

Ecosystem based adaptation

Some Rotterdam experiences

*Nico Tillie,
Researcher/Teacher, Landscape Architecture
Delft University of Technology
Landscape Architect City of Rotterdam*



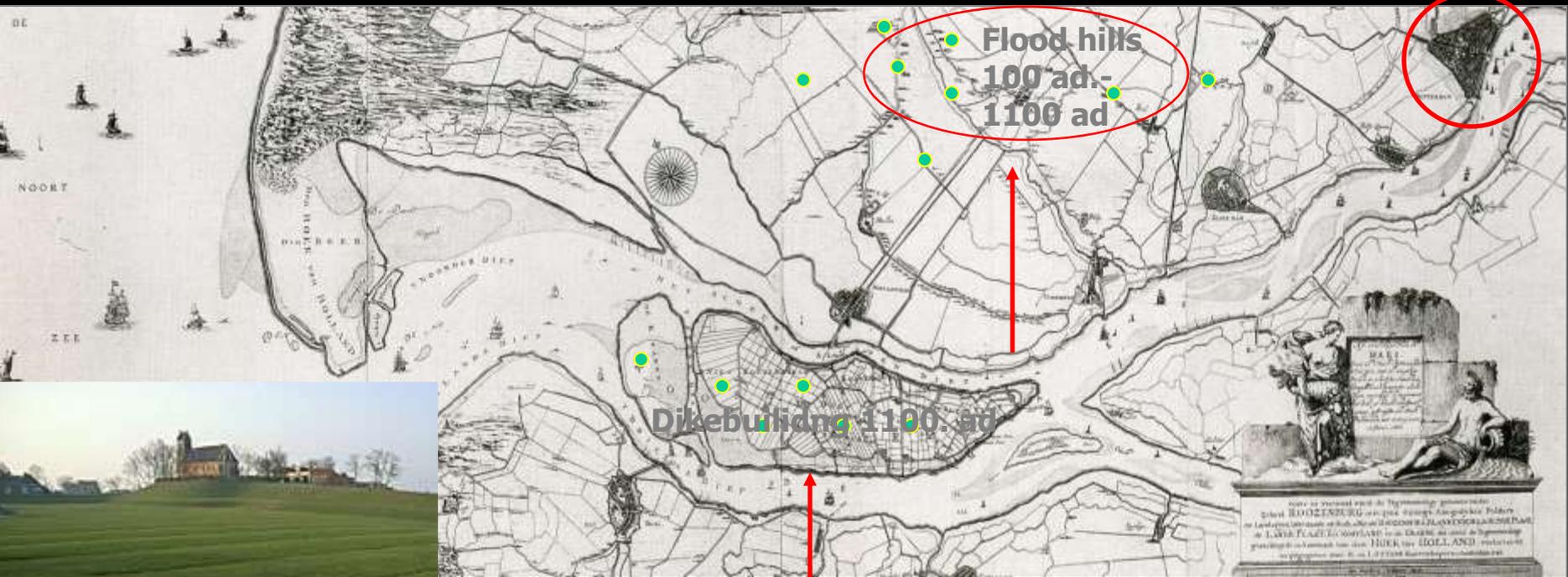
Gemeente Rotterdam
Stadsontwikkeling



Ecological and natural system

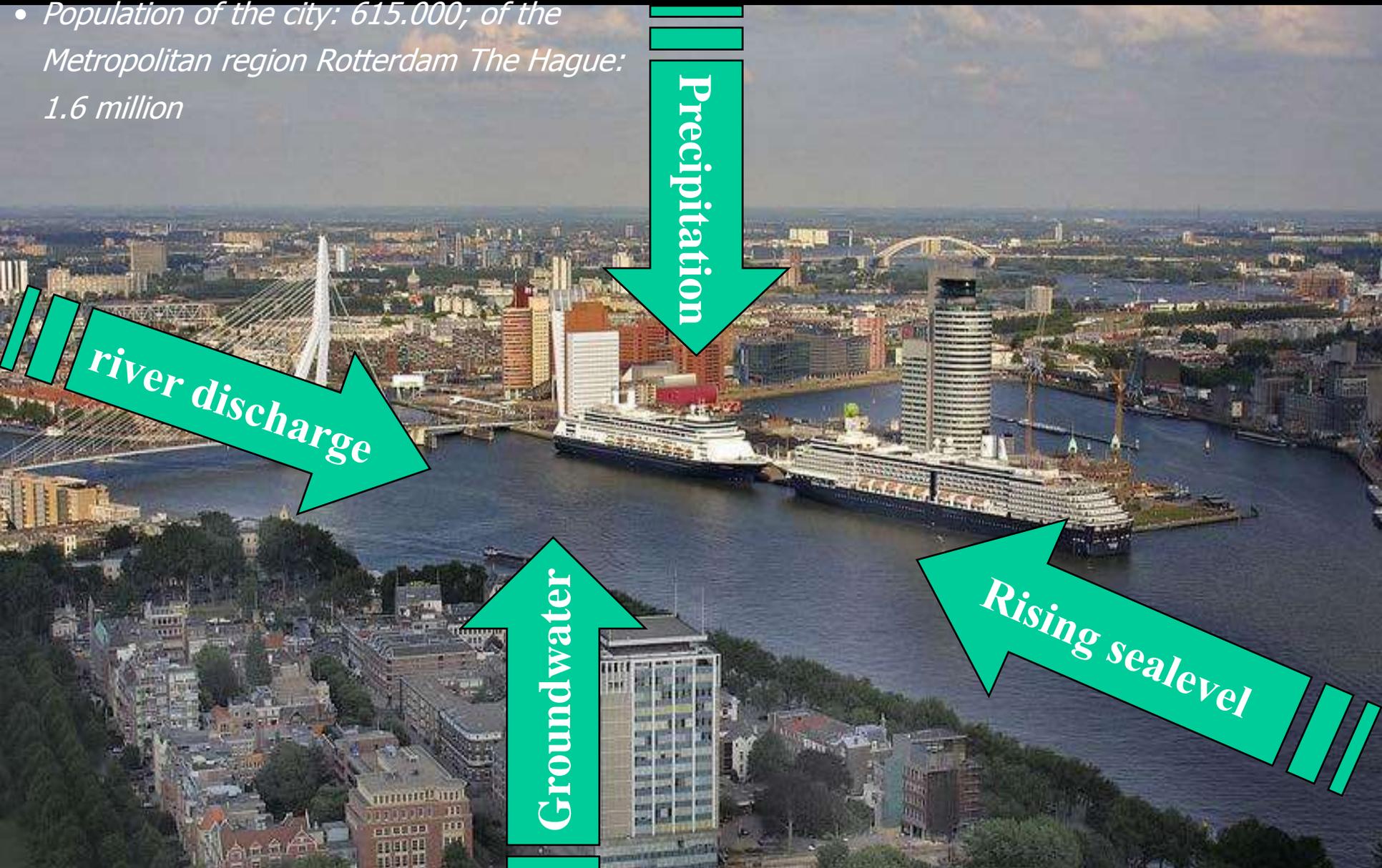
Rotterdam
dam, port and
watercity

History and water



Water in Rotterdam now

- *Surface area of Rotterdam: 300 km²;
of the region: 807 km²*
- *Population of the city: 615.000; of the
Metropolitan region Rotterdam The Hague:
1.6 million*



Precipitation

river discharge

Groundwater

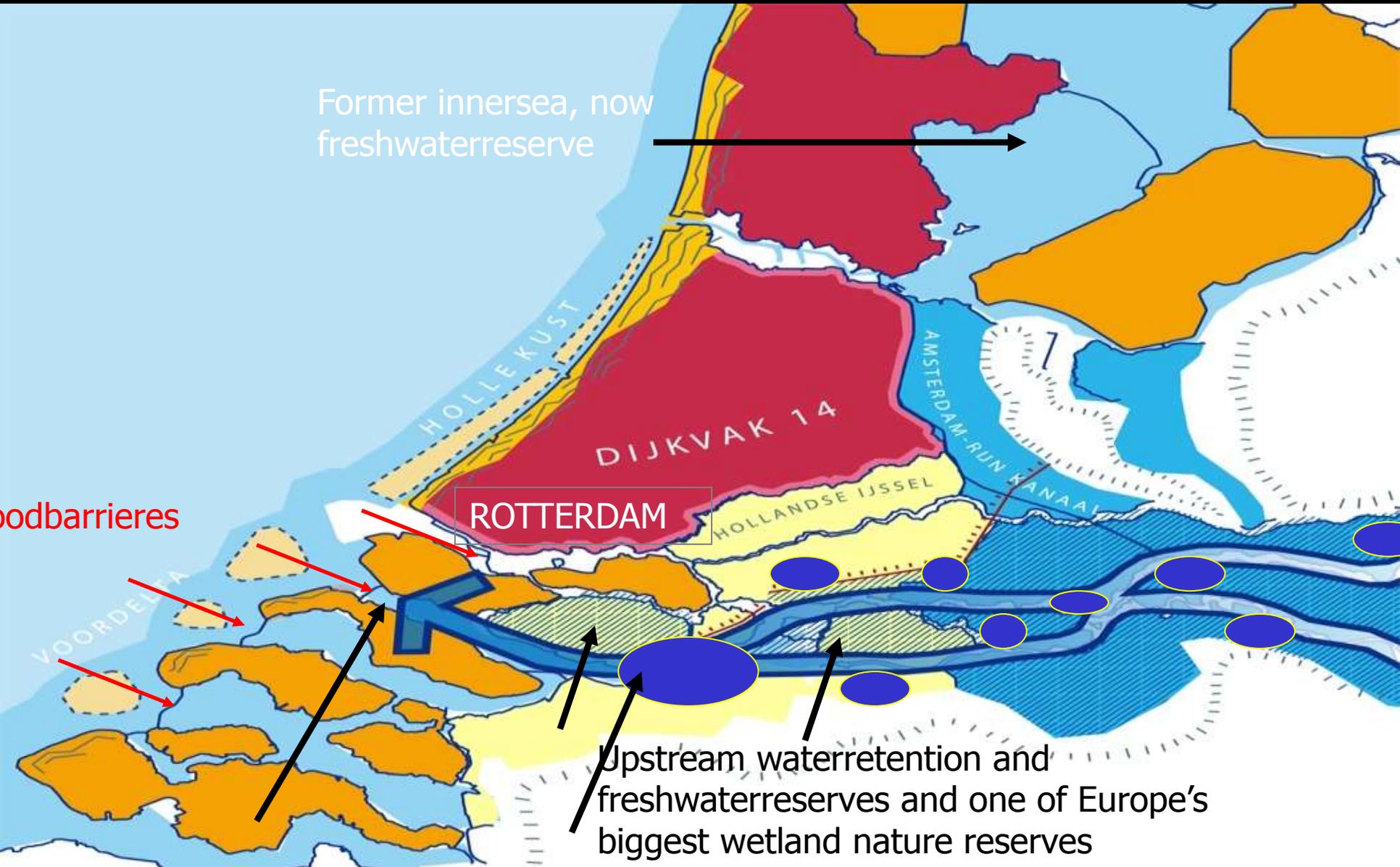
Rising sealevel

Sea and safety, flexible floodbarriers for shipping and ecology

Dunes (natural and artificially induced)
Dikes
Technical solutions i.e. Floodbarriers
riskmanagement

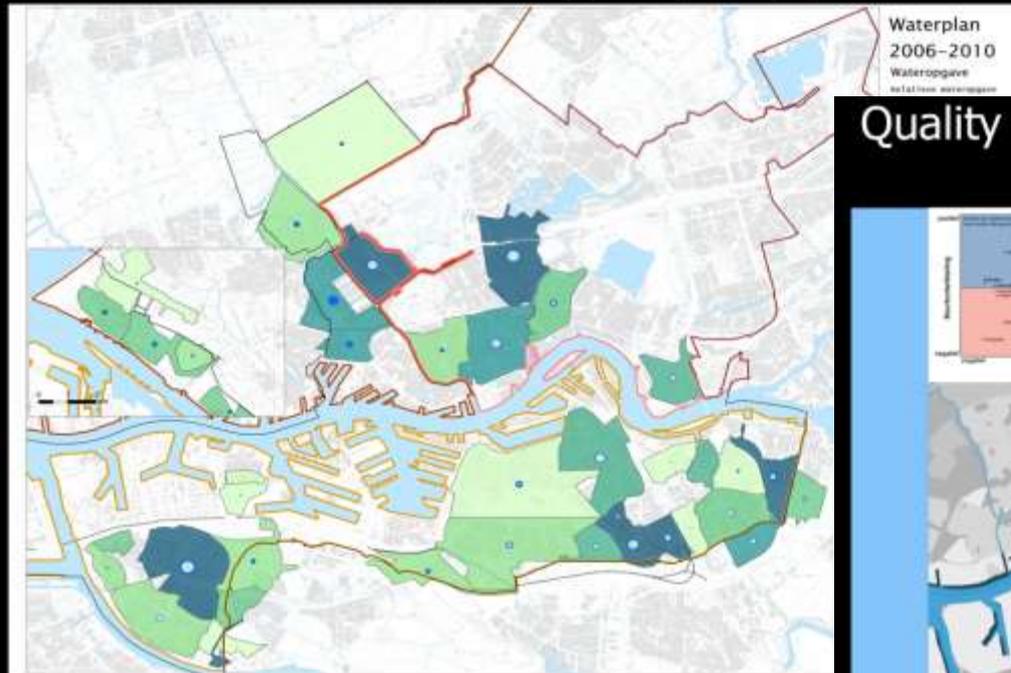


Rivers and safety and relation to Ecosystem services

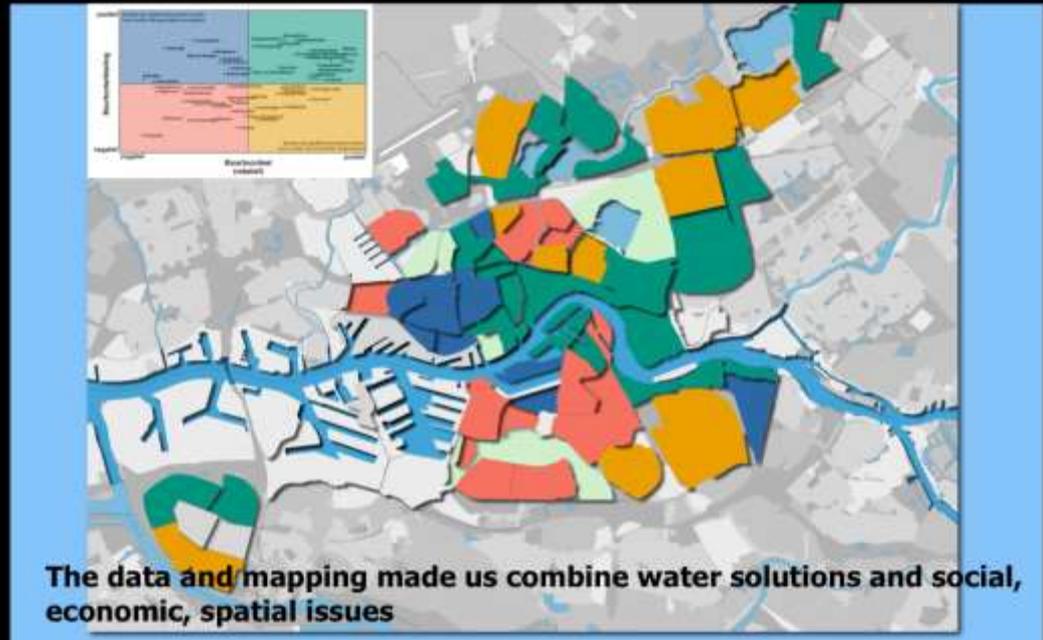


In the city water issues combined with social issues

1. Water: Precipitation, storage capacity per district

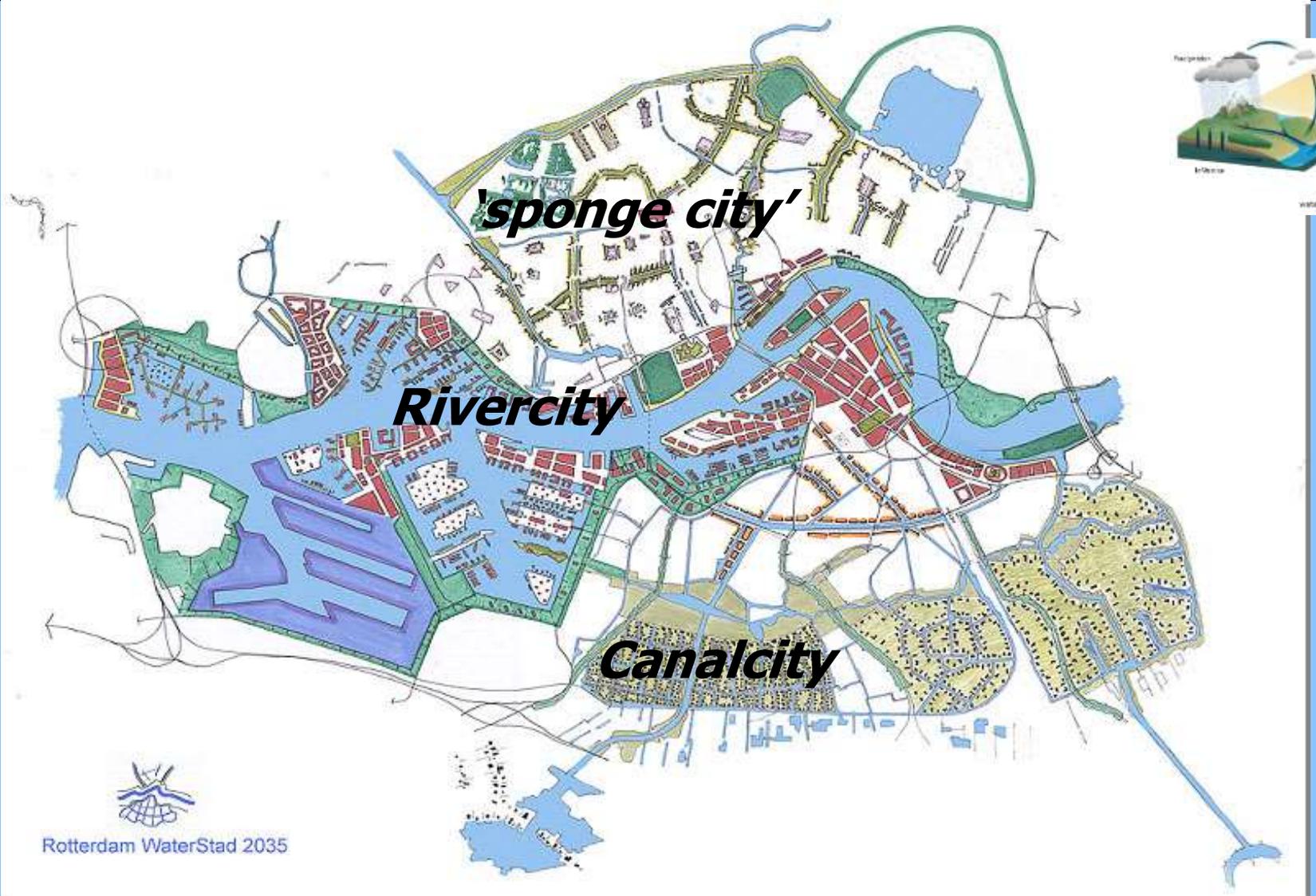


Quality of life data per district



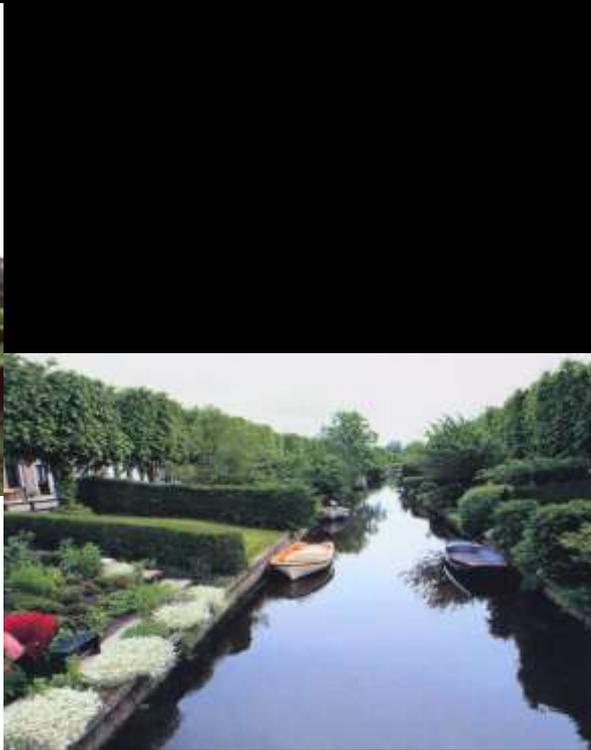
Future vision Rotterdam Watercity 2035

Watersolutions, good housing + public space + watertransport



Sponge City, the city as a forest! Waterretention!

green/water roofs



Water living, urban agriculture and good housing



Floating buildings

Watersquares, storage and good public space

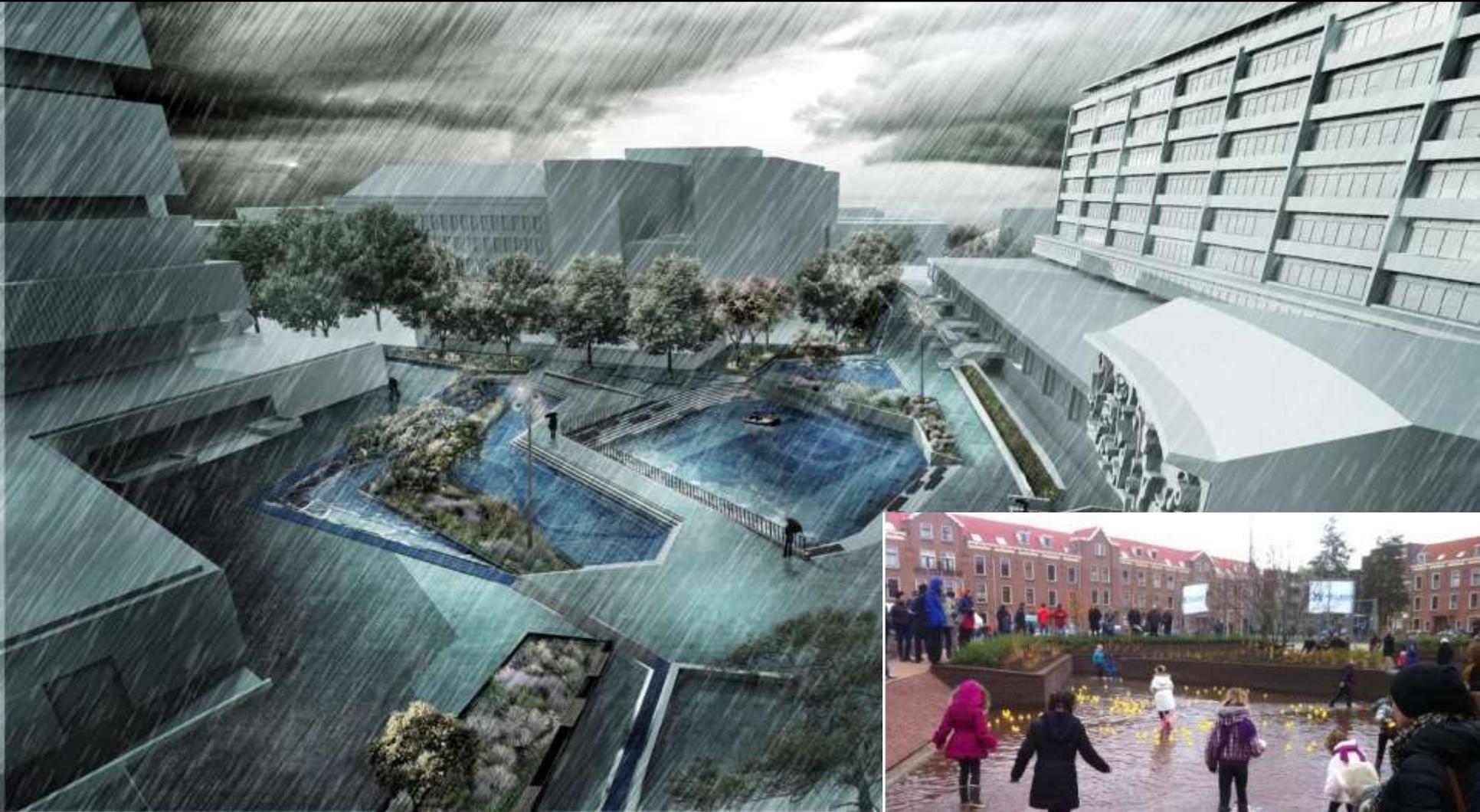
Watersquares finished in 2012/2013



Watersquare finished 2012/2013



Watersquares finished 2012/2013



Underground waterstorage for sewage overflow built in 2010 when excavations for underground carpark took place 10.000 m³ = 2.6 million gallon



A dike, with shops below and a roof garden to link the waterfront to the neighborhood: built in 2012/2013



Using Ecology for cleaning water and a green walkway



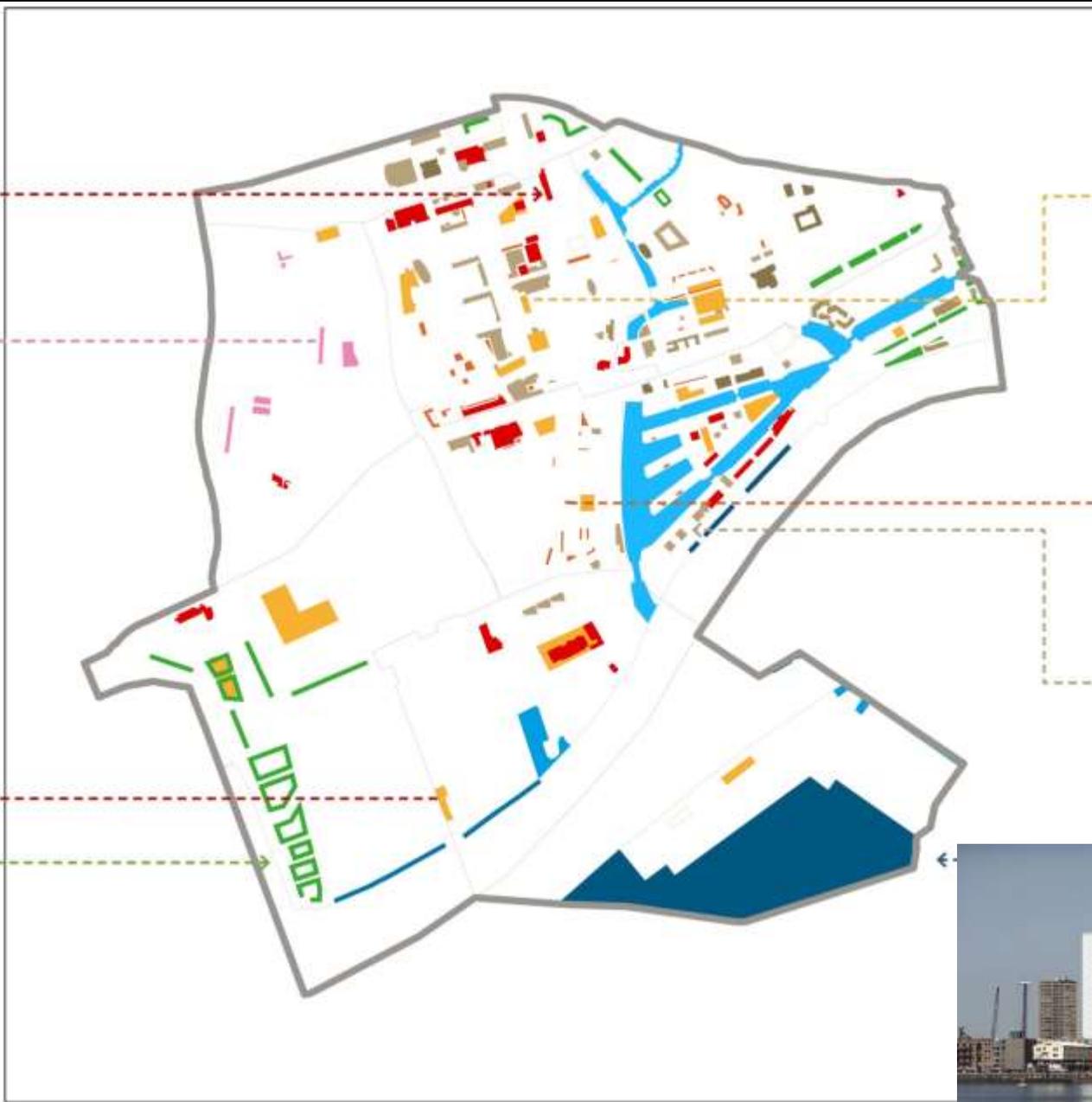
Baima Canal Restoration, Fuzhou, j. Todd, China

Human layer, respects ecological layer and benefits from ecosystem services



Quinly stormwater park, Turenscape

Densification using local initiatives



But if you densify...more green qualities needed !!



GLAMOROUS GRE

Urban green / Urban farming on empty lots



Parking lot becomes green public space



Playgrounds, childfriendly city 'woonerf' sidewalks go on for kids, special circulation for cars, public transport and bikes in all suburbs since 1980's designed that kids go first !

GREEN STRATEGY 05

PLAYGROUNDS



Kinderen zijn de toekomst van de stad

Hoe ben je zelf opgegroeid en wat waren jouw belangrijkste herinneringen? Met vriendelijke netjes buiten ravotten op het plein, klimmen in een boom, bloemen en bessen plukken kan ook in Een kindvriendelijke buitenruimte is essentieel voor een wervend en compleet woonmilieu in de kindvriendelijkheid heeft meer om het lijf heeft dan een aantal speelplekken te realiseren; het gaat om de ing van de openbare ruimte. Brede stoepen, langzaam verkeer routes en drempelruimten (engels: zones) spelen daarin een belangrijke rol. Brede stoepen bieden een informele ruimte voor spel. Dit zijn overgangsgebieden tussen het privé domein en de openbare ruimte, waar kinderen beschut er spelen. Daarnaast zijn ook specifieke voorzieningen voor allerlei doelgroepen nodig. Om de adolescenten een goede uitlaatklep te geven is er bijvoorbeeld het internationaal gewaardeerde skatepark aan de kleinsten en allerkleinsten is er het speelplein op 't Landje en zijn er de openbare sportvelden op werplein aan de rand van het centrum. Sport, spel en groen zijn bijzonder belangrijk voor de vitale en gezonde kinderen. In de speelplekkenstrategie wil de gemeente bases voor kinderen maken spelaanleidingen en voldoende zitgelegenheid. In combinatie met de verschillende leefmilieus, omken en voorzieningen die eigen zijn aan een binnenstad wordt het centrum zo een waar eldorado voor kinderen.

Kinderen zorgen voor levendigheid op straat en voor sociale contacten tussen alles en iedereen zijn de dragers van de nieuwe stedelijkheid. Quote Larry Beasley maart 2009

IN PROGRESS



1

2



play wilderness

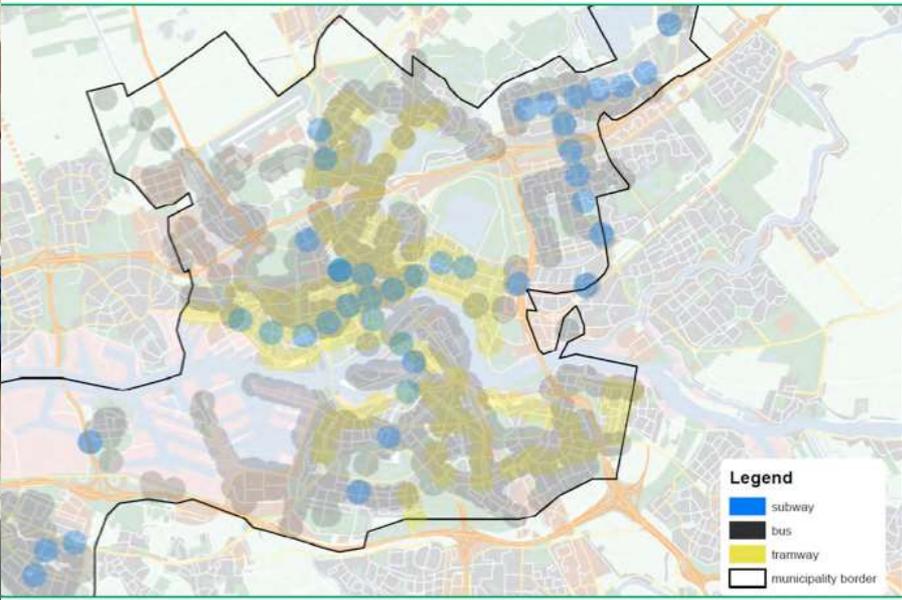
Green network provided more walking and biking, 'biking highways' 1.3 bikes per person

- Amsterdam, Delft #1 in model split
- Copenhagen
- Rotterdam 17%
- Portland 2%





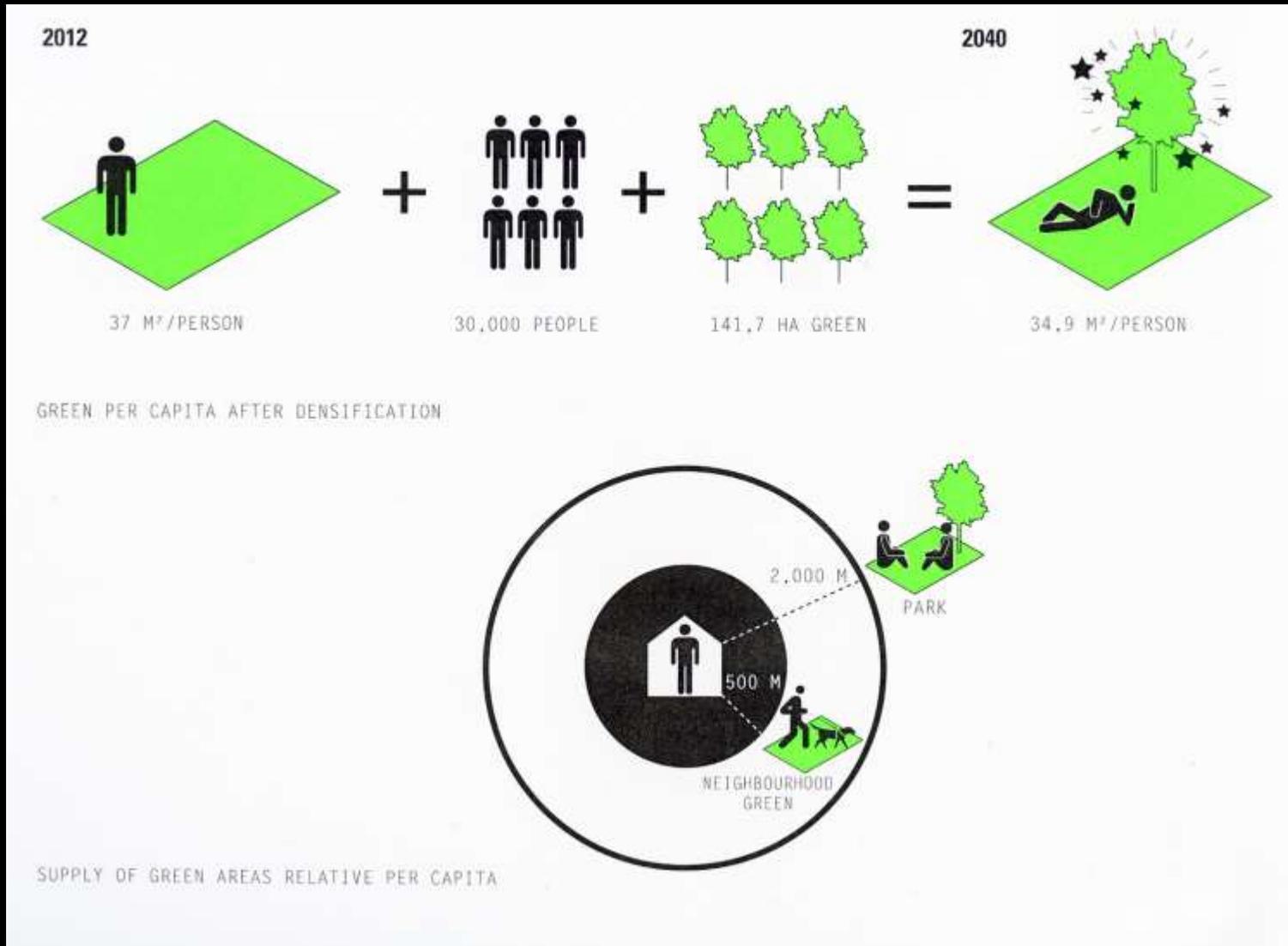
Areas in Rotterdam within 300 metres of public transport



- Legend**
- subway
 - bus
 - tramway
 - municipality border

Good public transport at the basis 300 m from every home...and combine it with green, grass!

Densification study: Assessment 30.000 inhabitants + 141 HA green



Ecosystem services increases mainly by introducing a green network

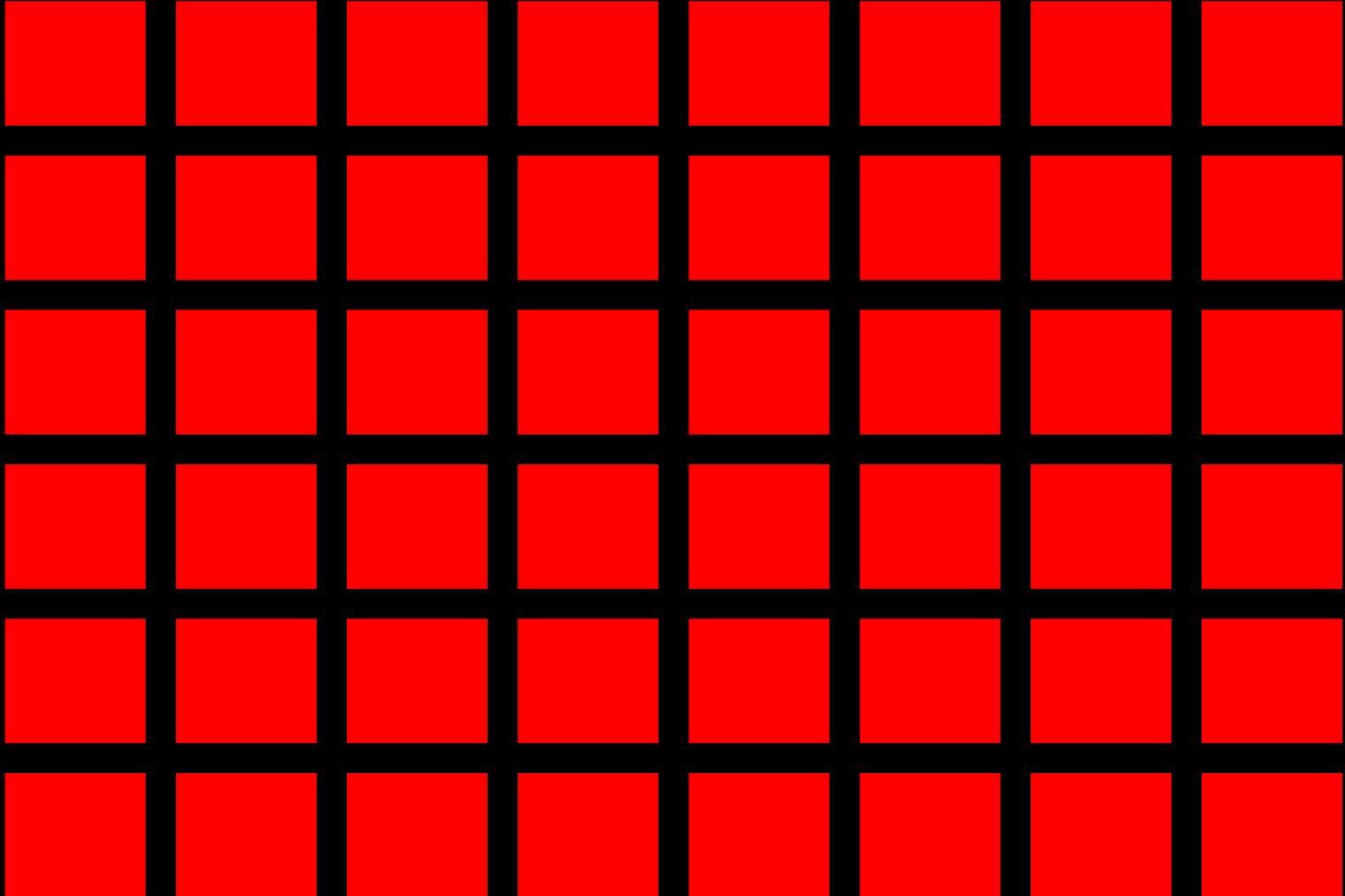
Healthy Life expectancy increased with two years



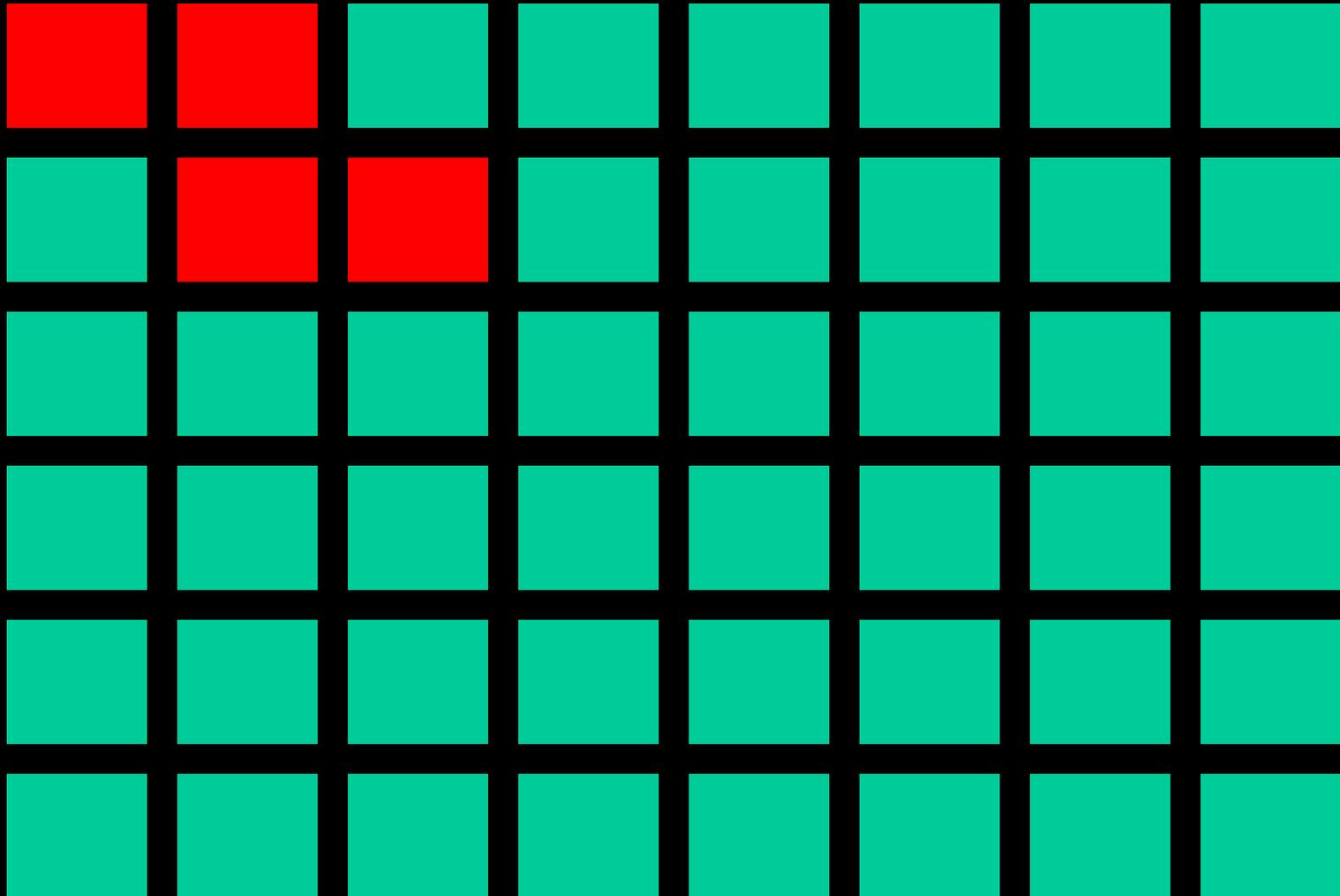
THERE IS ALREADY A LOT..... BUT MANY NUMBERS ...we should add mapping to this not just 1 number for an area!



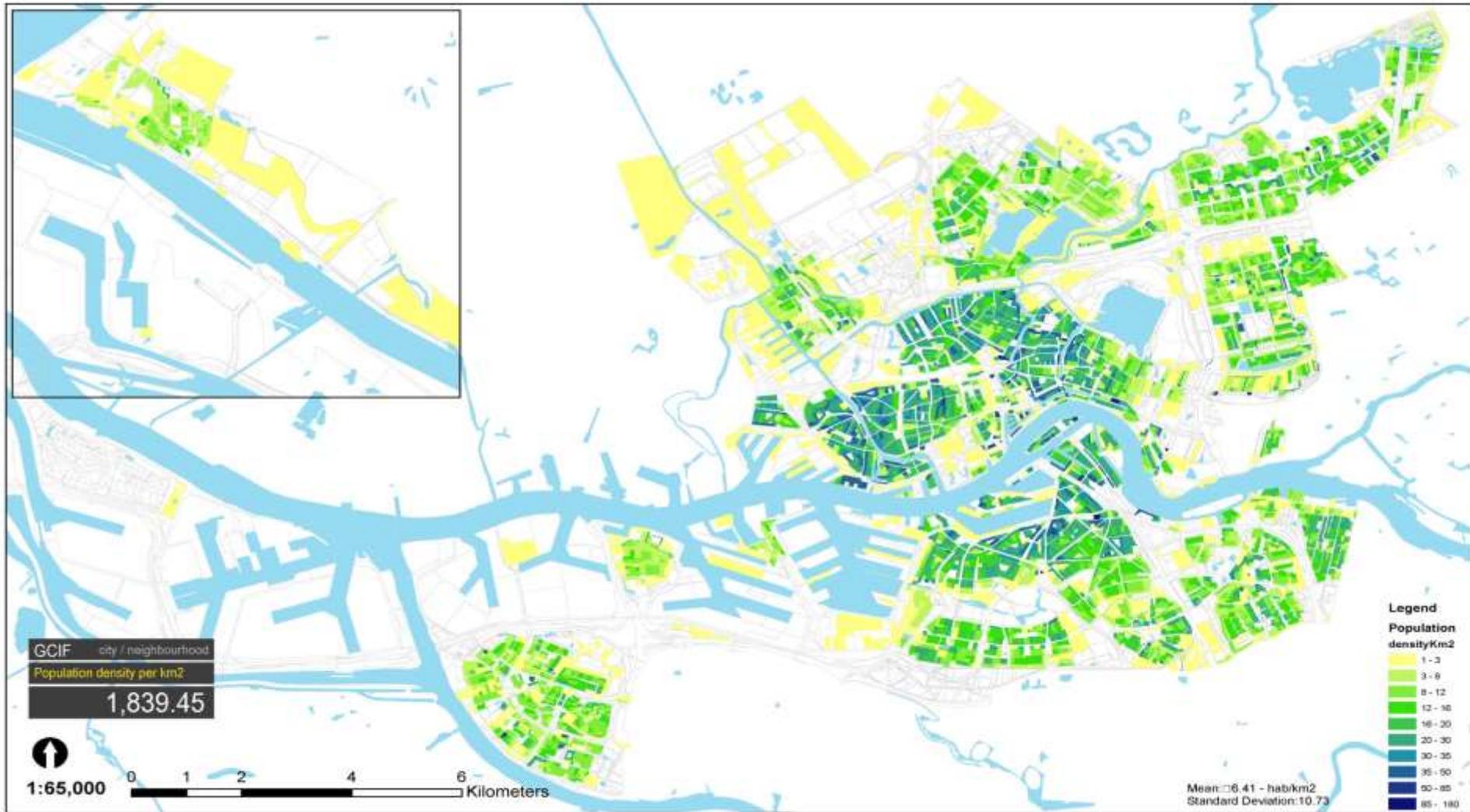
Using standerdized data in a local scalable GIS transilience approach



Detailed data to facilitate fast and flexible, it scalable !



A map is easier to read than dozens of excel sheets



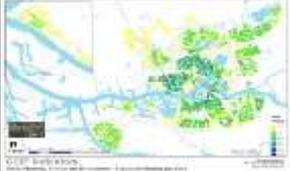
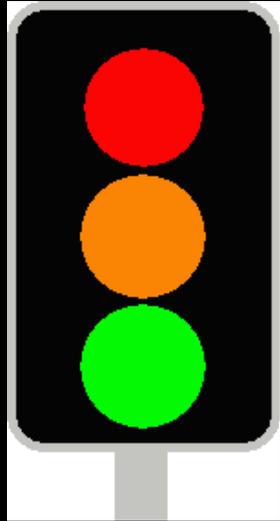
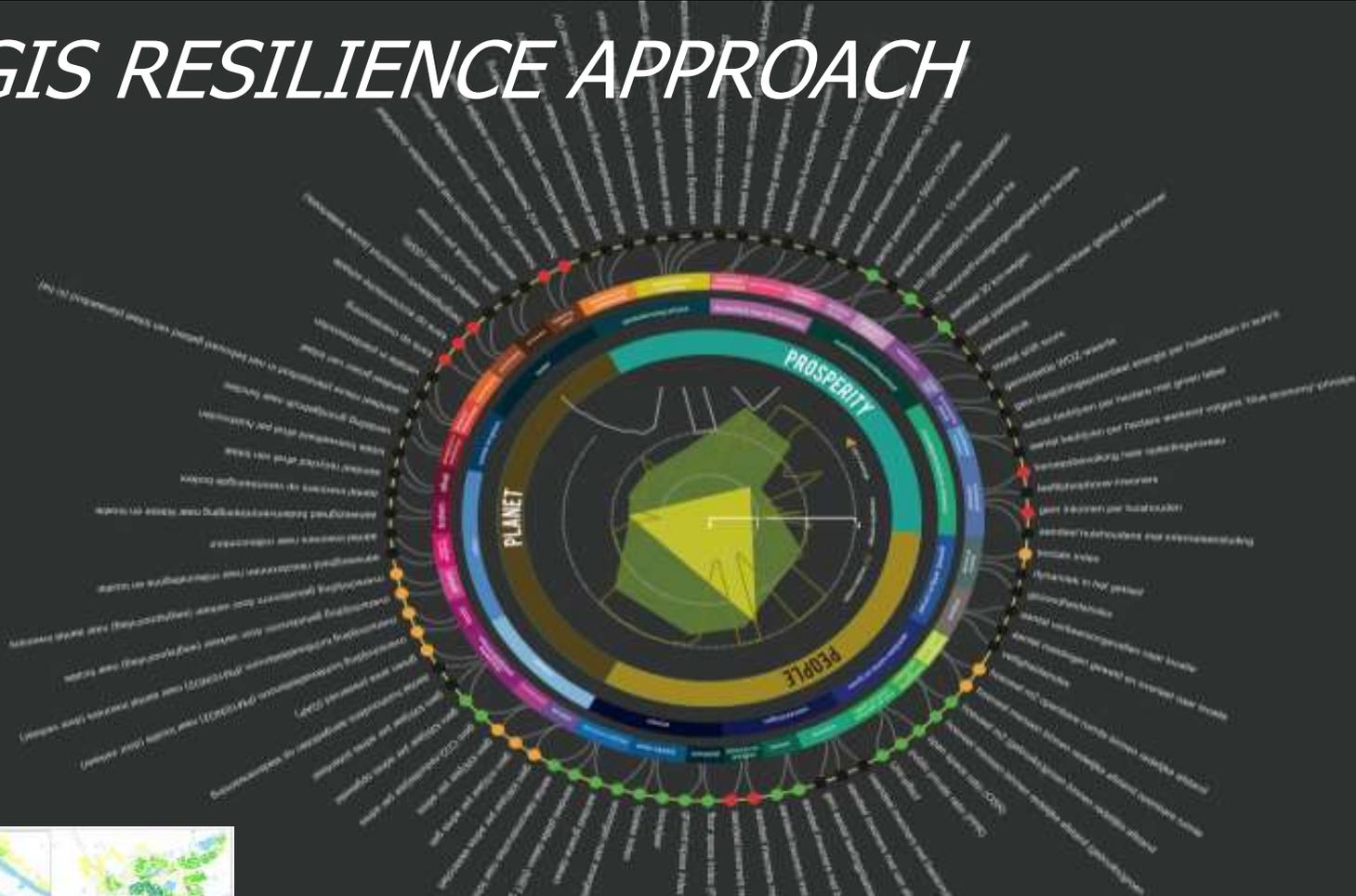
GCIF Indicators

Urban Planning, Shelter and Environment - Population density per Km2

Gemeente Rotterdam
dS+V, afd. Ruimtelijke Ordening
trainee: Raed Gindeya M.

Diagram easier to read than 100 maps!
USE DATA AS THERMOMETER OF WHAT IS DOING WELL/OR NOT
identify what themes are below goals, thresholds

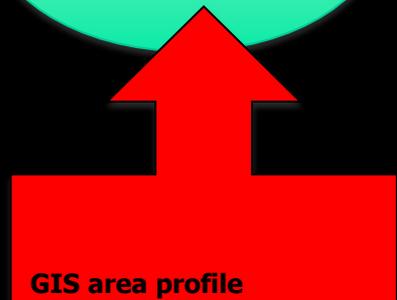
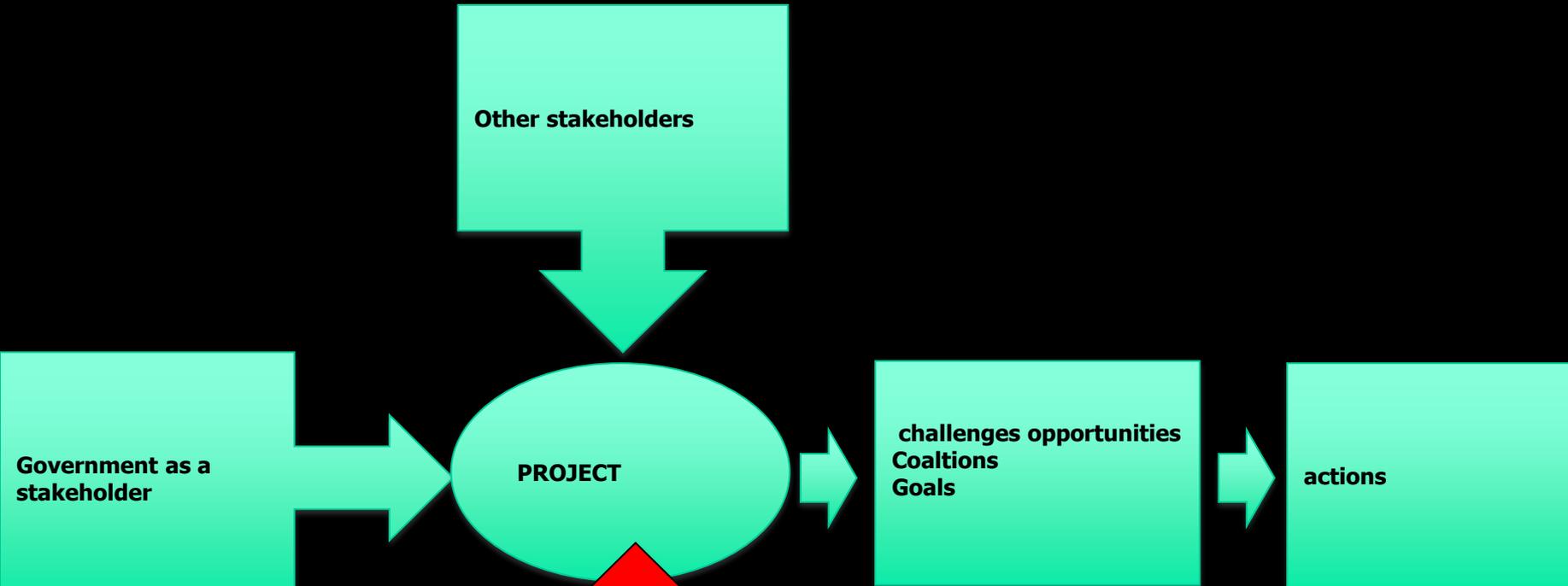
GIS RESILIENCE APPROACH



Behind each OF 100 indicator is a GIS map

*Spiderdiagram set up by:
Raed Gindeya Munoz*

Facilitate the transition process and stakeholders



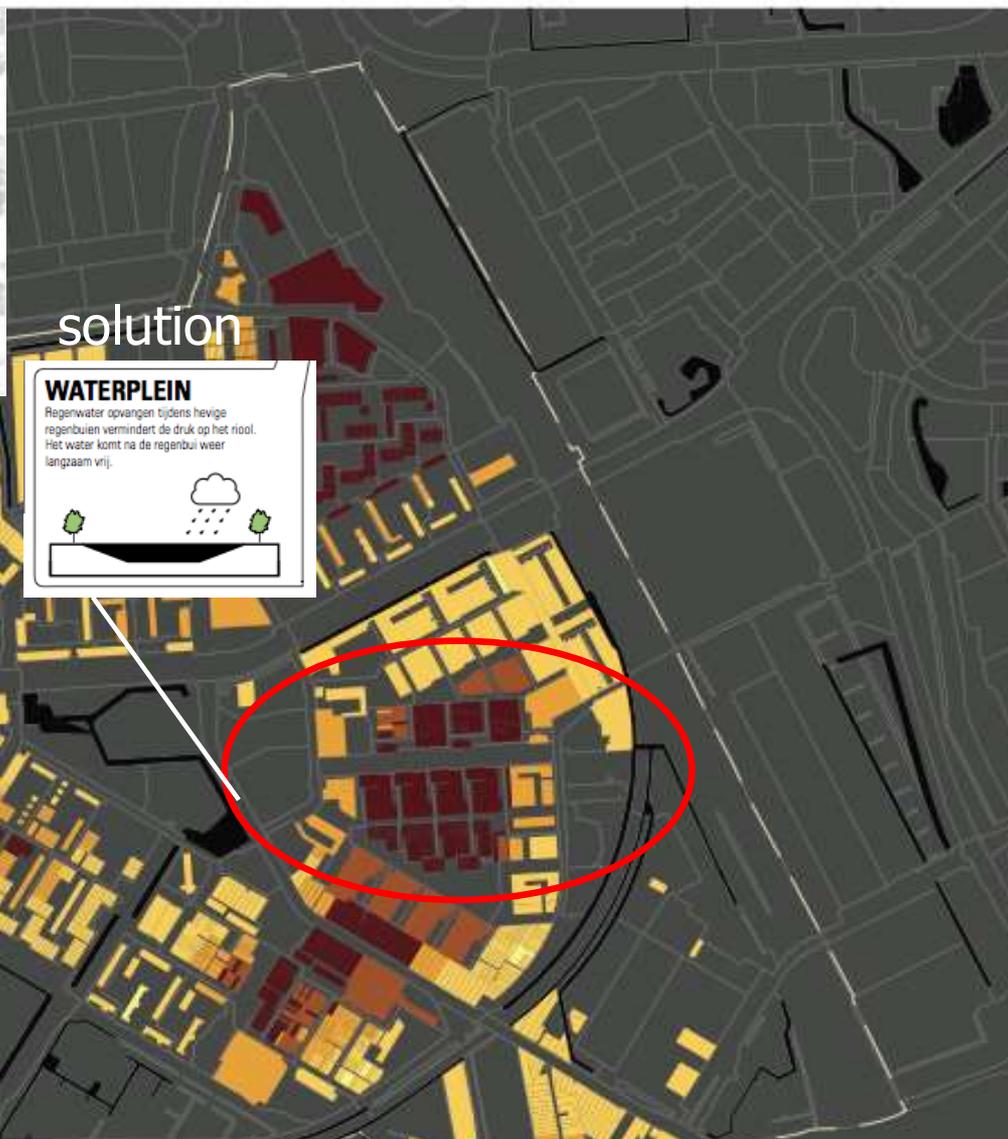
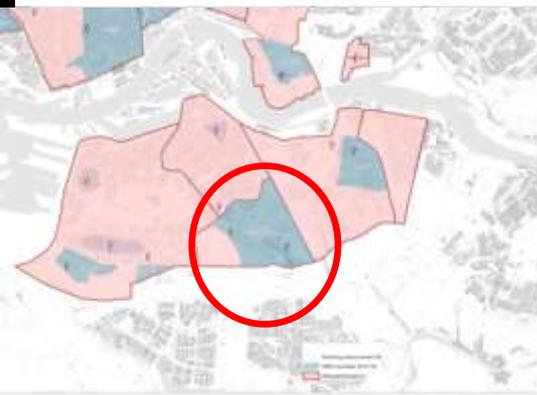
Asset based planning

To be used in Transition management
<http://www.drift.eur.nl>

Result: Stakeholder chosen themes

Waterproblems, recreation shortage

Possible solution : watergarden,square



Group topic **Environment** map code **En1 - L**

Monitor aim
Water for recreational uses.

Core variables / measurement
Water bodies for recreational use in 500m walking range from households

Threshold
Walking distance of max 250m² from a household, and with an area of average 1500m²

0m - 65m	- score 1
65m - 125m	- score 2
125m - 180m	- score 3
180m - 250m	- score 4
> 250m	- score 5

Legend
Lombardijen water scores ranges 1 to 5

1 - optimal
2
3
4
5

Follow up

- **Use this approach for every neighborhood**
- **Use it for certain urban typologies so you can see what to do in many cases**
- **Use this as a early warning system per typology....and design with nature!**

This years international Architecture Biennale: 'Urban by nature' about the metabolism of the city

In some parts of the world people access to the flows, can make the difference between life and death. In other cities they open the way to well-being.

Dirk Sijmons , 2013, TU Delft

**Can we plan Rotterdam as an Urban
Ecosystem with a high Q of life?**

A photograph of a lush urban garden in Rotterdam, featuring purple flowers in the foreground, a large crowd of people in white sitting on the grass, and the Erasmus Bridge in the background.



**'A city is a way of life'
Thank you for your attention!**

nmjd.tillie@rotterdam.nl

twitter: nicotillie72

twitter: urbanmetabolism

Photo: speeldernis Rotterdam (play wilderness)