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# Developing a Green Infrastructure Equity Index to Promote Equity Planning

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**Two guiding premises...**

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**Green infrastructure**  
provides  
**community**  
**benefits**  
above and beyond  
stormwater runoff  
reductions

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Implementation of green  
infrastructure on a large  
scale requires a  
**distributed  
approach.**

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**Given that...**

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**What would an  
equitable  
distribution  
of green  
infrastructure  
look like?**

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What if equity were about  
**need?**

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How do you  
**measure**  
need?

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**need**

**=**

**socio-economic conditions**

**+**

**the built environment**

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**Building the index...**

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# Step 1: Collect indicators

## Socioeconomic

- Percent minority
- Percent low-income
- Percent low education
- Percent under 5
- Percent over 64
- Percent owner-occupancy

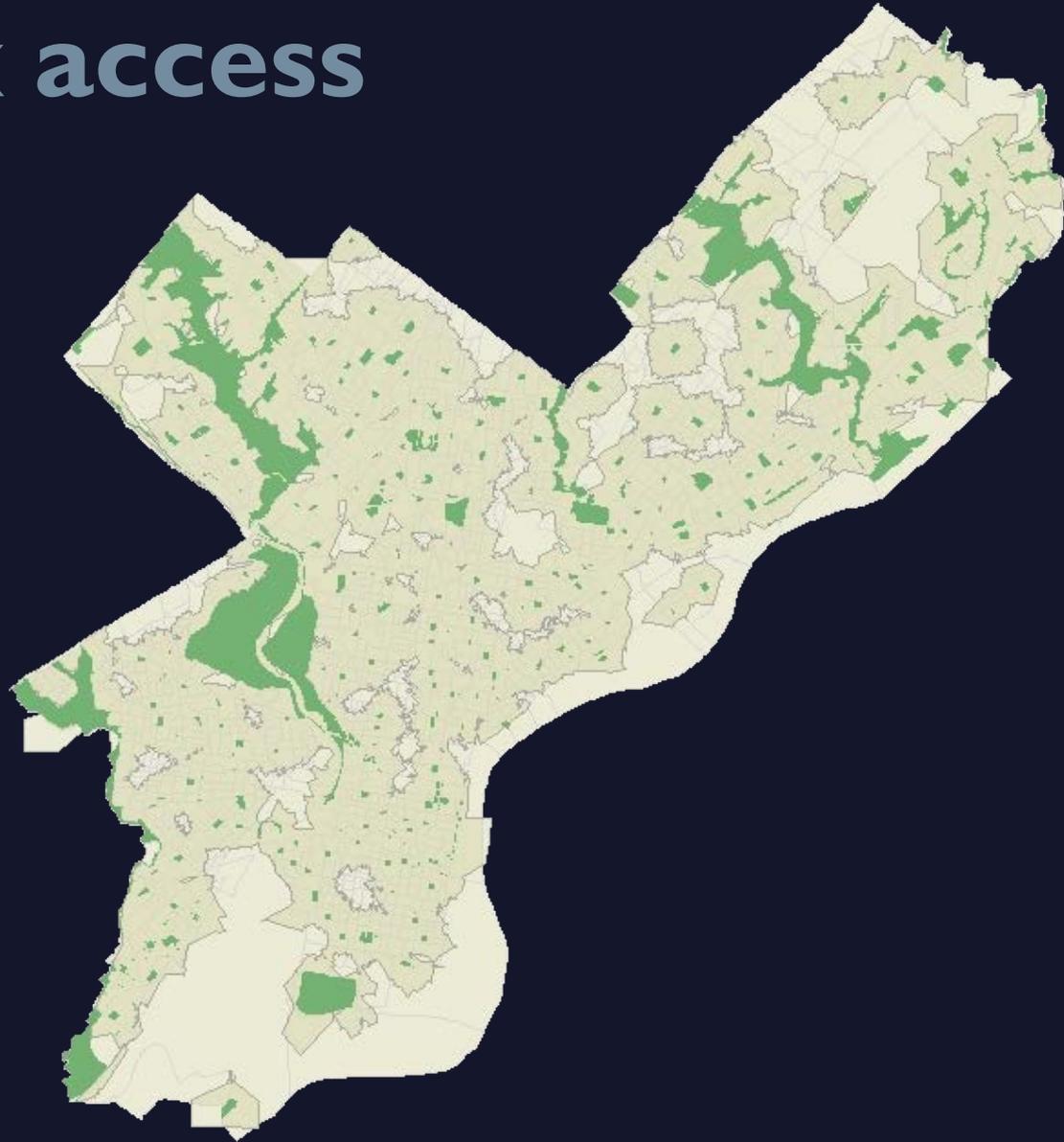
## Built environment

- Proximity to traffic
- Ozone levels
- Particulate matter
- Park access
- Tree canopy cover
- Playground access
- Percent impervious
- Amount of vacant land

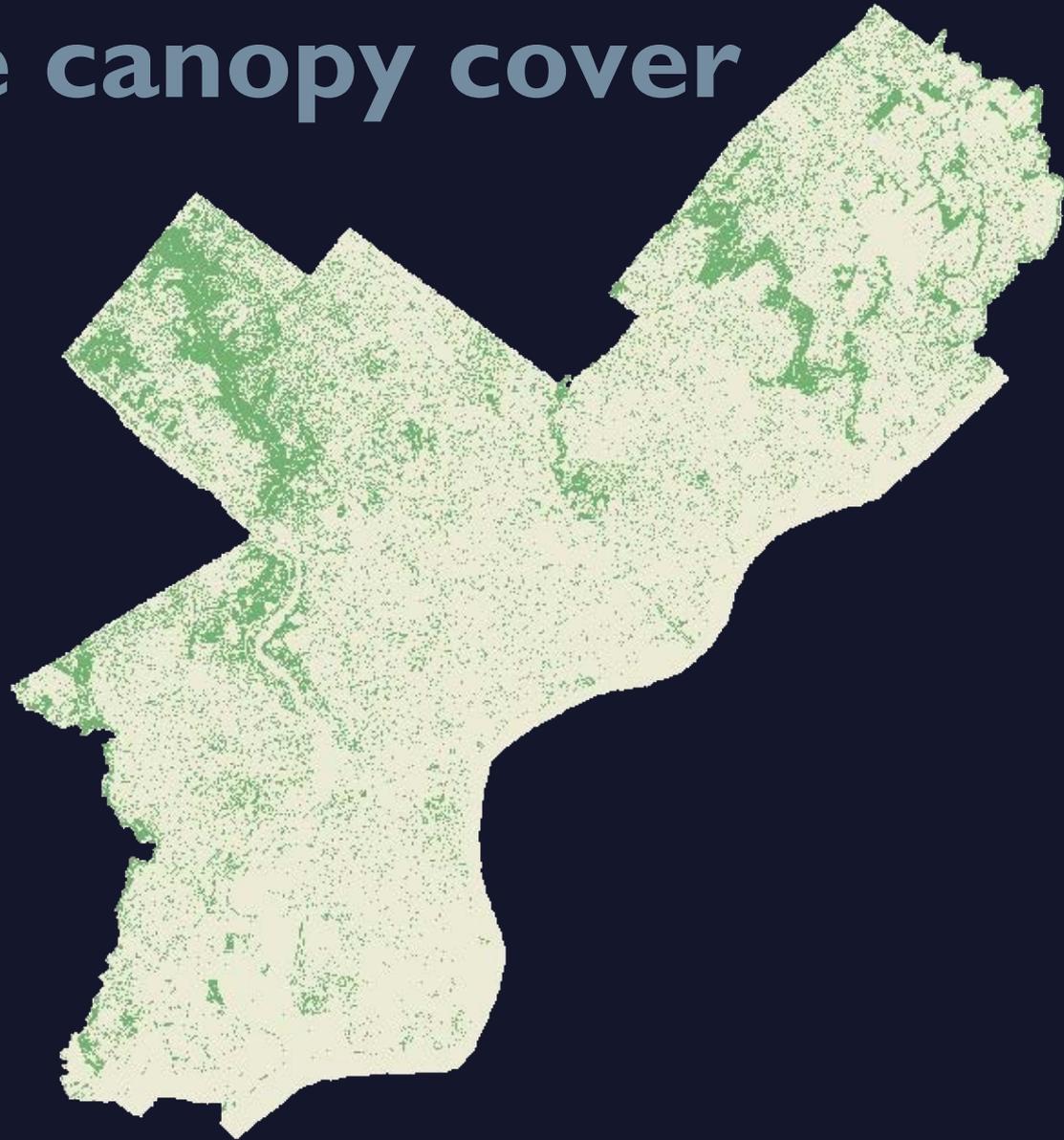
# Park access



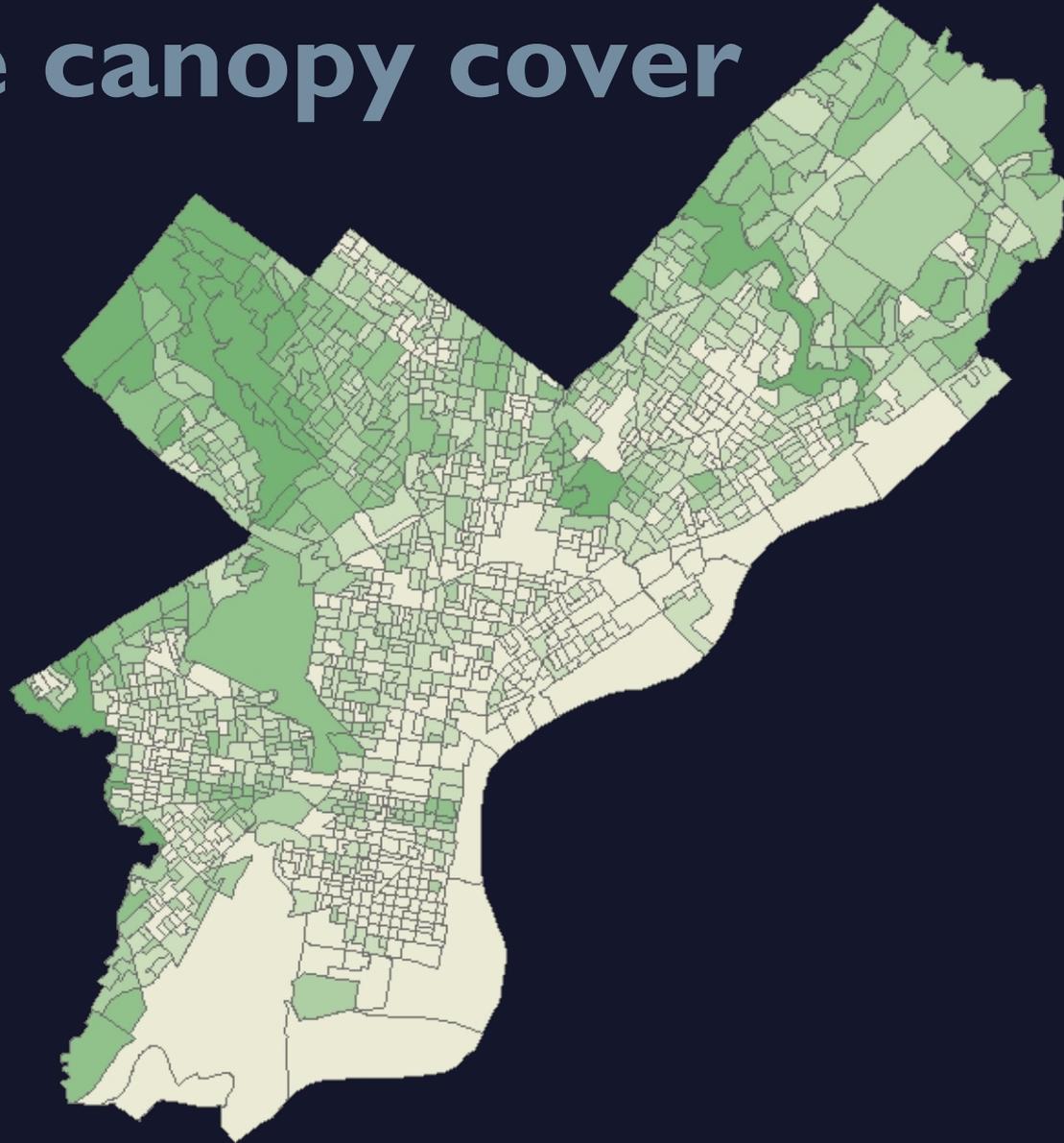
# Park access



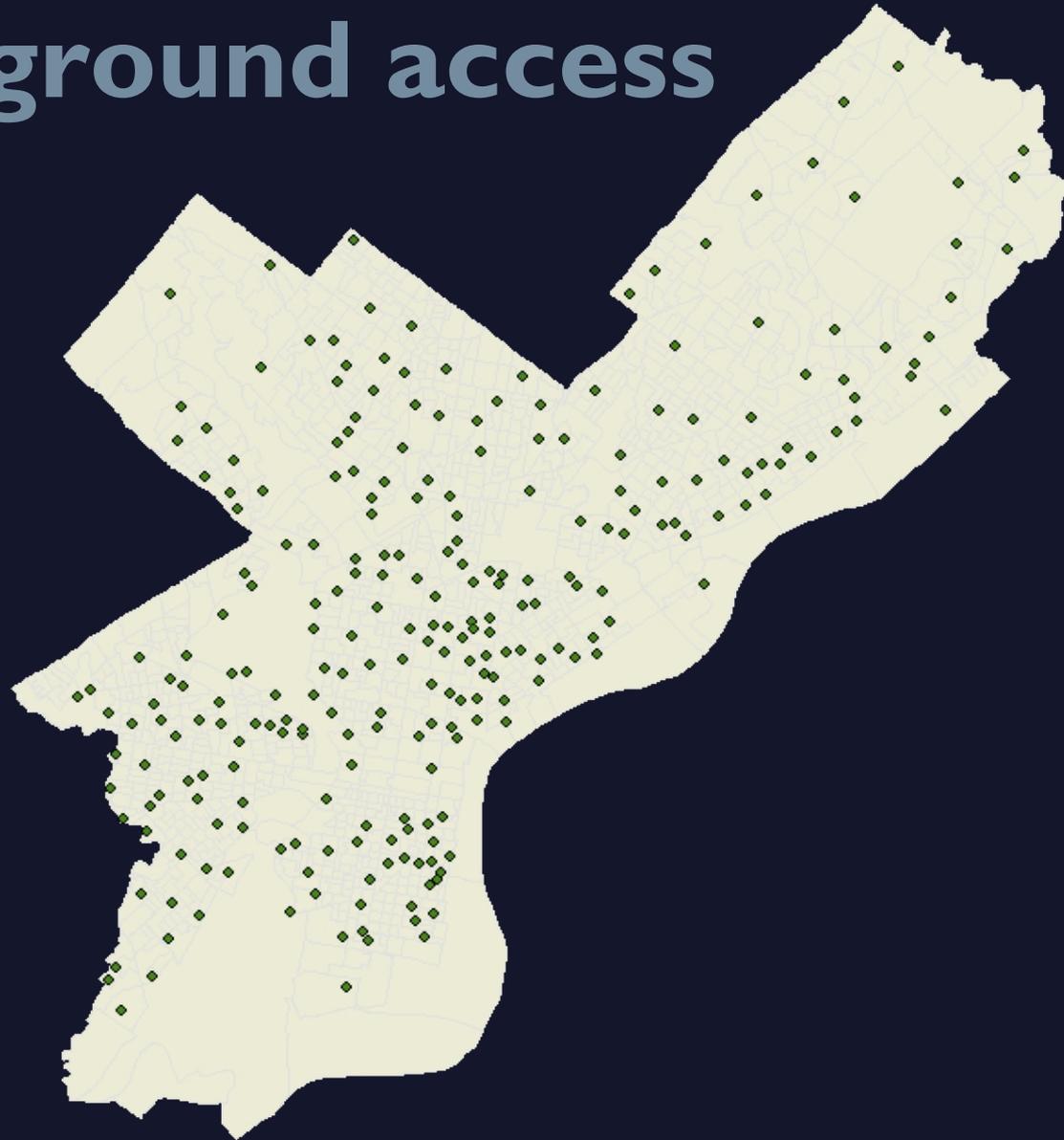
# Tree canopy cover



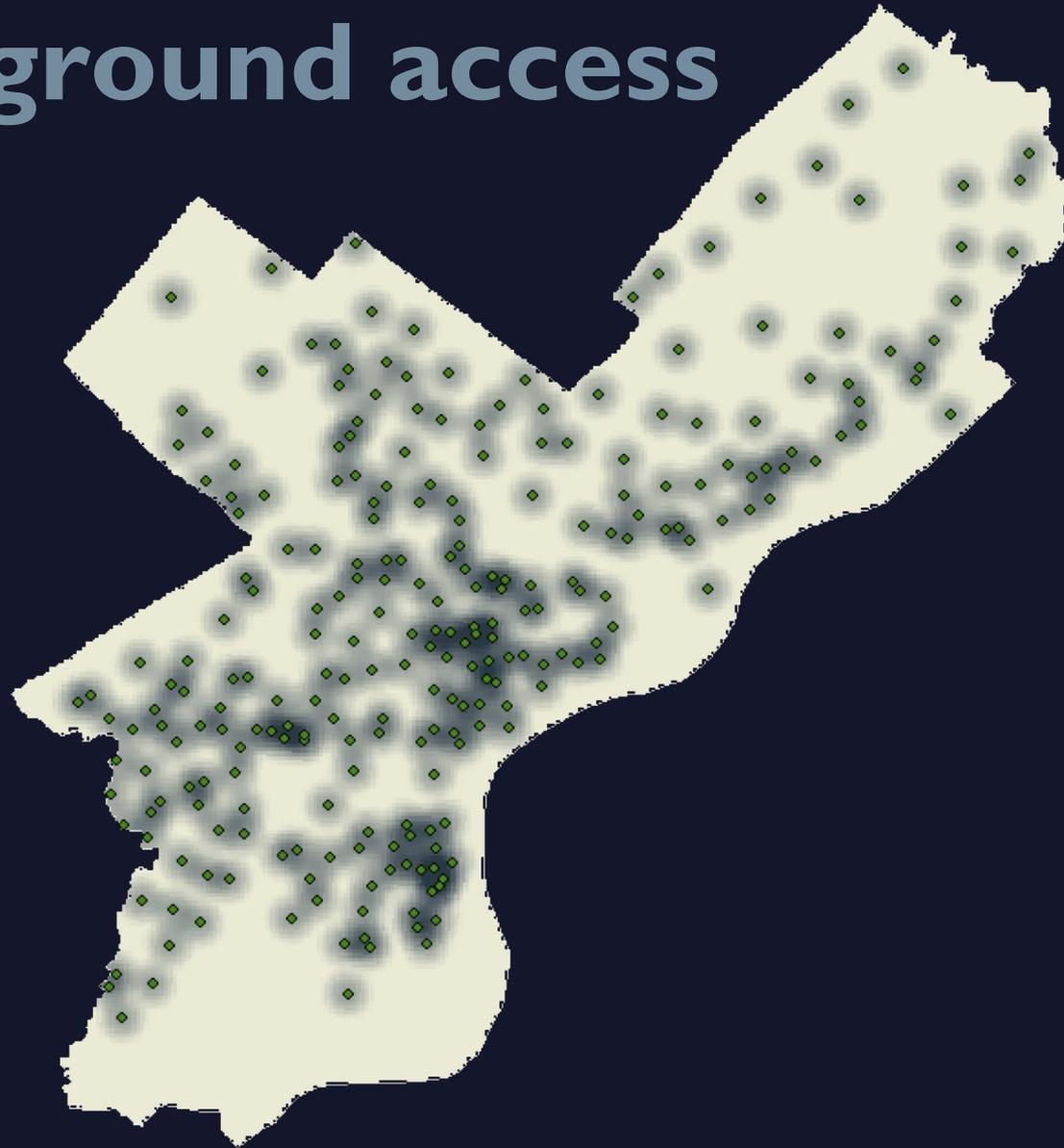
# Tree canopy cover



# Playground access



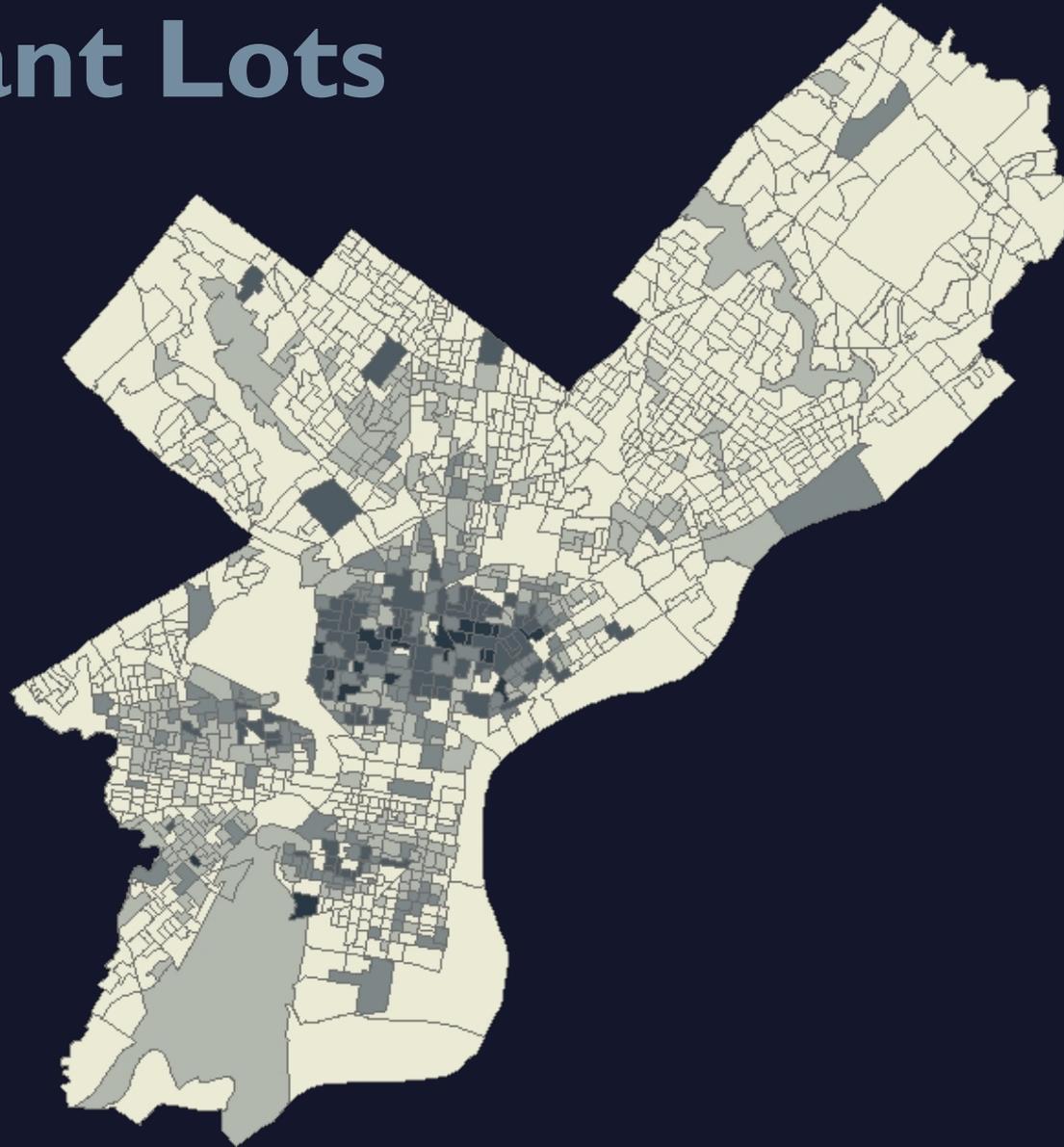
# Playground access



# Playground access



# Vacant Lots



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**Step 2:**

**Normalize indicators**

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# Index value

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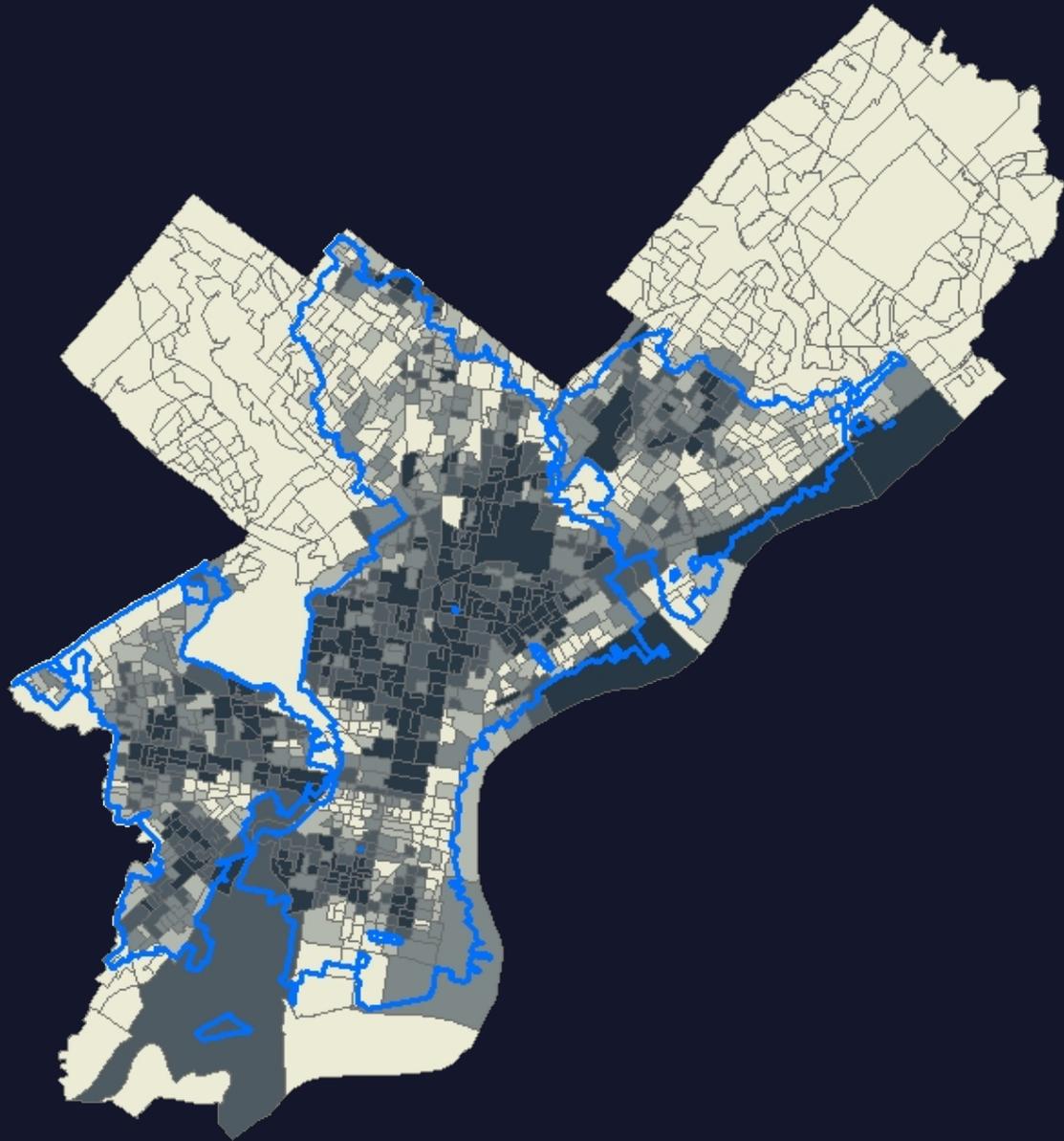
block group value – minimum value  
range of values

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**Step 2:**

**Create composite score**



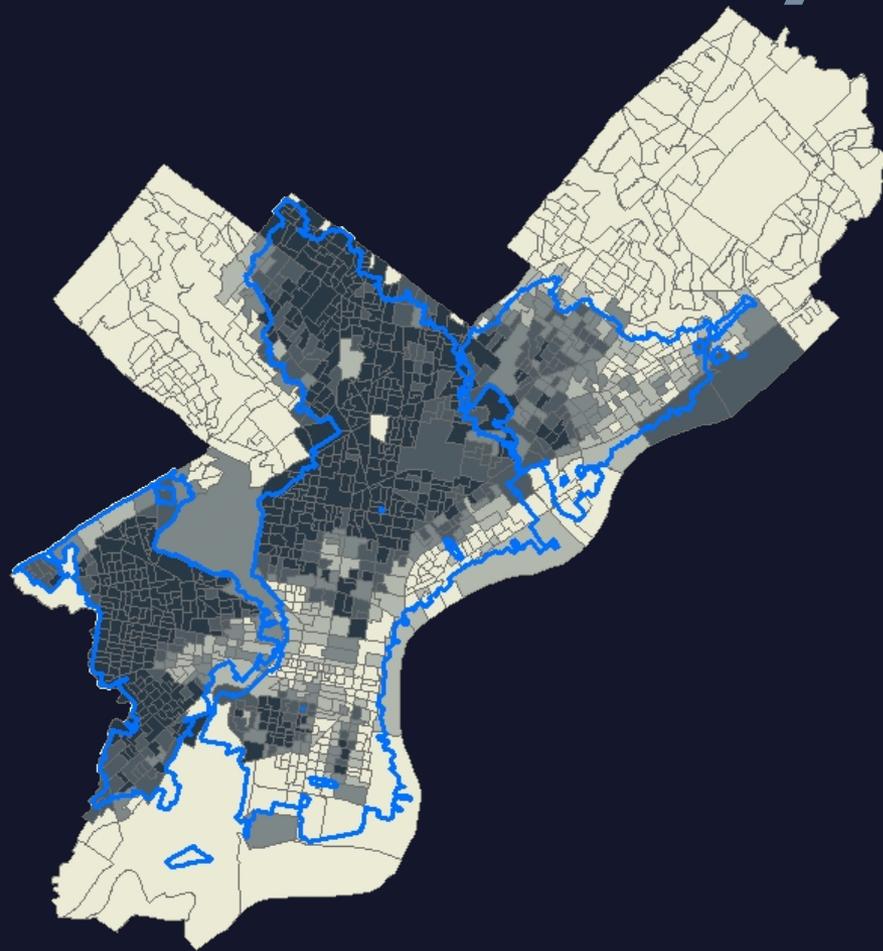
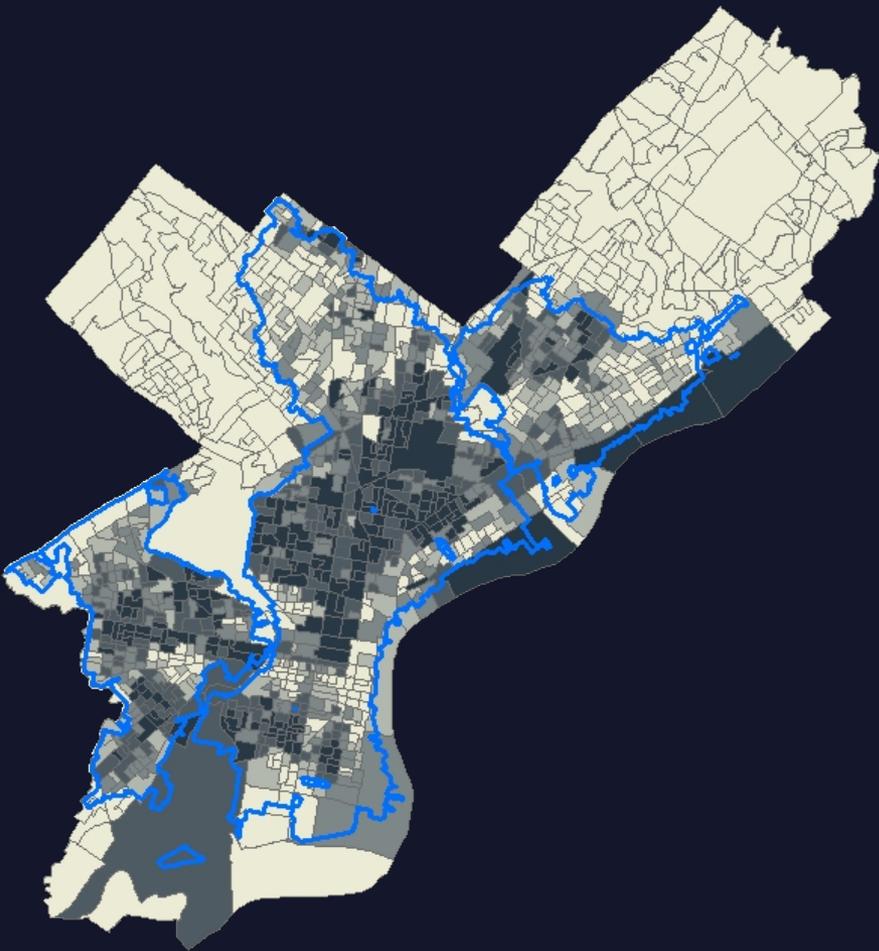
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**How does this compare to  
need based on a single  
indicator?**

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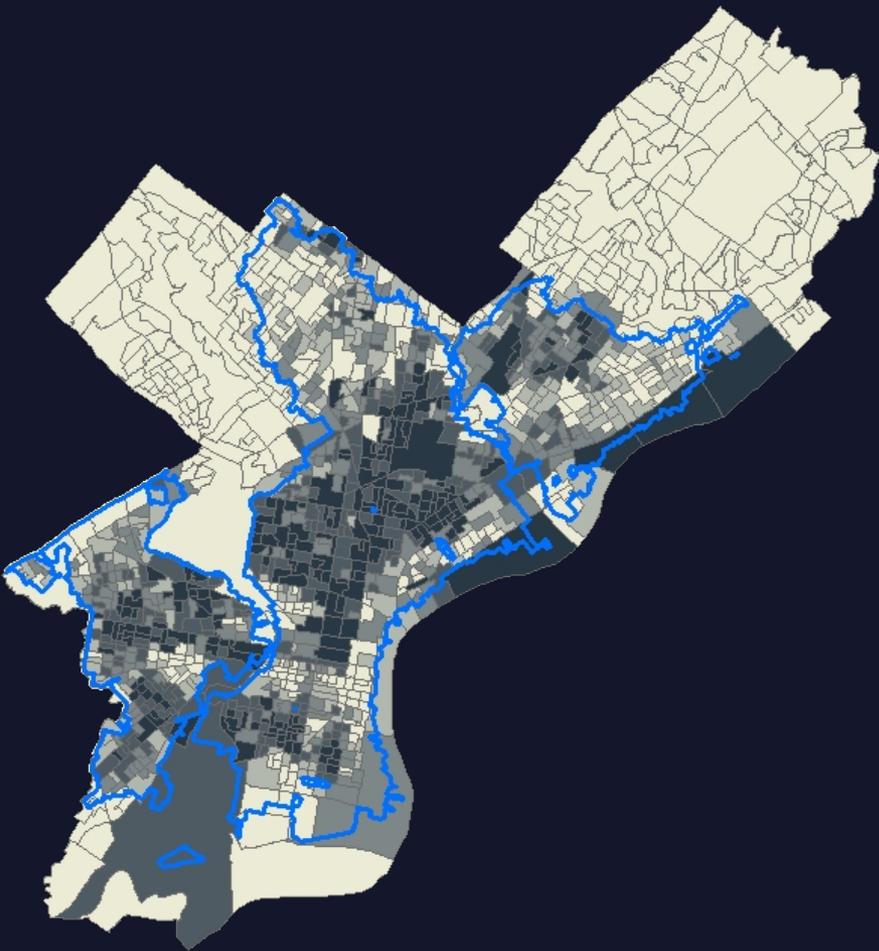
# Index Values

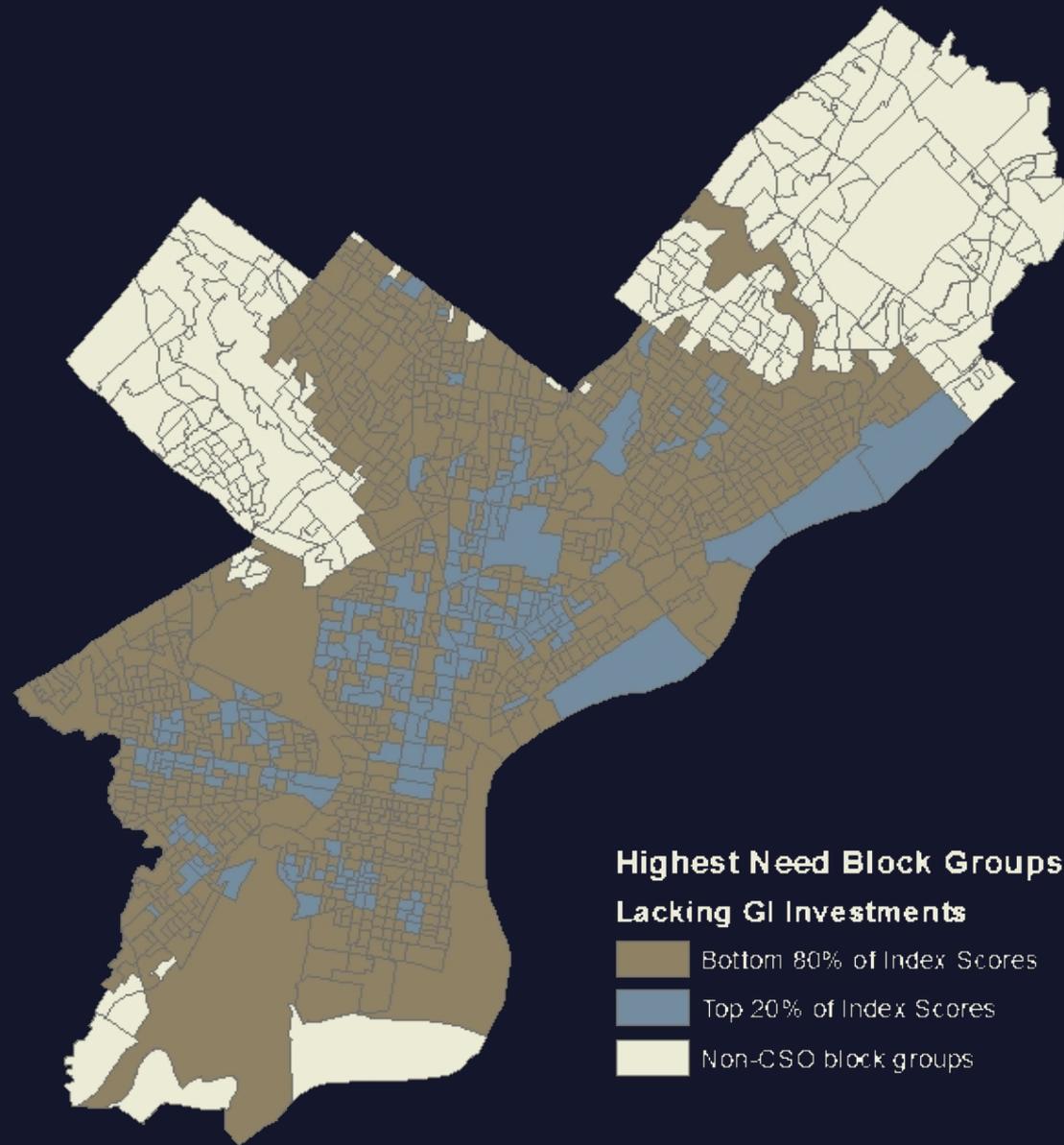
# % Minority



# Index Values

# % Low Income





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# of top 1/5 Index Values (226 block groups)

64 are in top 1/5 for percent minority

122 are in top 1/5 for percent low-income

33 are in top 1/5 for both

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**What does this say about  
the distribution of GI in  
Philadelphia so far?**

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# correlations between index scores and GI installation density

GI Projects: .115\*\*

Tree trenches: .144\*\*

Vegetated non-tree installations: .076\*

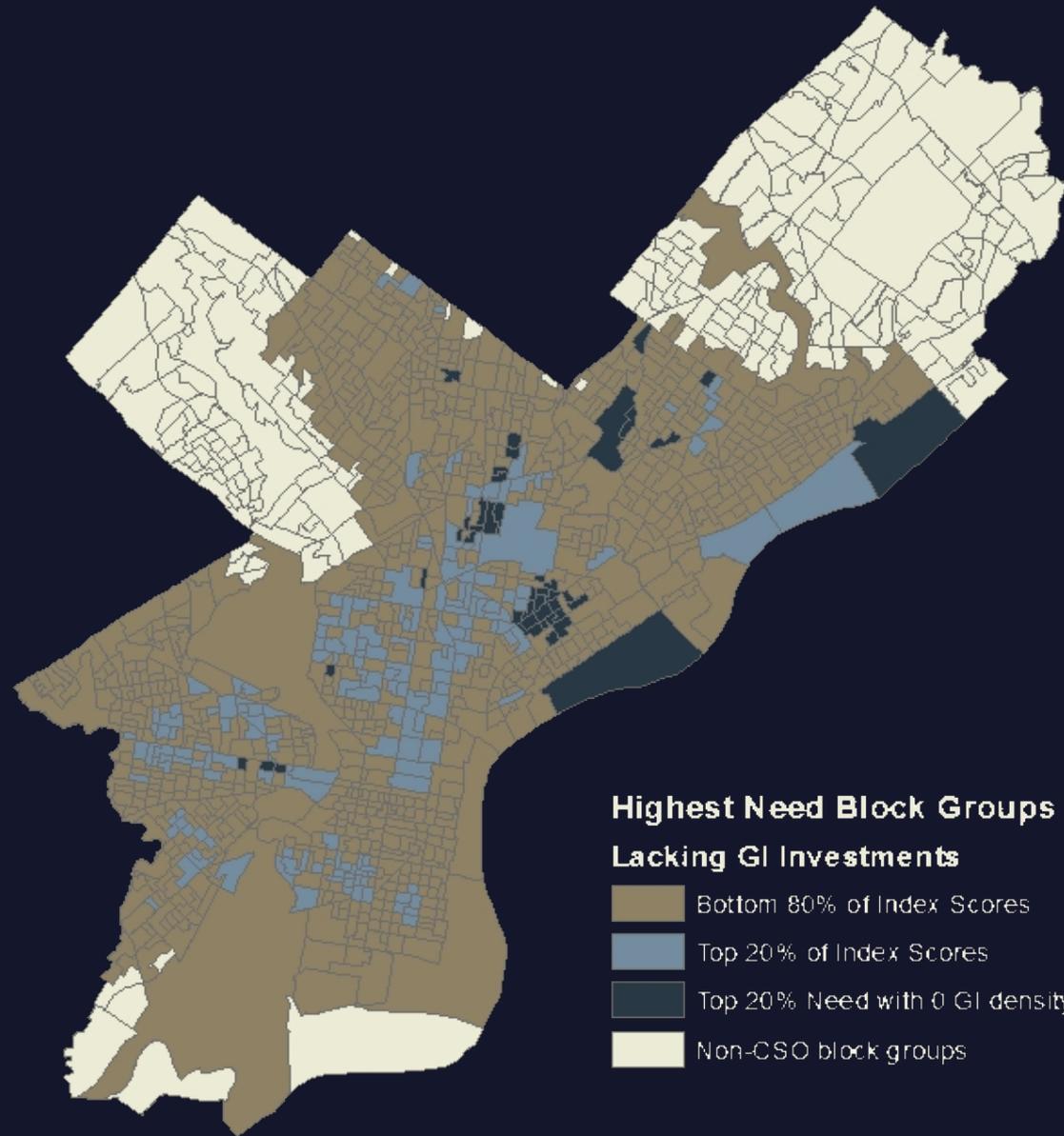
Non-vegetated installations: .002

\* $p < .05$ ; \*\* $p < .01$

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**Are there “equity voids”  
that do not currently have  
GI installations?**

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**not everyone will  
define need the same  
way**

**or**

**place the same value  
on every index variable**

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# Benefits of the Index Approach

**Change the conversation** about equity

Provide a **visual tool** that communities can use

Serves as a **flexible framework** for weighting priorities

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# Acknowledgements

- EPA – STAR grant 83555501
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