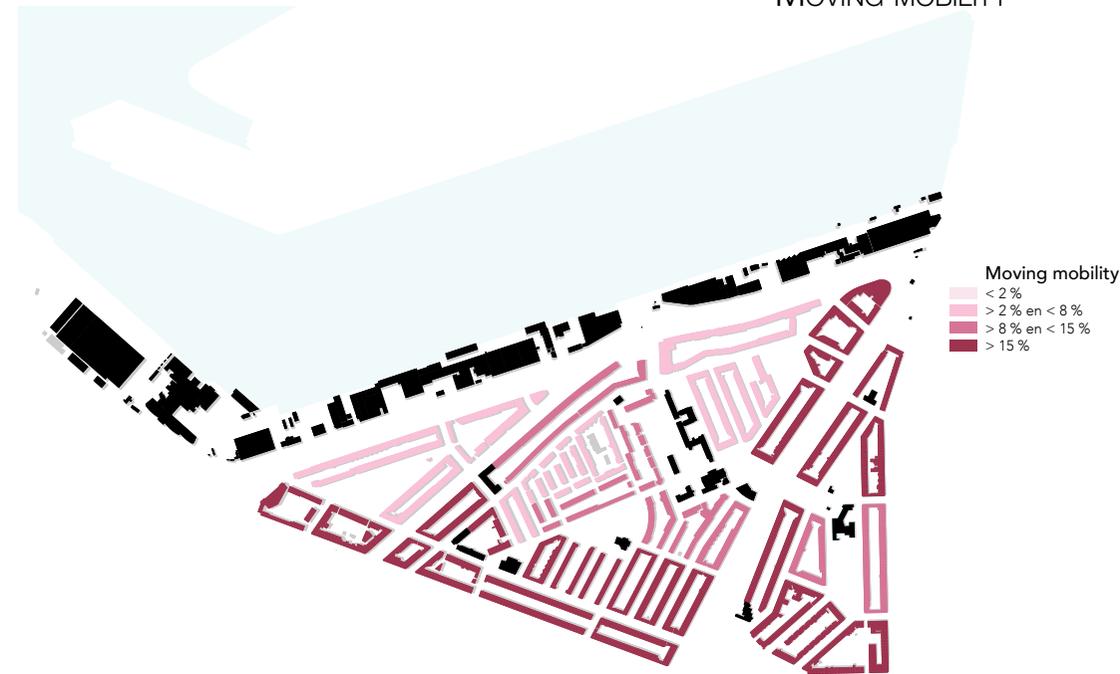
Source: <https://rotterdam.buurtmonitor.nl/home?Route=IMW&ZT>



VACANCY



MOVING MOBILITY



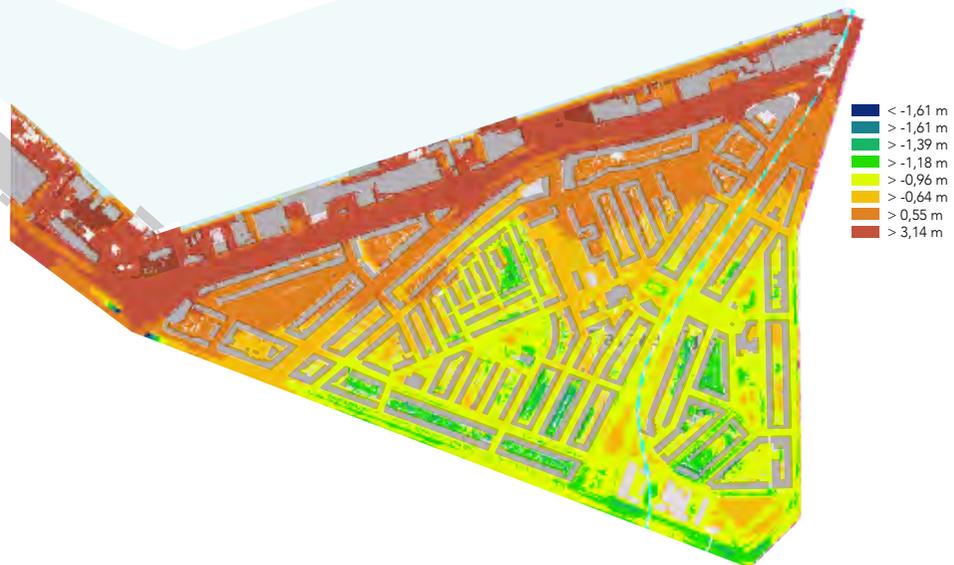
EDGES AND STREETS



3 ISLANDS AND BUSY OUTSIDE/ QUIET INSIDE.



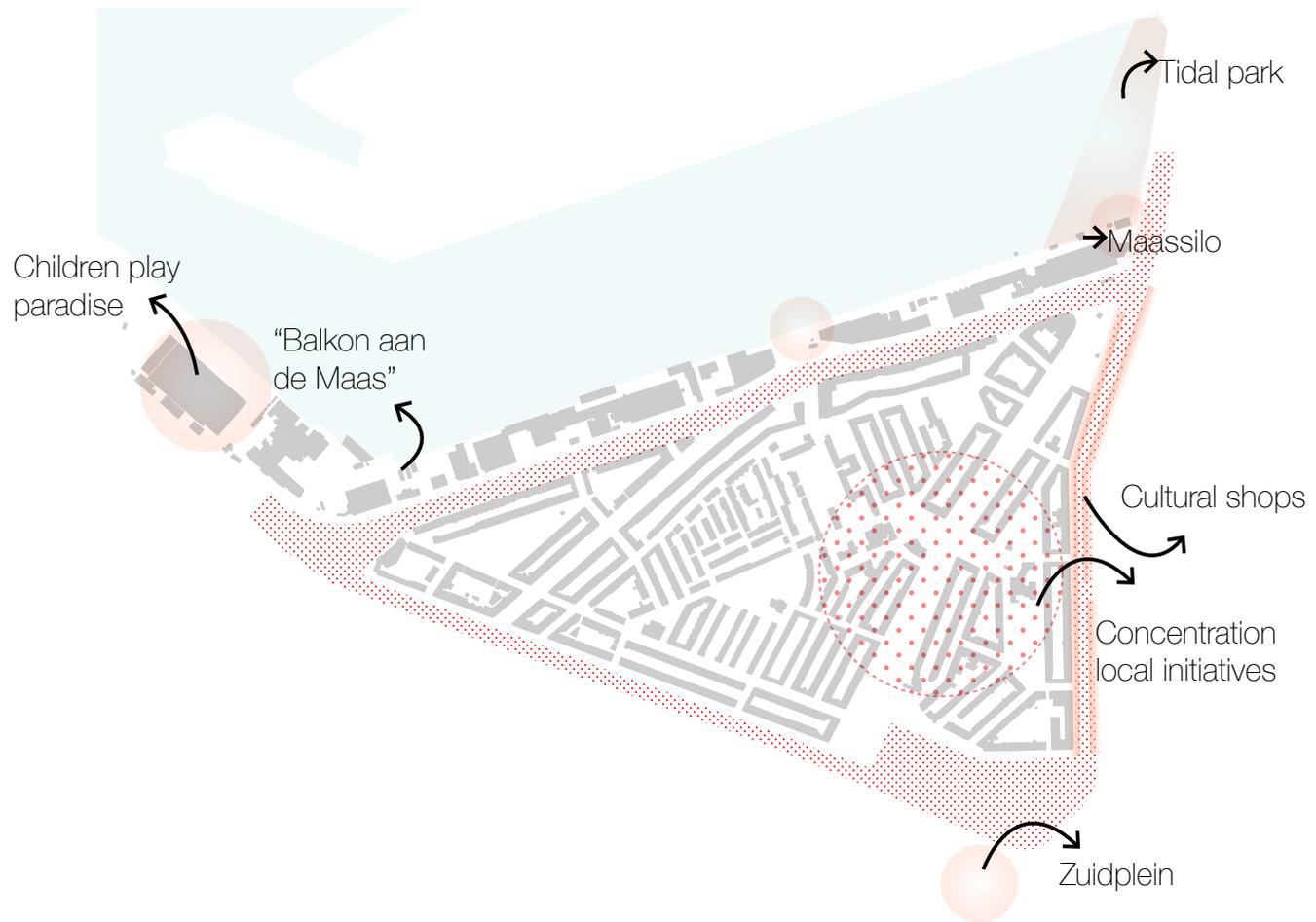
HEIGHT MAP



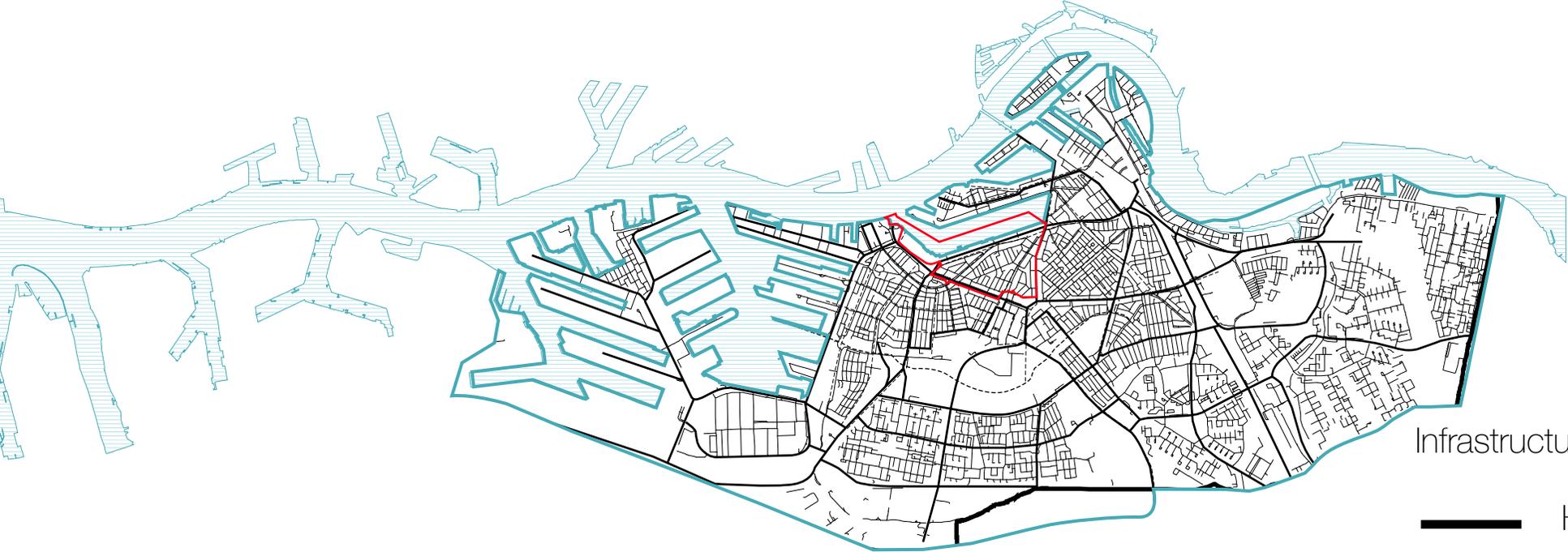
FUTURE WATERNUANCES.



VISITOR FLOWS WITH CURRENT DEVELOPMENTS/ATTRACTORS



POSITION SOUTH



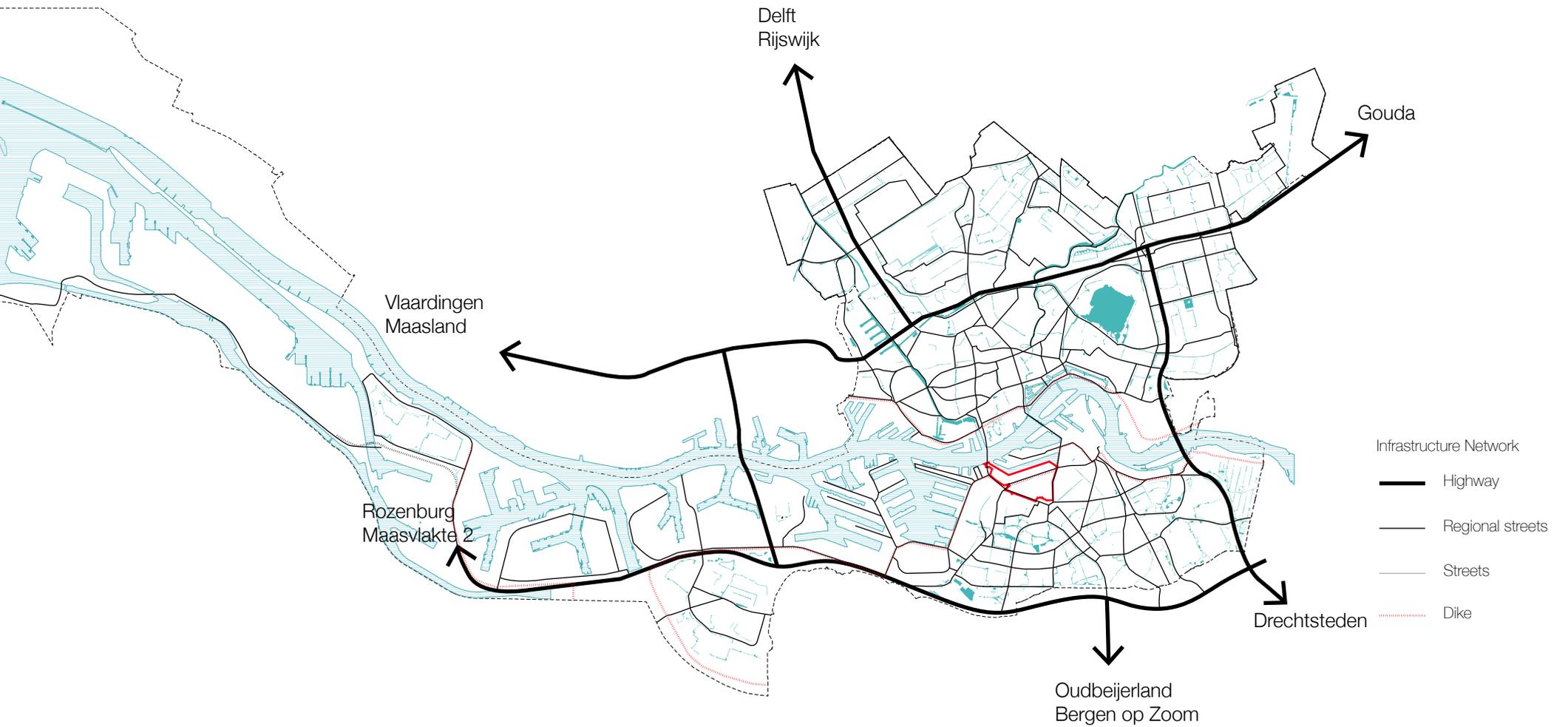
Infrastructure Network

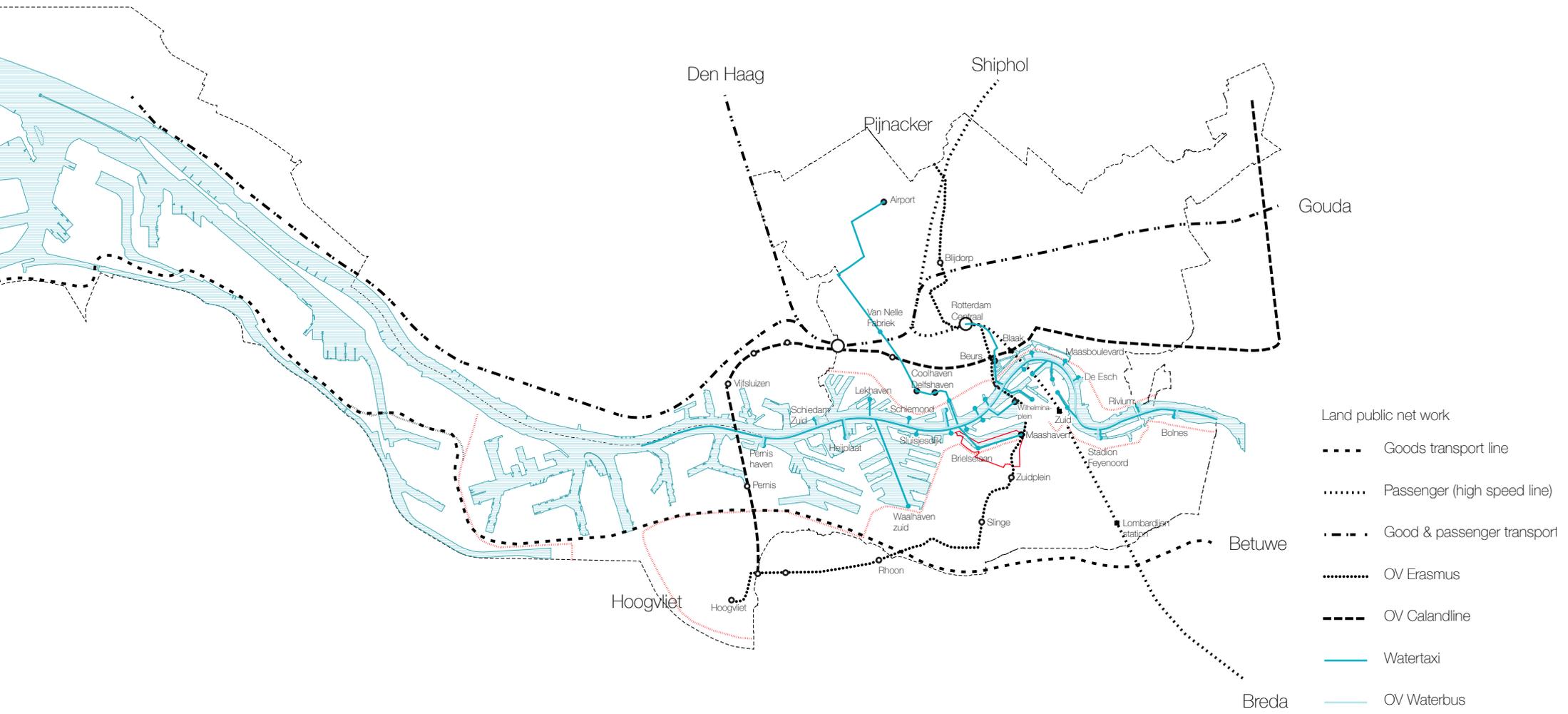
— Highway

— Regional streets

— Streets

POSITION ROTTERDAM



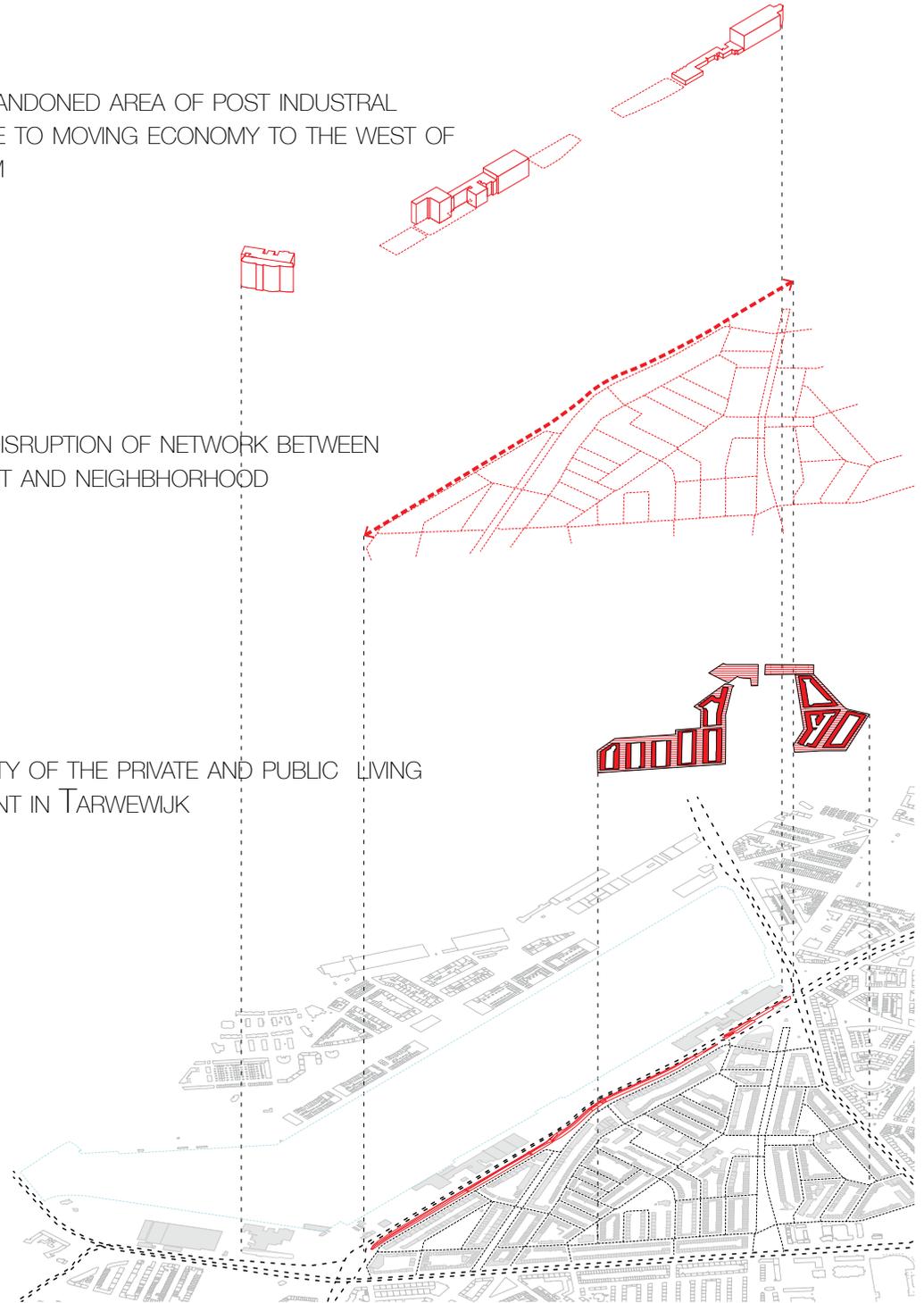


CHALLENGES

FUTURE ABANDONED AREA OF POST INDUSTRIAL SPACES DUE TO MOVING ECONOMY TO THE WEST OF ROTTERDAM

PHYSICAL DISRUPTION OF NETWORK BETWEEN WATERFRONT AND NEIGHBORHOOD

LOW QUALITY OF THE PRIVATE AND PUBLIC LIVING ENVIRONMENT IN TARWEWIJK

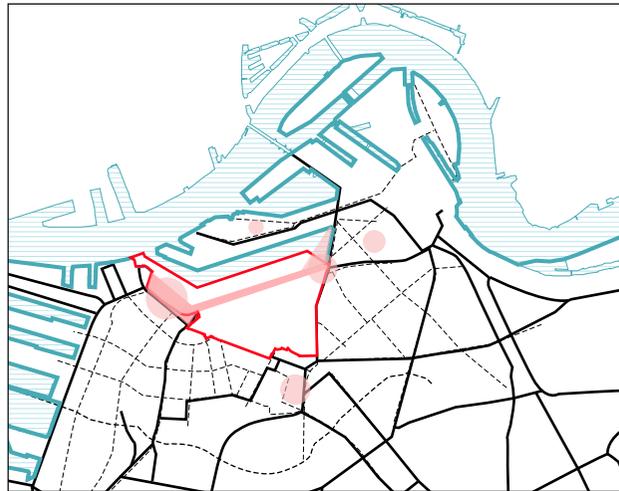


WHAT IF SCENARIO'S

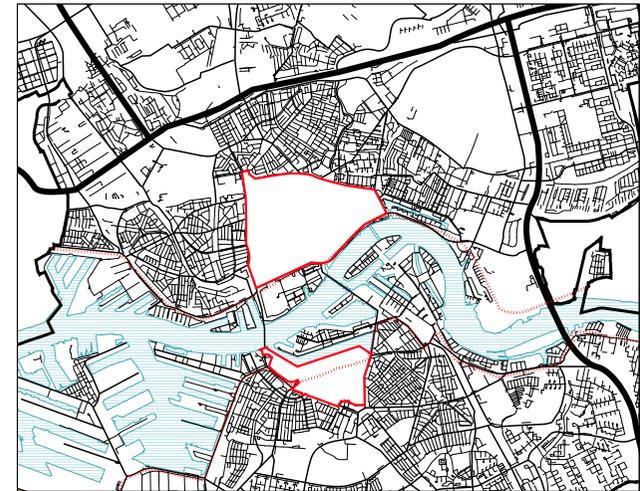
1. *What if.. water plays an asset role to empower Tarwewijk as an declining neighborhood*



2. *What if.. Tarwewijk is pointed out as a centrality by edges and nodes in Rotterdam South?*



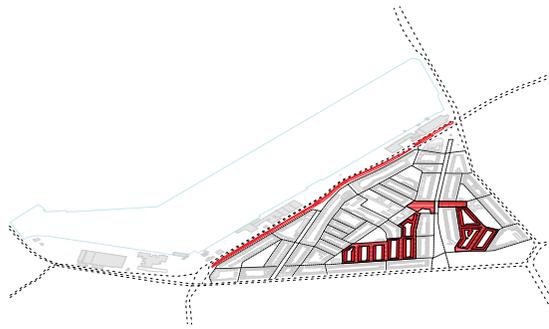
3. *What if.. the inner city and Tarwewijk had the possibilities to grow to each other?*



CHALLENGES



OPPORTUNITIES



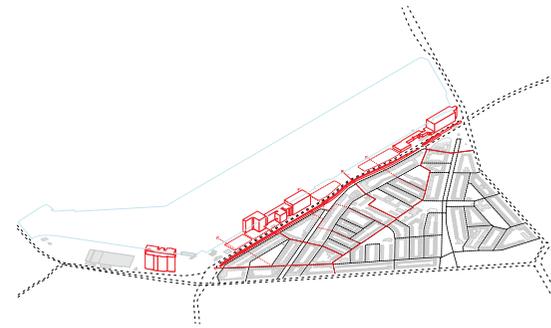
Low quality of the private and public living environment in Tarwewijk



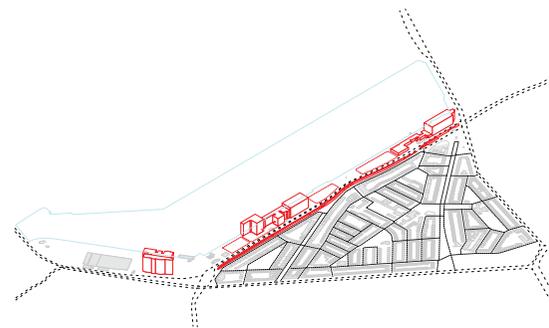
Rehabilitation
Development of the current private and public structure in the living environment



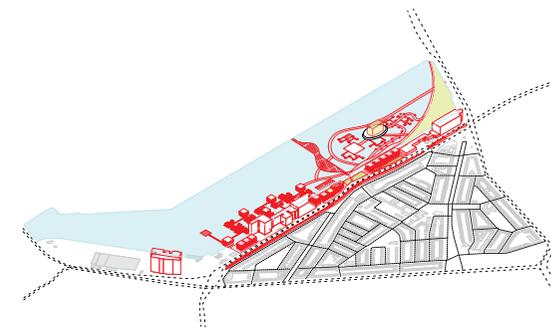
Physical disruption of network between waterfront and neighborhood



Reconnection
Corridors for waterfront and neighborhood to inter wine

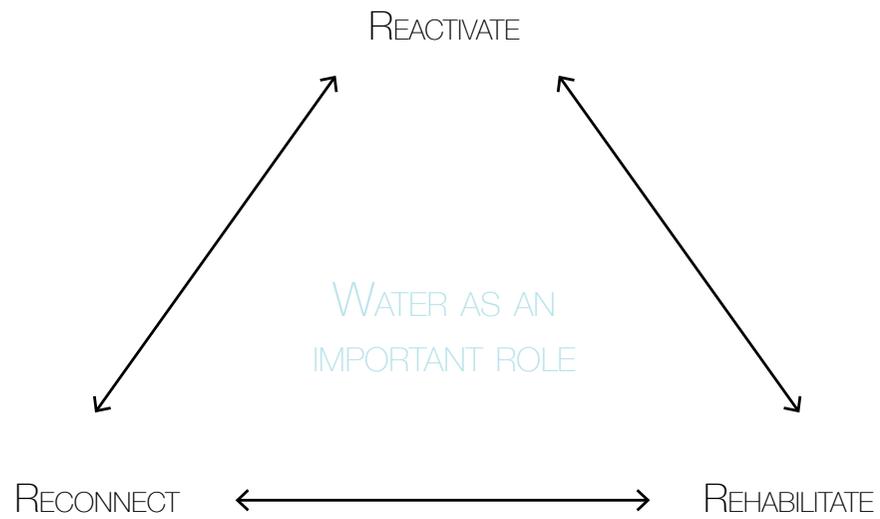


Future abandoned area of post industrial spaces due to moving economy to the west of Rotterdam

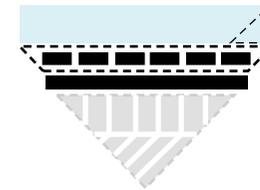


Reactivate
Multi-functional clusters for private and public life stimulating the regeneration of Tarwewijk.

STRATEGIC FRAMEWORK



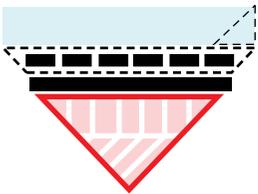
START
Existing situation



DESIGN



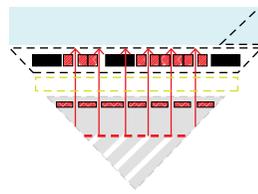
PHASE 1
Compact neighborhood



REHABILITATION



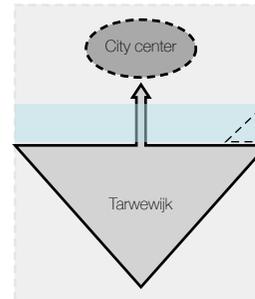
PHASE 2
Accessible Waterfront



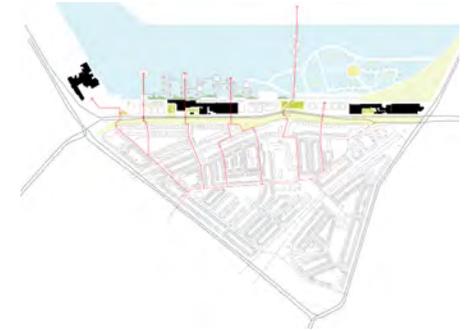
RECONNECT



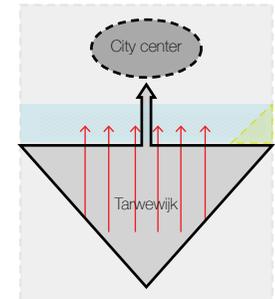
PHASE 3
Integrated neighborhood



REACTIVATE



PHASE 4
Activated river



PHASE 1 COMPACT NEIGHBORHOOD



PHASE 1
Compact neighborhood

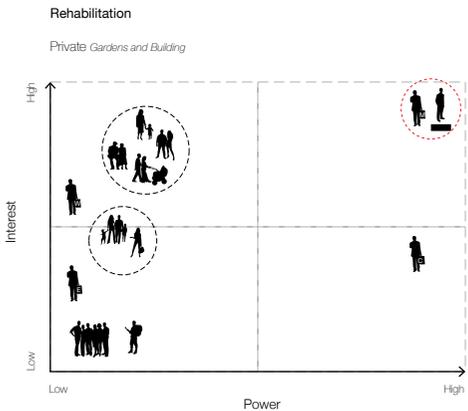
STRATEGY 1: REHABILITATION THROUGH WATER SENSITIVE DESIGN



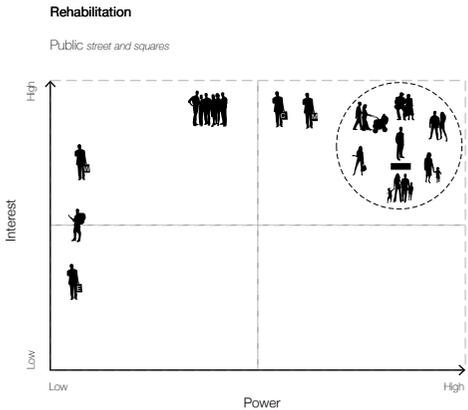
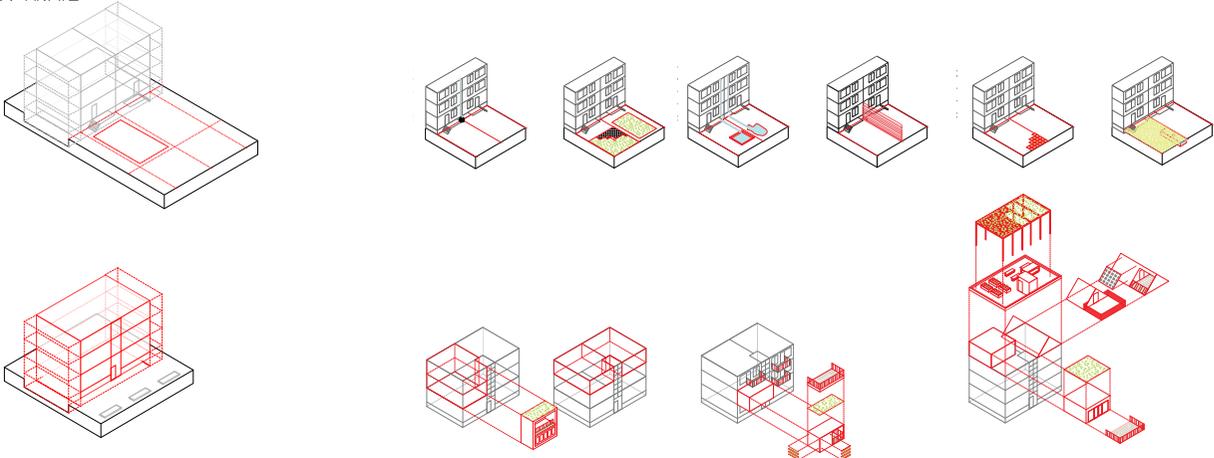
Map of interventions in the rehabilitation process

Source: By author

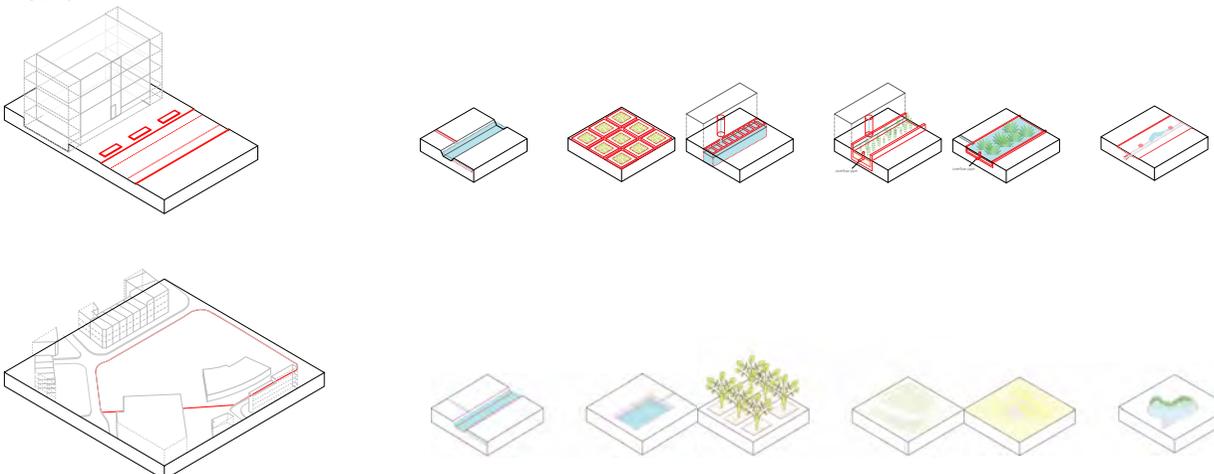
TOOLS



A PRIVATE



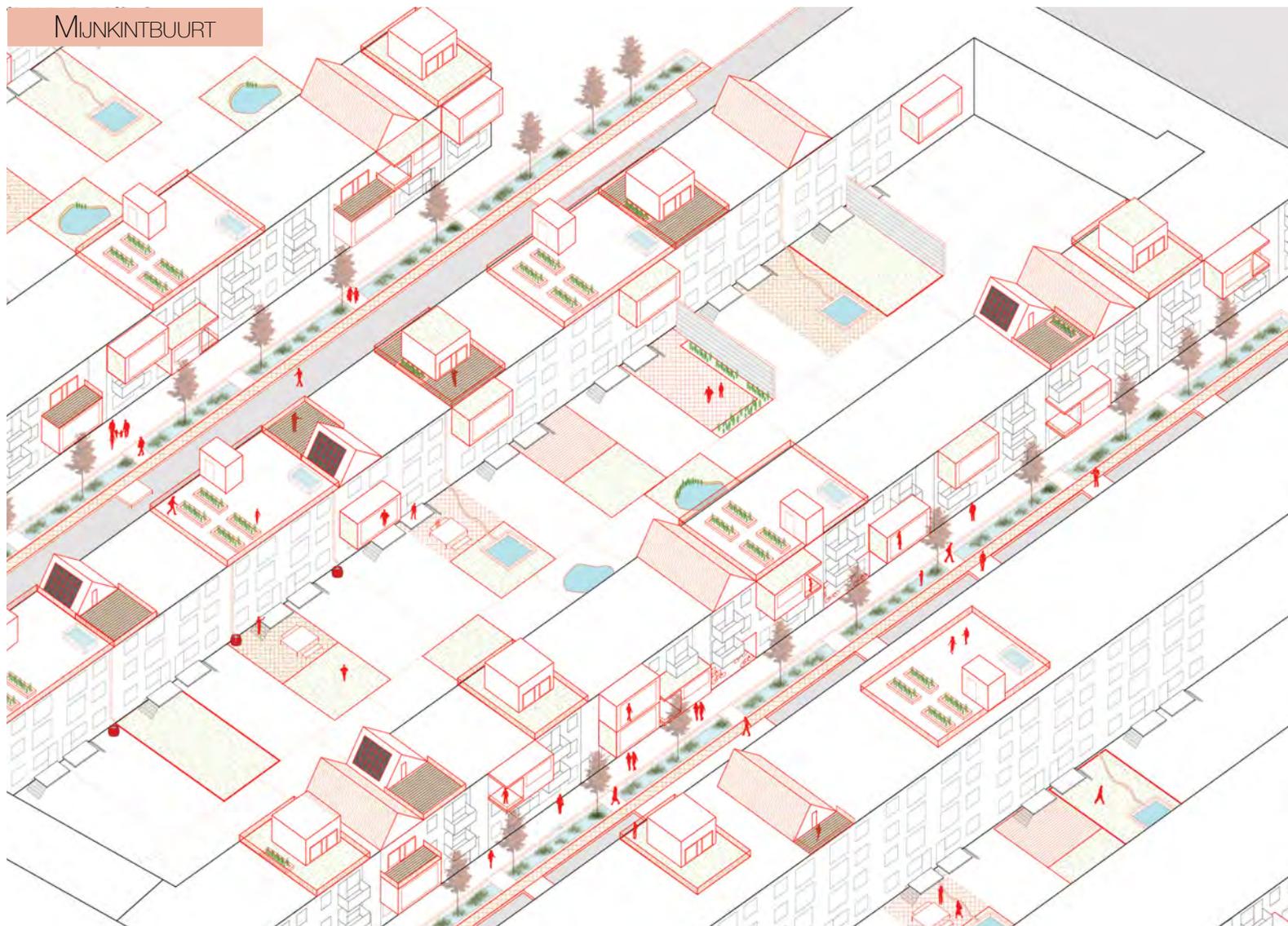
B PUBLIC



Overview of the uses tools in the rehabilitation process.

Source: By author

A PRIVATE



INFLUENCE OF WATER INTERVENTIONS ON CLIMATE CHANGE

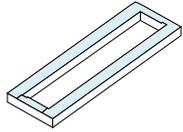
	ATTENUATION	INFILTRATION	STORAGE	HARVESTING	TRANSPORT	COST
Private green gardens	++	+	0	0	0	€
Facade gardens	++	++	0	0	+	€
Green shores and riverbanks	++	++	0	0	0	€€
Rainwater retention ponds	++	0	++	+	0	€€
Parks	+	+++	0	0	0	€
Reliéf	+	++	+	0	0	€
Infiltration strips with above ground storage	+	+++	++	0	0	€
Rain barrel	0	0	+	+	0	€
Rain water tank	0	0	+++	+++	0	€
Rain water fence	0	0	++	++	0	€
Gutters	0	0	0	+	+++	€€€
Underground rainwater storage	0	0	+++	+++	0	€€€
Urban agriculture	++	++	0	0	0	€
Permeable pavement	+	++	0	0	0	€
Water squares	+	0	+++	++	0	€€€
Green roofs	+++	+++	0	0	0	€€
Water roofs	++	0	+++	+++	0	€€
Green facade	++	++	+	+	0	€€

Legend:

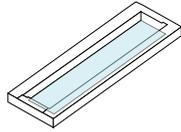
- + Minor effect € low cost to cost neutral
- ++ Substantial effect €€ Additional cost
- +++ Large effect €€€ High cost

Overview of blue green measures used in this research

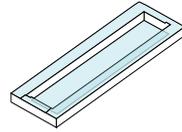
CONTRIBUTION TO CLIMATE CHANGE



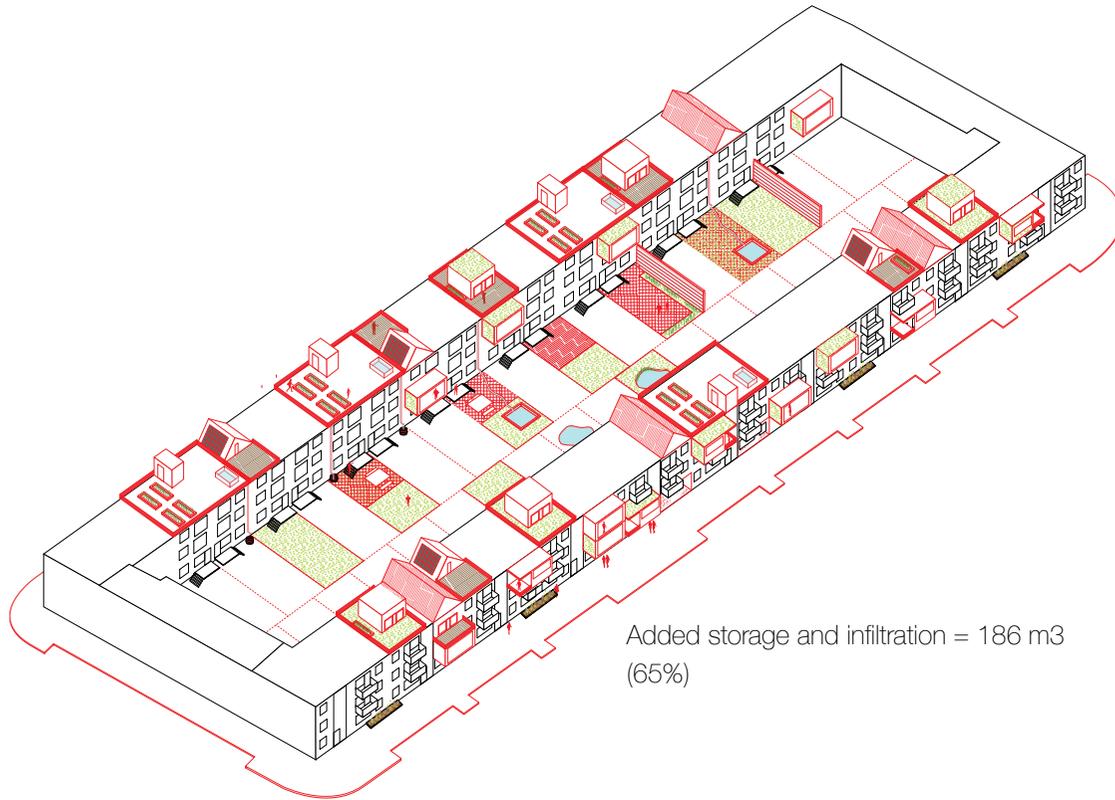
ROOF: $4280 \times 0,05 = 214 \text{ m}^3$



GARDEN: $1180 \times 0,05 = 59 \text{ m}^3$



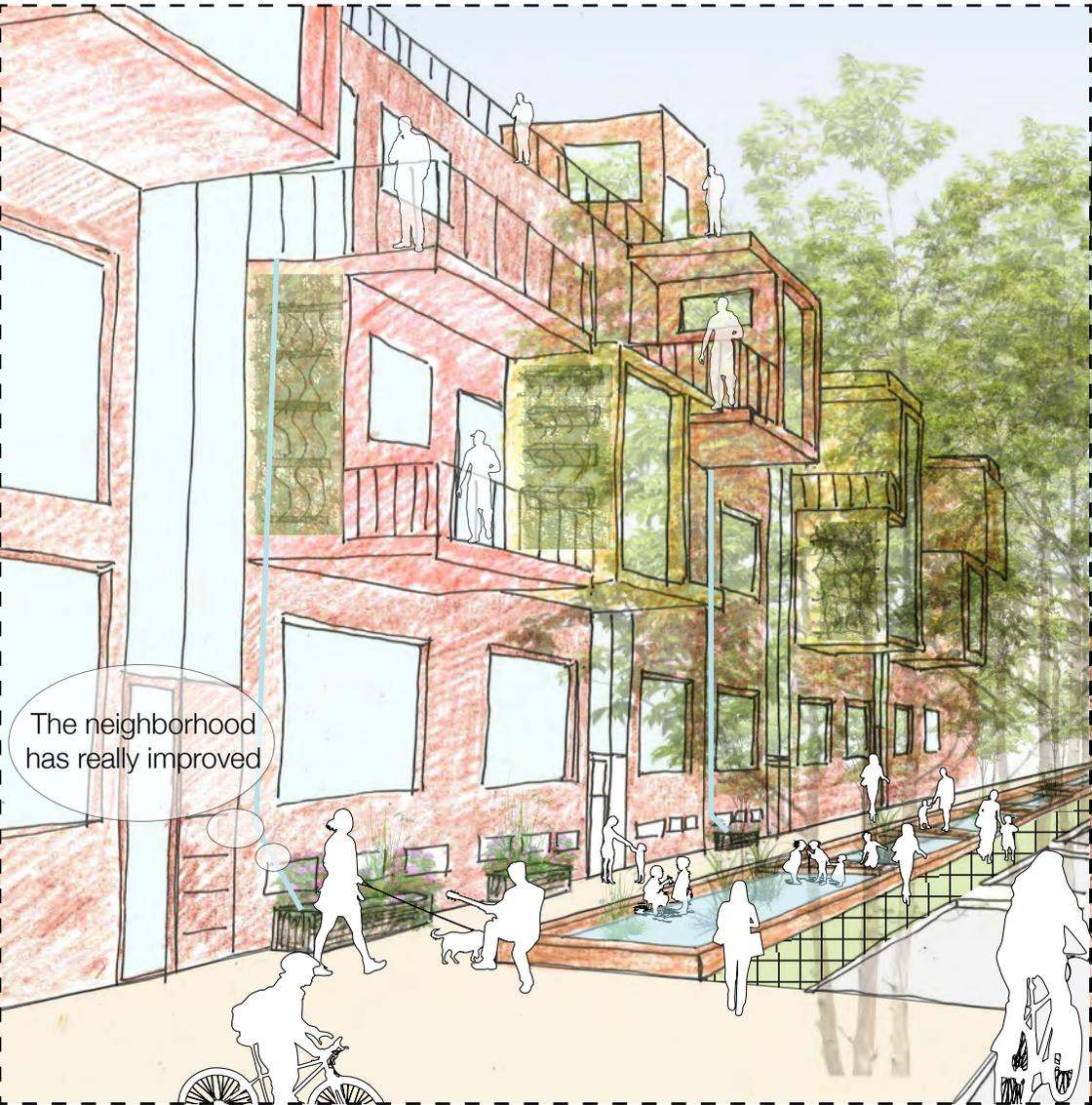
TOTAL = $214 + 59 = 283 \text{ m}^3$



Added storage and infiltration = 186 m^3
(65%)

TOOL	TOTAL
Green roofs	47,85 m ³
	17,6 m ³
	27,5 m ³
Roof agriculture	2,16 m ³
	21,6 m ³
Water tank	2,88 m ³
	2,16
Gardens with underground infiltration crates	0,72 m ³
	0,36 m ³
Permeable pavement	27 m ³
	24 m ³
Ponds	5,4 m ³
	0,45 m ³
Rainwater fence	6,4 m ³
	
Rain Barrel	
	
Facade garden	
	
Total	186,08 m ³

SCENES ON STREET LEVEL



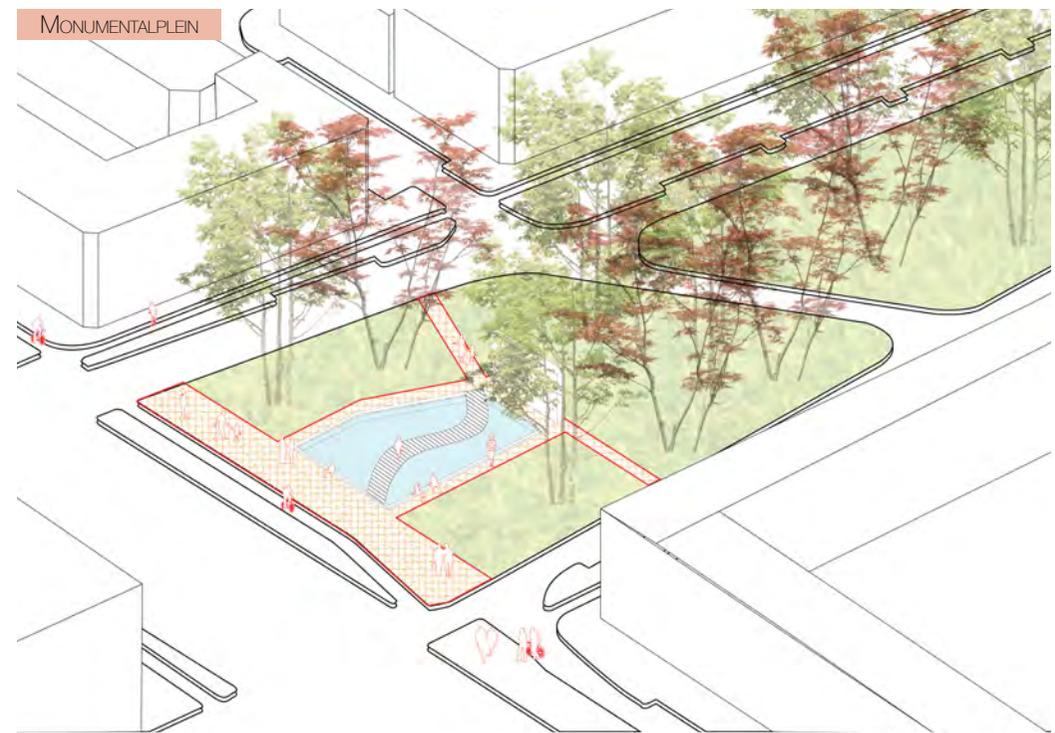
The neighborhood has really improved



Seems like these extension create more space, but look expensive.

Did, you know the municipality provides subsidies for people with a low income?

B PUBLIC



PHASE 2 ACCESSIBLE WATERFRONT

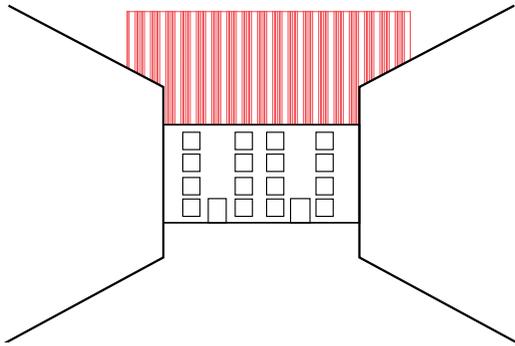


STRATEGY 2: RECONNECT TO MAIN WATER BODY OF ROTTERDAM



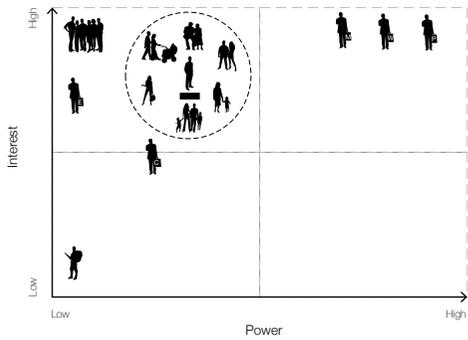
TOOLS

A ATTRACTING BY MONUMENTAL EYE CATCHER

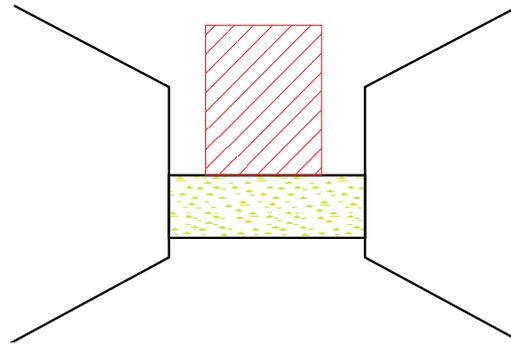


Reconnect

By Attracting as Monumental eyecatchers

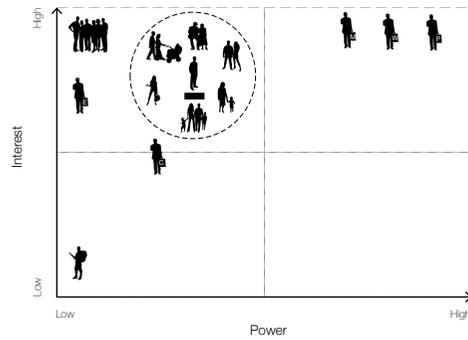


B ATTRACTING AS ARCHITECTURAL EYE CATCHER

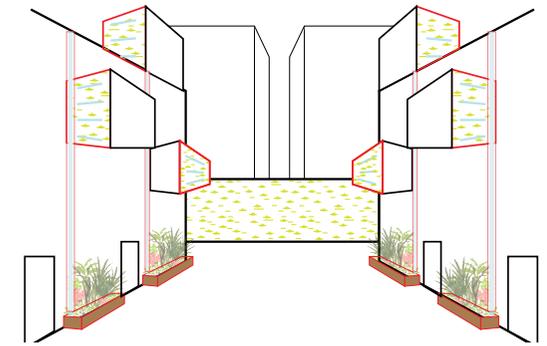


Reconnect

By Attracting as Architectural eyecatchers

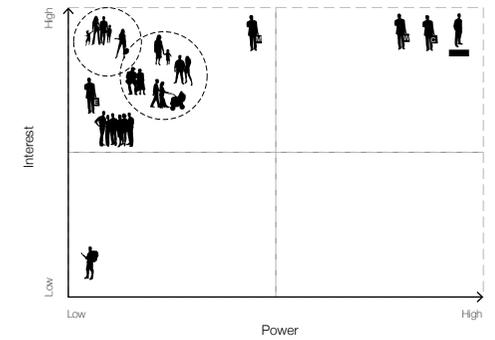


C THROUGH PRIVATE DEVELOPMENT AS BLEU-GREEN INFRASTRUCTURE.



Reconnect

Through Private developments as green-blue infrastructure



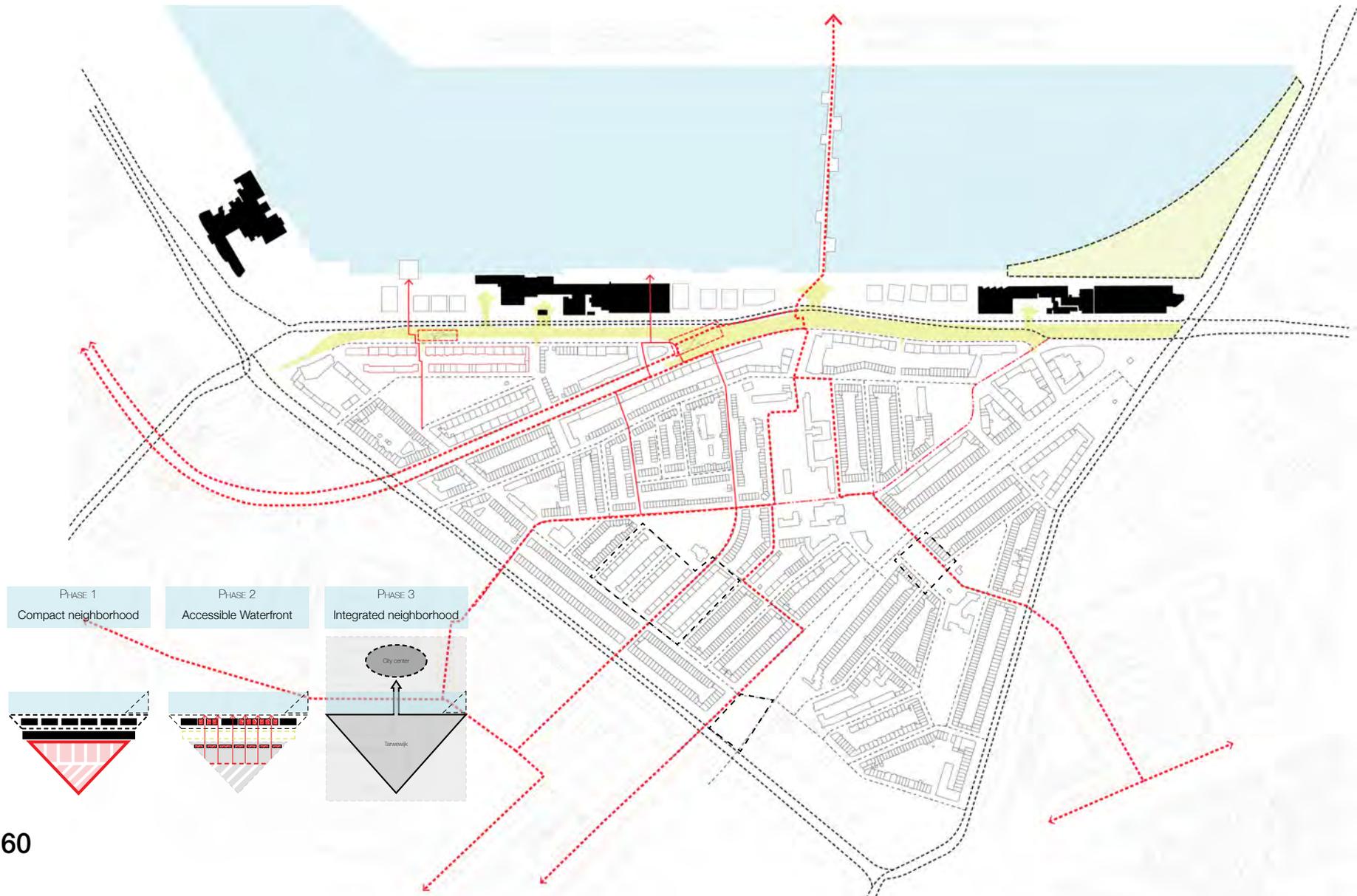
A + B ATTRACTING BY EYE CATCHER



C ATTRACTING THROUGH PRIVATE DEVELOPMENT



PHASE 3 INTEGRATED NEIGHBORHOOD







A new shorter route to the city centre through Katendrecht

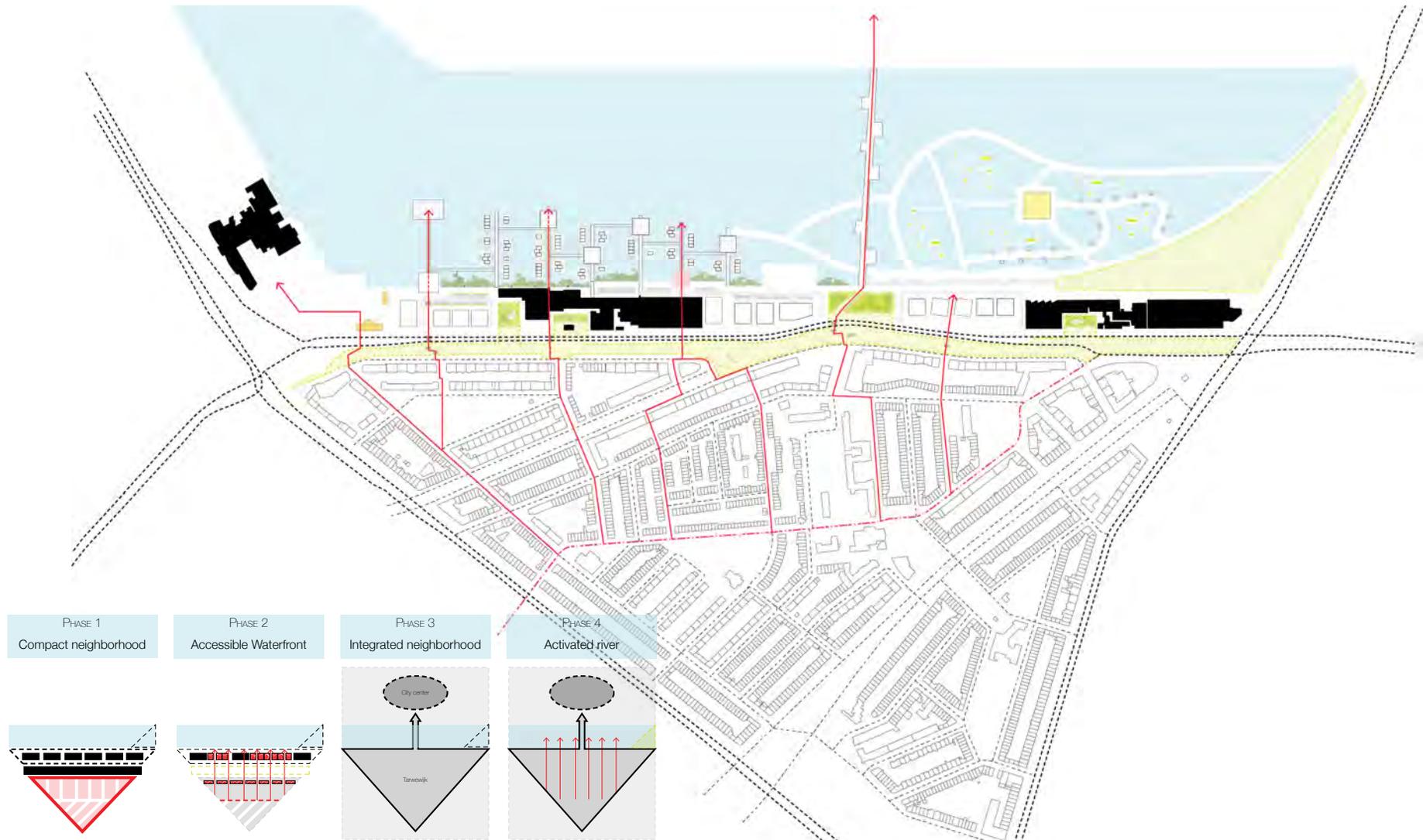




There's a new function in the former factory building..

FOOD HALL

PHASE 4 ACTIVATED RIVER LIFE



STRATEGY 3: *REACTIVATE PROGRAMMATIC USE ON AND AT THE WATER*

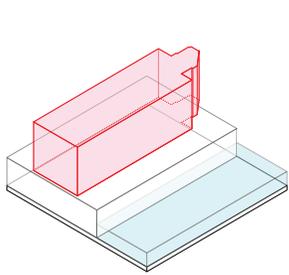


TOOLS

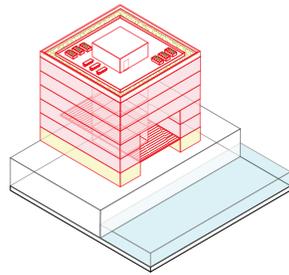
A SHORE DEVELOPMENT

B LAND/WATER TRANSITION

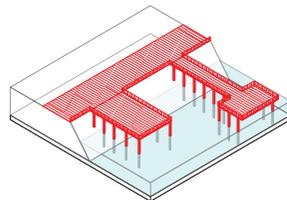
C DEVELOPMENT ON WATER



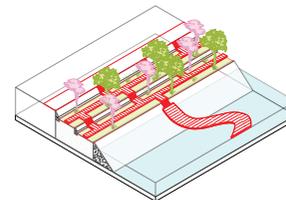
Monumental reuse



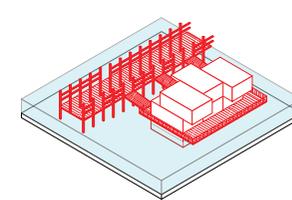
Mixed development



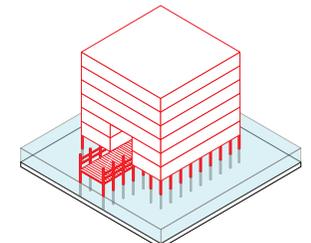
Pier viewpoint



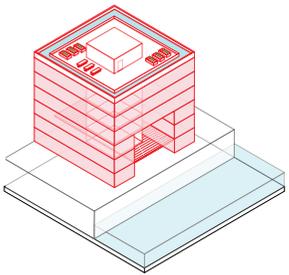
Tidal park



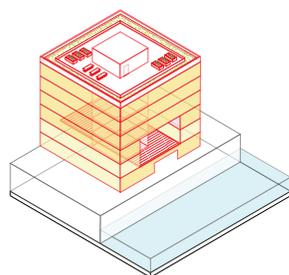
Floating houses



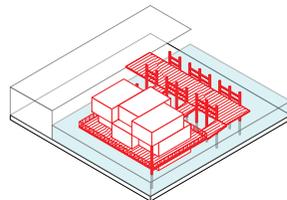
Pier construction



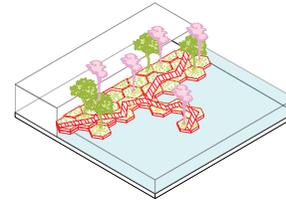
Collective housing



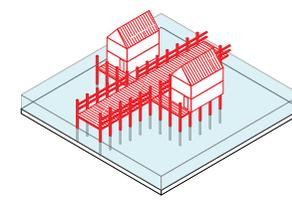
Public facilities.



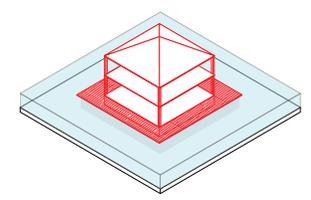
Floating houses



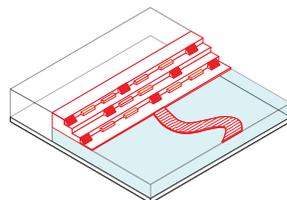
Floating landscape



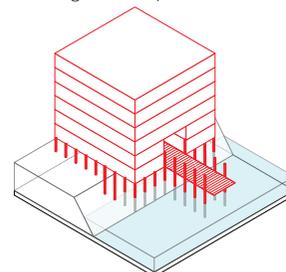
Pier housing



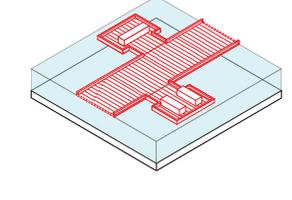
Floating Markethall



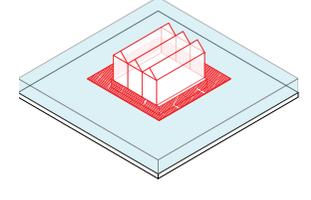
Floating stairs



Half pier construction



Floating market



Green house farming



The prices are very reasonable and not that expensive







Markethall



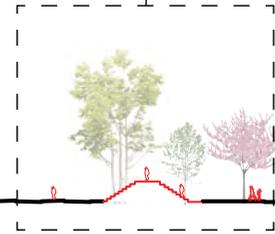
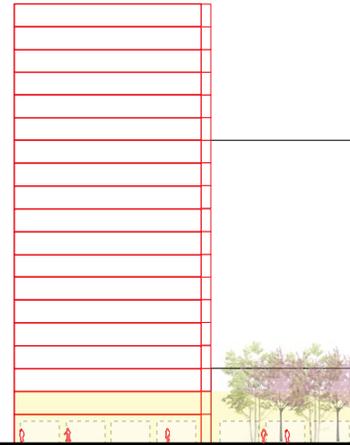
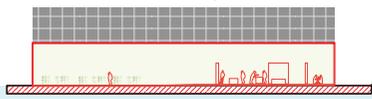
Urban farming on water



Floating stairs



Soft landscape in de dike



Pier construction



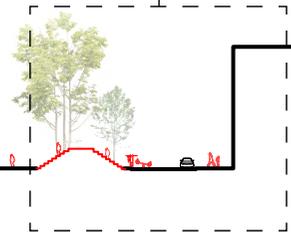
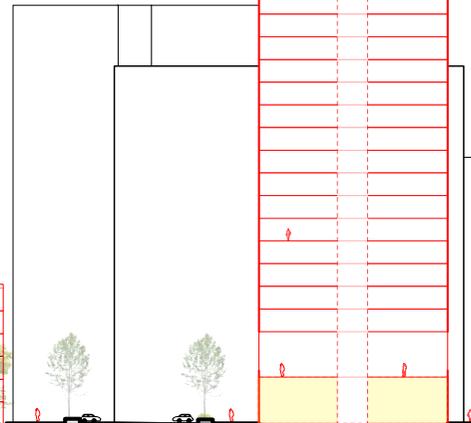
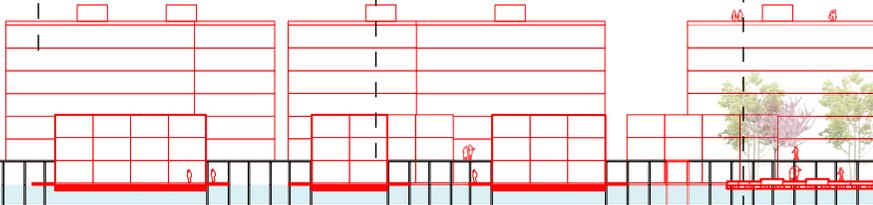
Floating dwelling

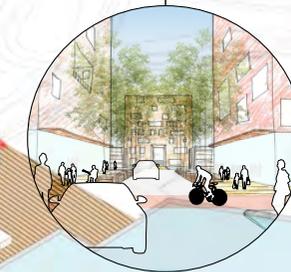
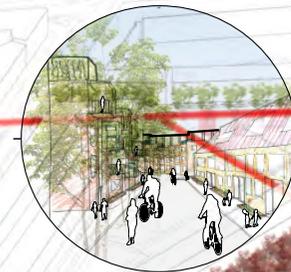


Floating green



Playground in the dike





Collective housing

Vocational center

Green landscape on roof

Green roofs

Floating and pier dwellings

Public functions

Water roofs

Collective housing

Commercial functions

Pedestrian and Biking bridge

Green house



PLANNING

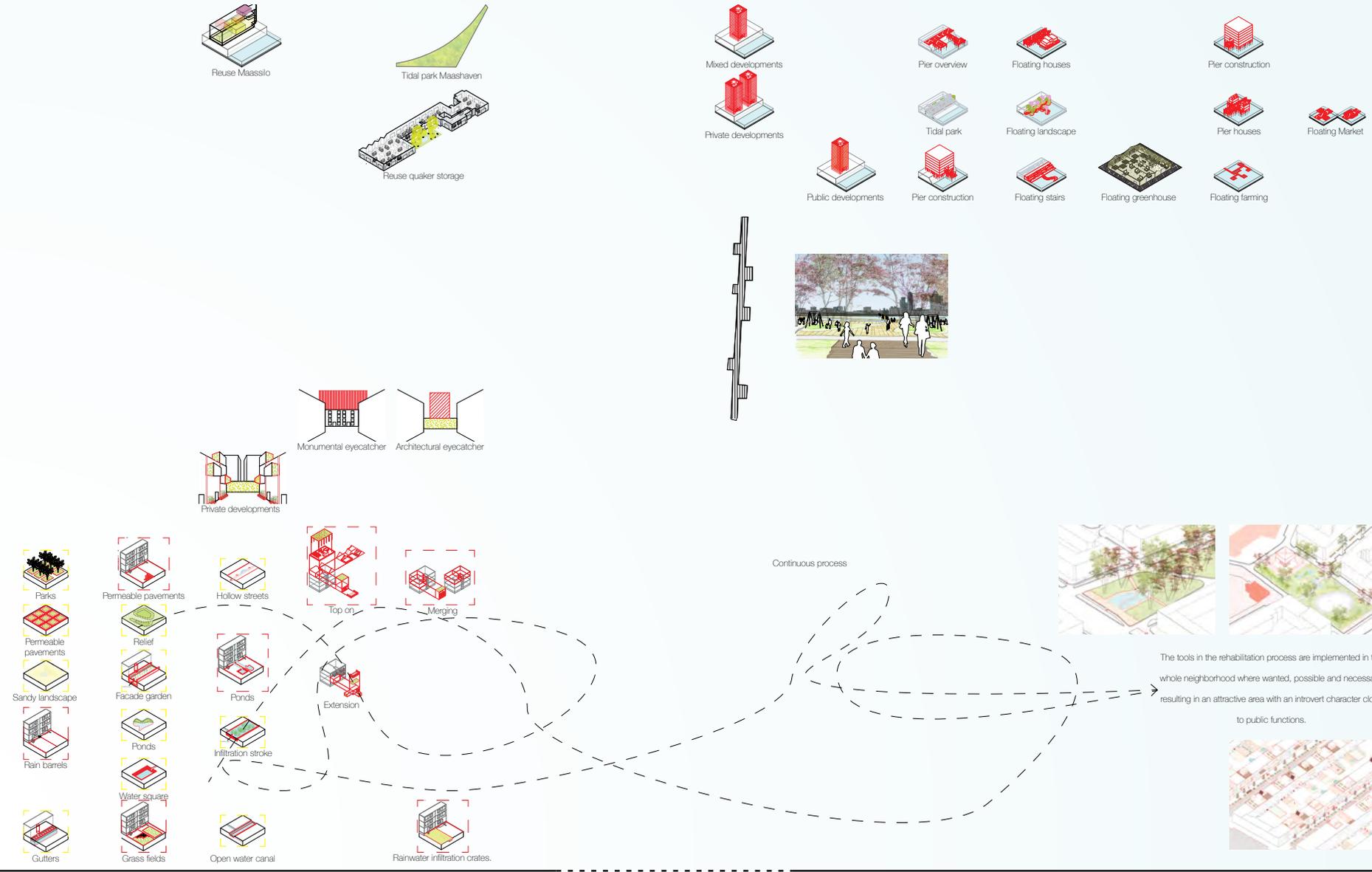
Phase 4: Activated River life

Phase 3: Integrated neighborhood

Phase 2: Accessible Waterfront

Phase 1: Compact neighborhood

First 1-2 year is reserved to introduce different tools and adjustment where necessary



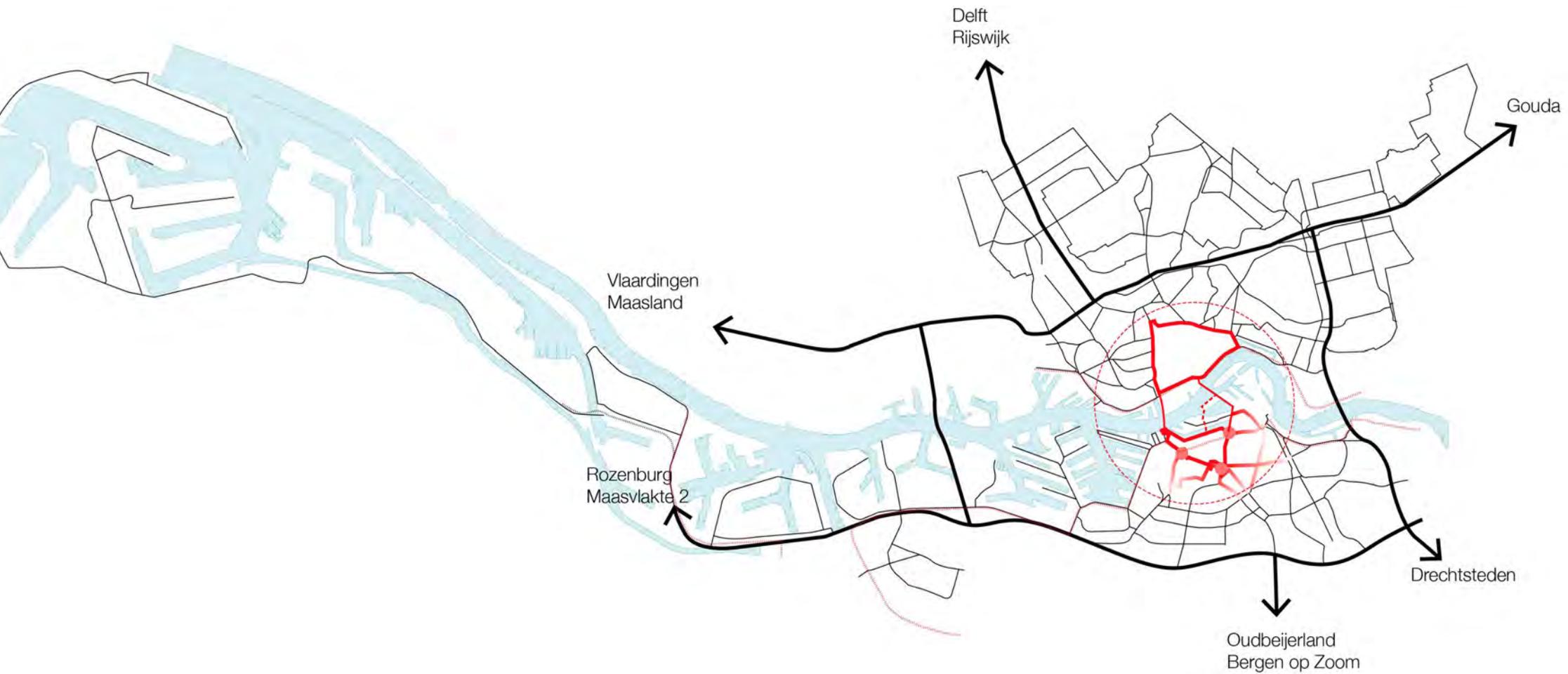
2020

Public tools
Private tools

The tools in the rehabilitation process are implemented in the whole neighborhood where wanted, possible and necessary, resulting in an attractive area with an introvert character close to public functions.

2040

IMPACT ON ROTTERDAM AS A WHOLE CITY



CONCLUSIONS

Water as a connector

Water plays the main role as a connector by connecting on different levels in the proposed integrated design which create a coherency between waterfront redevelopment and urban revitalization.

Merger of interest

The proposed integrated design aims to have a merger of interest between different stakeholders and to empower top-down and bottom up approach.

Compact neighborhood

Tarwewijk wil remain introvert and private for its residents inside the neighborhood but open for public involvement at the edges.

From segregation to integration

The inter-scalar design interventions integrates Tarwewijk into the larger entity of Rotterdam by adding a new layer of mobility and reclaiming back the water edge.

Reflection on Rotterdam

The inter-scalar design intervention on different levels show the asset and value of water which makes current structures adaptable and therefore also contribute to a qualitative and attractive living environment within the city Rotterdam.

THANK YOU