Developing a Green Infrastructure Equity Index to Promote Equity Planning

Megan Heckert, West Chester University
Christina Rosan, Temple University

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Two guiding premises...
Green infrastructure provides community benefits above and beyond stormwater runoff reductions.
Implementation of green infrastructure on a large scale requires a distributed approach.
Given that...
What would an equitable distribution of green infrastructure look like?
What if equity were about need?
How do you measure need?
need

= socio-economic conditions

+ the built environment
Building the index...
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
Step 2: Normalize indicators
Index value

= \frac{\text{block group value} - \text{minimum value}}{\text{range of values}}
Step 2:
Create composite score
How does this compare to need based on a single indicator?
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
What does this say about the distribution of GI in Philadelphia so far?
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
Are there “equity voids” that do not currently have GI installations?
not everyone will define need the same way or place the same value on every index variable
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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