The Archipelago of Knowledge is a new spatial strategy for the Port of Rotterdam, the Netherlands, that aims to reconsider the relationship between harbor and city. Through the redefinition of areas within the port, our proposal aims to create a series of artificial islands by digging new canals, multiplying waterfronts and subsequently enabling the formation of a continuous, 100% public accessible, waterfront. The urban and ecological potential embedded in the direct relationship between city and water, is re-established and enhanced, benefitting both citizens and the maritime clusters. The new linear waterfront finally brings water back to the city – a city that often lacks a direct relationship with its largest water body, the Maas River, despite its close proximity and historical and cultural significance.

The waterfront can become a shared space where the interests and needs of various stakeholders are confronted and negotiated, in order to find points of intersection and mutual interest that can be reflected in the new spatial configuration. In our vision, this port area becomes an archipelago, where new islands are spatially defined areas where economic and planning scenarios can unfold through time. Although their shape is fixed, their program, be it maritime, commercial, residential or recreational, can adaptively occupy the space according to future economic trends, political and logistic decision making processes, ensuring a new beneficial relationship between port and city. Port expansion has always implied dramatic transformations of the river landscape, of geographic proportions. As a matter of fact, the port has expanded and transformed through time, occupying more and more surface and reducing the public accessibility to the river. The time has come, now, with changing conditions of the port economy, to re-orient land transformations to the advantage of the city, people and biodiversity.
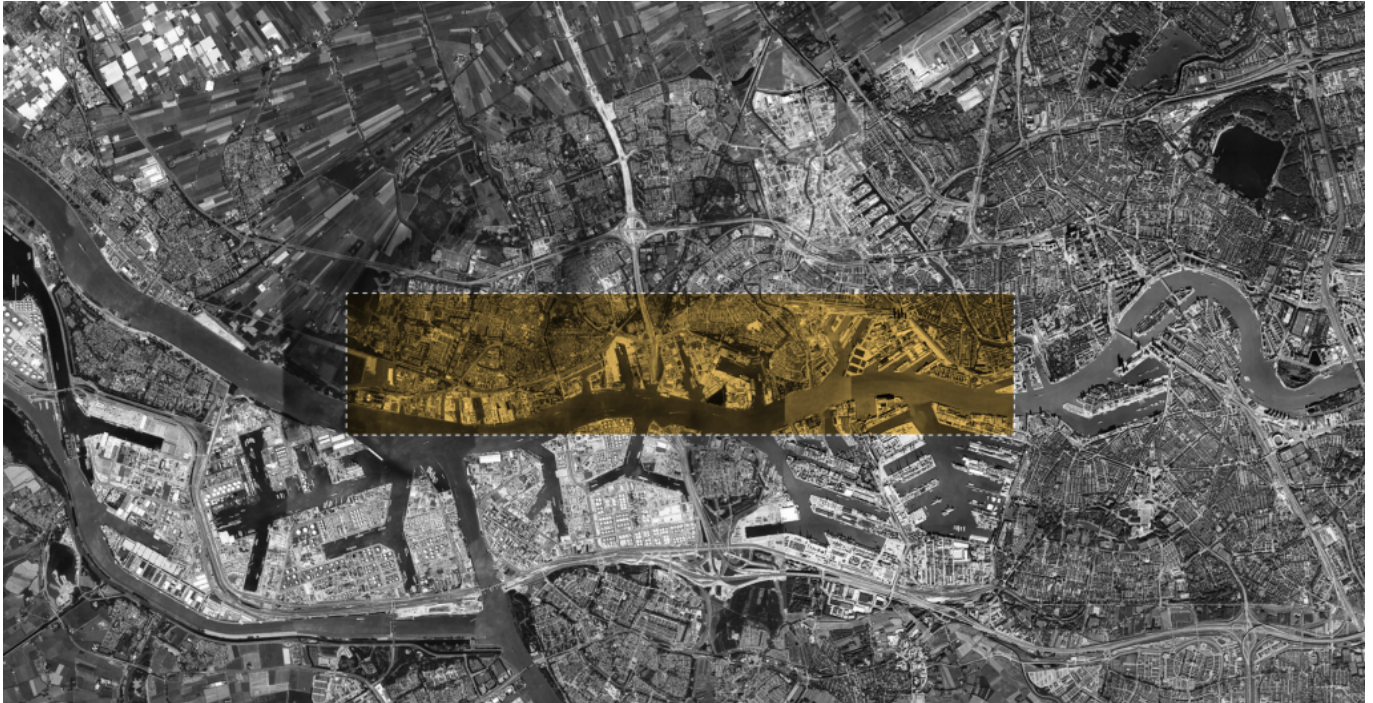
Area of the Spatial Strategy. (© Openfabric in collaboration with KartonKraft, Mauro Parravicini, Noha, Move Mobility).

Focus area | a condition rather than a location

The settlement patterns on the North and South bank of the Maas River are uniquely distinct. On the South bank of the Maas, the municipalities can be described as islands, largely isolated from each other and surrounded by industrial land-use. The North bank of the Maas, our study area, is defined by a more continuous urban pattern, where municipalities are well connected on a local and regional scale by more efficient transportation systems. This area is characterized by co-existence of industrial with a continuous urban fabric, a robust water system and a higher degree of public accessibility to water.
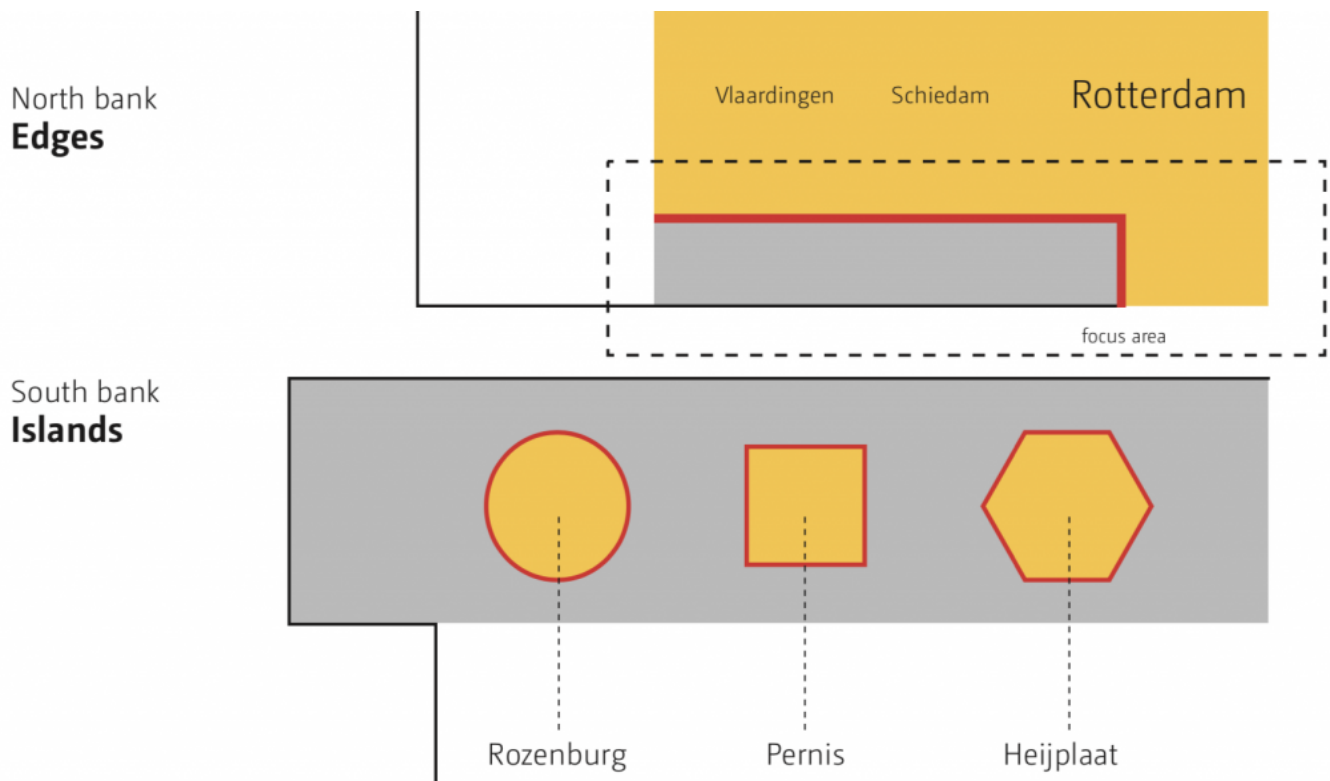
Diagram of diverse conditions between North and South bank of the Maas River. (© Openfabric in collaboration with KartonKraft, Mauro Parravicini, Noha, Move Mobility).

A Case | learning from Unilever

Studying existing cases of major spatial transformation within our study area, is important for understanding the dynamics of specific entities and how their past, present, and future operations and decisions relate to the attractiveness (or lack thereof) for the port of Rotterdam.

A relevant example is the company Unilever that has left the port area, perceived as industrial and disconnected. It has recently partnered with Wageningen University to relocate its global Foods Innovation Centre It has recently partnered with Wageningen University to relocate its global Foods Innovation Centre to the Wageningen in favor of the rich scientific environment of the campus and an area that is often referred as "Food Valley".

This decision raises several questions and serves to understand relations between a specific

multinational company and the port, more in depth. Unilever left the port area, perceived as industrial and disconnected, in favor of the rich scientific environment of the campus. While the benefits from the newly-established proximity to the university are many, the benefits of its former connection to the port infrastructure and its unique identity, are lost.

Former Unilever HD, Vlaardigen. (Photo: © JGF|ph. Jacopo Gennari Feslikenian).

Goal | new and diversified employment opportunities

The departure of Unilever seems to align with a study on economic scenarios for the so-called maritime clusters in South Holland with a perspective of 2045 [2] that project a dramatic loss in terms of employment (as well as a general growth in various sectors in terms of added value). Responding to those scenarios, our vision "*Archipelago of Knowledge. A diffuse campus*" is a strategy that aims to generate employment opportunities by creating a spatial framework for a diversified and knowledge-oriented environment, linking the city with its port.

Economic scenarios for the Maritime Clusters 2045 show a general **growth** in various sectors in terms of added value. On the other hand, they show a dramatic **loss** in terms of employment.

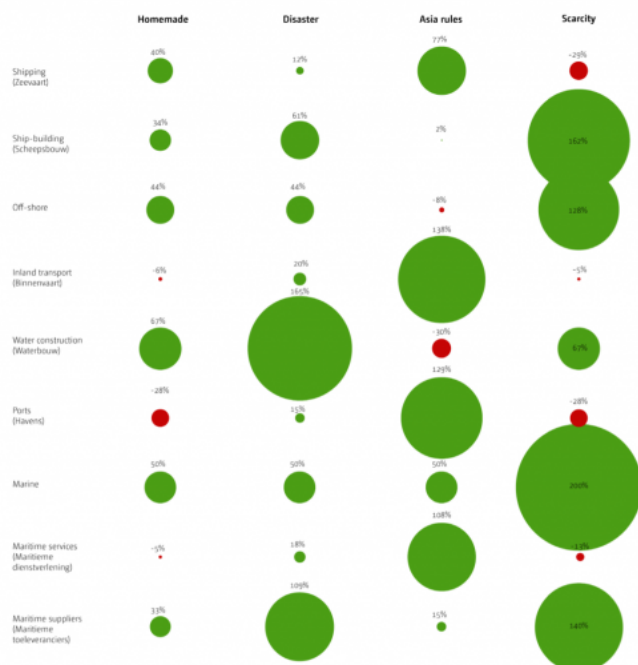**Added Value**

Decreased Employment

Archipelago of Knowledge is a strategy that aims to generate employment opportunities by creating a spatial framework for a **diversified and knowledge-oriented** environment, linking the city with its port.
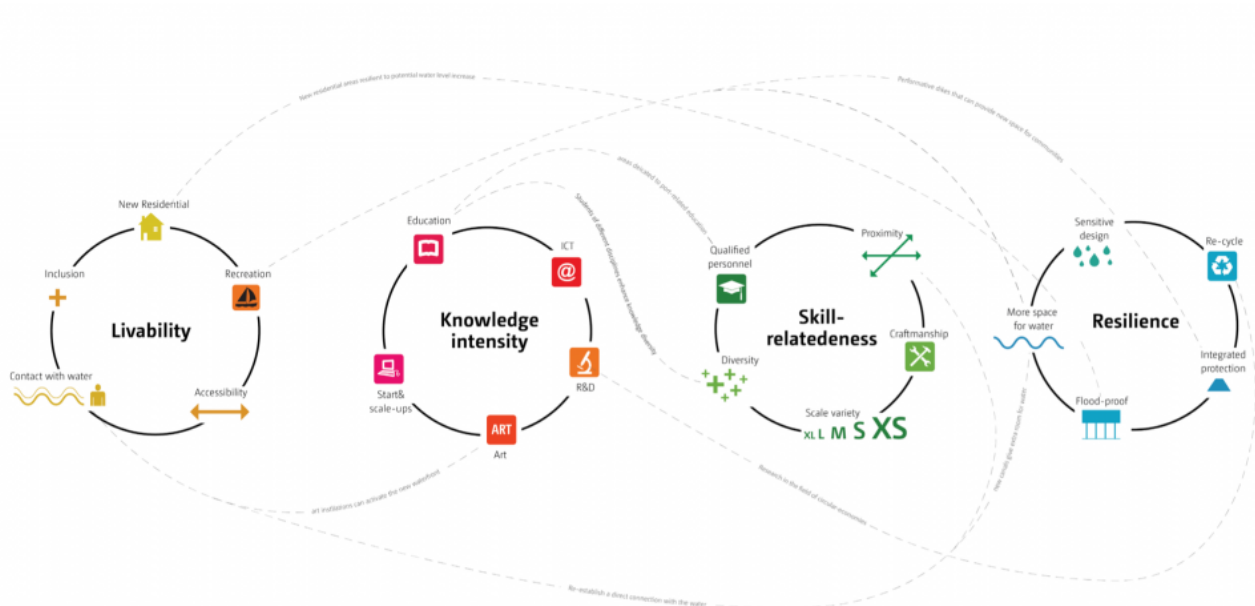
Diversify Employment

Added value 2045 | Groot Rijnmond


Employment 2045 | Groot Rijnmond

Archipelago of Knowledge goals (top figure). Maritime clusters 4 Scenarios (center figure). Principles about people, knowledge and environment (bottom figure). (© Openfabric in collaboration with KartonKraft Mauro Parravicini, Noha, Move Mobility).

Path dependency | about time and decisions

Such a proposal engages with recent discussions in the field of port city research related to path dependencies and ways to initiative new path ways in order to define a new, stronger, spatial relation.

"Diverging interests of both the city government, Port Authority, and the regional and national governments lead to the emergence of two independent spaces (port and city) governed by separate sets of institutions, tools, methods, laws, ideas, and even different time frames'' (Paolo de Martino) [3]. In the last few decades, though, there have been ideas and campaigns addressing the need for integration between city and port. Now, the long-lived path dependence needs to be 'broken' in order to define a new, stronger, spatial relation.
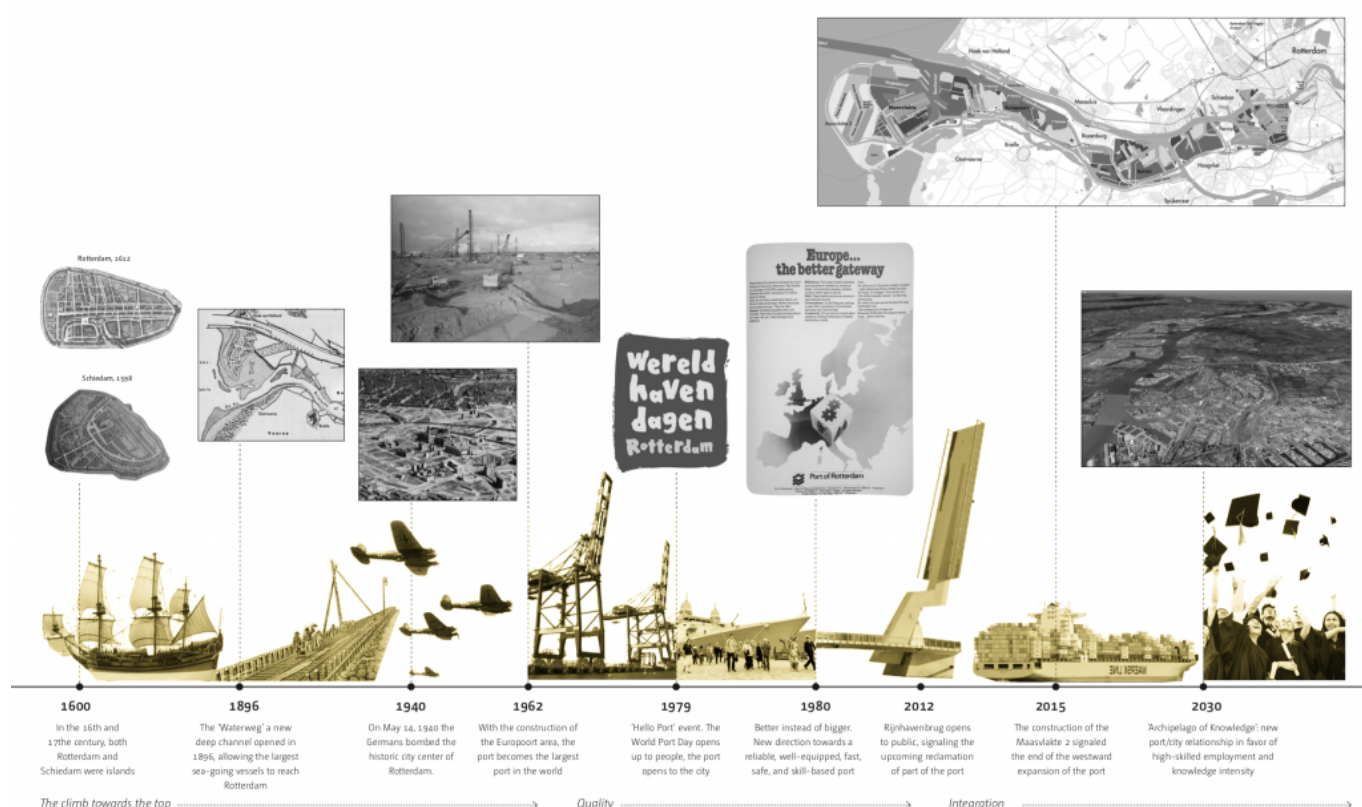
Port of Rotterdam Timeline. (© Openfabric in collaboration with KartonKraft, Mauro Parravicini, Noha, Move Mobility).

A dynamic past

Port expansion has always implied dramatic transformations of the river landscape. The port has expanded and transformed through time, occupying more and more surface. The time has come, now, with changing conditions of the port economy, to re-orient land transformations to the advantage of the city and its people.
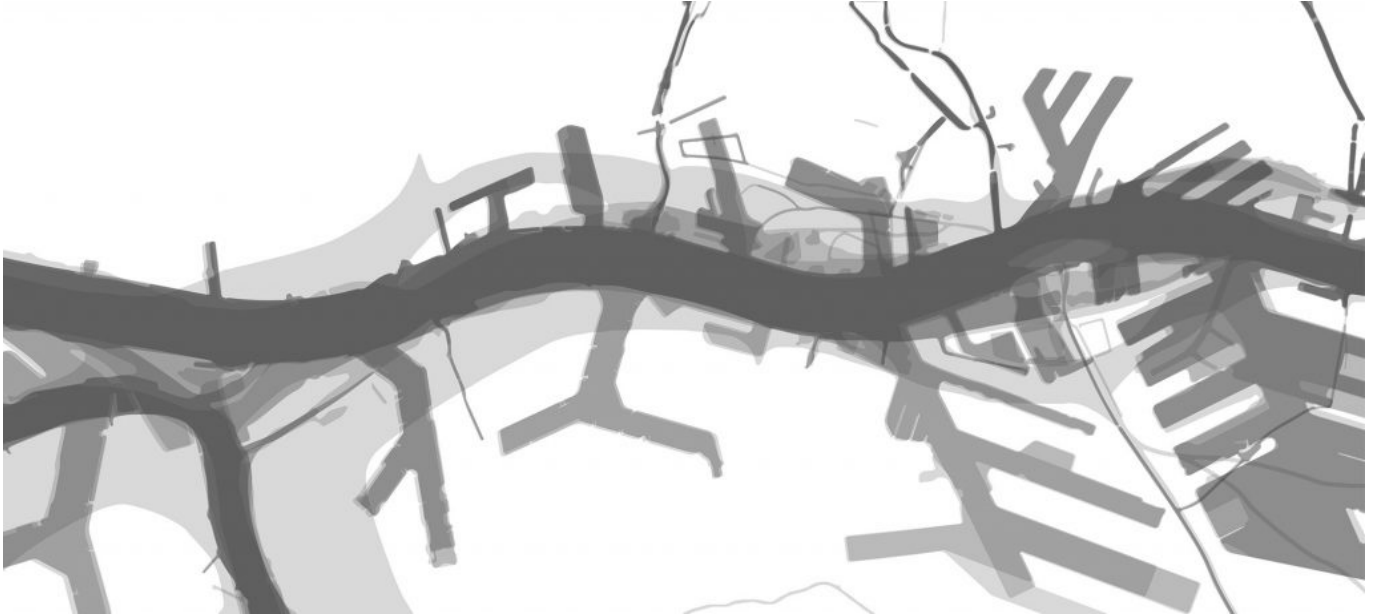
A dynamic paste, River Maas from 19th century to today. (© Openfabric in collaboration with KartonKraft, Mauro Parravicini, Noha, Move Mobility).

Fragmentation | lack of integration

The municipalities of Rotterdam, Schiedam, and Vlaardingen, despite being generally well connected in terms of urban fabric and transportation networks, each have distinct plans and approaches that drive the future developments of their waterfront. These plans can be considered 'balconies' to the Maas; they are independent, creating a fragmented edge.
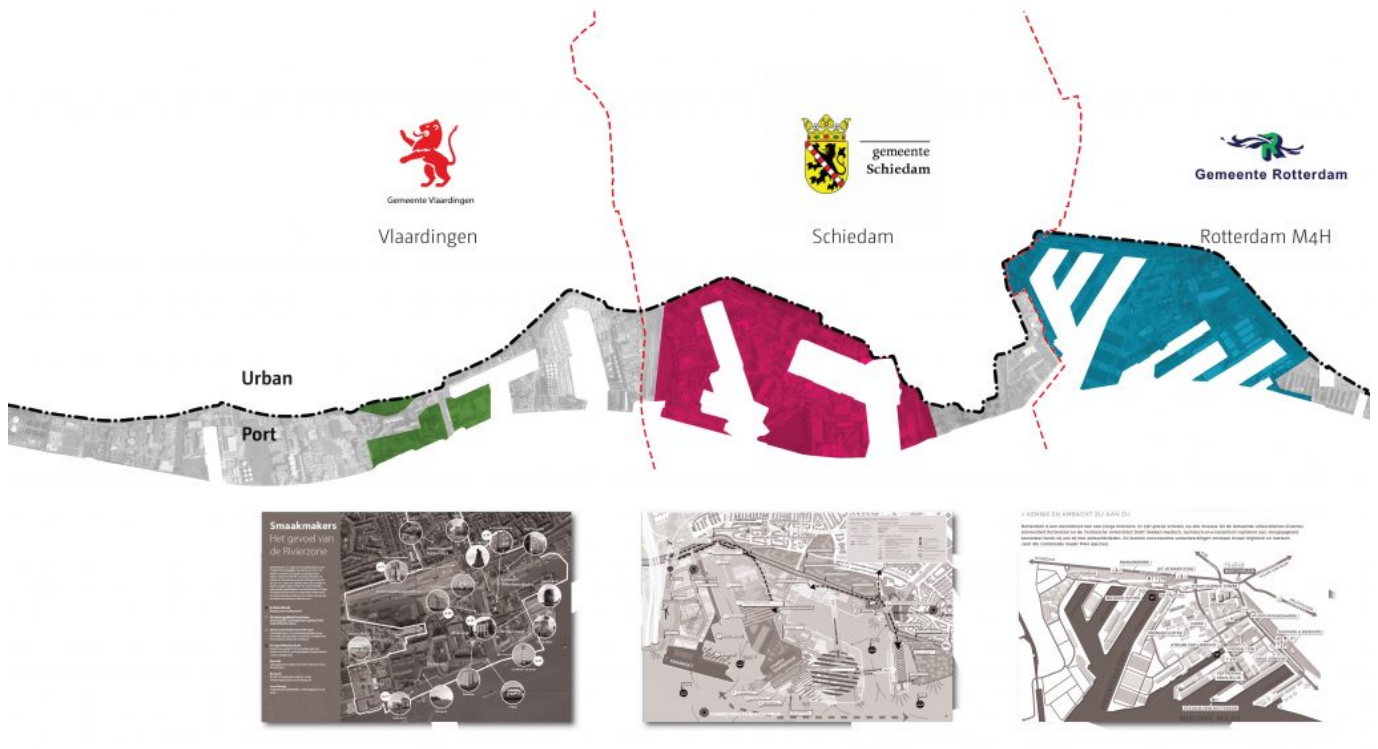
Administrative boundaries in the study area. (© Openfabric in collaboration with KartonKraft, Mauro Parravicini, Noha, Move Mobility).

Mobility

Public transportation systems create strong connectivity in the port area. On the north side of the study area, the existing railway line has been transformed in 2017 into a metro system linking Rotterdam, Schiedam and Vlaardingen. On the south side, the Maas is currently used by water-taxi and water-bus lines for public transportation on the river, and bears a great potential of being further developed.

Water accessibility in the study area. (© Openfabric in collaboration with KartonKraft, Mauro Parravicini, Noha, Move Mobility).

Access vs egregation

Access to the port is very limited and only 11% of the total water edge is reachable by the public, resulting in a segregated landscape. While several areas are incompatible with urban life and need to remain isolated from the city, many other bear the potential of retaining their productive capacity while becoming accessible to the public.

Companies | maritime vs non-maritime

The maritime clusters are spatially defined areas where partner companies are gathered. The scale of the enterprises varies dramatically: the large ones need water access, docks, and large scale infrastructures for transportation, manufacturing, processing, storage, and security, while the small ones do not. Currently maritime and non- maritime companies are interspersed, with smaller companies isolated from the urban fabric.
A great potential exists for spatial reorganization to optimize relationships between the

companies, the waterfront, and the city.
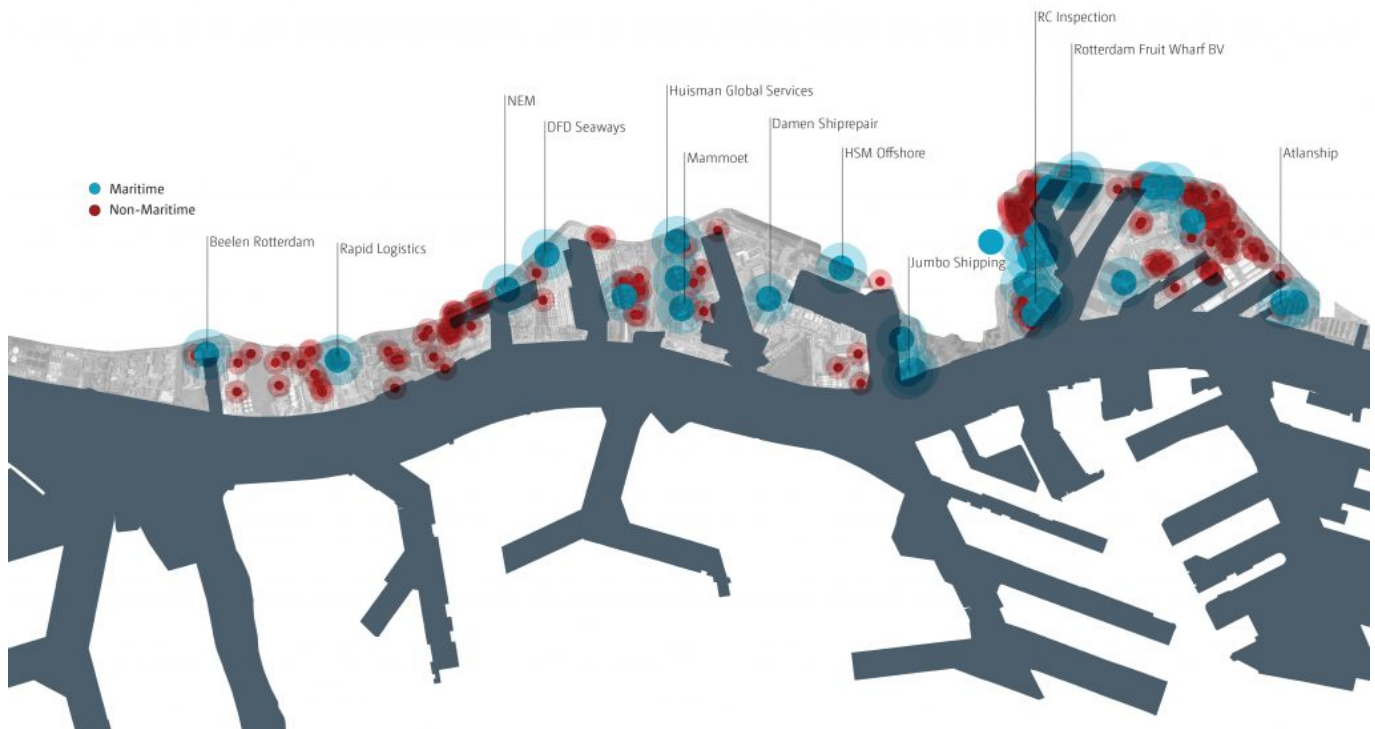
Maritime and Non-Maritime companies in the study area. (© Openfabric in collaboration with KartonKraft, Mauro Parravicini, Noha, Move Mobility).

Archipelago of Knowledge | new port-city relationship

"*Archipelago of Knowledge. A diffuse Campus*" is a new spatial configuration that reconsiders the relation between port and city. In a speculative fashion, our vision proposes to create an archipelago of commercially active areas -islands-, resulting in the formation of a continuous, 100% accessible waterfront. The quality embedded in the direct relationship between city and the water is re-establish and enhanced, for the benefit of the citizens and the maritime cluster.
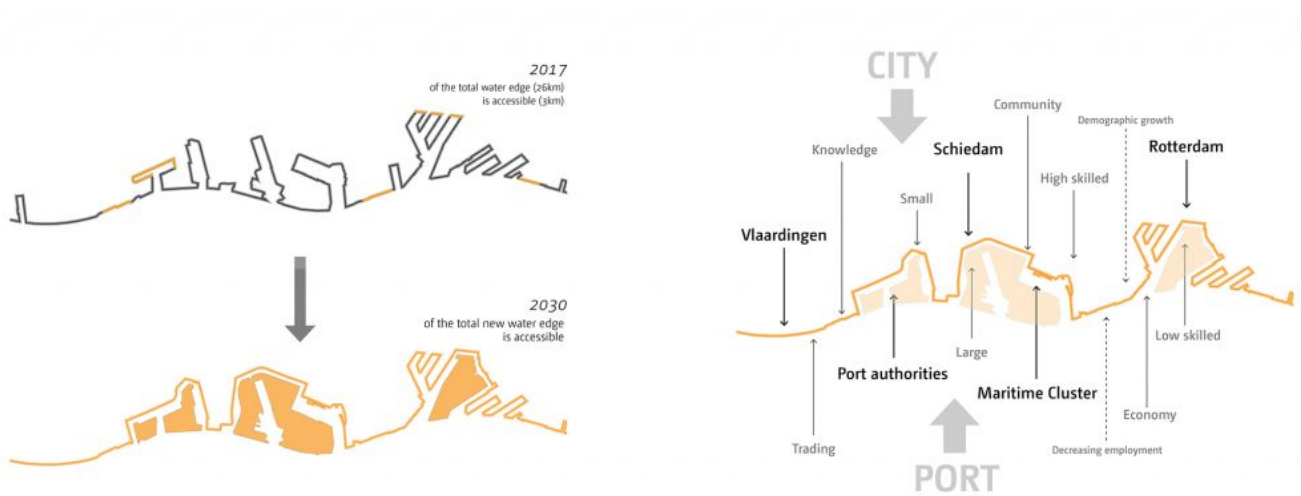
*Archipelago of Knowledge concept. (© Openfabric in collaboration with KartonKraft, Mauro Parravicini, Noha, Move Mobility).*

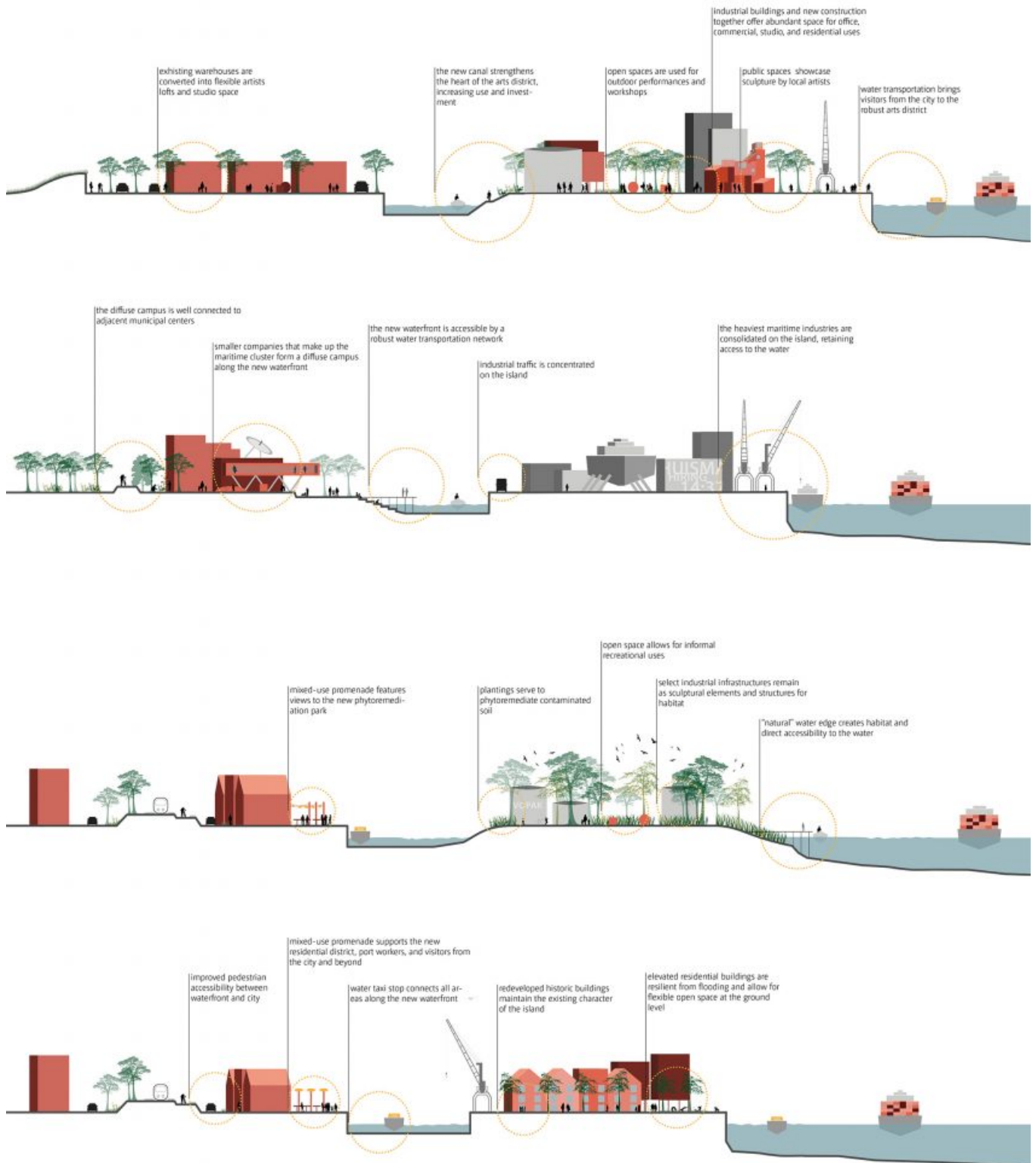## Waterfront | a shared space for negotiation

A new unfolded linear space, a continuous waterfront, is envisioned for the area. The new system can finally bring back water to the city that, although in close proximity to water, often lacks a direct relationship with its largest water body, the Maas River. The waterfront is a system that goes beyond administrative boundaries and fragmentation, but rather unifies the ongoing efforts of port revitalization into one, coherent urban vision. The strategy itself, before its implementation, can be seen as the tool to bring all the different actors together at the same table; actors from the city, the maritime cluster, and the port.

Islands | spaces resilient to different economic scenarios

The islands are spatially defined areas where scenarios can unfold over time. Although their shape is fixed, in order to assure a new beneficial relationship between port and city, their program – be it maritime, commercial, residential or recreational – can occupy the space according to future economic trends, needs and decisions.
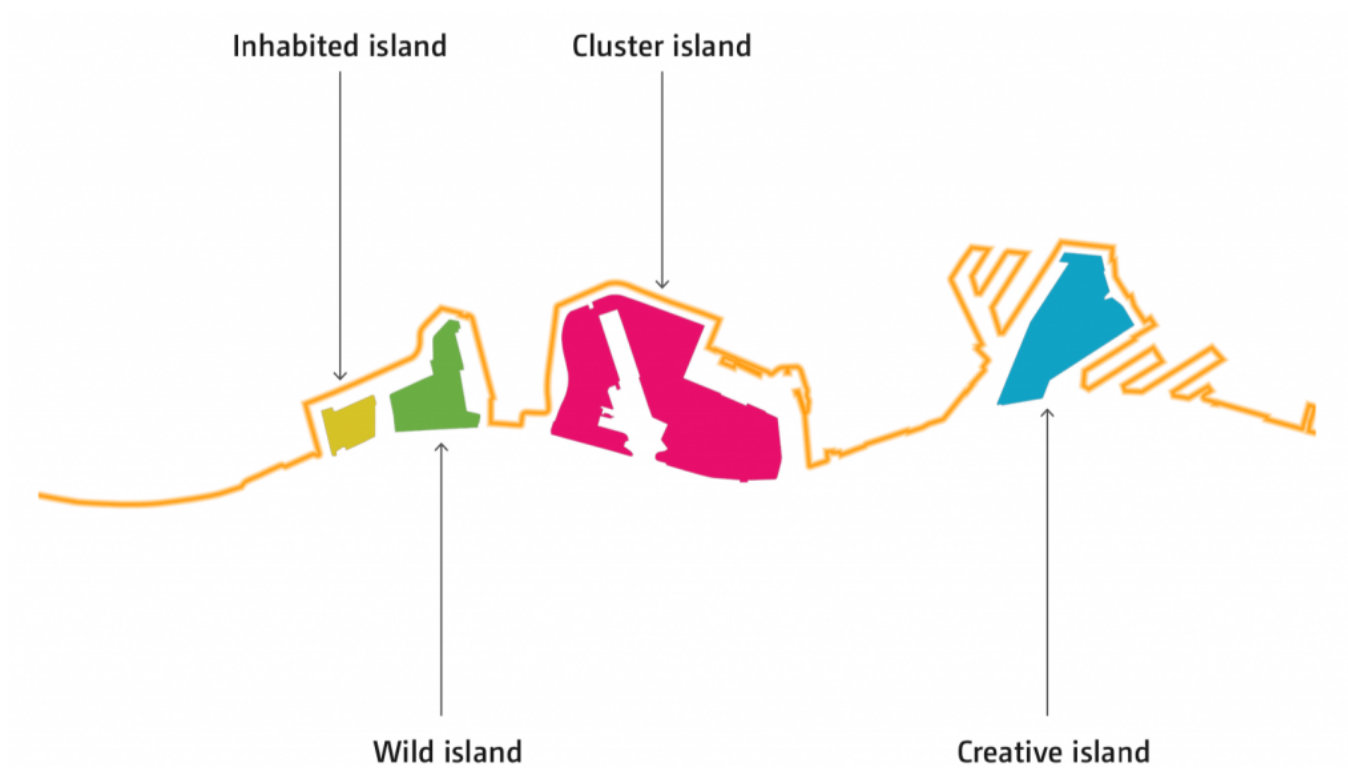
Concept of islands. (© Openfabric in collaboration with KartonKraft, Mauro Parravicini, Noha, Move
Mobility)

industrial buildings and new construction together offer abundant space for office, commercial, studio, and residential uses

exhisting warehouses are converted into flexible artists lofts and studio space

the new canal strengthens the heart of the arts district, increasing use and investment

open spaces are used for outdoor performances and workshops

public spaces showcase sculpture by local artists

water transportation brings visitors from the city to the robust arts district

the diffuse campus is well connected to adjacent municipal centers

smaller companies that make up the maritime cluster form a diffuse campus along the new waterfront

the new waterfront is accessible by a robust water transportation network

industrial traffic is concentrated on the island

the heaviest maritime industries are consolidated on the island, retaining access to the water

open space allows for informal recreational uses

select industrial infrastructures remain as sculptural elements and structures for habitat

mixed-use promenade features views to the new phytoremediation park

plantings serve to phytoremediate contaminated soil

"natural" water edge creates habitat and direct accessibility to the water

mixed-use promenade supports the new residential district, port workers, and visitors from the city and beyond

improved pedestrian accessibility between waterfront and city

water taxi stop connects all areas along the new waterfront

redeveloped historic buildings maintain the existing character of the island

elevated residential buildings are resilient from flooding and allow for flexible open space at the ground level

Concept of the new proposed islands. (© Openfabric in collaboration with KartonKraft, Mauro
Parravicini, Noha, Move Mobility).

## A proactive approach | planning is not a consequence

Port Vision 2030 [4], instead, a framework fixes main 'quality principles', which are guided by a primary spatial strategy that aims to prioritize the livability if the city. The scenarios are not 4 separate options, rather, scenarios can coexist with different weight. A framework fixes the main 'quality principles', which are guided by a primary spatial strategy that aims to create high quality urban space and allows scenarios to develop flexibly.
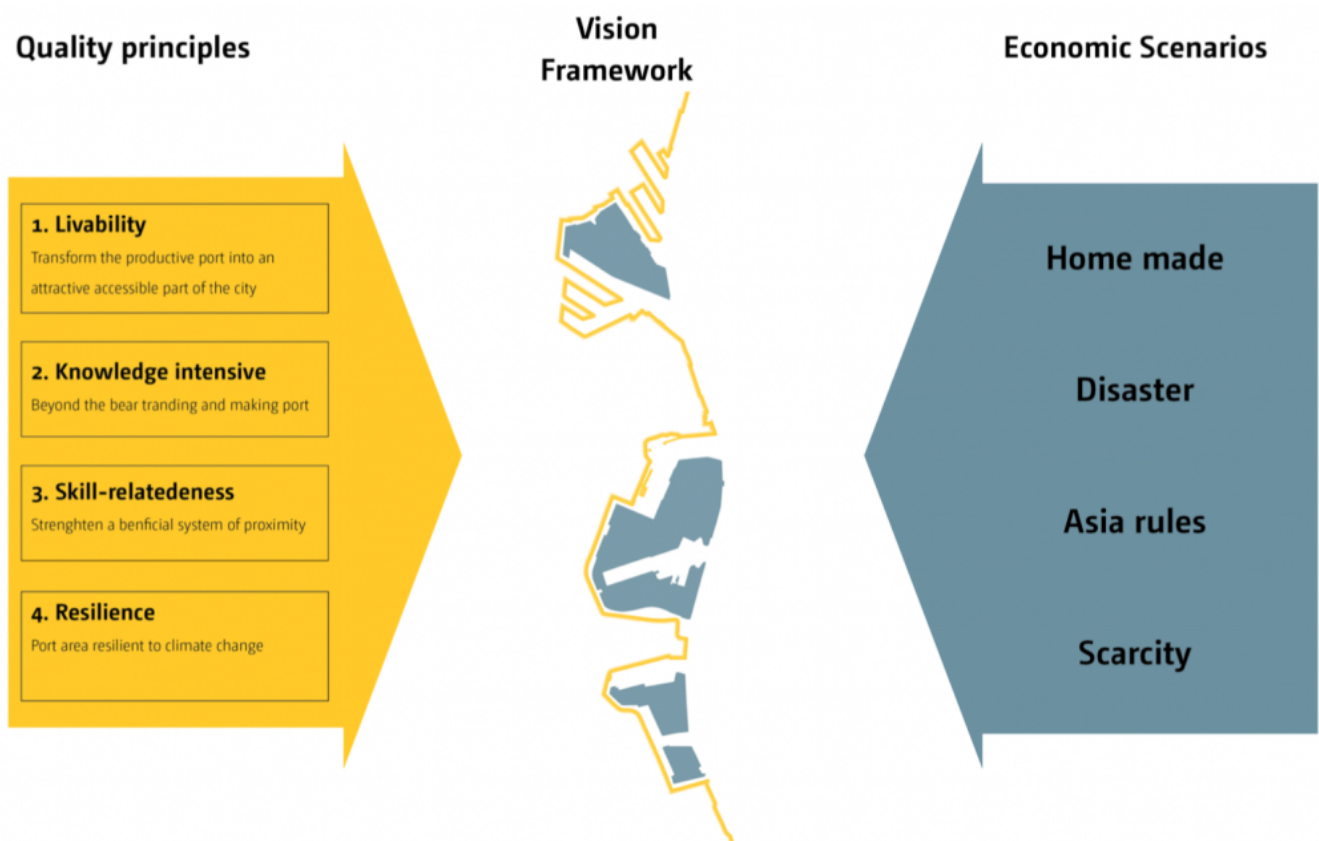

Quality principles VS Scenarios. (© Openfabric in collaboration with KartonKraft, Mauro
Parravicini, Noha, Move Mobility).

The diffuse campus | trading, making, learning, researching, living, recreating

Starting from the idea of 'making over trading', we can elaborate on ideas for programmatic diversity to meet our 'themes', for instance learning, living, and recreating. Those topics are tied together by the common spatial framework of a continuous accessible waterfront that defines new relations with the Maas. The key is to relate the main maritime companies and supporting companies to cultural and educational institutions for the mutual benefit of the maritime cluster and the city. To achieve those objectives it is necessary a shifting of paradigm in terms of spatial transformation and asset balance, where human scale and ecology gains a central role; without neglecting the industrial/logistic role of port areas, a more virtuous cohexistence is possible.
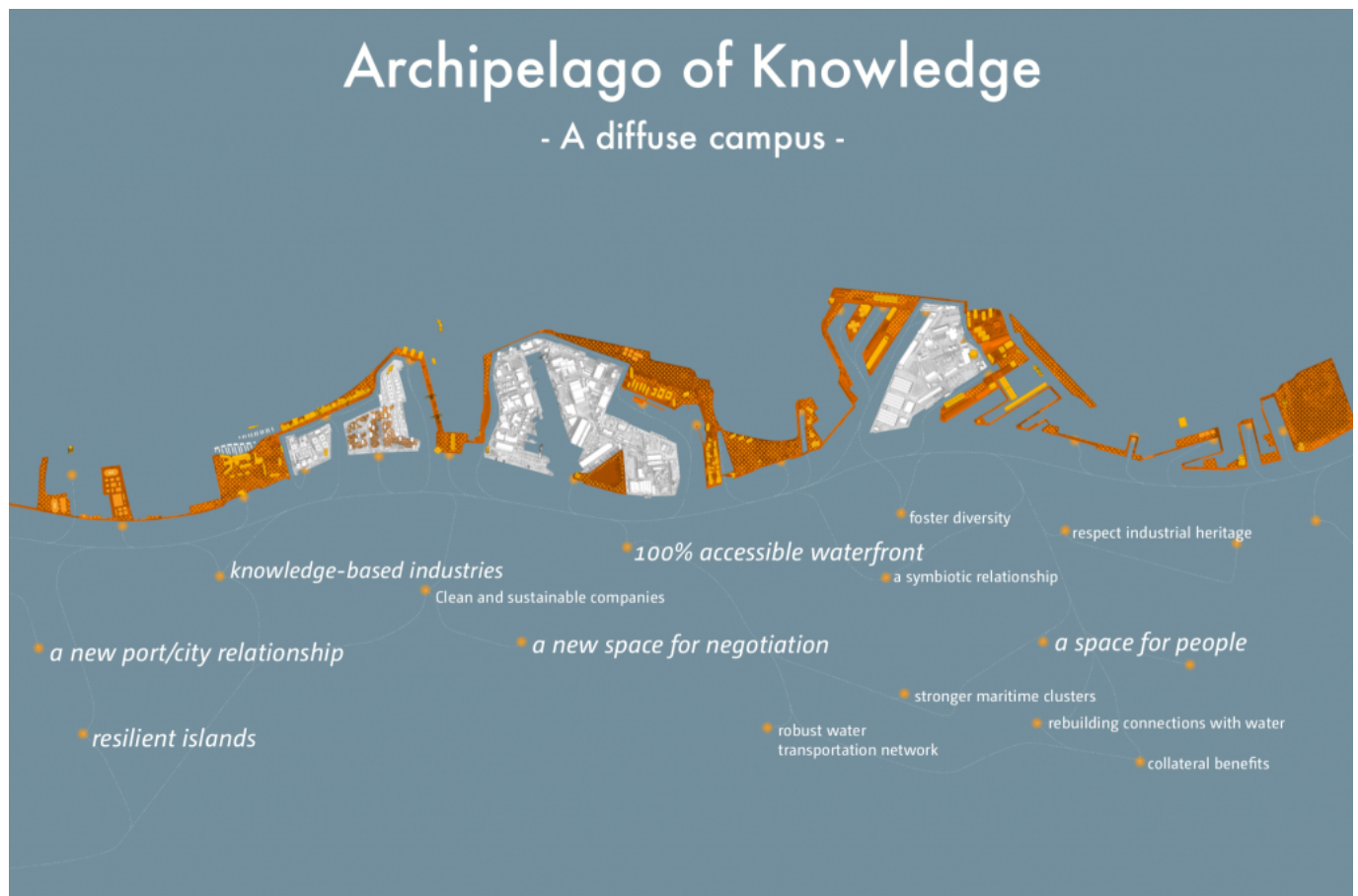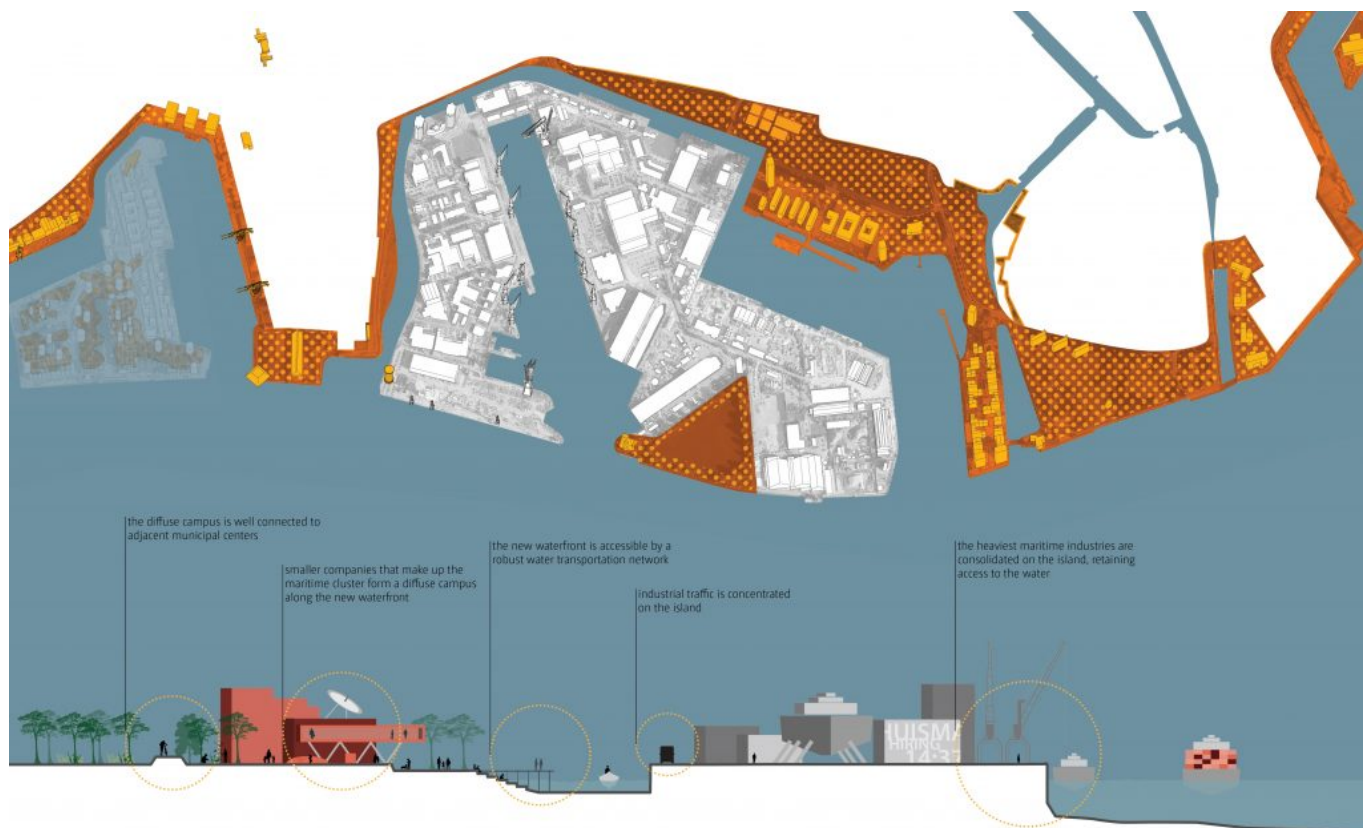

Archipelago of Knowledge. A diffuse Campus. (© Openfabric in collaboration with KartonKraft, Mauro Parravicini, Noha, Move Mobility).
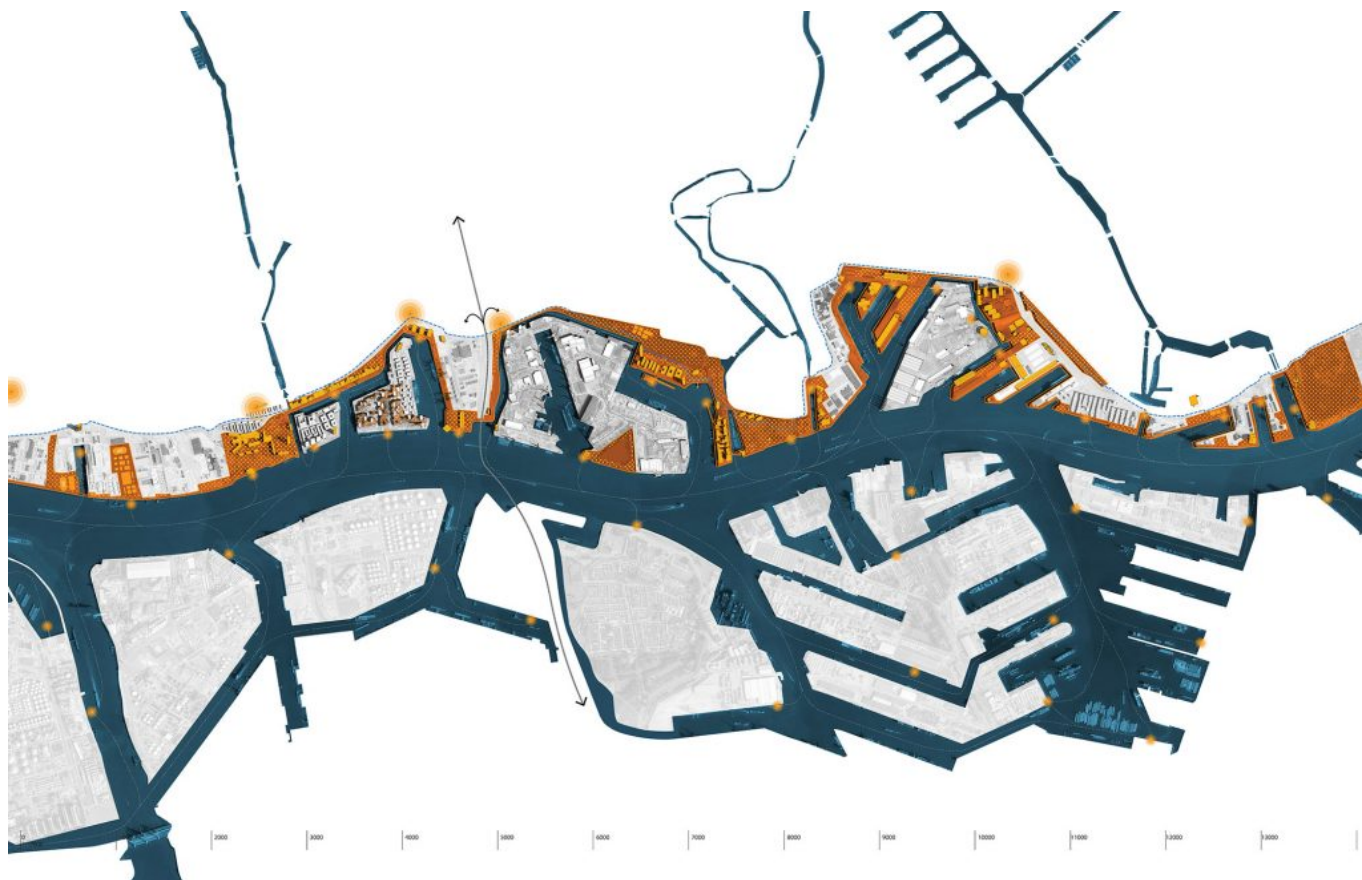
Archipelago of Knowledge. A diffuse Campus. Masterplan. (© Openfabric in collaboration with KartonKraft, Mauro Parravicini, Noha, Move Mobility).
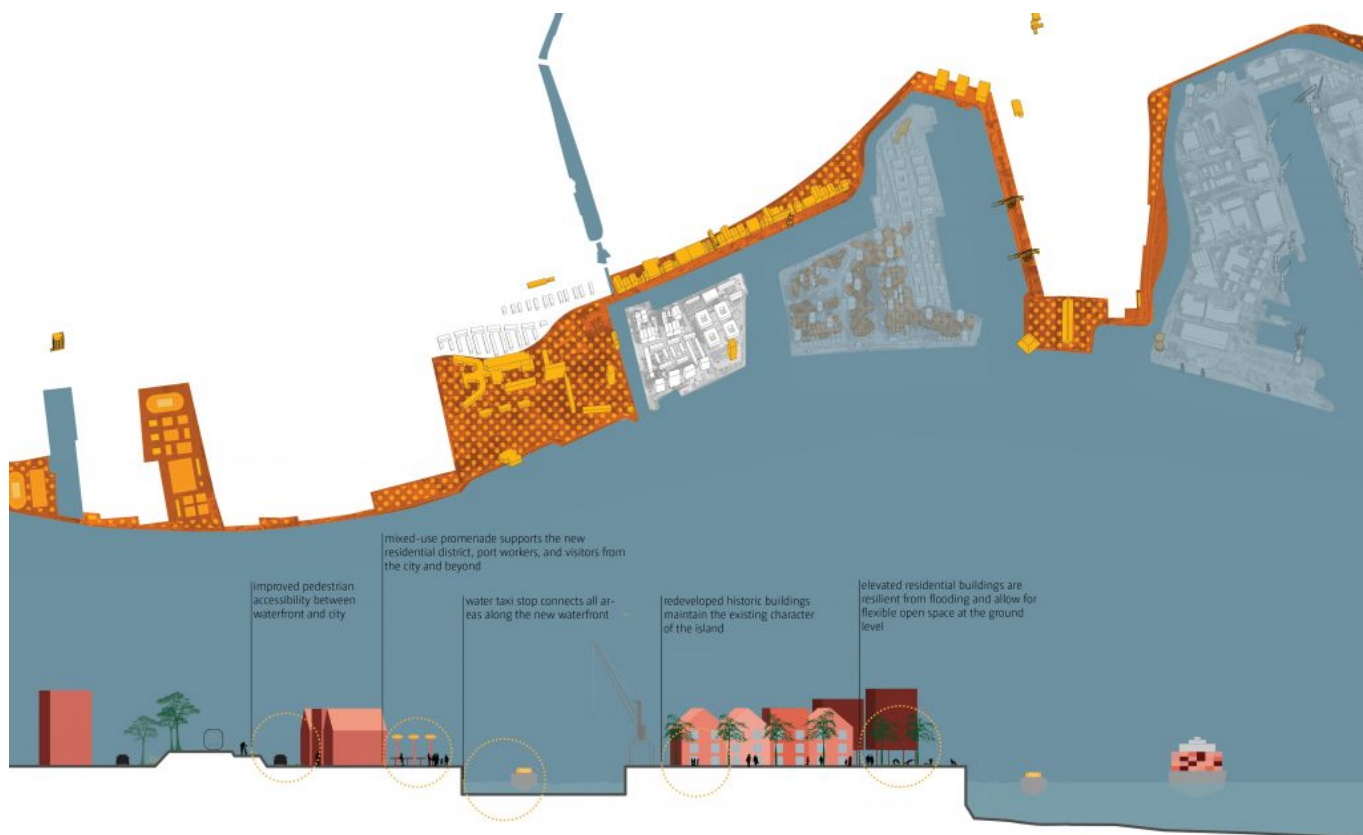
Archipelago of Knowledge. A diffuse Campus. The Creative Island. (© Openfabric in collaboration with KartonKraft, Mauro Parravicini, Noha, Move Mobility).

Archipelago of Knowledge. A diffuse Campus. The Cluster Island. (© Openfabric in collaboration with KartonKraft, Mauro Parravicini, Noha, Move Mobility).

Archipelago of Knowledge, A diffuse Campus. The Wild Island. (© Openfabric in collaboration with KartonKraft, Mauro Parravicini, Noha, Move Mobility).

Archipelago of Knowledge. A diffuse Campus. The Inhabited Island. (© Openfabric in collaboration with KartonKraft, Mauro Parravicini, Noha, Move Mobility).

Archipelago of Knowledge, A diffuse Campus. Aerial view
(© Openfabric in collaboration with KartonKraft, Mauro Parravicini, Noha, Move Mobility).

Head Image | *Port of Rotterdam. (©JGF|ph. Jacopo Gennari Feslikenian).*

Notes

[1] The Research by Design project "Archipelago of Knowledge. A diffuse Campus" was commissioned by Deltametropool (Research Coordinator) and Uenl (Coordinator) in collaboration with Province South-Holland, Regio Drechtsteden, MRDH, Regio Alblasserwaard-Vijfheerenlanden, Gemeente Rotterdam.
It was developed by a multidisciplinary team lead by Openfabric (Francesco Garofalo, Jacopo Gennari Feslikenian, Matteo Motti, Garrett Craig-Lucas, Laura Lopez Iglesias) in collaboration with Kartonkraft (Marta M. Roy Torrecilla), Mauro Parravicini, Noha (Kai Van Hasselt), Move Mobility (Marcen Van Lieshout).

[2] B. Kuipers, M. Streng, W. Manshanden & O. Koops (2017), Scenarios for the maritime cluster in Zuid-Holland and Werkendam. Background study 'Prospective Survey of the Maritime Cluster in Zuid-Holland', Rotterdam; Erasmus UPT & NEO.

[3] De Martino, Paolo. "Land in limbo: understanding Planning Agencies and Spatial Development at the Interface of the Port and City of Naples", in Carola Hein (ed.) International Planning History Society Proceedings, 17th IPHS Conference, History-Urbanism-Resilience, TU Delft 17-21 July 2016, V.03 p.203, TU Delft Open, 2016.

[4] Port Vision 2030 (Port Compass by Port of Rotterdam Authority)
https://www.portofrotterdam.com/sites/default/files/2021-06/port%20vision.pdf/.