Ecopia

Understand
our planet with AI.

Ecopia's History

2010 - 2013

- Spun core technology out of PhD research at **UWaterloo**
- Commercialized services and refined **AI algorithms,** with a focus on building footprint mapping

2016

- Completed first continental-scale mapping initiative, for the Australian Government: **16 million buildings** across **3 million sq. miles** in **6 months**

2017 - 2018

- Generated complete map of every building in the USA: **169 million buildings** across **3.1 million sq. miles** in **6 months**
- Transitioned from man made objects to high accuracy **land cover mapping**

2018-2020

- Focus on developing **advanced land-cover** for: smart cities, transportation engineering, autonomous vehicles, large scale state and federal operations, etc.

2021 - present

- Largest project to date mapping **51 countries** across Sub-Saharan Africa covering **9.3M sq. miles** – Including **416M buildings, and 11M linear miles of roads in 8 months**
- Development of first **US Nationwide 3D land cover** map

Ecopia

Our Clients

Ecopia

Ecopia's data is embedded into **hundreds of customer applications**, spanning 100+ countries across the world.

Civil Engineers

- BLACK & VEATCH
- FEHR PEERS

Telecom

- Deutsche Telekom
- NTT

Government

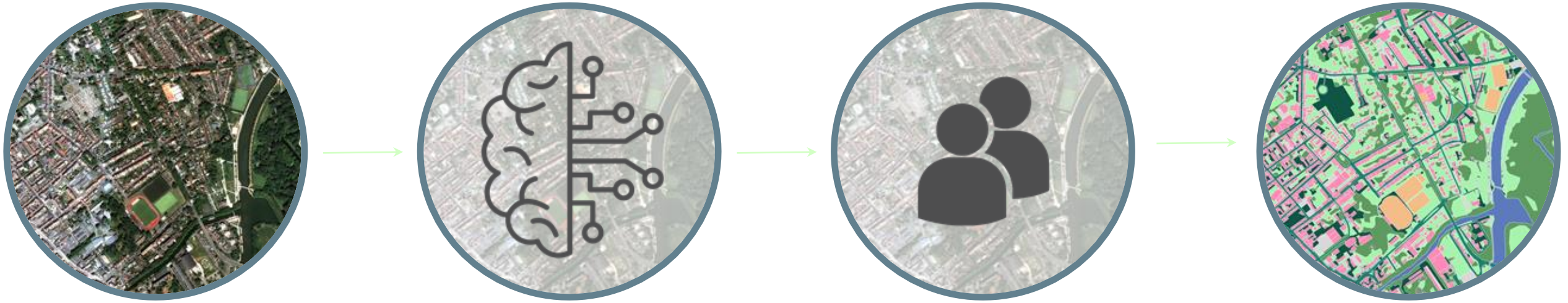
- Chicago Metropolitan Agency for Planning
- County of Hamilton, State of Indiana
- City of Detroit

Insurance

- Munich RE
- CoreLogic

Ecopia's core AI technology is the heart of this process

A distributed, highly scalable, accurate system



Raw imagery

Machine learning

Distributed human annotation

Vector layers

Traditional solutions require compromise

With existing options for digitization, end users are continuously having to make trade-offs between accuracy, speed, and the cost of data creation.

	Manual digitization	Automated software
≥ 95% accuracy	✓	✗
Normalized data	✗	✓
Fast nationwide extraction capabilities	✗	✓
Low price	✗	✓
Ability to update data quickly	✗	✓

GIS-professional quality, AI scale

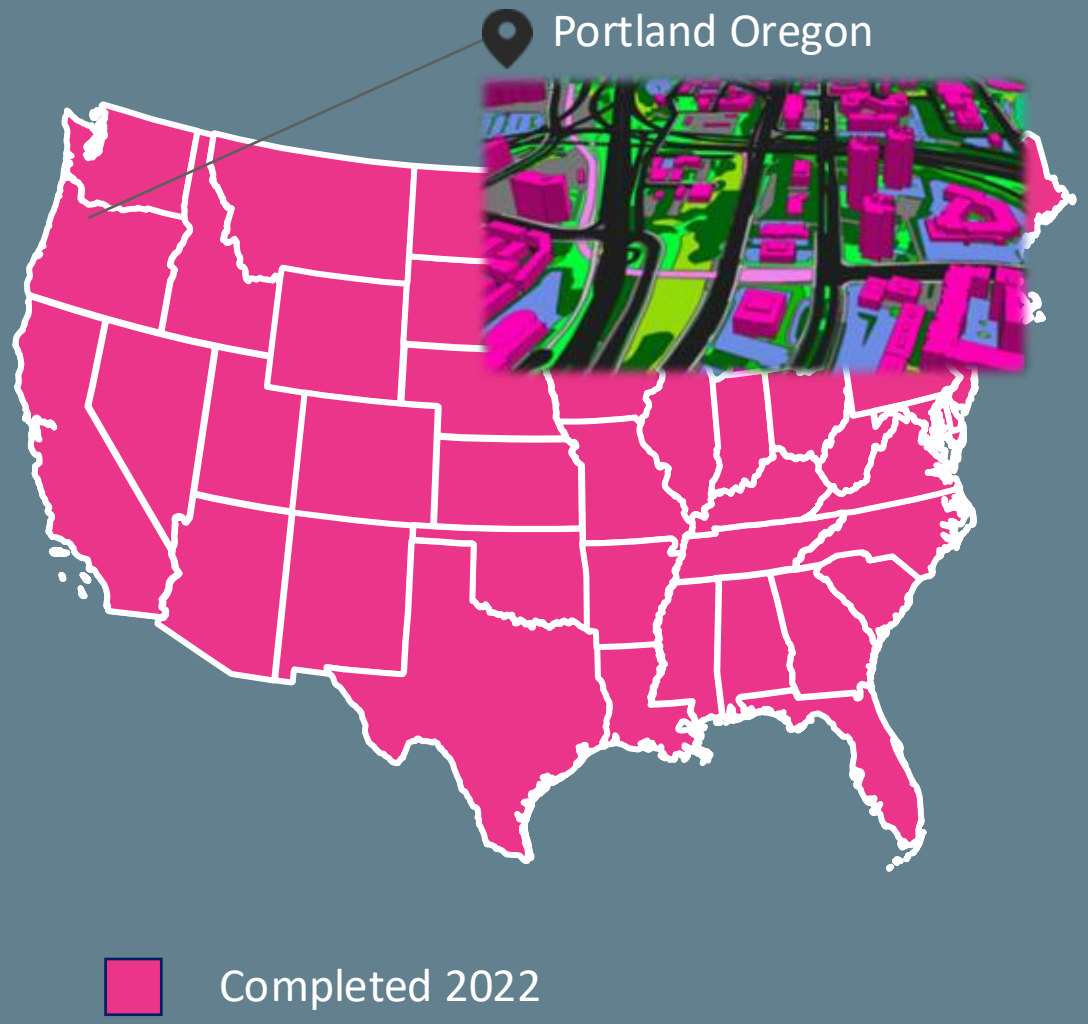
With Ecopia, there is no need to compromise between quality and cost

	Ecopia AI
Highest accuracy A geometric accuracy of 95% or higher is guaranteed	✓
Normalized data Features consistently defined and precisely extracted to meet strict quality control guidelines	✓
Fast nationwide extraction capabilities +50 nationwide datasets available off-the-shelf + custom feature extraction capabilities	✓
Low price Cost efficiencies achieved through automation and content creation for multiple end users enables competitive market pricing	✓
Ability to update data quickly Advanced AI systems allow data to be refreshed as new imagery is captured	✓

3D Land Cover Across The United States

Project: Build the first 3D nationwide high resolution landcover map of the USA

Data Input: 15-30cm stereo aerial imagery



Height-Attributed Features

Buildings	Trees + Shrub	Bridges

Standard Land Cover Features

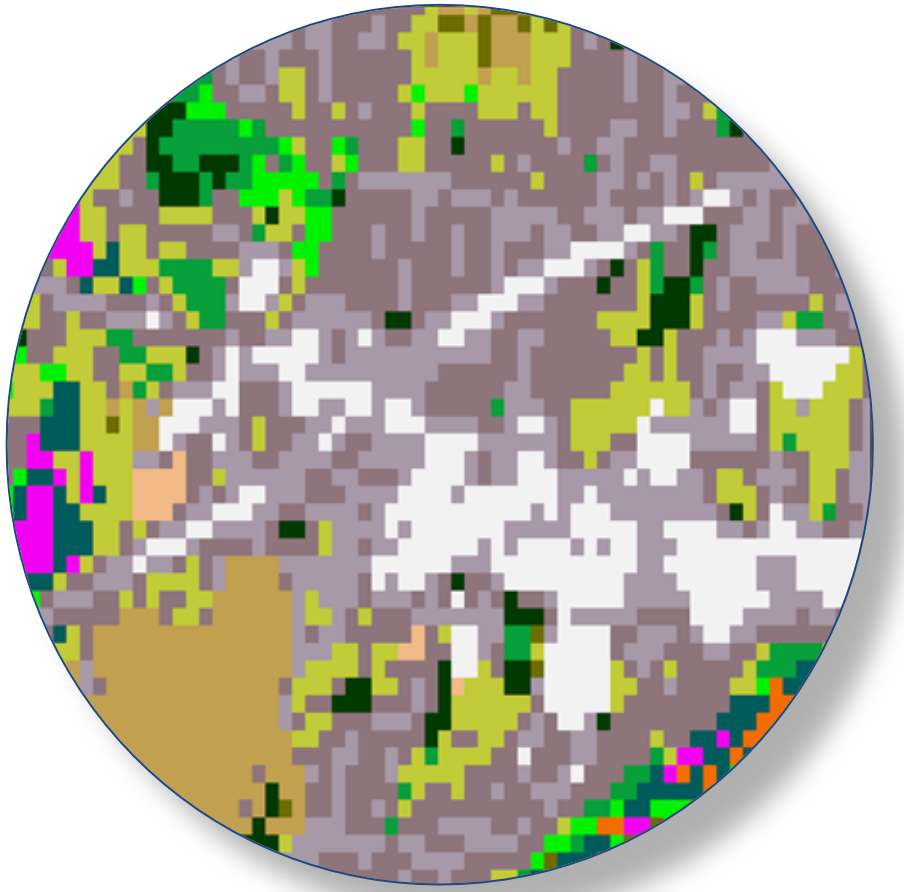
Building	Railway	Grass
Driveway	Sidewalk	Bare Land
Pavement	Road	Water Body
Parking	Swimming Pool	Sports Field

Upcoming High Resolution Mapping

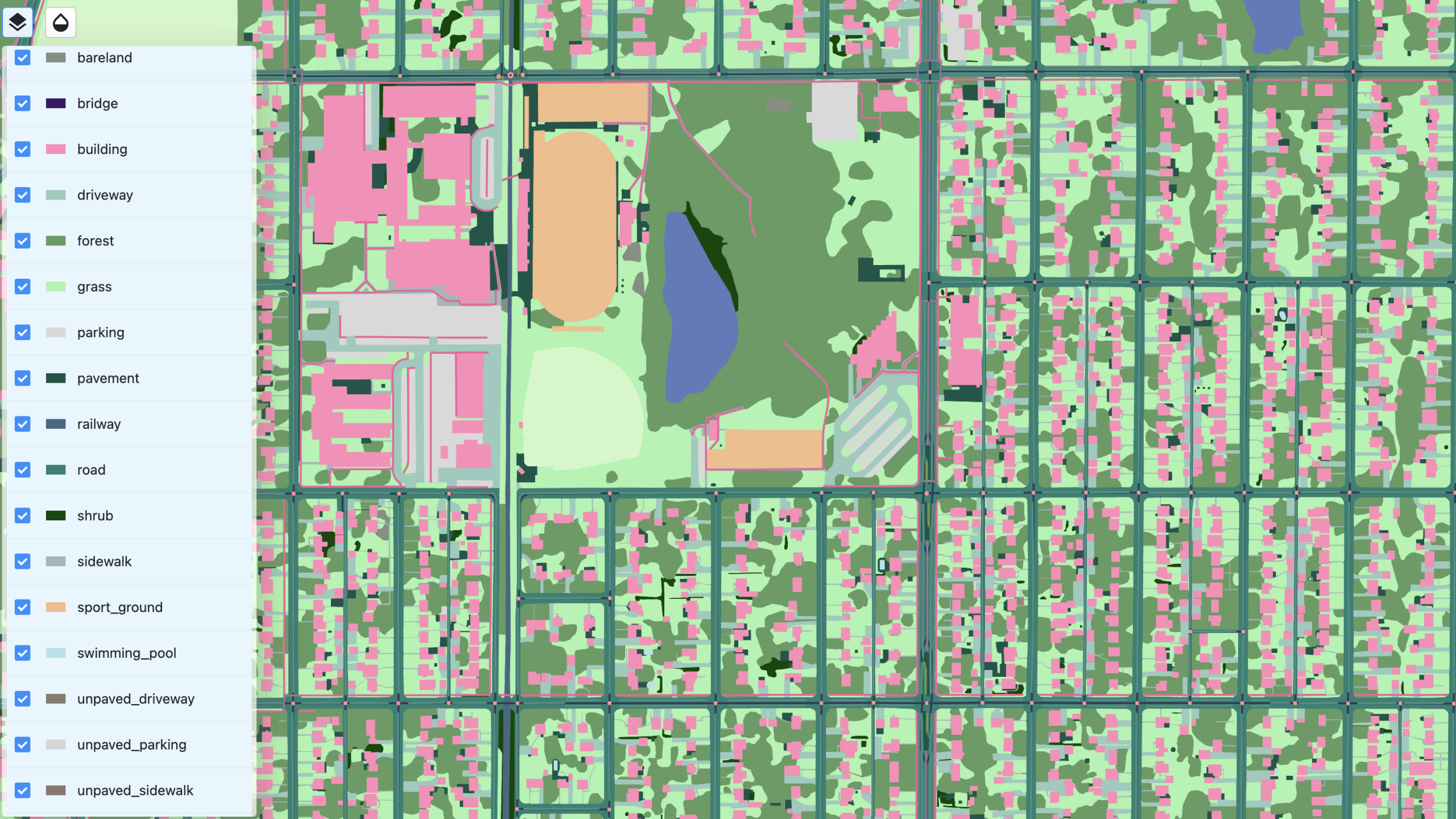
Phase 1 Geographies

High Resolution Example Applications

30-meter Regional Land Cover



1-meter Local Land Cover


bareland
bridge
building
driveway
forest
grass
parking
pavement
railway
road
shrub
sidewalk
sport_ground
swimming_pool
unpaved_driveway
unpaved_parking
unpaved_sidewalk

Ecopia

Geospatial Strategy

1. Risk Assessment & Vulnerability Mapping
2. Stormwater Infrastructure Planning & Design
3. Emergency Response & Preparedness
4. Natural Resource Management
5. Community Engagement & Awareness

The Problem

The total cost of **Climate Disasters** in USA since 1980 is roughly $2.065 Trillion

Source: NOAA National Centers for Environmental Information

Flooding/Stormwater

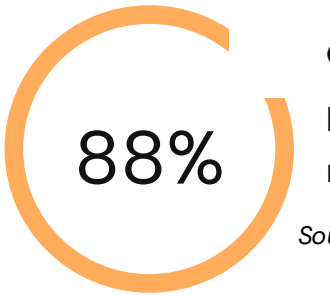
Flooding causes widespread property damage, loss of life, and environmental disruption.

Average Annual Cost of Flooding in USA

Source: NOAA
** last decade*

Vulnerable Road Users

Growing reliance on transportation infrastructure in US cities cause an increase in accidents surrounding vulnerable road users.



Crashes that can be prevented by using medians/buffers

Source: FHWA

Extreme Heat

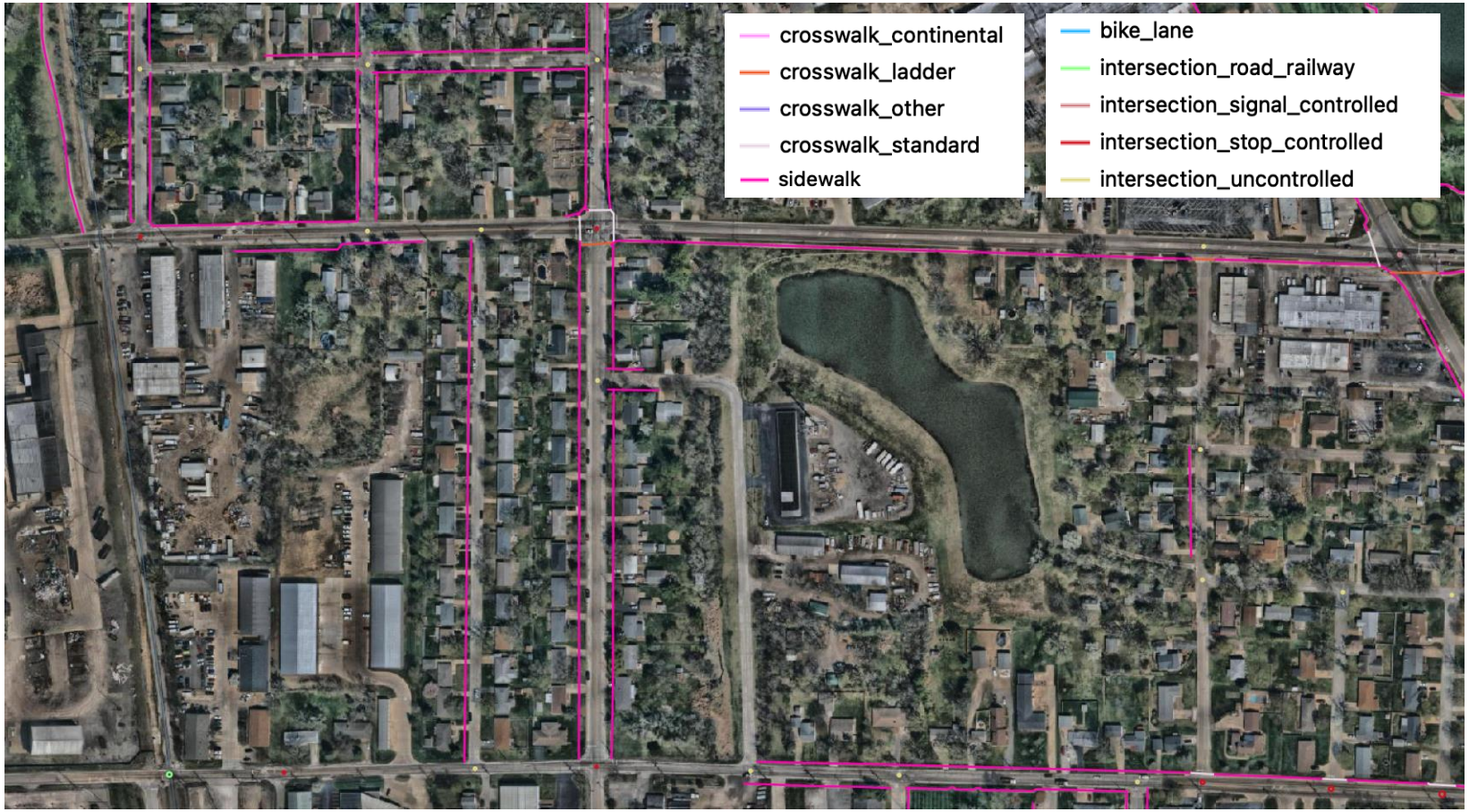
Extreme Heat and Urban Heat Islands have a greater impact on marginalized communities and vulnerable populations.

Heat-related Deaths in USA in 2022

Source: CDC

Striving towards complete networks to greatly reduce pedestrian crashes

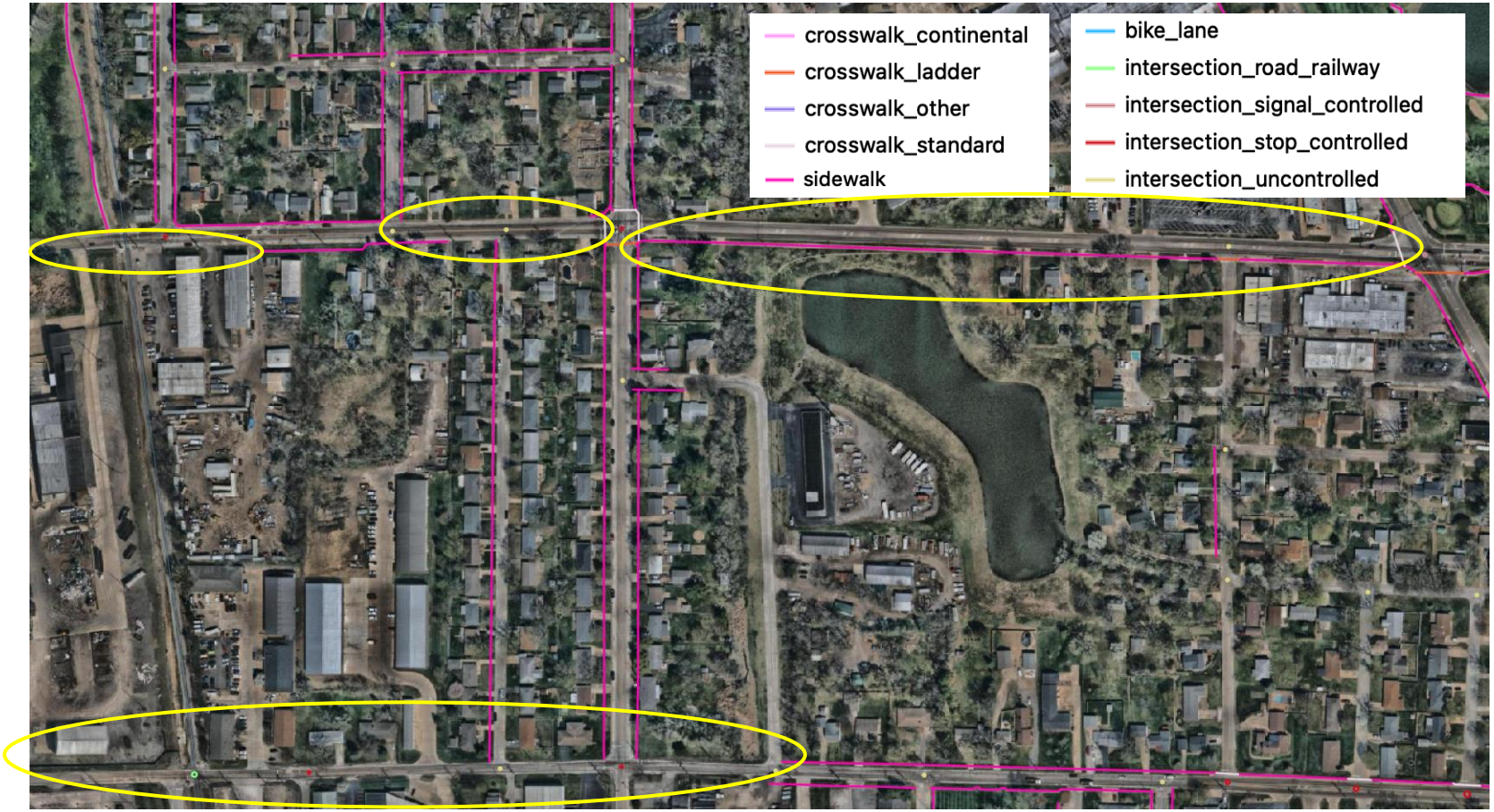
Vector data provides both visual indications of gaps as well as a foundational base for analytics to be run on top of to categorize the severity of network gaps.



A screenshot of the pedestrian related features Ecopia extracted that need to be analyzed to determine areas for improved safety.

Striving towards complete networks to greatly reduce pedestrian crashes

Vector data provides both visual indications of gaps as well as a foundational base for analytics to be run on top of to categorize the severity of network gaps.



A screenshot of the gaps in the infrastructure Ecopia's full network enables.

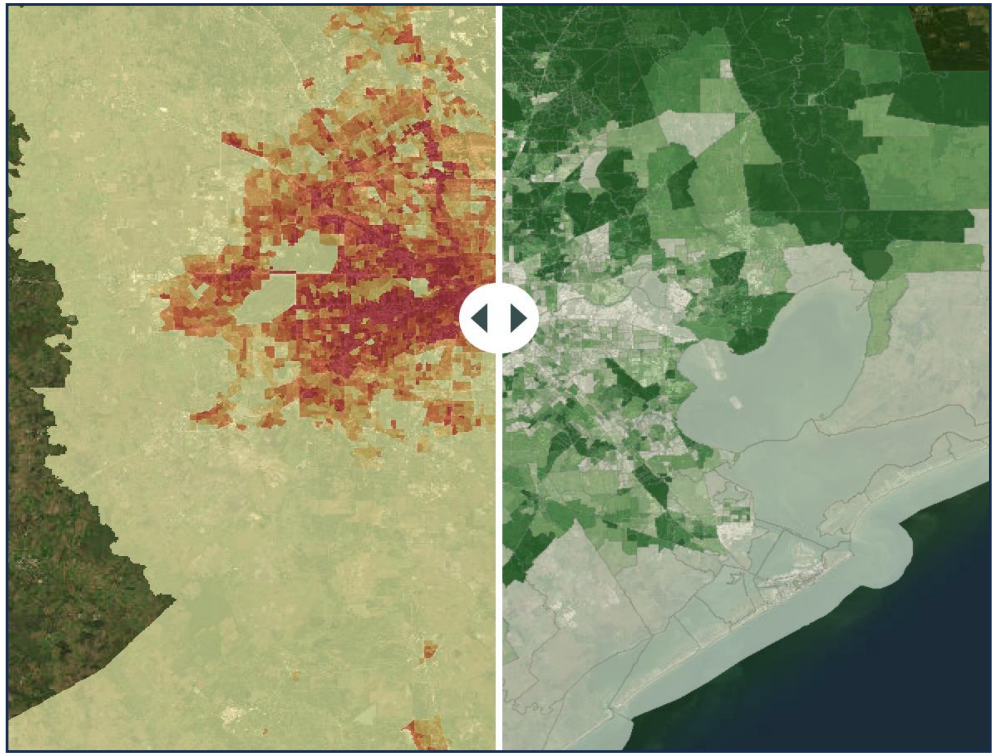
A case study in climate equity throughout the Houston Metro Area

Examining the spatial relationships between **income, poverty, tree equity, and impervious surface** distribution across the over 12,533 square mile area

Why?

It is clear there are disparities in impervious surface and tree canopy land cover.

Impervious surfaces lead to a greater likelihood of flooding in extreme precipitation events as well as a stronger urban heat island effect. Tree canopy can counteract these natural hazards and is an important mitigation tool.



% impervious vs. tree canopy per census block
Greater Houston Metro

A case study in climate equity throughout the Houston Metro Area

Examining the spatial relationships between **income, poverty, tree equity, and impervious surface** distribution across the over 12,533 square mile area

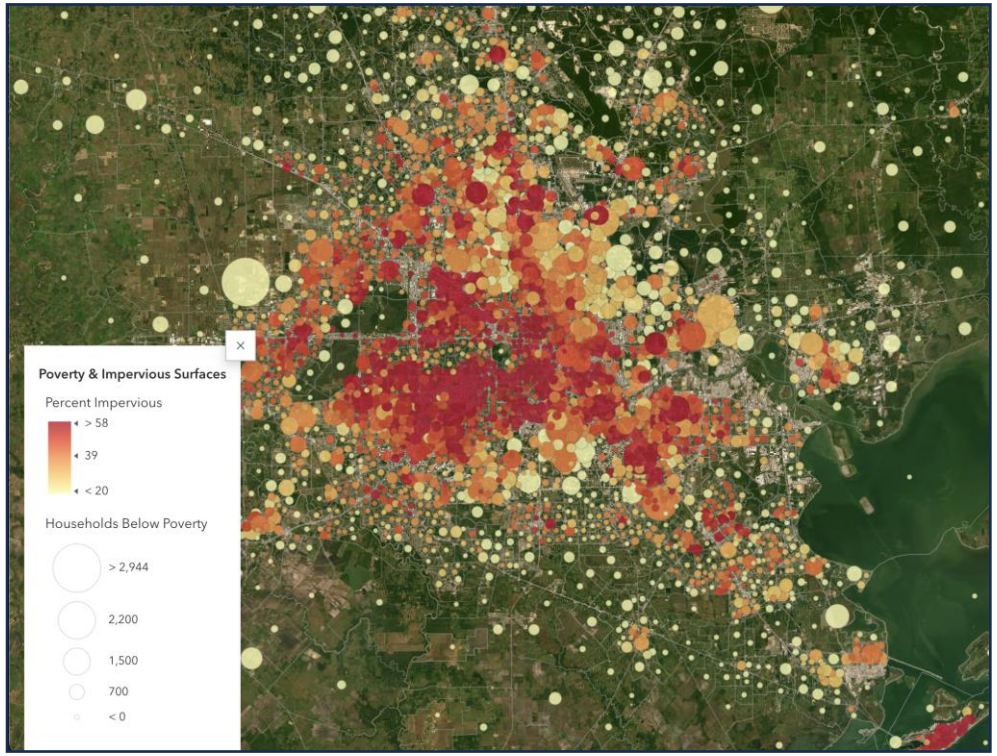
Why?

It is clear there are disparities in impervious surface and tree canopy land cover.

Impervious surfaces lead to a greater likelihood of flooding in extreme precipitation events as well as a stronger urban heat island effect. Tree canopy can counteract these natural hazards and is an important mitigation tool.

How?

Leveraging Ecopia Vector Layers and publicly available census data, we are able to extract a direct correlation between communities most at risk (lower income, visible minorities, age, multi-unit housing)



Correlation between poverty and impervious surfaces

A case study in climate equity throughout the Houston Metro Area

Examining the spatial relationships between **income, poverty, tree equity, and impervious surface** distribution across the over 12,533 square mile area

Why?

It is clear there are disparities in impervious surface and tree canopy land cover.

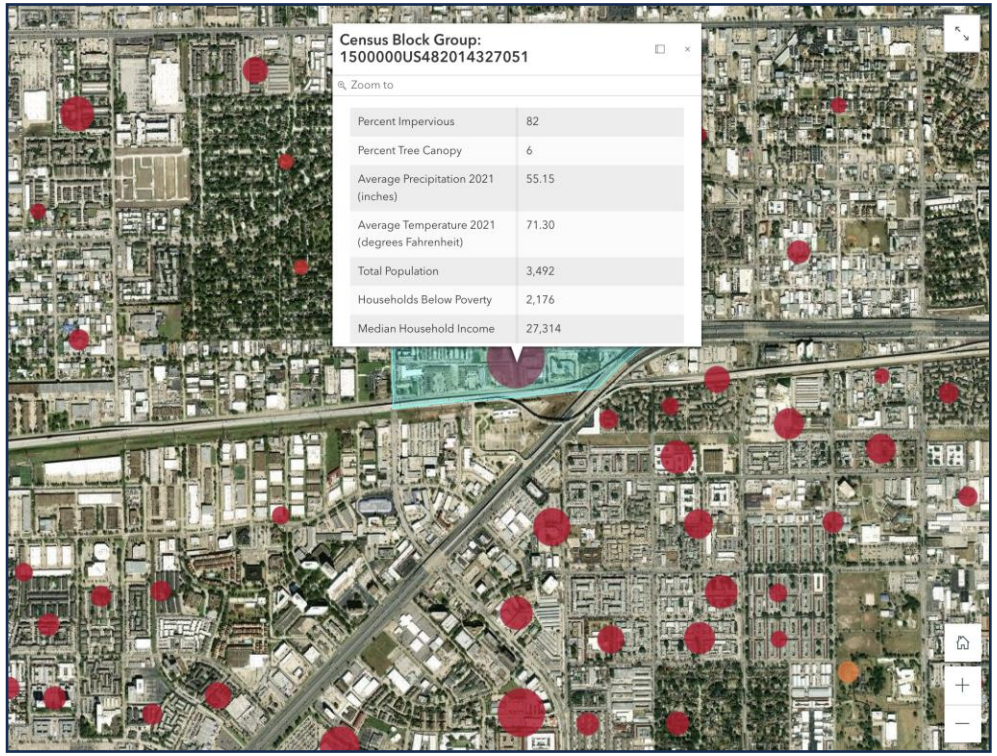
Impervious surfaces lead to a greater likelihood of flooding in extreme precipitation events as well as a stronger urban heat island effect. Tree canopy can counteract these natural hazards and is an important mitigation tool.

How?

Leveraging Ecopia Vector Layers and publicly available census data, we are able to extract a direct correlation between communities most at risk (lower income, visible minorities, age, multi-unit housing)

Outcome?

Households in the bottom 20th percentile of median income are in CBGs with an average of 48% impervious land cover. Households in the top 20th percentile of median income are in CBGs with an average of 36.5% impervious land cover.



Targeted understanding of social and economic disparities in communities across Houston

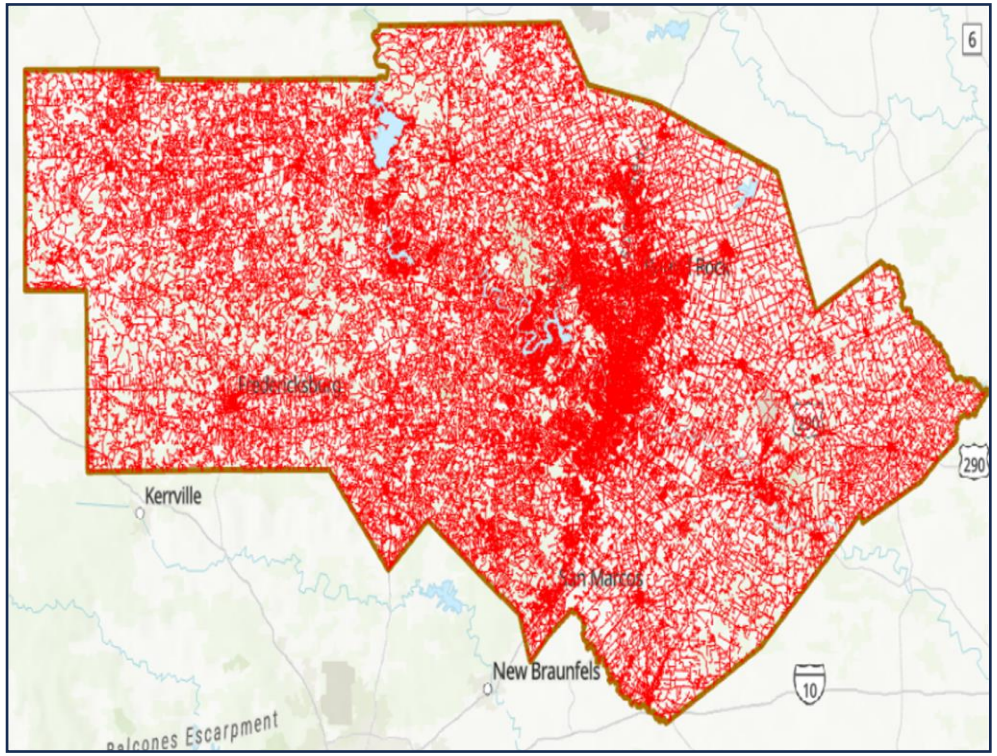
A case study in critical infrastructure resiliency across Texas

Designing a road elevation model that takes into account the height of bridges and roads to support emergency services

Why?

Texas leads the nation in flood deaths.
More than half of these people die in their car.

The Road Elevation Model enables the creation of precise real-time flood inundation maps. These help TxDOT to be proactive in its flood response, and provide better flood information for citizens and communities



TxDoT – Austin District (11 counties) 38,000 miles of road extracted by Ecopia

CWE
The University of Texas at Austin
Texas Department of Transportation
Oak Ridge National Laboratory
Ecopia

A case study in critical infrastructure resiliency across Texas

Designing a road elevation model that takes into account the height of bridges and roads to support emergency services

Why?

Texas leads the nation in flood deaths.
More than half of these people die in their car.

The Road Elevation Model enables the creation of precise real-time flood inundation maps. These help TxDOT to be proactive in its flood response, and provide better flood information for citizens and communities

How?

The 38,000 miles of roads in the TxDOT Austin District covers only 1.6% of the landscape. High Performance Computing is used to filter the data collections and select the most accurate and recent data for the road system. Each point is labelled with its elevation in feet above geodetic datum.

TxDoT – Austin District (11 counties) 38,000 miles of road extracted by Ecopia

CWE

The University of Texas at Austin

Texas Department of Transportation

Oak Ridge National Laboratory

Ecopia

A case study in critical infrastructure resiliency across Texas

Designing a road elevation model that takes into account the height of bridges and roads to support emergency services

Why?

Texas leads the nation in flood deaths.
More than half of these people die in their car.

The Road Elevation Model enables the creation of precise real-time flood inundation maps. These help TxDOT to be proactive in its flood response, and provide better flood information for citizens and communities

How?

The 38,000 miles of roads in the TxDOT Austin District covers only 1.6% of the landscape. High Performance Computing is used to filter the data collections and select the most accurate and recent data for the road system. Each point is labelled with its elevation in feet above geodetic datum.

Outcome? Lives Saved

TxDoT – Austin District (11 counties) 38,000 miles of road extracted by Ecopia

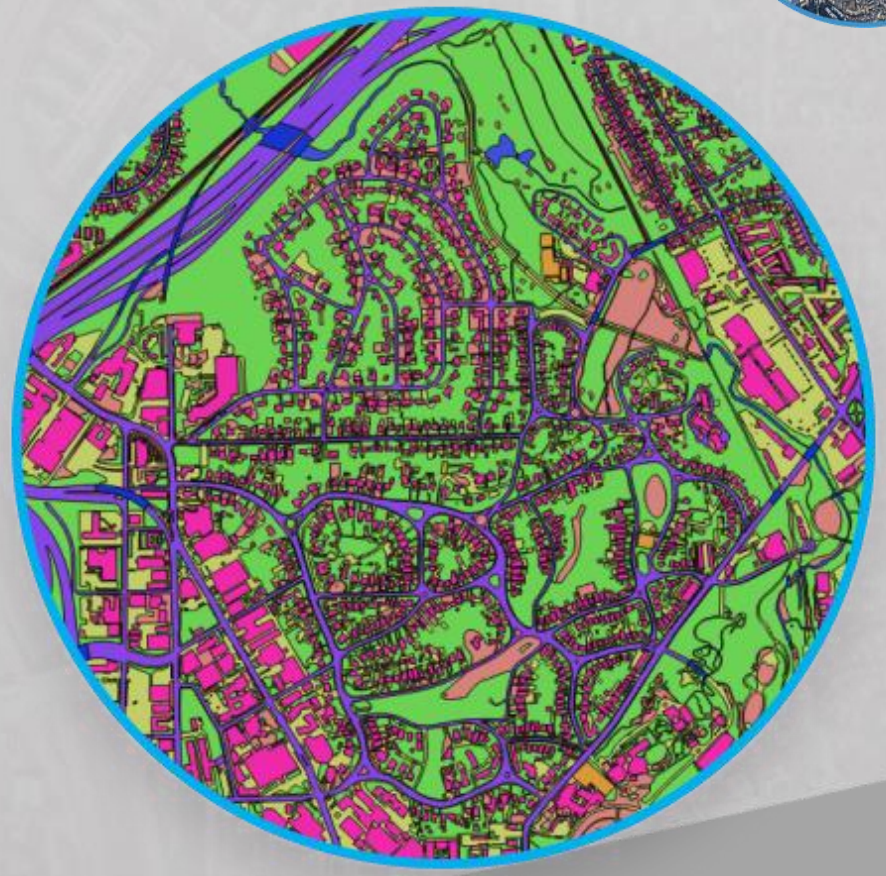
CWE

The University of Texas at Austin

Texas Department of Transportation

Oak Ridge National Laboratory

Ecopia



Geospatial Data

The Foundation of Truth in Building a Climate Resiliency Strategy

Thomas Peck
Associate, Public Sector

Ecopia