



EU MISSIONS

CLIMATE-NEUTRAL & SMART CITIES



6-8 May 2025
VILNIUS

Harnessing City Successes:

Advancing Climate Action for 2030



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**CITY OF
VILNIUS**

20
25



Vilnius
European
Green
Capital

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EU MISSIONS
CLIMATE-NEUTRAL & SMART CITIES

Strengthening climate resilience through citizen-powered data



Marcelo Lampkowski
Senior Expert for Green Digital Transformation, ICLEI Europe



Nora Gāgane
Main Spatial Development Planner - Expert, Rīga



Eileen Roth
Climate Policy Advisor, City of Mannheim



Albin Hunia
Policy Advisor for Greening, City of Utrecht



Athanasia Tsertou
CTO, CIBOS Innovation



Todd Harwell
Research Scholar, International Institute for Applied Systems Analysis (IIASA)



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Todd Harwell

Research Scholar,

International Institute for Applied
Systems Analysis (IIASA)



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Urban
ReLeaf

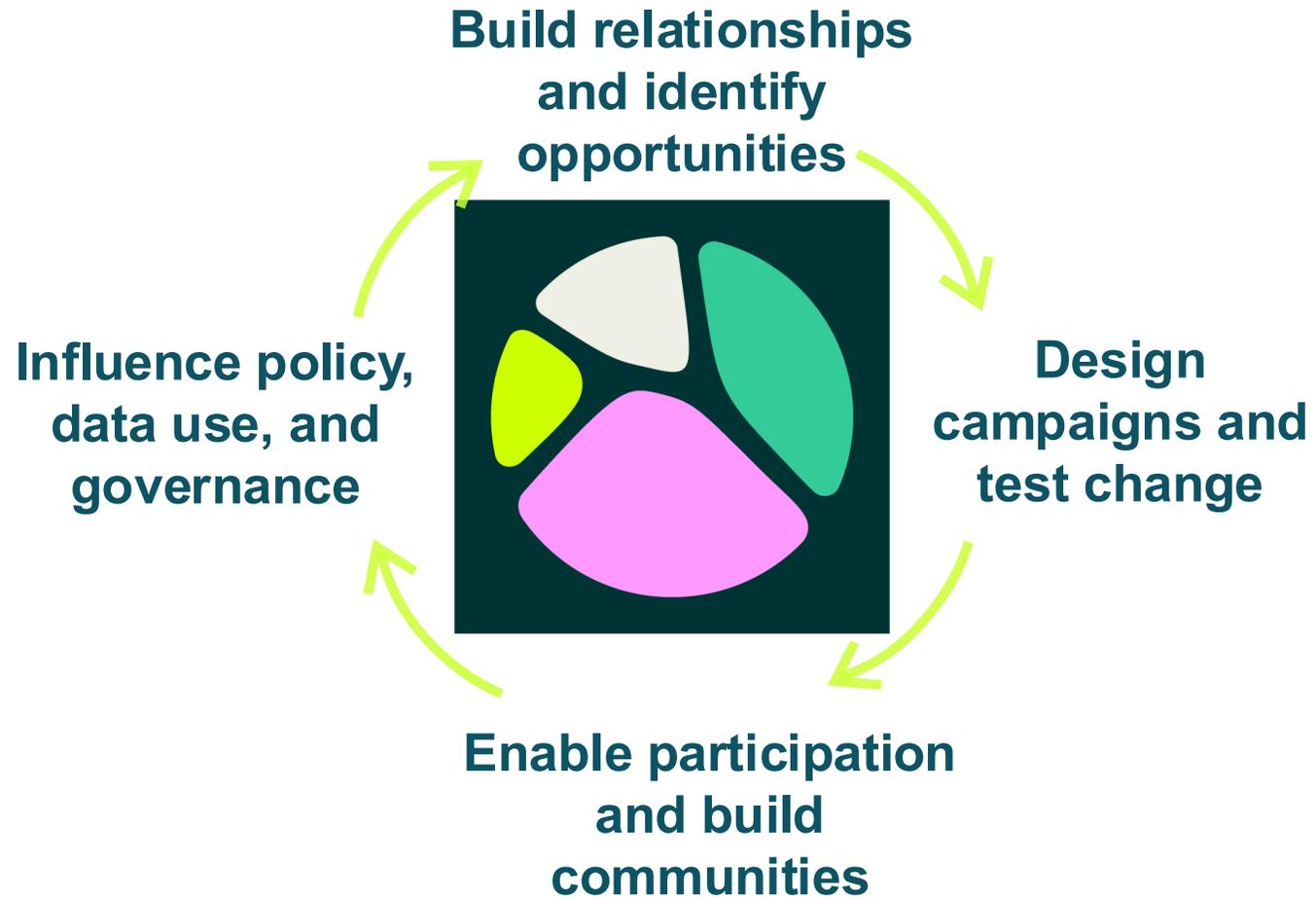
Urban ReLeaf empowers
communities with **citizen-powered**
data to influence public policy and
strengthen city resilience for all

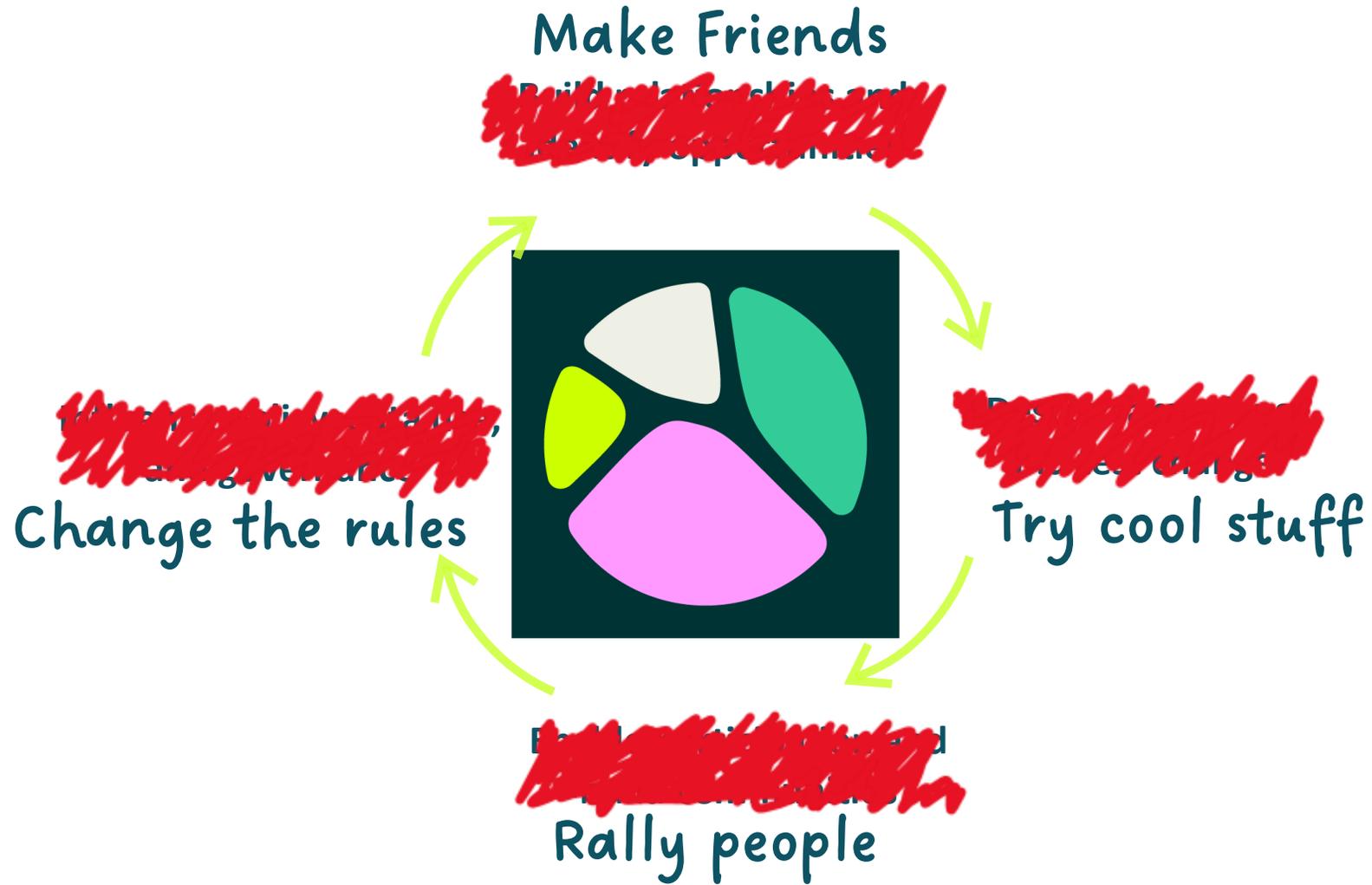
@releafcities

<https://urbanreleaf.eu>



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Novel data sources & technologies coupled with civic engagement



Urban Trees



Greenspace perception

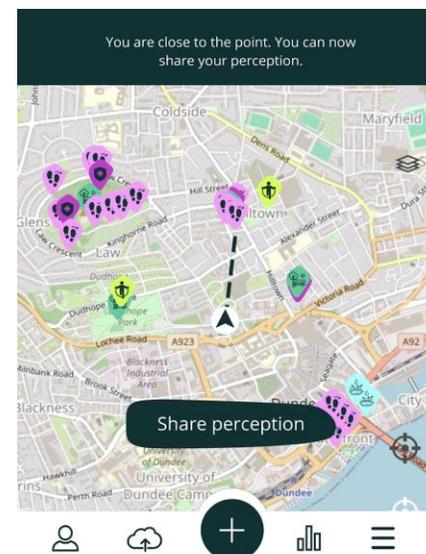


Heat Stress



Air quality

- **Mobile apps** to generate comprehensive tree registries
- **Wearable sensors** for measuring temperature and relative humidity
- **Mobile apps and web-based surveys** to collect insights on greenspace observations & perceptions
- Deploying **low-cost air quality monitors** for localized mapping of air pollution (PM2.5)



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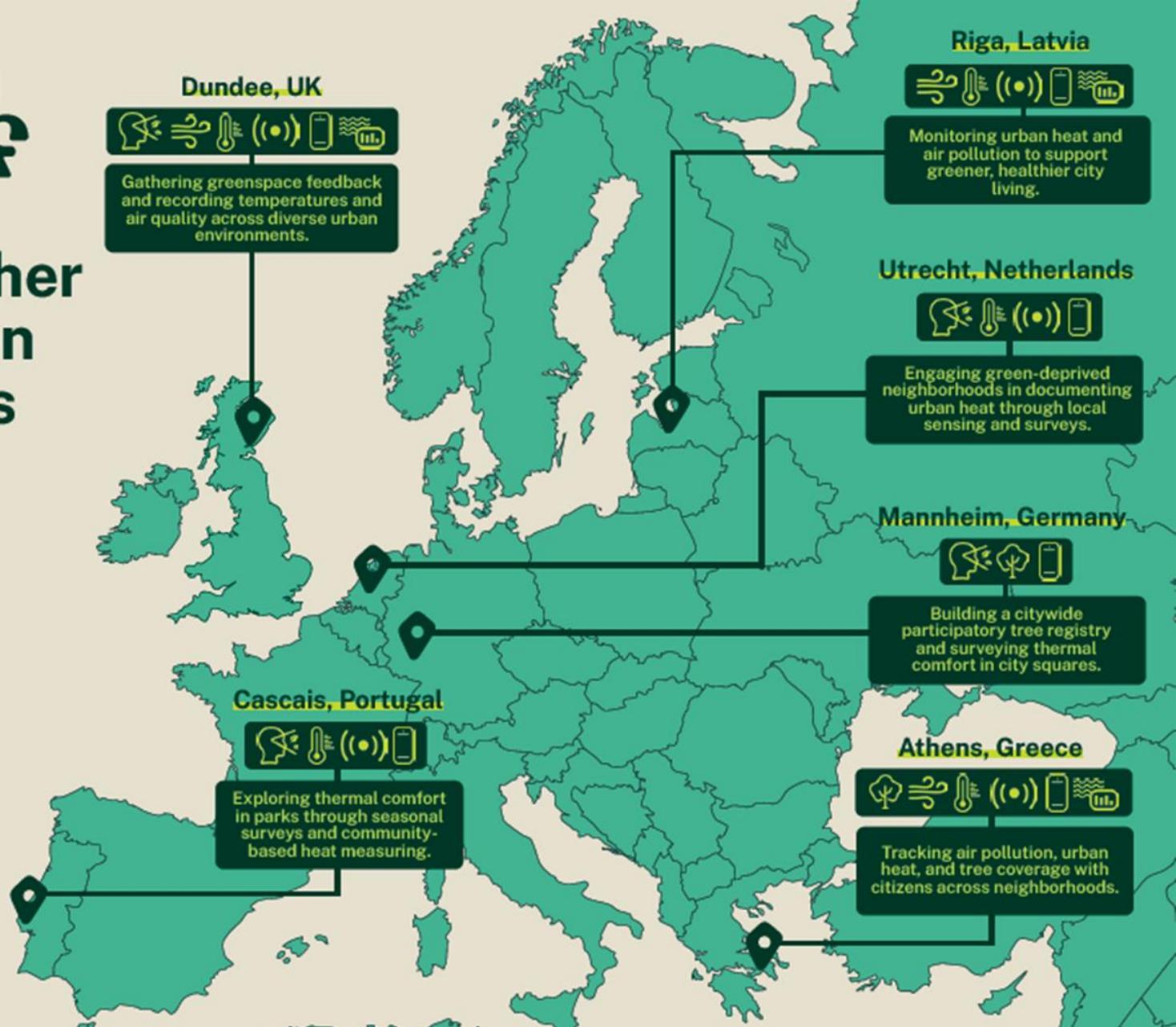


Urban Releaf



Innovating Together for Just and Green Urban Transitions

Themes	Technologies
 Greenspace Perception	 Wearable Sensors
 Urban Trees	 Mobile Applications
 Air Quality	 Air Quality Monitors PM _{2.5}
 Heat Stress	



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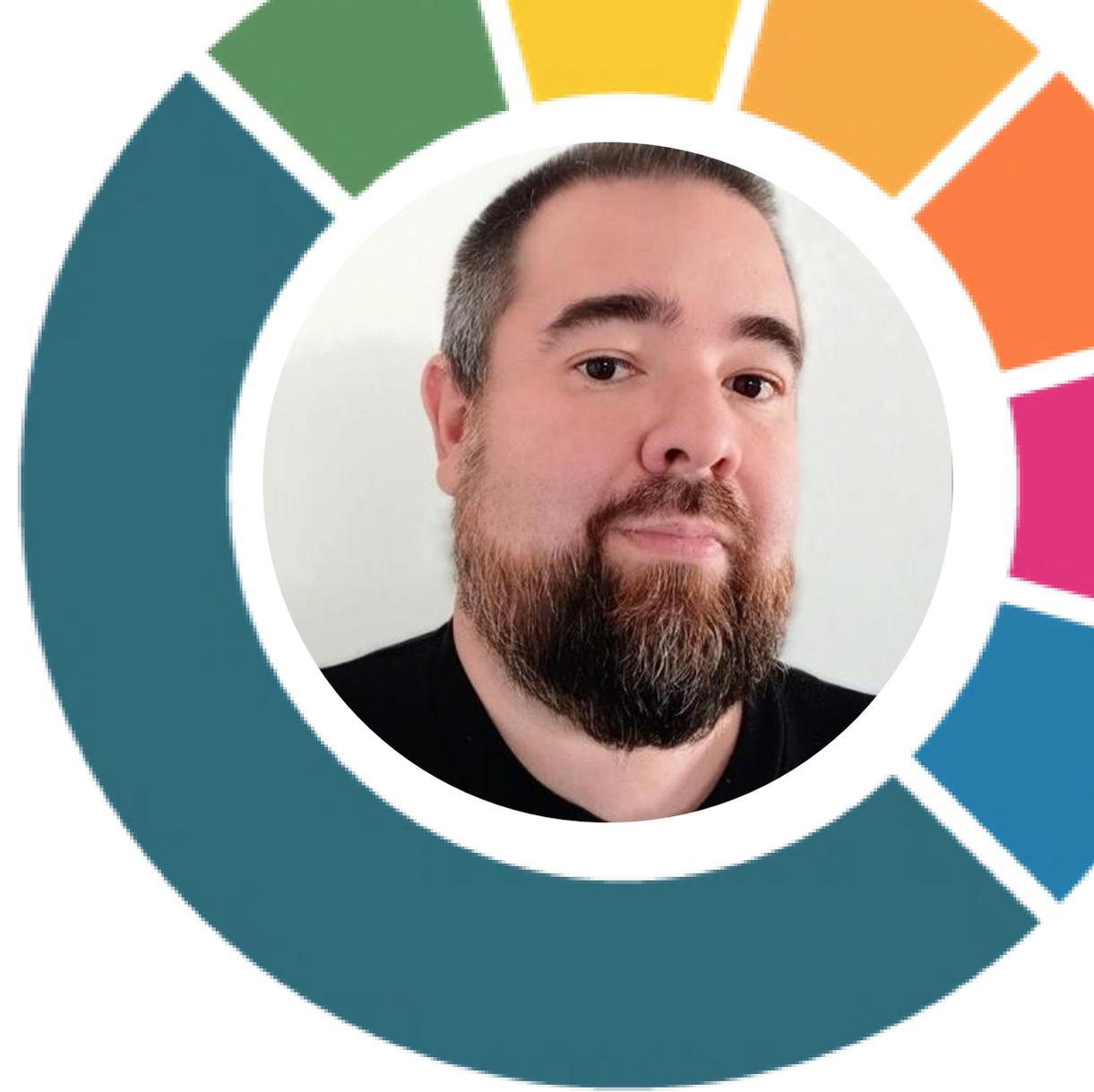
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Marcelo Lampkowski

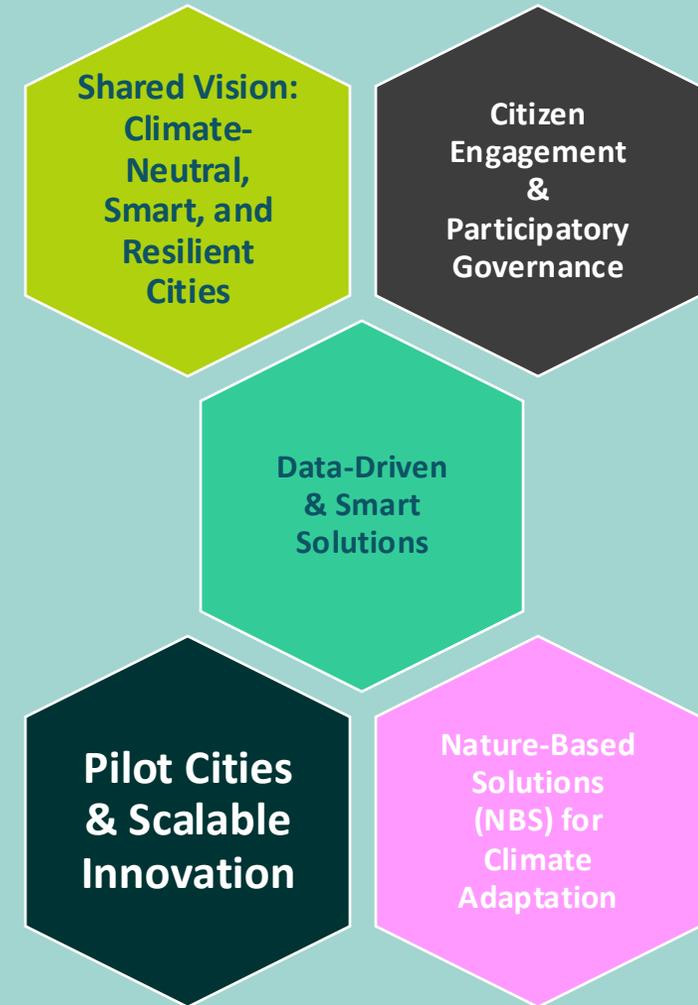
Senior Expert, Green Digital
Transformation (ICLEI Europe)



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EU Cities Mission and Urban ReLeaf





EU Cities Mission and Urban ReLeaf

Climate-Neutral, Smart, and Resilient Cities

- EU Cities Mission aims for 100(ish) climate-neutral cities by 2030, serving as **innovation hubs**.
- Urban ReLeaf focus on urban greening, heat resilience, and air quality - **key elements for climate neutrality** (critical for both mitigation and adaptation).
- Both initiatives support local climate action under the **European Green Deal**.





EU Cities Mission and Urban ReLeaf

Citizen Engagement & Participatory Governance

- EU Cities Mission **emphasises inclusive climate action**, involving citizens in **systemic change**.
- Urban ReLeaf **actively engages communities** in environmental monitoring, co-creating solutions for green spaces.
- Both initiatives foster **bottom-up** innovation alongside **top-down** policy support.





EU Cities Mission and Urban ReLeaf

Data-Driven & Smart Solutions

- EU Cities Mission **promotes smart technologies** for energy efficiency and emissions reduction.
- Urban ReLeaf **integrates citizen-powered data** (e.g., tree inventories, heat stress monitoring) to inform urban planning.
- Both leverage **data ecosystems** for evidence-based decision-making.





EU Cities Mission and Urban ReLeaf

Pilot Cities & Scalable Innovation

- EU Cities Mission supports **pilot** projects and **peer-learning among cities**.
- Urban ReLeaf works with 6 **pilot cities** (Athens, Cascais, Dundee, Mannheim, Riga, Utrecht) and **5 to 10 accelerator cities**, testing participatory approaches.
- Both aim to **scale successful models** across Europe.





Cities Mission (Net Zero Cities) and Urban ReLeaf

NbS for climate adaptation

- Urban ReLeaf directly tackles urban heat islands and air pollution through **green infrastructure**.
- EU Cities Mission **includes NbS in systemic climate strategies** (e.g., carbon sequestration via urban forests).
- **Greener cities** contribute to both **mitigation** (CO₂ reduction) and **adaptation** (heat resilience). It is a win-win for climate and livability.





In summary... it is a collaborative blueprint

- EU Cities Mission set the vision and infrastructure, while Urban ReLeaf delivers hyper-local, citizen-driven action.
- Together, both initiatives show how **policy + tech + community engagement** can fast-track climate neutrality.



Athanasia Tsertou

CTO, CIBOS Innovation



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Citizen-based tree registries

- Making a city tree registry is a task requiring many resources
- Several success stories (New York, Melbourne, Vienna)
 - Relied on public-private partnerships (greening department employees coupled with NGOs/volunteer groups)
 - Offered free view to the public with layers of information
 - Exploited citizen science groups organised in neighbourhood-level
 - Ongoing projects with user friendly interfaces for updating tree information





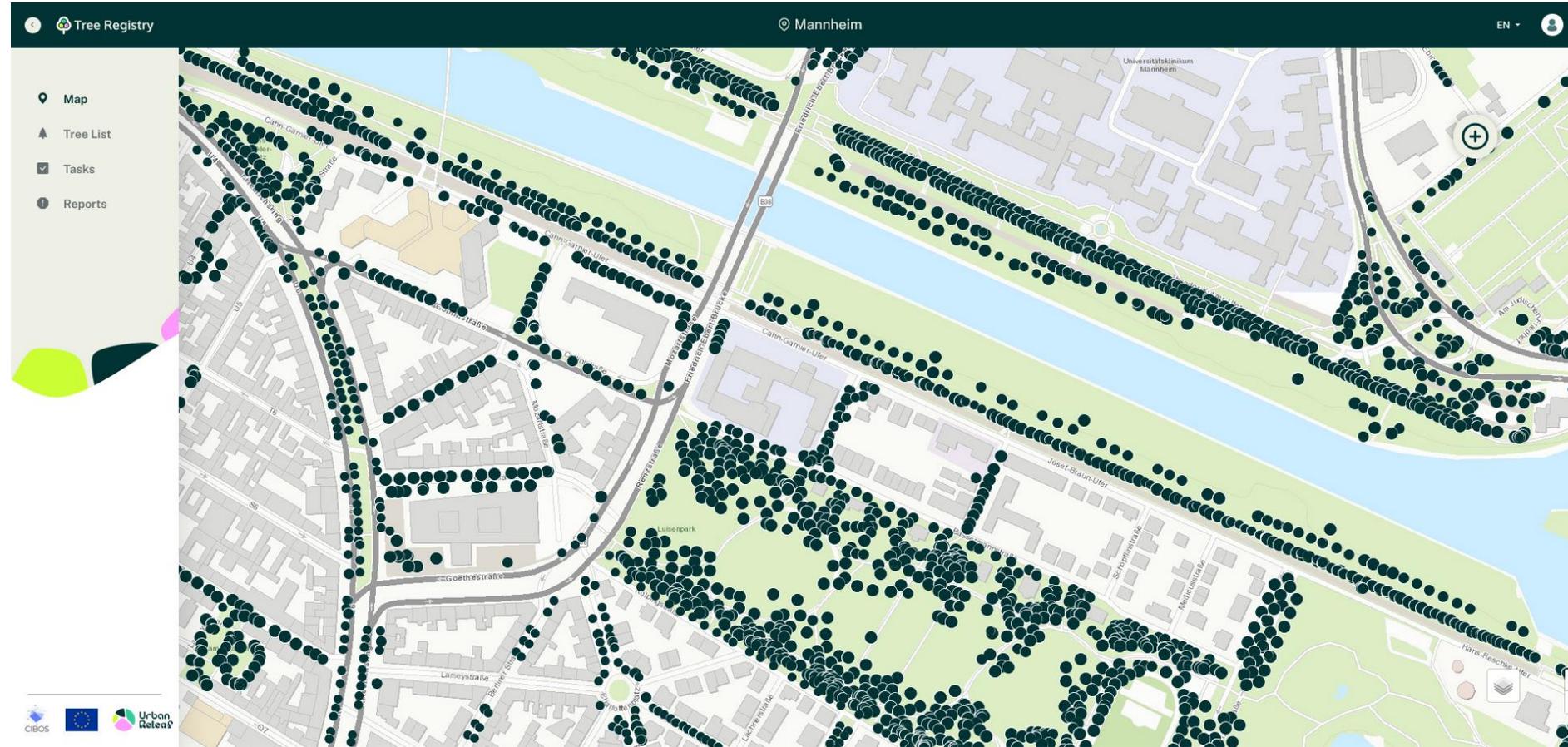
UrbanReleaf Tree registry application features

- Citizen view & Expert view
- Easy process for adding, updating, deleting street trees
- Data collection campaigns
- Citizen contribution levels and leaderboard
- Digitalisation of greening department tasks
- Cross-platform (Google store, Apple store, web app)



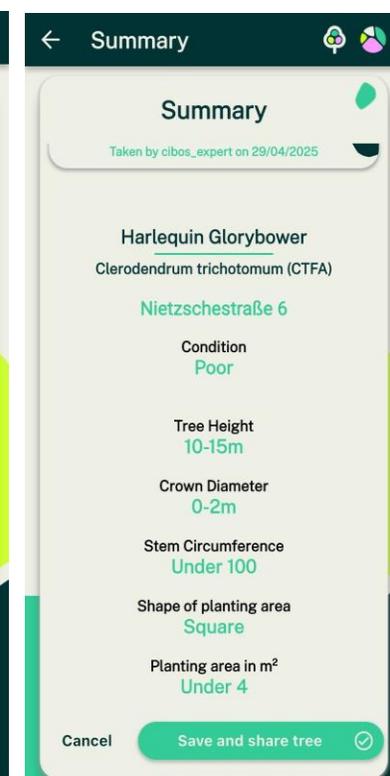
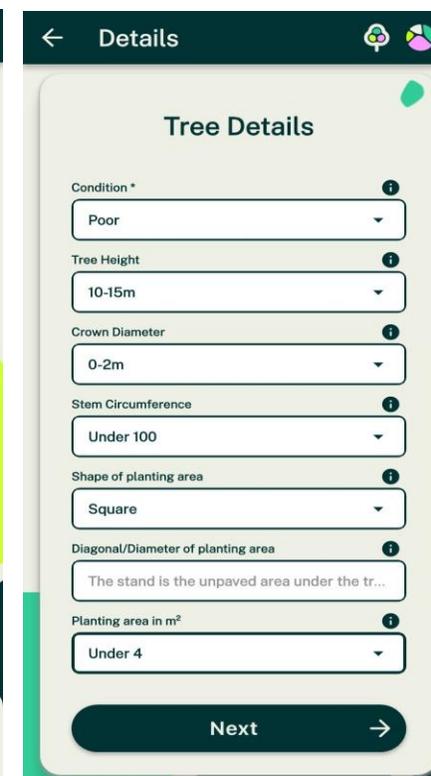
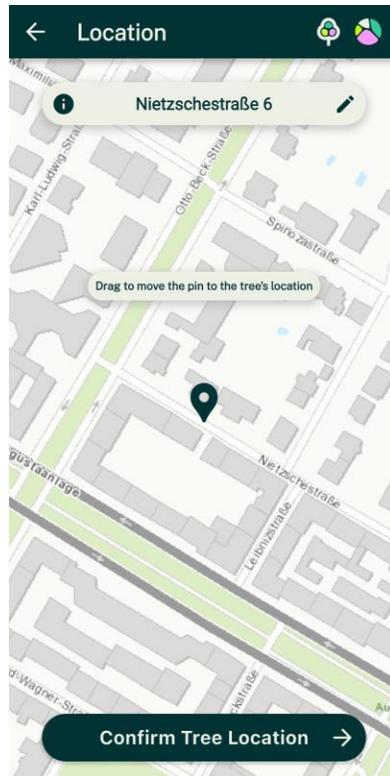
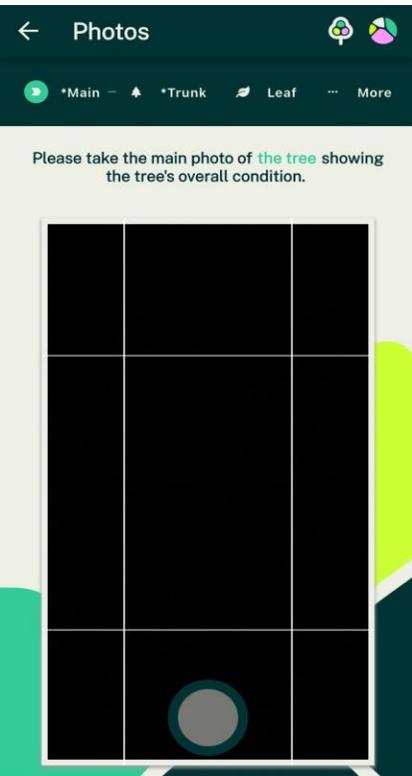


Street trees' views from different devices



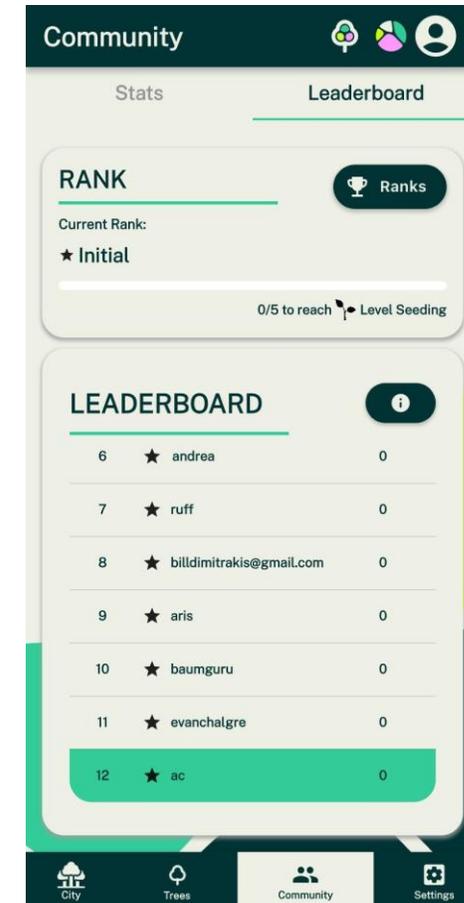
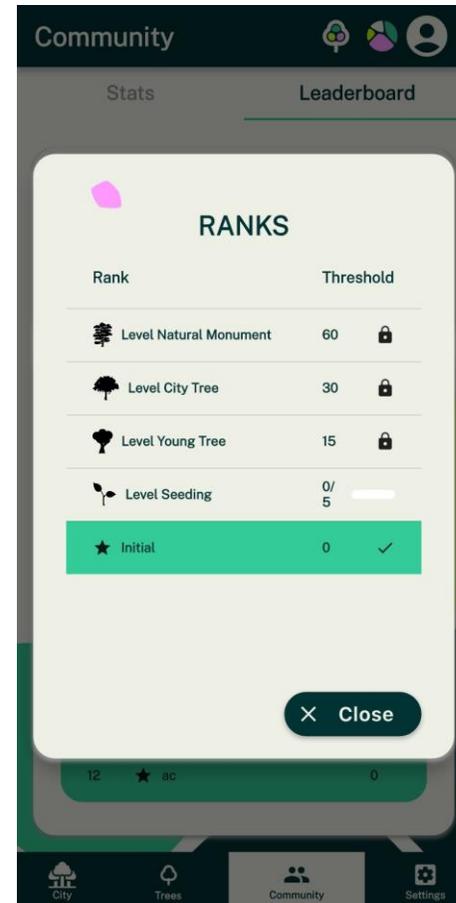
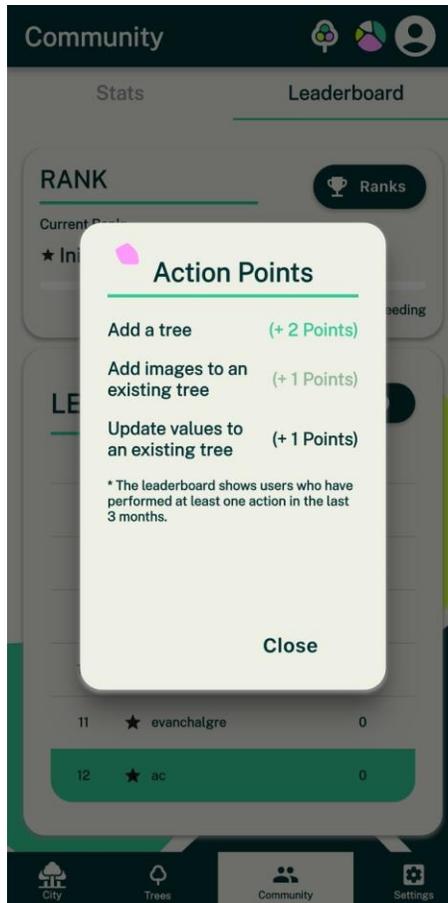


Mapping street trees from your mobile





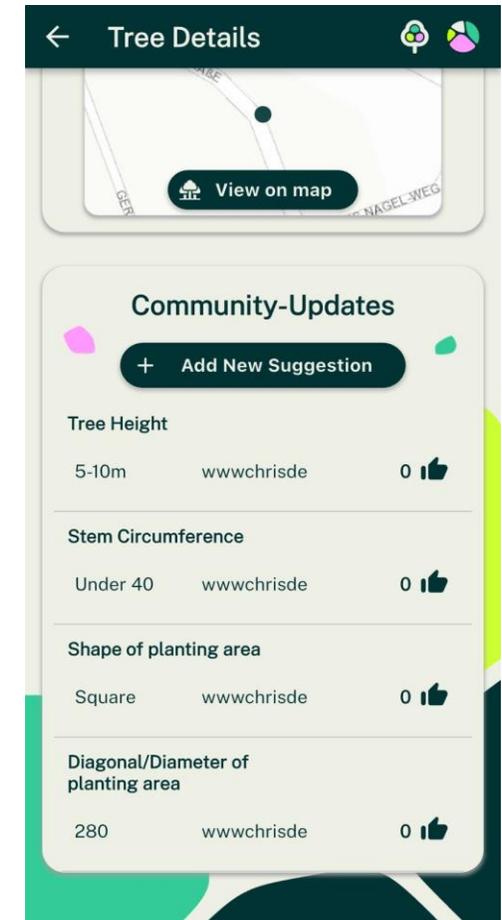
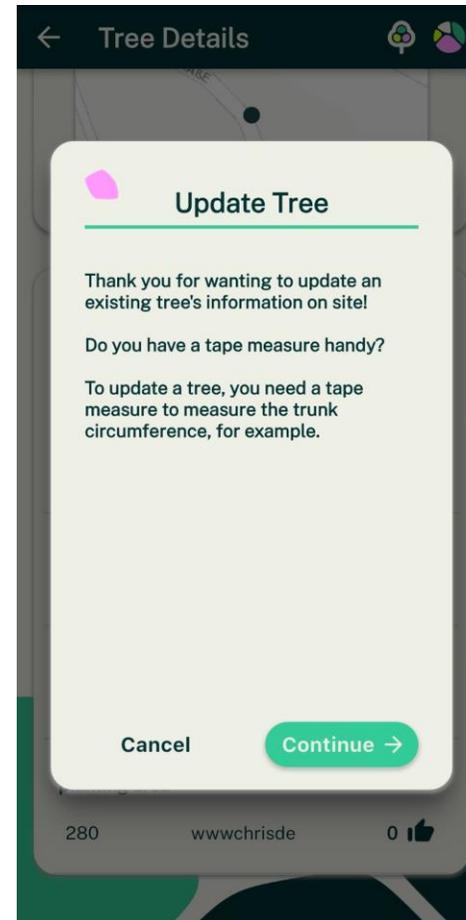
Gamification for boosting citizen engagement





Training & collective feedback for citizen data

- Step-by-step guidance
- Info-tip messages
- Voting system for citizen contributions for increasing data quality





Expert view – tree information updates

Tree Registry Mannheim EN

Edit Tree

Map
Tree List
Tasks
Reports

Latitude: 49.48780747528024
Longitude: 8.472709912621875
Address: R7 9-11

Species: Field Maple
Status: Good
Crown Diameter: Crown Diameter
Diagonal/Diameter of planting area: Diagonal/Diameter of planting area
Planting area in m²: Planting area in m²
Shape of planting area

Map showing a street grid with a green dot indicating the tree location. A photo of a tree in front of a building is shown with an 'Edit photos' button.

CIBOS European Union Urban Release





Expert view – managing tasks

The screenshot displays the 'Tree Registry' application interface for Mannheim. The main content area is titled 'Task Types' and contains a table with the following data:

Code	Name	Description
ad21a...dd7e8	Remove Alien Vegetation	-
54047...41cc2	Remove Foreign Trees	-
2d34d...159d1	Tree Preservation	-
2297b...41447	In-Depth Examination	-
09158...9ba00	Shortening of Crown Sections	-
a45bb...aff4a	Distance	-
bd6a7...954c9	Distance/Torso	-
797d2...278fe	Replacement	-
73750...2cc73	No Replacement Possible	-
e93d2...cfbd5	Growing and Construction Cutting	-
db9e6...42cb1	Crown Thinning 10%	-

At the bottom of the table, there is a pagination control showing 'First Page', '1', and 'Last Page', along with a '25 per page' dropdown menu.

On the left side, there is a sidebar menu with options: Map, Tree List, Tasks (checked), and Reports. The top navigation bar includes 'Tree Registry', 'Mannheim', 'EN', and a user profile icon.



Eileen Roth

*Climate Policy Advisor to the
Deputy Mayor*

City of Mannheim



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Mannheim – Key Facts

- 300.000 inhabitants
- Important industry hub
- Socially diverse
- One of the hottest cities in Germany



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MANNHEIM²



Industrial Powerhouse goes Climate Neutral

- 2019: Mannheim 2030 based on the UN-2030 Agenda
- 2020: "Mannheim Message" --> Creation of Local Green Deals
- 2021: Decision of the City Council to
 - Become climate neutral by 2030
 - Become Local Green Deal Pilot City
 - Apply for the EU Mission 100 CNSC
- 2022: Selection as EU Mission City, Climate Action Plan 2030
- 2023: Local Green Deal picks up its work, Mannheim receives the EU Mission Label as first German City





Urban ReLeaf in Mannheim

- **Initial situation**

- 1.000 trees programme
- Existing urban digital tree registry with various data gaps

- **Main aims**

- Expand state of information about Mannheim's city trees
- Draw people's attention to urban greening, tree preservation and heat protection
- Get a better overview for planning the replanting and new planting of trees (e.g. for 1,000 trees programme)

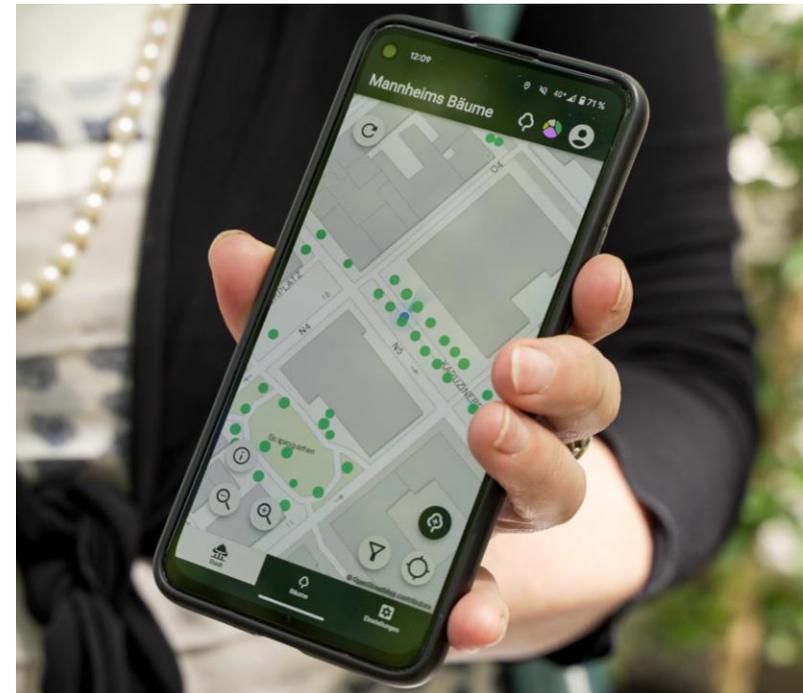
→ App to fill different data gaps in the Mannheim tree registry





App - *Urban ReLeaf* – Mannheim's trees

- Available since June 2024, updated (incl. additional functions) in January 2025
- Possibility to update and add tree-related data (location, height, species, condition, photos, etc.)
- Available free of charge, for all interested persons
- Easy to use





App - *Urban ReLeaf* – Mannheim's trees

- Joint presentation of information from the Mannheim tree registry and the additionally collected tree data in the app
- After verification, the citizen-generated data is fed into the database of the existing municipal tree registry
- Additional 'expert version' for use by greening department for simplified implementation and documentation of tree inspections

Limitations:

- Not possible to propose new tree planting sites
- Not possible to report broken branches (separate city app)





Urban ReLeaf - Citizen Science Approach

Purpose

- empower them to shape climate change mitigation and green infrastructure actions in their neighbourhoods
- Create data ecosystems
- encourage citizen participation and engagement

Target Group: citizens, no specific focus

Communication/ outreach:

- Promotion alongside heat protection
- Various events
- May 25: first tree walk

Gamification:

- most active users and city districts





Engaging Citizens in Climate Action / Adaptation

- Climate Action Agency



- Local Green Deal



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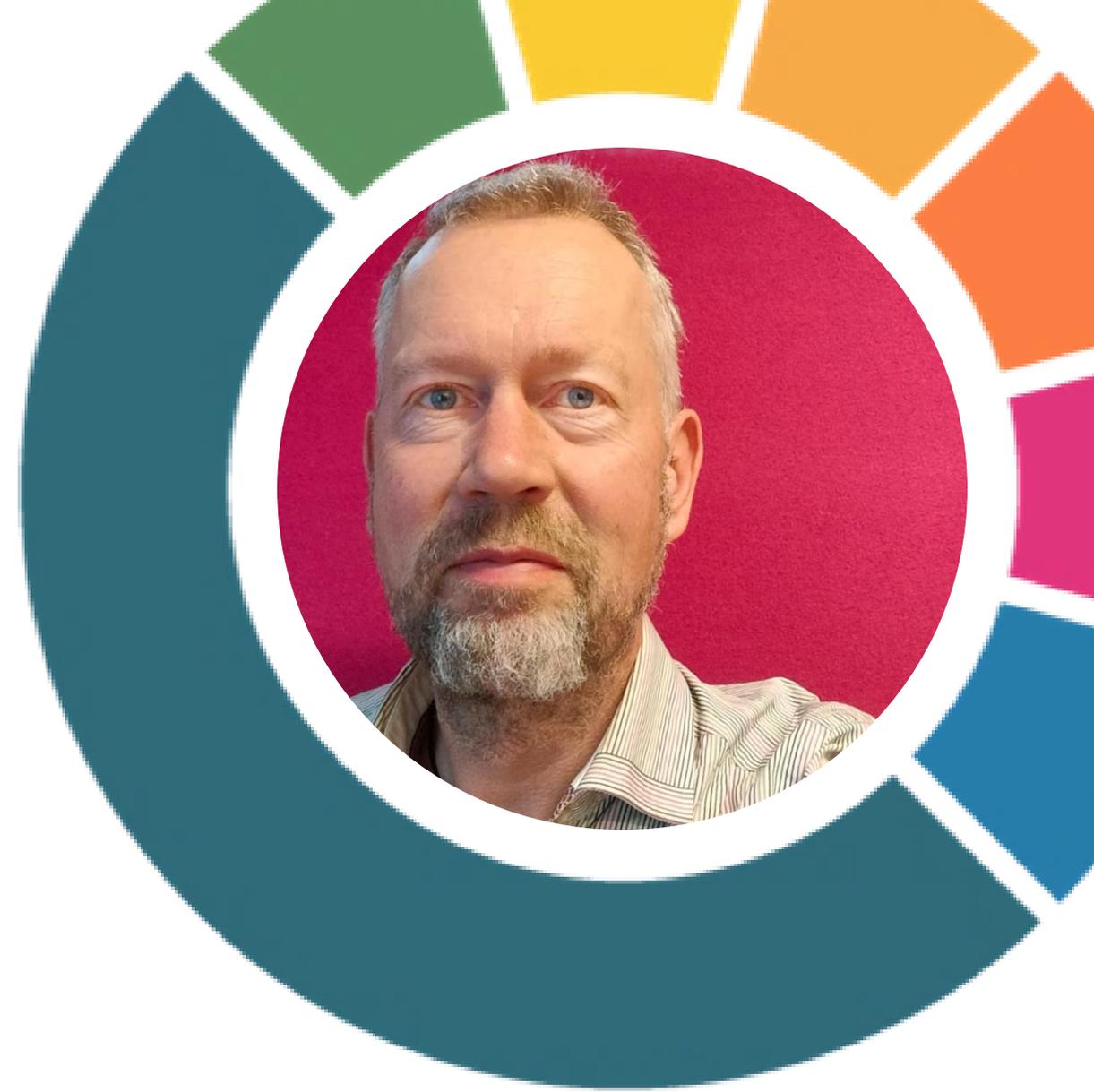


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Albin Hunia

Urban Greening Policy Advisor

City of Utrecht

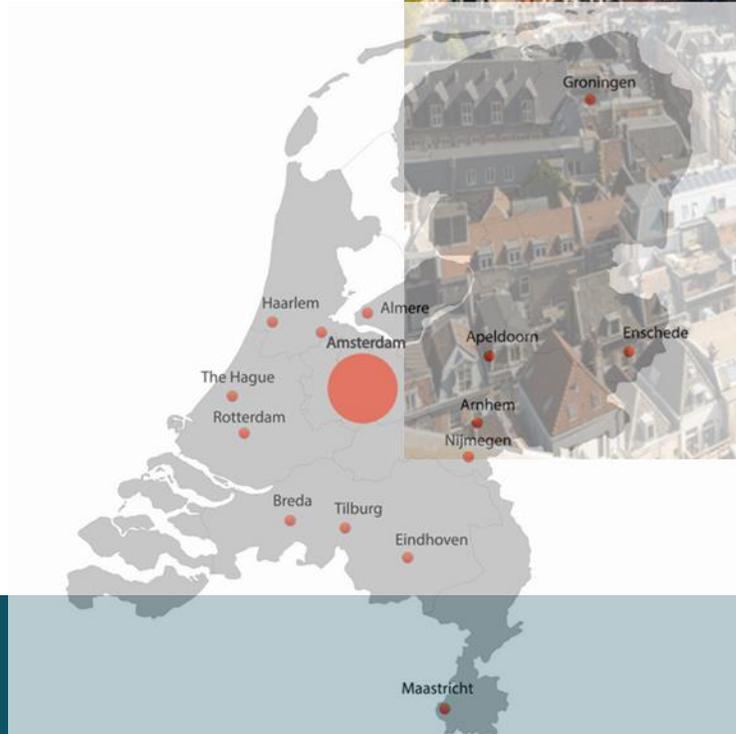


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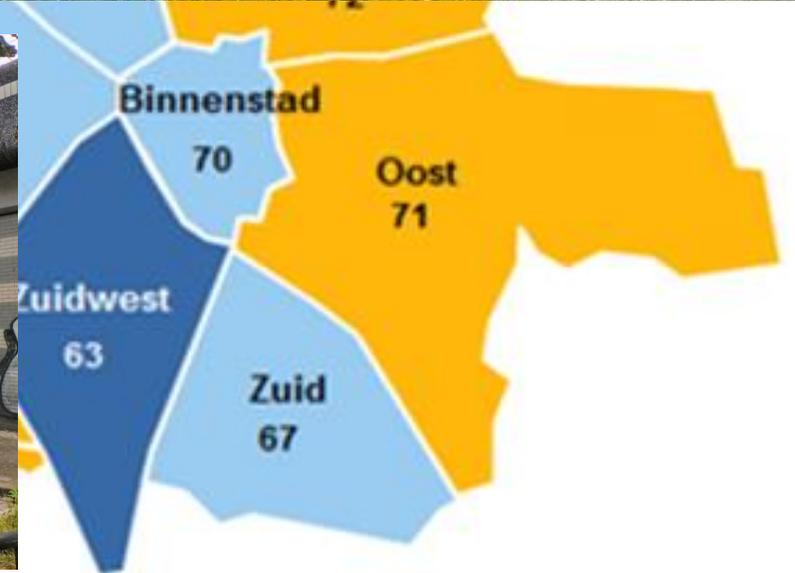
Utrecht

- Big 4 ~ 350.000 ppl
- fast growing
- old & new
- green & cool / hot & stony



Utrecht

- 10 city parts
- ..life expectancy!



- Hoger dan in Utrecht gemiddeld
- Gelijk aan Utrecht gemiddeld
- Lager dan in Utrecht gemiddeld



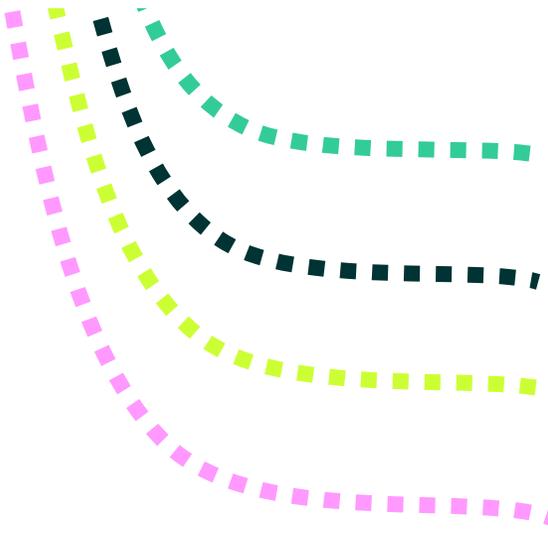
Utrecht pilots

- 4 neighbourhoods
- diverse populations
- vulnerable groups
-  HEAT STRESS



- Hoger dan in Utrecht gemiddeld
- Gelijk aan Utrecht gemiddeld
- Lager dan in Utrecht gemiddeld

Utrecht pilots



Citizen science

Data driven policy

Vulnerable groups

Technology integration



heat stress



Utrecht pilots



Citizen science



Utrecht pilots

Citizen science



- Campaign

2 SUMMERS

green neighbourhood
cool neighbourhood

- NGO: NMU
- 4 communities
- general participants
vulnerable groups
- support & events

Utrecht pilots

..... Data driven policy



- Policy documents
- Neighbourhood projects
- Surveys & statistics
- Digital Twin
- other Citizen Science projects

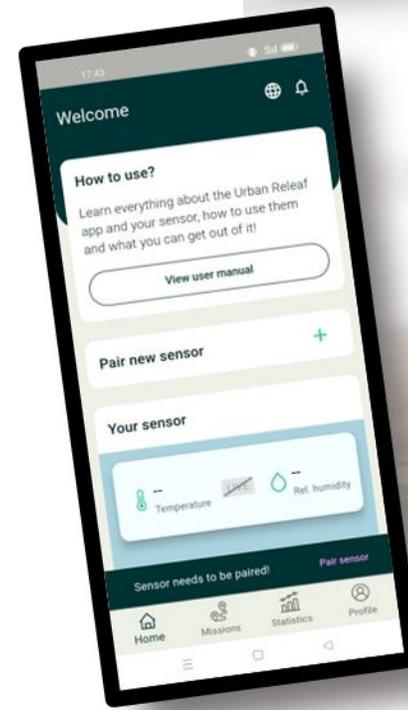
Utrecht pilots



Vulnerable groups

- general participants
→ *citizen science*
- vulnerable groups
→ *inclusive approach*

Utrecht pilots

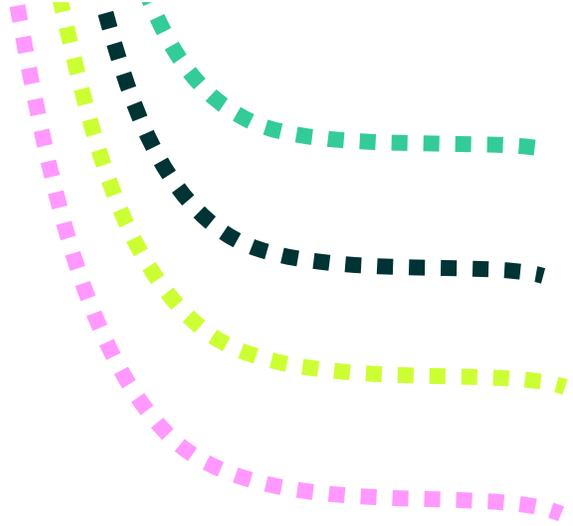


Technology integration

- TRH sensors
temperature & relative humidity
- APP 'EcoPulse'
interface & upload
- Analysis & presentation



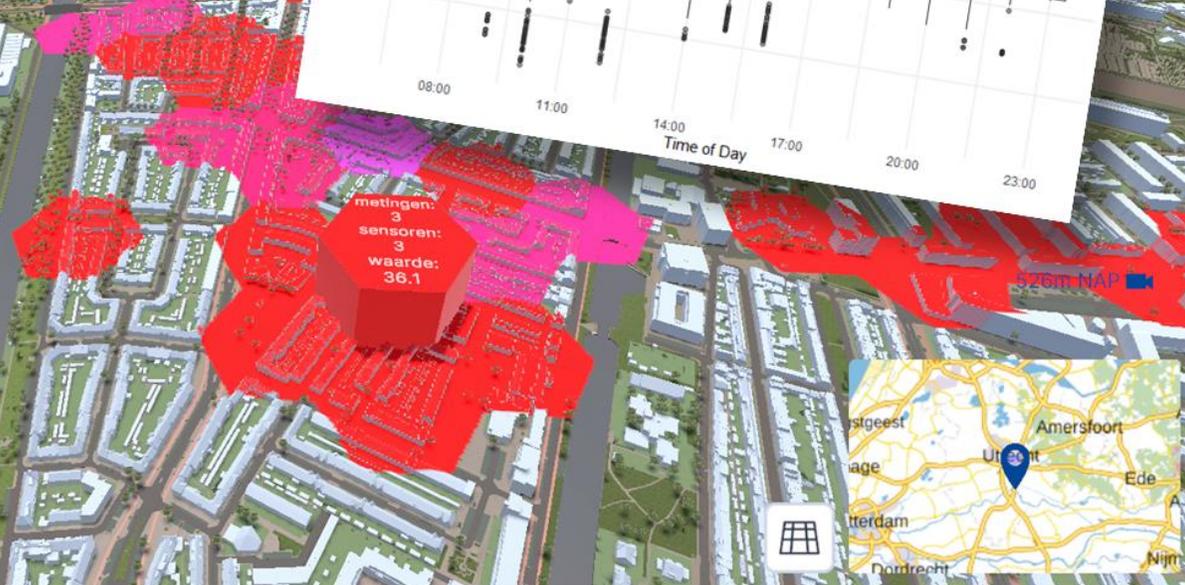
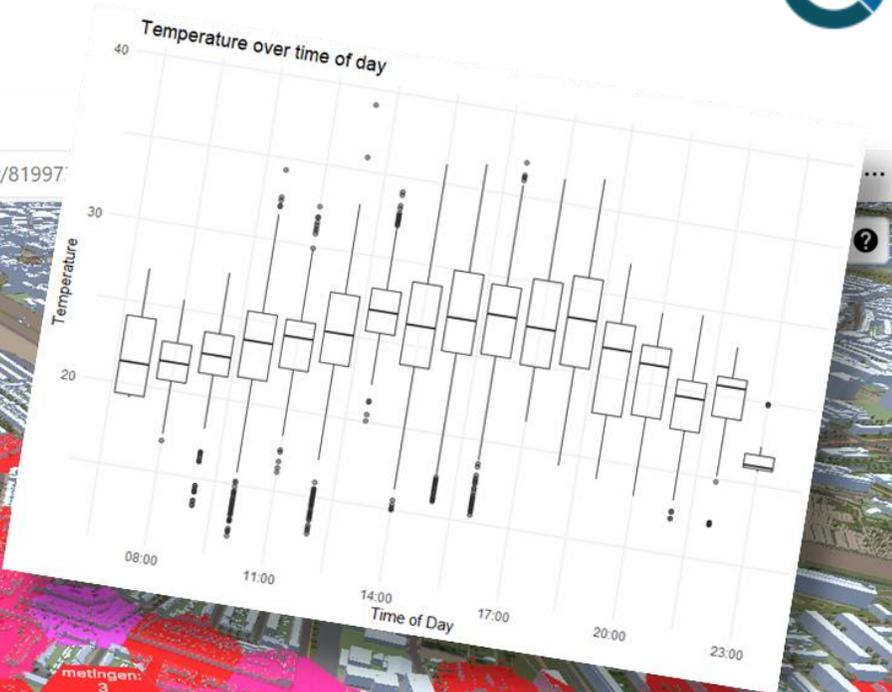
Utrecht pilots



1 SUMMER

first insights

<https://cdn-dev-ams-3da.azureedge.net/autobuild/feature/wms-image-layer/81997>



Netherlands3D

x136315 y453329 z526

Citizen science

- invest in communities
- tech support
- app groups
- 'events' & 'experiences'
- views & data analysis

Data driven policy

- transparent policy process
- co-creation
- data management
- align internal organisation

Vulnerable groups

- separate from citizen science !
- inclusivity vs. privacy

Technology integration

- tech should work! TRL7+
- focus on the 'science'

Nora Gagane

Riga municipality, Project Expert in Riga
planning region



Riga



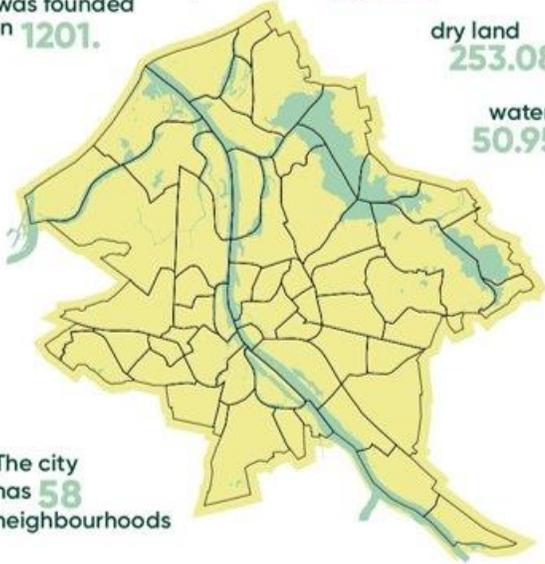
Location:
56°56'56"N 24°6'23"E

Riga is the Republic of Latvia's capital city and was founded in **1201**.

Riga's city limit is **304.03** km², including:

dry land **253.08** km²

water **50.95** km²



~ **1 million** inhabitants live in the Riga Metropolitan Area

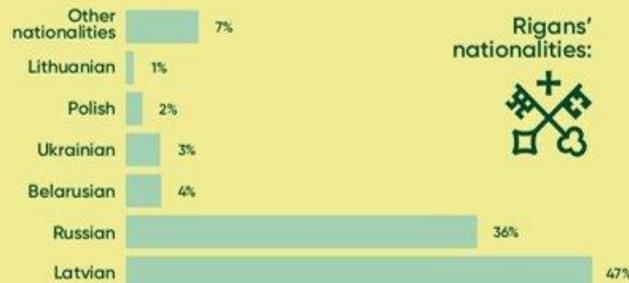
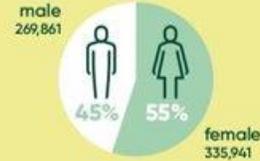
Population of Riga **605,802**

2,394 people per square kilometre live in Riga

The average Rigan is **43.2** years old

and earns **€1,525** a month

Rigans' genders:





Riga



- ✓ Covenant of Mayors (joined 2008) > SECAP2030
- ✓ EU initiative «Green City Accord» (joined 2021)
- ✓ EU Mission «100 climate-neutral and smart cities by 2030» (joined 2022)



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RIGA CITY URBAN GREENING PLAN 2027–2031

Greener Riga: better and more green infrastructure in public and private properties

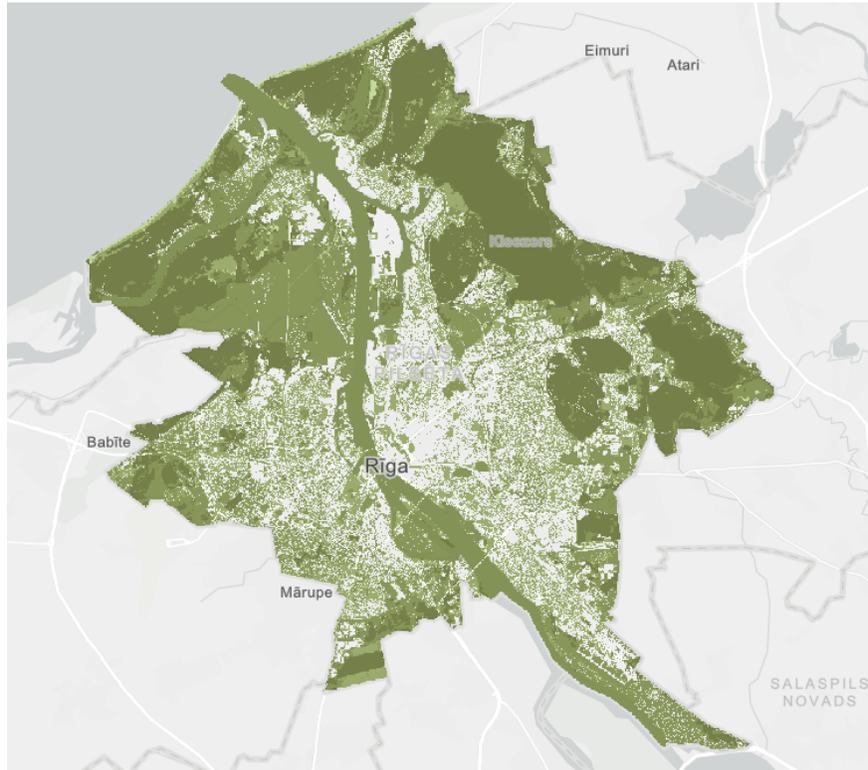
Climate resilient Riga: reduced heat island and reduced stormwater influence on cities inhabitants and infrastructure

Sustainably managed green infrastructure:
safeguarding and promotion of biodiversity, clear and improved green infrastructures management structure





**One of the greenest European capitals,
40% of the city is green and blue,
15 % of historic centre is green.**





Problem areas where there is a strong heat wave and/or a risk of flooding



186 Problem areas

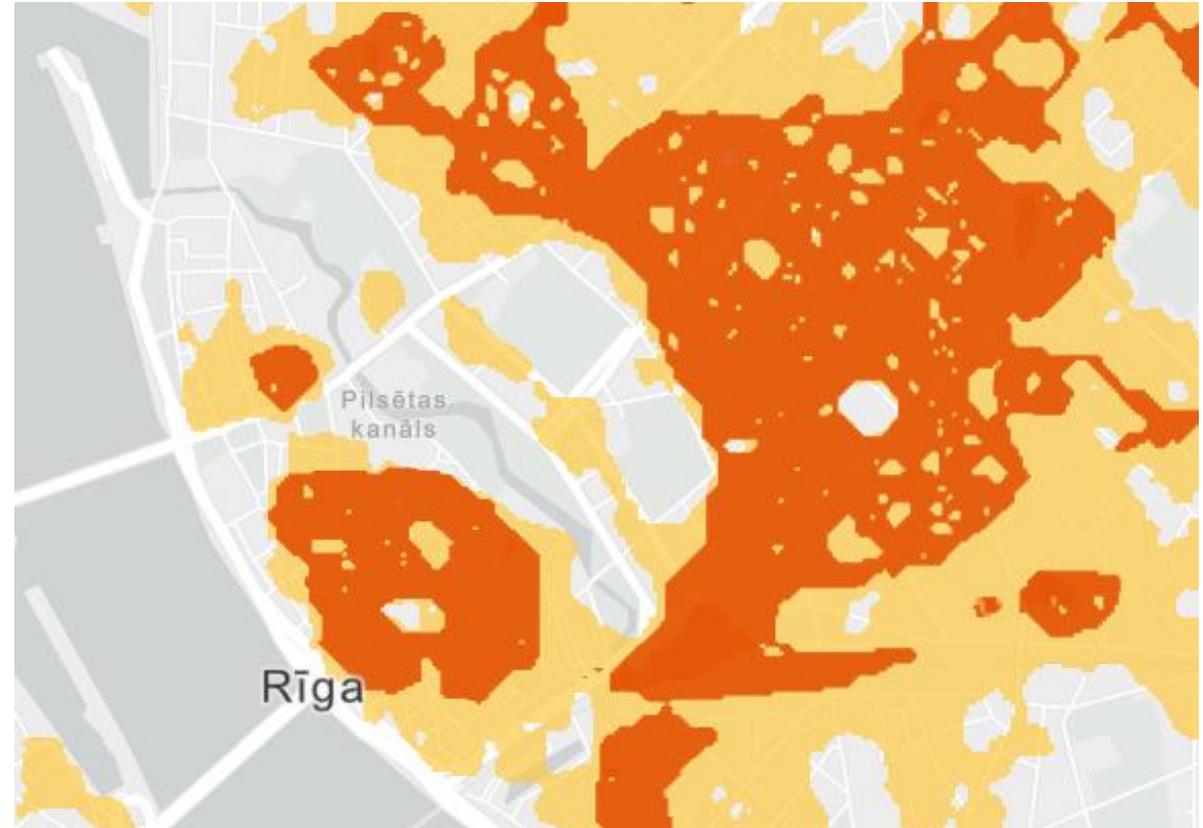
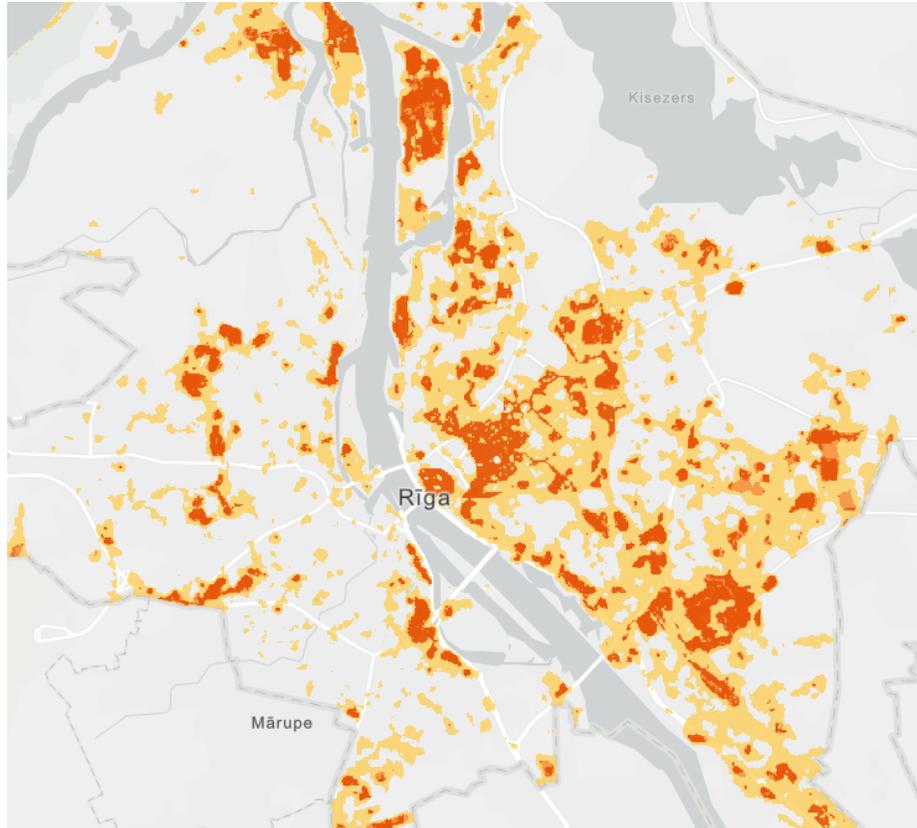


Priority areas for nature based solutions



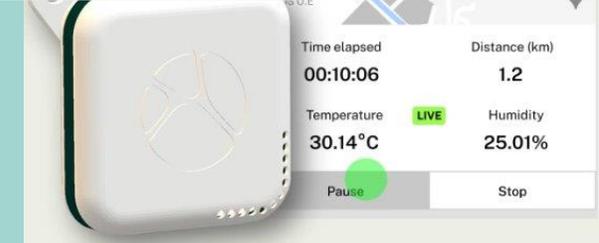
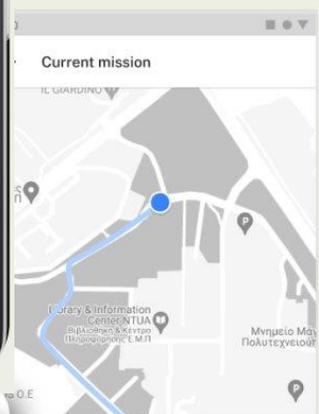
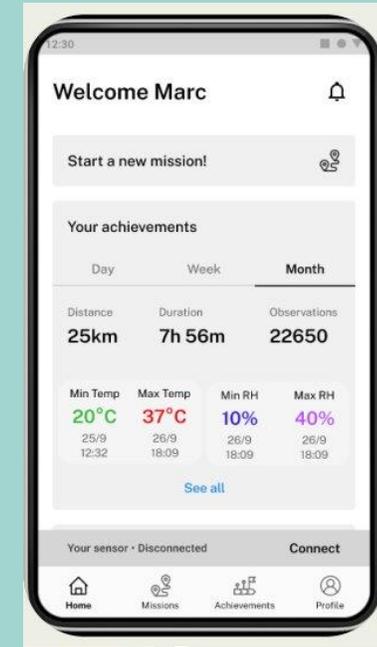
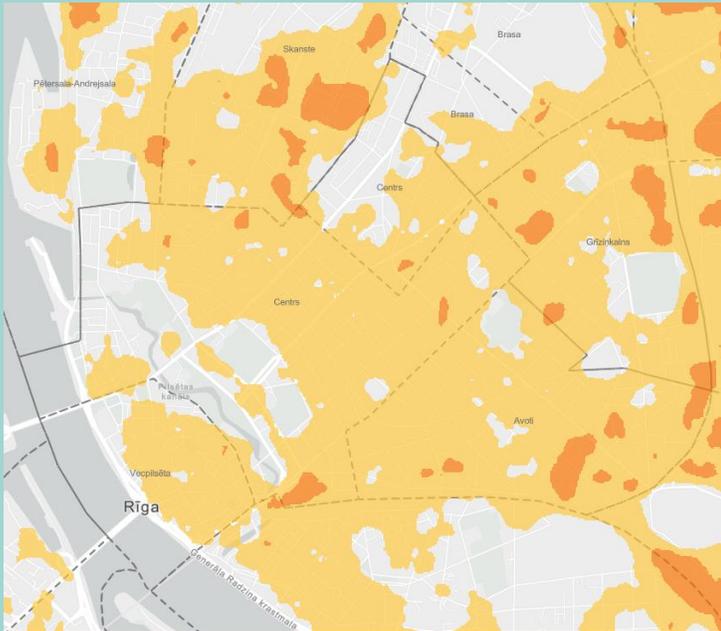


Heat island prioritisation





Here comes the citizen science!





20



Related to AQ
campaign

30



Stewardship

20



Regular routes

10



Vulnerable group
+ constant data+
education





More than a data collection



Made with Napkin





Campaign

Spring

Summer

Autumn

What is this about?

Community building activities

Data analysis

Citizen science
Heat islands, thermal
discomfort

Educational walks

Reflection

Trying out technologies
Onboarding e- community

Lectures and workshops

Further action

Culture – lab



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Bring together

Activate

Raise awareness and stewardship

Active citizens

**NGOs,
neighbourhood
associations**

**Dog
owners**

**Municipal
outdoor
workers**

Interested to know more

Closer dialogue on greening plan

Knows the area and its problems

Vulnerable group that needs to be educated



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Climate Assebly X Greening plan



- organized by NGO Green Freedom with the support of the Riga Municipality
- dedicated to the Riga Urban Greening Plan
- 34 participants representing various groups of Riga residents.
- 5 Saturdays
- developed 41 recommendations for Greening plan





Citizens wants to get involved in Green Transition

- ½ of recommendations towards involvement and support for greening by the citizens themselves.
- **Educate and Engage Residents**
Consultations, public campaigns, and educational media (TV/radio/web)
- **Support and Incentivize Greening** –
Provide grants, tax incentives, and competitions for individuals and organizations.
- **Enhance Public Participation Tools**

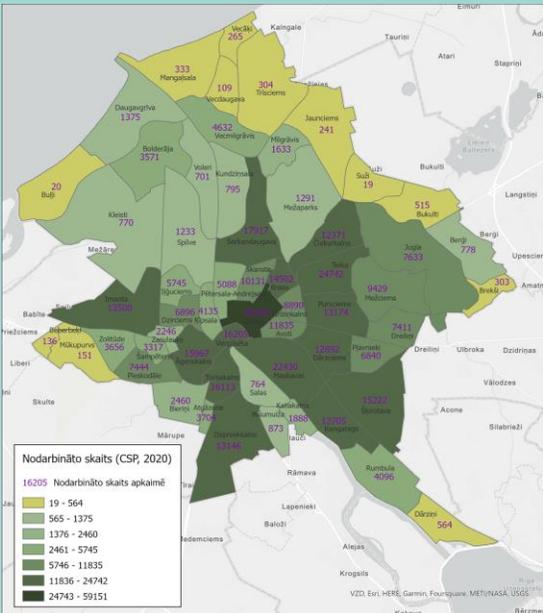


Development of the neighborhood concept in Riga

Evolution of the concept from the need for analytical monitoring to community development and place-making



From a top-down governance model to decentralised support for community-based initiatives



First ideas and design since 2008



Benefits of local NGO-City Council collaboration

- Small scale development and initiatives
- Better dialogue on specific, difficult and ambiguous issues
- Direct communication, which makes citizen (effective) involvement much easier
- More trust and deeper understanding - positive relationships with key influencers
- Building networks of community support





Success story...

RĪGA + A -

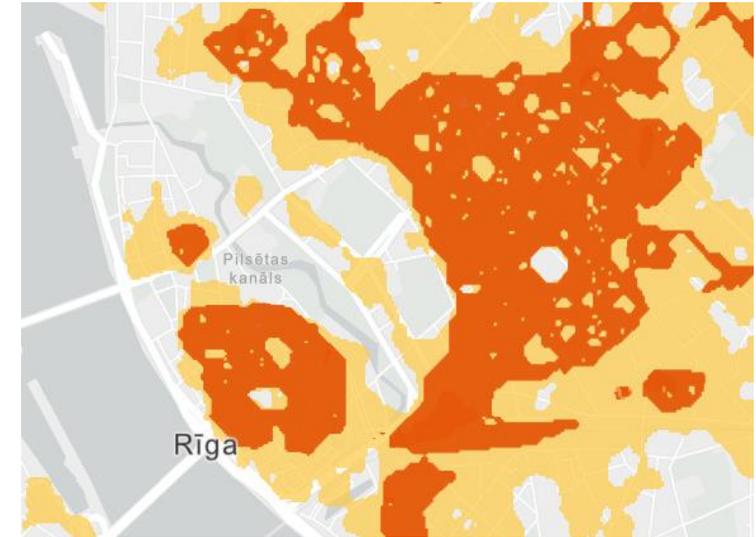
PROJEKTI | AKTUALITĀTES | PAR INICIATĪVU | KONTAKTI

Projekta nosaukums vai iesniezējs | Apkaime | Izmaksas | 2024 | **Atlasīt**

PROCESSES

Balsu skaits 3023
Istenojas
[Vairāk par projektu](#)

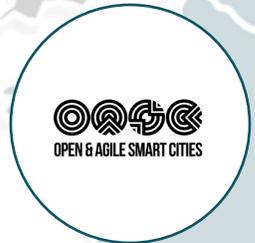
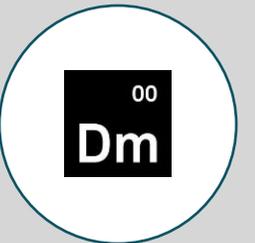
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Questions & Answers





Get in touch with NetZeroCities!



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