



# GWFF

GEOSPATIAL WORLD FORUM

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# Nature's services, trees, and the circular economy

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*Geospatial Knowledge Infrastructure for National Development, GSW Forum, Rotterdam, Netherlands, 12 May, 2024*

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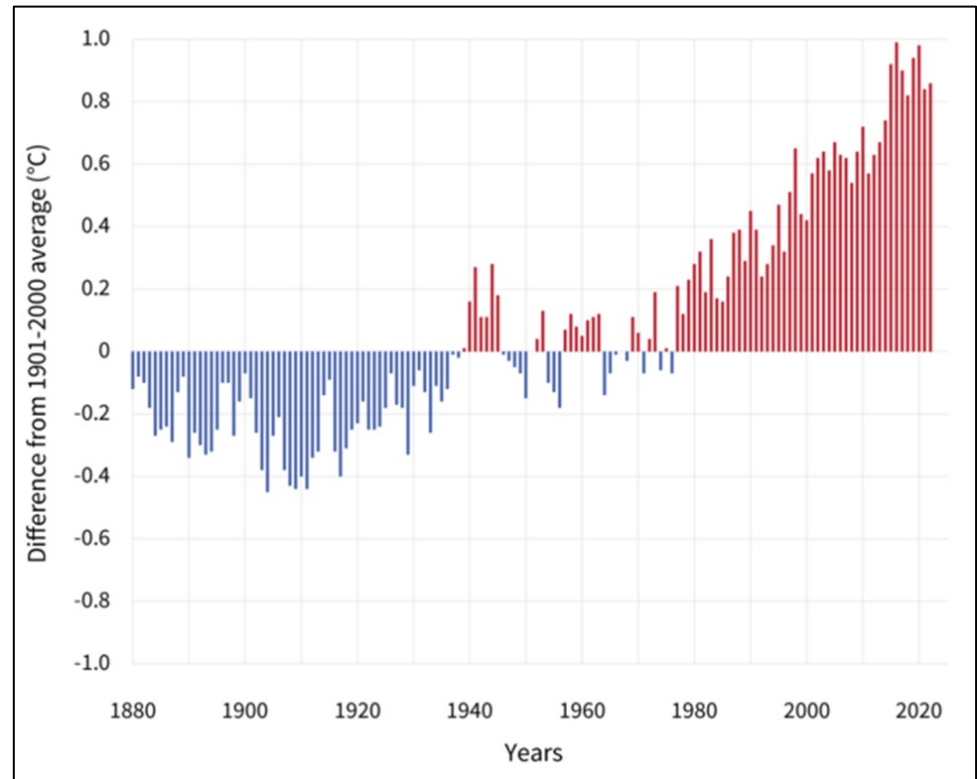
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# Outline

- Two examples of nature's services from Spain and China
- Describe some of my team's work detailing how the optimal placement of trees can help vulnerable neighborhoods in Los Angeles combat rising temperatures
- The need to enlist nature's services as part of efforts to build circular economies



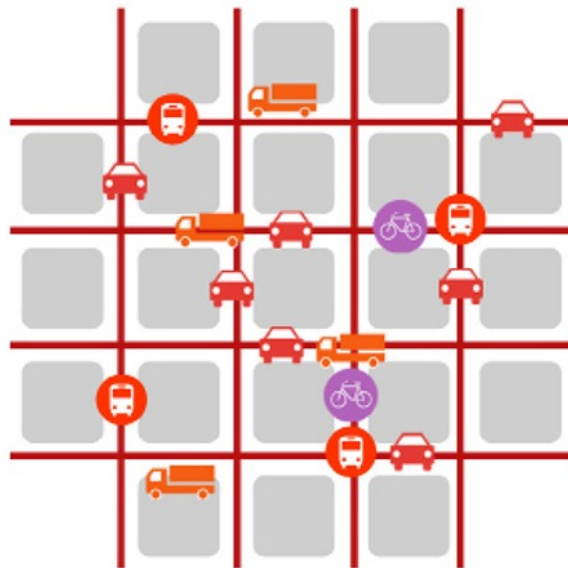
**Yearly surface temperature compared to the 20th-century average from 1880–2022**

Blue bars indicate cooler-than-average years; red bars show warmer-than-average years. NOAA Climate.gov graph, based on data from the National Centers for Environmental Information.



# Superblocks in Spain ...

## Current Model



## Superblocks Model















-  PUBLIC TRANSPORT NETWORK
-  BICYCLES MAIN NETWORK (BIKE LANE)
-  BICYCLES SIGNPOSTS (REVERSE DIRECTION)
-  FREE PASSAGE OF BICYCLES
-  PRIVATE VEHICLE PASSING
-  RESIDENTS VEHICLES
-  URBAN SERVICES AND EMERGENCY
-  DUM CARRIERS
-  DUM PROXIMITY AREA
-  ACCESS CONTROL
-  BASIC TRAFFIC NETWORK
-  SINGLE PLATFORM (PEDESTRIANS PRIORITY)

Image by Ajuntament de Barcelona (<https://barcelonarchitecturewalks.com/superblocks/>)

# Sponge cities in China



Yanweizhou Park, Jinhua City, Zhejiang Province, China

Slide: Complements of Kongjian Yu

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# Sponge cities (2)



Slide: Complements of Kongjian Yu

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# Building a vibrant urban canopy



**Develop design solutions** to overcome constraints

**Community engagement** to inform the research and designs

**Shade equity** follows the strategic allocation of benefits based on need



**Existing street parkway** with few private or public trees



**Proposed “cool” street**

# Elementary schools – pedestrian traffic



Household locations

Street network

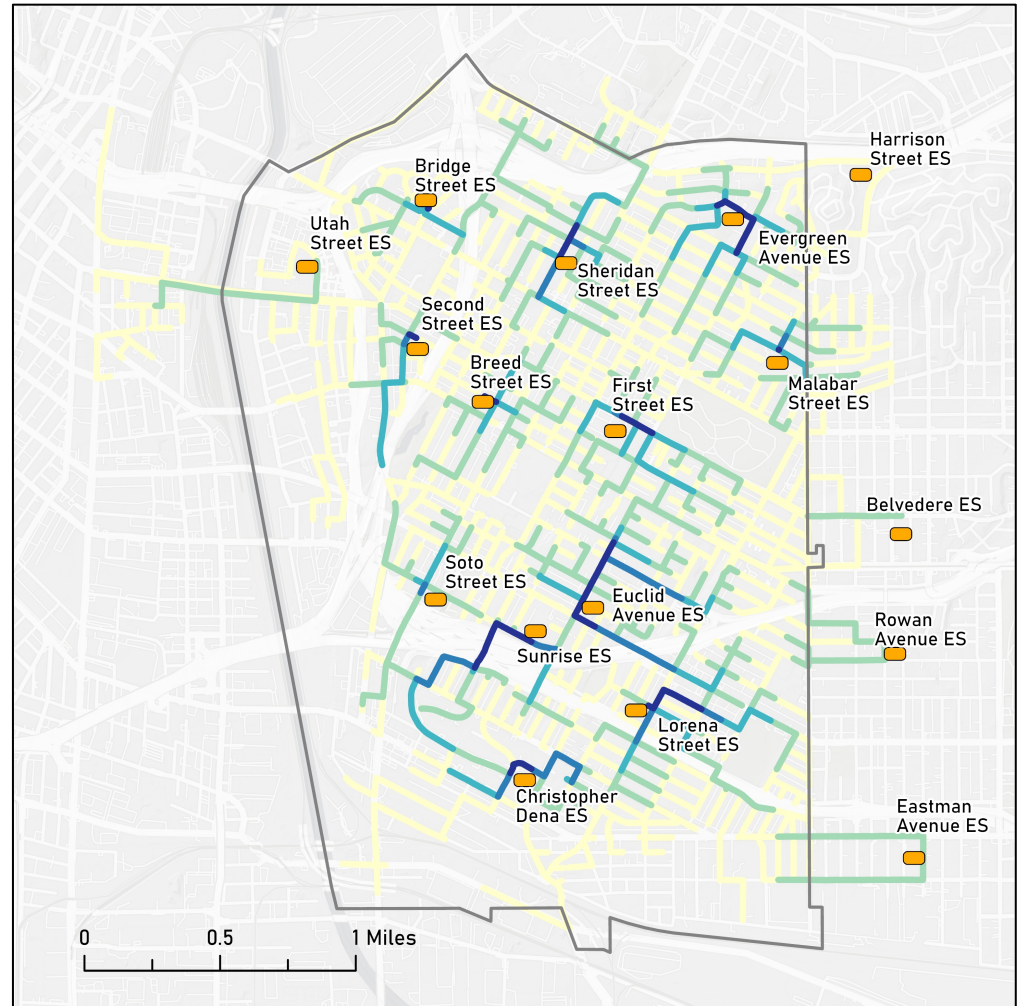
Elementary school enrollment areas

Elementary school locations

Elementary school entrances

Elementary school enrollments

## Safe Routes to School pedestrian counts



Predicted elementary school pedestrian traffic by number of households scaled by school enrollment

LAUSD Elementary Schools	≤ 10	11 - 50	51 - 100	101 - 150	> 150
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# Priority streets ...

High pedestrian traffic

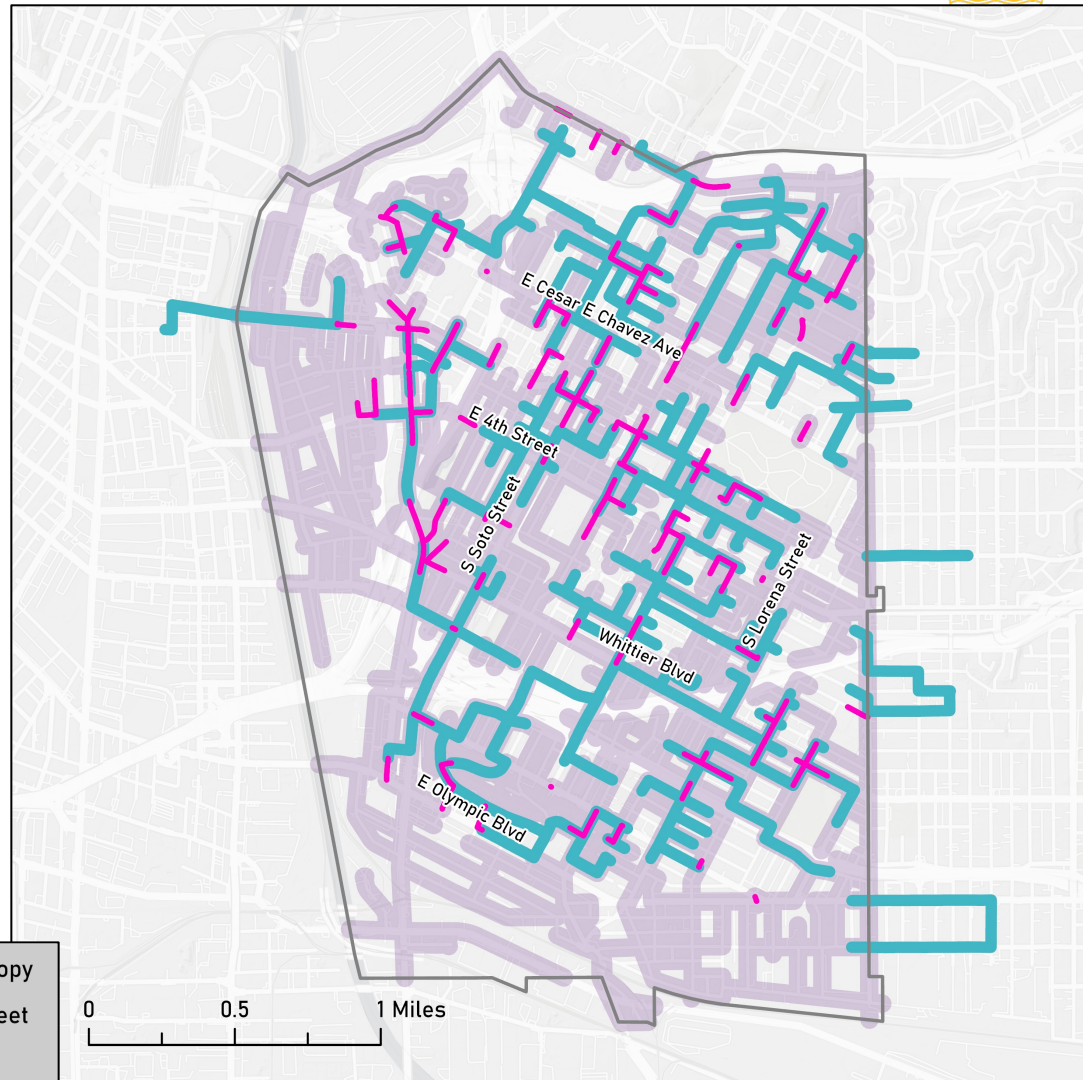
Household locations

Street network

Elementary schools

Transit stops

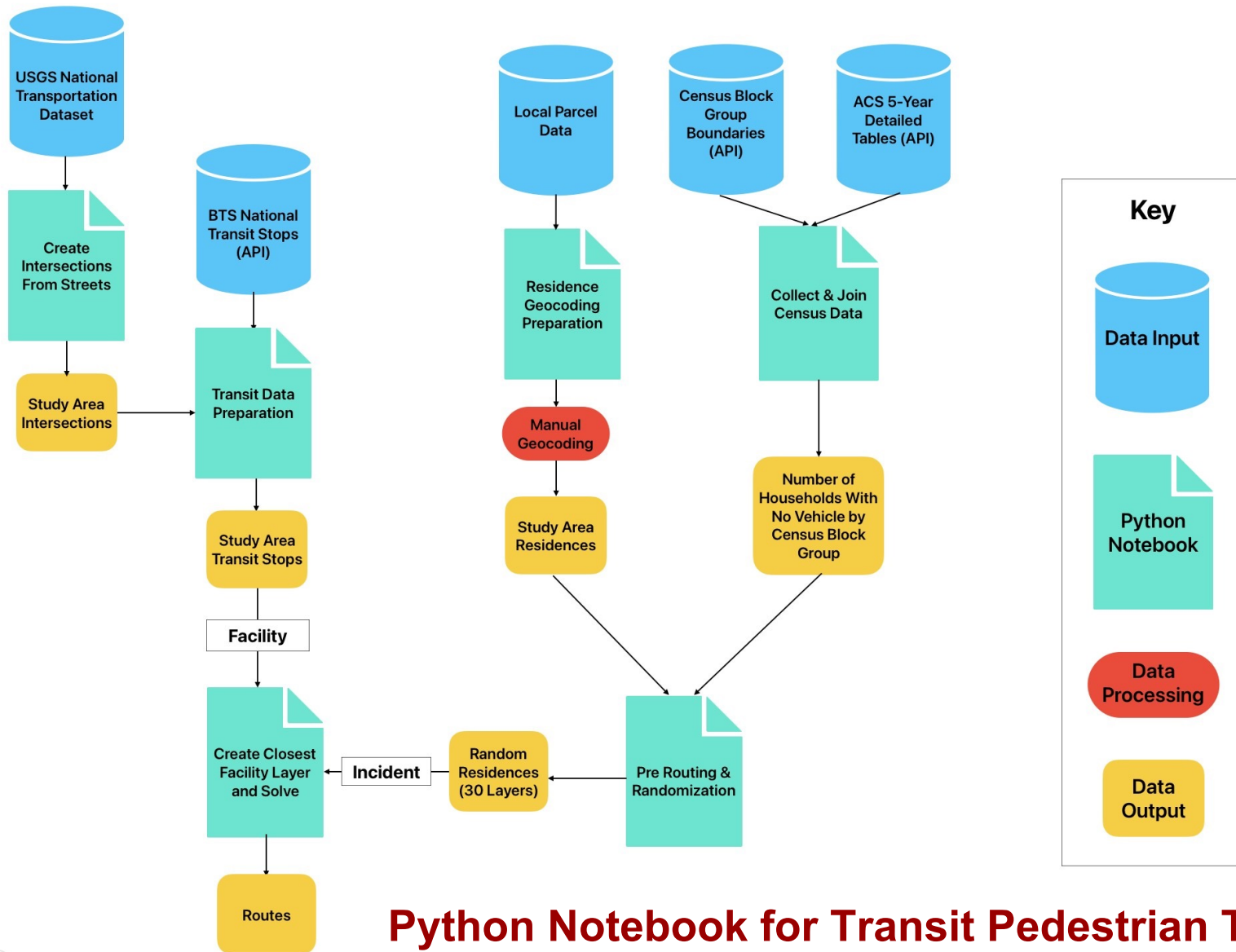
Sparse tree canopy



High pedestrian traffic along street segments with sparse tree canopy

— Routes to transit  
— Routes to schools

— One or less trees per 100 feet



## Python Notebook for Transit Pedestrian Traffic



# The circular economy ...

